Trial decision

Invalidation No. 2016-800033

Tokyo, Japan
Demandant KABUSHIKI KAISHA PILOT CORPORATION

Tokyo, Japan
Patent Attorney NAGAI, Hiroshi

Tokyo, Japan
Patent Attorney NAKAMURA, Yukitaka

Tokyo, Japan
Patent Attorney HOTTA, Yukihiro

Tokyo, Japan
Patent Attorney MAEKAWA, Hideaki

Tokyo, Japan
Patent Attorney KASHIWA, Nobuyuki

Tokyo, Japan
Attorney SUNAYAMA, Rei

Tokyo, Japan
Attorney KONDO, Keiji

Tokyo, Japan
Demandee MITSUBISHI PENCIL KABUSHIKI KAISHA

Tokyo, Japan
Patent Attorney AOKI, Atsushi

Tokyo, Japan
Patent Attorney SHIMADA, Tetsuro

Tokyo, Japan
Patent Attorney MITSUHASHI, Shinji

Tokyo, Japan
Patent Attorney ITO, Kentaro

Tokyo, Japan
Patent Attorney SEKINE, Nobuo

Tokyo, Japan

Patent Attorney SAITO, Miyako

Tokyo, Japan
Attorney HAGIO, Yasushige

Tokyo, Japan
Attorney YAMAGUCHI, Kenji

The invalidation trial regarding Patent No. 3775972, titled "OIL-BASED INK COMPOSITION AND OIL-BASED BALL-POINT PEN USING THE SAME" between the parties above has resulted in the following decision.

Conclusion

The Claims 1 and 2 of Patent No. 3775972 may be corrected according to the corrected specification attached to the correction request.

The patent of the invention according to Claim 1 of Patent No. 3775972 shall be invalidated.

The trial request concerning the invention according to Claim 2 of Patent No. 3775972 is groundless.

Demandant shall bear half the costs for trial and Demandee shall bear the remaining half.

Reason

No. 1 History of the procedures

The application of the inventions according to Claims 1 and 2 of Patent No. 3775972 (hereinafter referred to as "Patent") were filed on April 3, 2000 (claiming priority date of February 2, 2000, Japan). The Patent of the Inventions (hereinafter referred to as the "Inventions 1 and 2") was granted on March 3, 2006 (the Inventions 1 and 2 are collectively referred to as the "Invention").

Demandant requested the invalidation trial for the patents of Inventions 1 and 2 on March 9, 2016.

In response, Demandee submitted a first written correction request and a written reply on June 1, 2016, requesting a correction of the specification (hereinafter referred to as "the patent specification") attached to the application.

Demandant submitted a written refutation on July 27, 2016.

Demandant and Demandee submitted an oral proceedings statement brief on November 24, 2016.

Demandant submitted an second oral proceedings statement brief on December 13, 2016

The first oral proceeding was held on December 15, 2016.

Demandant and Demandee submitted written statements on January 12, 2017 and January 26, 2017.

The body sent a first advance notice regarding the trial decision on March 23, 2017.

In response, Demandee submitted a second written correction request and a written statementon May 26, 2017, requesting a correction of the patent specification.

Demandant submitted a written refutation on July 19, 2017.

The body notified Demandant and Demandee of a result of an examination of evidence on September 8, 2017 under the provision of Article 150(5). In reply, Demandant and Demandee submitted an opinion on October 13, 2017.

The body sent a second advance notice of a trial decision on November 22, 2017.

In response, Demandee submitted a third written correction request a written statement on January 19, 2018, requesting a correction of the patent specification.

Demandant submitted a written refutation on March 2, 2018.

As aforementioned, since Demandee submitted the written correction request on January 19, 2018 to correct the patent specification (hereinafter referred to as "Correction"), the correction requests submitted on June 1, 2016 and May 26, 2017 were deemed to be withdrawn under the provision of Article 134-2(6) of the Patent Act.

No. 2 Regarding the correction request

1 Contents of the corrections

(Body's note: The underlines in the "1 Correction" was made by Demandee.)

(1) Correction 1

The following matters are added to Claim 1: "as a pigment dispersant and viscosity-controlling agent," "said halochromic dye is selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, and Valifast Yellow 1110, and a combination thereof," "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof," "an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition," "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition," "a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition.” The decription "an oil-based ink composition of a chromatic color" is corrected to "an ink composition of a chromatic color <u>for</u> an oil-based <u>ballpoint pen</u>."

(2) Correction 2

The following matters are added to Claim 2: "said halochromic dye is selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and a combination thereof," "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof," "an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition," "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition," "a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition," and "an amount of said butyral resin is from 2 to 3% by weight on a total

weight basis of the ink composition." The description "The oil-based ballpoint pen filled with an oil-based ink composition of a chromatic color according to Claim 1." is corrected to "An oil-based ballpoint pen filled with an ink composition of a chromatic color for an oil-based ballpoint pen,

said ink composition for an oil-based ballpoint pen comprising at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a butyral resin, and not comprising an alcohol-soluble type dyes other than said halochromic dye," and "oil-based ballpoint pen."

No. 3 Judgment on the correction

1 Correction 1

Correction 1 is to specify "butyral resin," "halochromic dye of a basic dye and an organic acid," and "organic pigments" according to Claim 1 before the correction respectively as the following matters: "a butyral resin as a pigment dispersant and viscosity-controlling agent," "said halochromic dye is selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and a combination thereof," "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof," and further specify the amounts of "halochromic dye of a basic dye and an organic acid," "organic pigments," and "butyral resin" according to Claim 1 before the correction, respectively as "an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition," "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition," and "a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition," and further specify "an oil-based ink composition of a chromatic color" according to Claim 1 before the correction as "an oil-based ink composition of a chromatic color for an oil-based ballpoint pen" to specify the use of the oil-based ink composition.

Therefore, Correction 1 is intended to restrict the scope of the claims and made for the purpose specified in the item (i) of the proviso to Article 134-2(1) of the Patent Act.

Further, in this Correction 1, the Correction to specify that "a butyral resin as a pigment dispersant and viscosity-controlling agent" is based on the following description of the paragraph [0007] of the patent specification: "a butyral resin is used as a pigment dispersant and viscosity-controlling agent" (Body's note: The underline includes the one noted by the body; the same shall apply hereinafter). Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Further, in this Correction 1, the Correction to specify that "said halochromic dye is selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and a combination thereof" is based on the following description of paragraph [0010] of the patent specification: "The dye used in the present

invention is a halochromic dye of a basic dye and an organic acid.
Examples thereof include Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Red C-BH, Aizen Spilon Violet C-RH, Aizen Spilon Blue C-RH, Aizen S.B.N Blue 701, Valifast Red 1360, and Valifast Yellow 1110. These dyes each may be used alone or in a mixture of two or more kinds thereof." and the following description of the specific examples in the column of halochromic dye of a basic dye and an organic acid in the raw material name of [Table 1] of the paragraph [0033] with respect to the examples of the Invention: "Aizen Spilon Yellow C-2GH," "Aizen Spilon Yellow C-GNH," "Aizen Spilon Red C-GH," "Aizen Spilon Violet C-RH," "Valifast Red 1360 and Valifast Yellow 1110." Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Further, in this Correction 1, the correction to specify that "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof" is based on the following descriptions of paragraph [0012] of the patent specification: "the organic pigment as a blue colorant," paragraph [0016]: "the organic pigment as a red colorant," paragraph [0020]: "the organic pigment as a yellow colorant" and paragraph [0023]: "the organic pigment as a green colorant." Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Further, in this Correction 1, the correction to specify that "an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition" is based on the following description of [0010] of the patent specification: "The dye used in the present invention is a halochromic dye of a basic dye and an organic acid.
Examples thereof include Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Red C-BH, Aizen Spilon Violet C-RH, Aizen Spilon Blue C-RH, Aizen S.B.N Blue 701, Valifast Red 1360, and Valifast Yellow 1110. These dyes each may be used alone or in a mixture of two or more kinds thereof. These halochromic dyes of basic dyes and organic acids are added preferably in a range of 5 to 40% by weight on a total weight basis of the ink composition." Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from all the descriptions of the specification, and thus has been made within the scope of the patent specification.

Further, in this Correction 1, the correction to specify that "an amount of the organic pigments is 30% by weight or less on a total weight basis of the ink composition" and "wherein a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition" is based on the following description of paragraph [0026] of the patent specification: "These organic pigments each may be used alone or in a mixture of two or more kinds thereof. Furthermore, the use of butyral resin is preferable as a dispersing agent of these organic pigments. A blending amount of the coloring materials of these dyes and organic pigments in terms of the total of the dyes and the pigments falls preferably in a range of 5 to 60% by weight on a total weight basis of the ink composition, and a

blending amount of the organic pigments is preferably 30% by weight or less on a total weight basis of the ink in a combined use formulation of dyes and organic pigments." Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Furthermore, in this Correction 1, the correction to specify as "an oil-based ink composition for an oil-based ballpoint pen" is based on the following description of paragraph [0001] of the patent specification: "The present invention relates to ... (omitted)... an oil-based ink composition of a chromatic color, ... (omitted)... suited to an oil-based ballpoint pen, and a ballpoint pen using the same." and paragraph [0007] of the patent specification: "an object of the present invention is to provide an oil-based ink composition of a chromatic color ... (omitted)... suited to a ballpoint pen, and a ballpoint pen using the same." Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Therefore, Correction 1 conforms to the provision of Article 126(5) of the Patent Act as applied mutatis mutandis pursuant to Article 134-2(9) of the Patent Act.

Furthermore, Correction 1 does not substantially expand or change the invention recited in the scope of the claims before and after the correction, and thus does not substantially expand or change the scope of the claims, but Correction 1 complies with the provision of Article 126(6) of the Patent Act as applied mutatis mutandis to Article 134-2(9) of the Patent Act.

2 Correction 2

Correction 2 adds former Claim 1 to former Claim 2 and deletes citation of the other claims in former Claim 2. And further, it specifies "halochromic dye of a basic dye and an organic acid" and "organic pigments" according to Claim 1 before the correction respectively as the following matters: "said halochromic dye is selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and a combination thereof" and "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof," and further specifies the amounts of "halochromic dye of a basic dye and an organic acid," "organic pigments," and "butyral resin" according to Claim 1 before the correction, respectively as "an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition," "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition," and "a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition" and "an amount of said butyral resin is from 2 to 3% by weight on a total weight basis of the ink composition," and further replaces "filled with an oil-based ink composition of a chromatic color" according to Claim 2 before the correction with "filled with an oil-based ink composition of a chromatic color for an oil-based ballpoint pen" to specify the use of the oil-based ink composition.

Therefore, Correction 2 is a correction to make the recitation of Claim 2 before the correction, which cites the recitation of Claim 1 before the correction, independent

from the recitation of Claim 1, and corresponds to the restriction of the scope of claims. Thus the correction is made for the purpose specified in the items (i) and (iv) of the proviso to Article 134-2(1) of the Patent Act.

Further, in this Correction 2, the correction to specify that "said halochromic dye is selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and a combination thereof," "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof," and "filled with an oil-based ink composition of a chromatic color for an oil-based ballpoint pen" is based on the description of the patent specification as discussed in the above item "1." Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Further, in this Correction 2, the correction to specify that "These halochromic dyes of basic dyes and organic acids are added preferably in a range of 5 to 40% by weight on a total weight basis of the ink composition" is based on the following description of [0010] of the patent specification: "The dye used in the present invention is a halochromic dye of a basic dye and an organic acid.
Examples thereof include Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Red C-BH, Aizen Spilon Violet C-RH, Aizen Spilon Blue C-RH, Aizen S.B.N Blue 701, Valifast Red 1360, and Valifast Yellow 1110. These dyes each may be used alone or in a mixture of two or more kinds thereof. These halochromic dyes of basic dyes and organic acids are added preferably in a range of 5 to 40% by weight on a total weight basis of the ink composition." Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Further, in this Correction 2, the correction to specify that "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition" and "a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition" is based on the following description of the paragraph [0026] of the patent specification: "These organic pigments each may be used alone or in a mixture of two or more kinds thereof. Furthermore, the use of butyral resin is preferable as a dispersing agent of these organic pigments. A blending amount of the coloring materials of these dyes and organic pigments in terms of the total of the dyes and the pigments falls preferably in a range of 5 to 60% by weight on a total weight basis of the ink composition, and a blending amount of the organic pigments is preferably 30% by weight or less on a total weight basis of the ink." Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Furthermore, in this Correction 2, the correction to specify that "an amount of said butyral resin is from 2 to 3% by weight on a total weight basis of the ink composition" is based on the following description of one butyral resin "S-LEC B BL-1" (Example 1) as a raw material name of [Table 1] of paragraph [0033] of the patent

specification and "2.0" in the column of weight parts of "Denka Butyral #2000-L" (Example 2), and "3.0" in the column of weight parts of "S-LEC B BX-L" (Example 3). Thus the Correction does not introduce any new technical matters in relation to the technical matters derived from the whole disclosure of the specification, and thus has been made within the scope of the patent specification.

Therefore, Correction 2 conforms to the provision of Article 126(5) of the Patent Act as applied mutatis mutandis pursuant to Article 134-2(9) of the Patent Act.

Furthermore, Correction 2 does not substantially expand or change the invention recited in the scope of the claims before and after the correction, and thus does not substantially expand or change the scope of the claims, but complies with the provision of Article 126(6) of the Patent Act as applied mutatis mutandis to Article 134-2(9) of the Patent Act.

3 Regarding a group of claims

Regarding Claims 1 to 2 before the correction according to Corrections 1 to 2, Claim 2 refers to Claim 1, which corresponds to Article 45-4 of Regulations under the Patent Act, and thus complies with the provision of Article 134-2(3) of the Patent Act.

4 Independently patentable at the time of filing of the patent application

In the invalidation trial case, Claims 1 and 2 before the correction are subjected to a trial for patent invalidation. Therefore, the independent requirements for patentability of Article 126(7) of the Patent Act as applied mutatis mutandis by replacing certain terms pursuant to Article 134-2(9) of the Patent Act shall not apply to Corrections 1 and 2 according to Claims 1 and 2 before the correction.

5 Summary of correction request

As described above, the correction made to a unit of claims consisting of Claims 1 and 2 according to the Correction of the case is aiming at the matter listed in items (i) and (iv) of the proviso to Article 134-2(1) of the Patent Act, and complies with the provision of Articles 126(5) to (6) of the Patent Act as applied mutatis mutandis pursuant to Article 134-2(9) of the Patent Act. Therefore, the correction should be accepted.

No. 4 The inventions relating to the Patent

The correction shall be accepted as mentioned in the above "No. 3." Therefore, the respective inventions according to Claims 1 to 2 of the Patent should be specified as in the following by the matters respectively recited in Claims 1 to 2 of the scope of the claims of the corrected specification.

Additionally, the inventions according to Claims 1 and 2 of the Patent are respectively referred to as "Invention 1" and "Invention 2" according to the corresponding claim number. Further, Inventions 1 and 2 are collectively referred to as "the Invention." Further, the corrected specification of the Patent is referred to as "the specification."

"[Claim 1]

An oil-based ink composition of a chromatic color, the ink composition comprising at least a halochromic dye of a basic dye and an organic acid, an organic

pigment, and a butyral resin as a pigment dispersant and viscosity-controlling agent, and not comprising an alcohol-soluble type dyes other than halochromic dye,

wherein said halochromic dye is selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and a combination thereof,

wherein said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof,

wherein an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition,

wherein an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition,

wherein a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition.

[Claim 2]

An oil-based ballpoint pen filled with an oil-based ink composition of a chromatic color,

wherein said oil-based ink composition for ballpoint pen comprises at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a butyral resin, and does not comprise an alcohol-soluble type dyes other than halochromic dye,

wherein said halochromic dye is selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and a combination thereof,

wherein said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof,

wherein an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition,

wherein an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition,

wherein a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition, and

wherein an amount of said butyral resin is from 2 to 3% by weight on a total weight basis of the ink composition."

No. 5 Reasons for invalidation and Means of proof argued by Demandant

Demandant requested a trial decision to the effect that "the patents regarding the inventions according to Claims 1 and 2 of the scope of claims of Patent No. 3775972 shall be invalidated. The costs for trial shall be borne by Demandee," and submitted the following documentary evidence as a means of proof, and argued that the Patent should be invalidated under the provision of Article 123(1)(iv) of the Patent Act (Reason 1 for invalidation), and should be invalidated under the provision of Article 123(ii) of the Patent Act (Reason 2 and Reason 3).

The summary of the reasons 1 to 3 for Invalidation is in the following.

1 Reasons 1 for Invalidation (Violation of the description requirement)
(1) (Violation of the support requirement)
The Inventions 1 and 2 are not described in the Detailed Description of the Invention, and thus the patent application fails to comply with the requirement of Article 36(6)(i) of the Patent Act, and thus the patents correspond to the provision of Article 123(1)(iv) of the Patent Act and thus should be invalidated.

(2) (Violation of Ministerial Ordinance Requirement) Regarding Inventions 1 and 2, the specification fails to sufficiently describe matters necessary for a person who has an ordinary knowledge in the technical field to which the invention belongs to understand a technical significance of the invention, wherein the matters include a problem to be solved by the invention and a means for solving the problem. Therefore, the patent application does not comply with the Ministerial Ordinance Requirement of Article 36(4) of the Patent Act before the revision by the Act No. 24 of 2002 (hereinafter simply referred to as "Article 36(4) of the Patent Act"), and the patent corresponds to the provision of Article 123(1)(iv) of the Patent Act and thus should be invalidated.

In addition, Demandant titles "Violation of enablement requirement" in the written demand; however, exclusively argues about so-called "Violation of Ministerial Ordinance Requirement," according to the description on page 14 of the written demand. Therefore, it was found to be "Violation of Ministerial Ordinance Requirement" as described above.

2 Reasons 2 for invalidation (Lack of novelty)
(1) Inventions 1 to 2 are identical to the inventions described in Evidence A No. 1. Thus these inventions are not patentable under the provision of Article 29(1)(iii) of the Patent Act. Consequently, the patents correspond to the inventions specified in Article 123(1)(ii) of the Patent Act and should be invalidated.

(2) Inventions 1 to 2 are identical to the inventions described in Evidence A No. 2. Thus these inventions are not patentable under the provision of Article 29(1)(iii) of the Patent Act. Consequently, the patents correspond to the inventions specified in Article 123(1)(ii) of the Patent Act and should be invalidated.

(3) Inventions 1 to 2 are identical to the inventions described in Evidence A No. 3. Thus these inventions are not patentable under the provision of Article 29(1)(iii) of the Patent Act. Consequently, the patents for these inventions correspond to the inventions specified in Article 123(1)(ii) of the Patent Act and should be invalidated.

(4) Inventions 1 to 2 are identical to the inventions described in Evidence A No. 4. Thus these inventions are not patentable under the provision of Article 29(1)(iii) of the Patent Act. Consequently, the patents correspond to the inventions specified in Article 123(1)(ii) of the Patent Act and should be invalidated.

3 Reasons 3 for invalidation (Lack of Inventive Step)
(1) Inventions 1 and 2 were easily conceivable by a person skilled in the art on the basis of the invention described in Evidence A No. 1 and the descriptions of Evidence A No.

1 to No. 9 before filing the application of the patent, and thus could not be granted a patent under the provision of Article 29(2) of the Patent Act. Consequently, the patents correspond to the provision of Article 123(1)(ii) of the Patent Act and should be invalidated.

(2) Inventions 1 and 2 were easily conceivable by a person skilled in the art on the basis of the invention described in Evidence A No. 2 and the descriptions of Evidence A No. 2 to No. 8 before filing the application of the patent, and thus could not be granted a patent under the provision of Article 29(2) of the Patent Act. Consequently, the patent corresponds to the provision of Article 123(1)(ii) of the Patent Act and should be invalidated.

(3) Inventions 1 and 2 were easily conceivable by a person skilled in the art on the basis of the invention described in Evidence A No. 3 and the descriptions of Evidence A No. 2 to No. 8 before filing the application of the patent, and thus could not be granted a patent under the provision of Article 29(2) of the Patent Act. Consequently, the patent corresponds to the provision of Article 123(1)(ii) of the Patent Act and should be invalidated.

(4) Inventions 1 and 2 were easily conceivable by a person skilled in the art on the basis of the invention described in Evidence A No. 4 and the descriptions of Evidence A No. 2 to No. 8 before filing the application of the patent, and thus could not be granted a patent under the provision of Article 29(2) of the Patent Act. Consequently, the patent corresponds to the provision of Article 123(1)(ii) of the Patent Act and should be invalidated.

4 Means of Proof
Evidence A No. 1: Japanese Unexamined Patent Application Publication No. H09-272251
Evidence A No. 2: Japanese Unexamined Patent Application Publication No. H06-157966
Evidence A No. 3: Japanese Unexamined Patent Application Publication No. H11-293174
Evidence A No. 4: Japanese Unexamined Patent Application Publication No. H10-60356
Evidence A No. 5: Japanese Unexamined Patent Application Publication No. H04-342777
Evidence A No. 6: Japanese Unexamined Patent Application Publication No. H05-279615
Evidence A No. 7: Japanese Unexamined Patent Application Publication No. H08-199105
Evidence A No. 8: Japanese Unexamined Patent Application Publication No. H11-343444
Evidence A No. 9: Japanese Unexamined Patent Application Publication No. H10-120962
Evidence A No. 10: The notice of reasons for refusal of the corresponding U.S. patent application (No. 10/182570) (with translation)

Evidence B No. 11: The written amendment and the written opinion of the corresponding U.S. patent application (No. 10/182570) (with translation)
Evidence A No. 12: Japanese Unexamined Patent Application Publication No. 2004-107596
Evidence A No. 13: Japanese Unexamined Patent Application Publication No. 2000-25673
Evidence A No. 14: Japanese Unexamined Patent Application Publication No. 2001-279154
Evidence A No. 15: International Publication No. WO2002-24821
Evidence A No. 16: International Publication No. WO2001-74956
Evidence A No. 17: Japanese Unexamined Patent Application Publication No. 2001-123101
Evidence A No. 18: Japanese Unexamined Patent Application Publication No. H11-12518
Evidence A No. 19: Certificate of experimental results (prepared on November 15, 2016 by Demandant of PILOT CORPORATION)
Evidence A No. 19-2: Certificate of experimental results (prepared on December 9, 2016 by Demandant of PILOT CORPORATION)
Evidence A No. 19-3: Certificate of experimental results (prepared on January 11, 2017 by Demandant of PILOT CORPORATION)
Evidence A No. 20: A website of Musashino Art University
http://zokeifile.musabi.ac.jp/wpwp/wp-content/uploads/2014/08/229_chromatic-and-achromatic-colors.pdf
Evidence A No. 21: A website of KOTOBANK
https://kotobank.jp/word/%E7%84%A1%E5%BD%A9%E8%89%B2-140389
(Searched on July 18, 2017)
Evidence A No. 22: General Catalog of MITSUBISHI Pencil 2000
Evidence A No. 23: Japanese Unexamined Patent Application Publication No. 2001-271018
Evidence A No. 24: A written statement (prepared on February 28, 2018 by Demandant of PILOT CORPORATION)

No. 6 Demandee's allegation and means of proof

Demandee seeks for the trial decision to the effect that "The trial of the case was groundless. The costs in connection with the trial shall be borne by Demandant," and argues that none of Reasons 1 to 3 for invalidation described in the above item "No. 5, 1 to 3" was groundless, and submits the following means of proof:

Evidence B No. 1 and B No. 1-1: Toshihiko NAKAMICHI, "Yokuwakaru Ganryo Bunsan," First edition, second printing, cover page, pages 18, 19, 28 to 33, 56 to 65, and 70 to 71, colophon, published by NIKKAN KOGYO SHIMBUN, LTD., April 15, 2011
Evidence B No. 1-2: Toshihiko NAKAMICHI, "Yokuwakaru Ganryo Bunsan," First edition, third print, pages 20 and 21, colophon, published by NIKKAN KOGYO SHIMBUN, LTD., June 20, 2012
Evidence B No. 2: Certificate of experimental results (prepared on November 22, 2016 by Demandee of Mitsubishi Pencil Co., Ltd.)
Evidence B No. 3-1: Japanese Unexamined Patent Application Publication No. 2000-

26784
Evidence B No. 3-2: Japanese Unexamined Patent Application Publication No. H11-116879
Evidence B No. 3-3: Japanese Unexamined Patent Application Publication No. H11-92706
Evidence B No. 3-4: Japanese Unexamined Patent Application Publication No. H10-251587
Evidence B No. 3-5: Japanese Unexamined Patent Application Publication No. H10-60356
Evidence B No. 3-6: Japanese Unexamined Patent Application Publication No. H9-217037
Evidence B No. 3-7: Japanese Unexamined Patent Application Publication No. H9-48941
Evidence B No. 3-8: Japanese Unexamined Patent Application Publication No. H9-111177
Evidence B No. 3-9: Japanese Unexamined Patent Application Publication No. H9-78020
Evidence B No. 3-10: Japanese Unexamined Patent Application Publication No. H9-71748
Evidence B No. 3-11: Japanese Unexamined Patent Application Publication No. H11-246812
Evidence B No. 3-12: Japanese Unexamined Patent Application Publication No. H11-100539
Evidence B No. 3-13: Japanese Unexamined Patent Application Publication No. H11-21495
Evidence B No. 3-14: Japanese Unexamined Patent Application Publication No. H10-245518
Evidence B No. 3-15: Japanese Unexamined Patent Application Publication No. H10-95948
Evidence B No. 3-16: Japanese Unexamined Patent Application Publication No. H10-130562
Evidence B No. 3-17: Japanese Unexamined Patent Application Publication No. H10-36745
Evidence B No. 3-18: Japanese Unexamined Patent Application Publication No. H9-316381
Evidence B No. 3-19: Japanese Unexamined Patent Application Publication No. H9-235503
Evidence B No. 3-20: Japanese Unexamined Patent Application Publication No. H9-176552
Evidence B No. 3-21: Japanese Unexamined Patent Application Publication No. H9-12959
Evidence B No. 3-22: Japanese Unexamined Patent Application Publication No. H9-12958
Evidence B No. 3-23: Japanese Unexamined Patent Application Publication No. H8-319446
Evidence B No. 3-24: Japanese Unexamined Patent Application Publication No. H8-302265

Evidence B No. 3-25: Japanese Unexamined Patent Application Publication No. H7-196972
Evidence B No. 3-26: Japanese Unexamined Patent Application Publication No. H1-275678
Evidence B No. 3-27: Japanese Unexamined Patent Application Publication No. H6-271804
Evidence B No. 3-28: Japanese Unexamined Patent Application Publication No. H6-157971
Evidence B No. 3-29: Japanese Unexamined Patent Application Publication No. H11-335614
Evidence B No. 3-30: Japanese Unexamined Patent Application Publication No. H11-21494
Evidence B No. 3-31: Japanese Unexamined Patent Application Publication No. H9-194783
Evidence B No. 3-32: Japanese Unexamined Patent Application Publication No. H9-169941
Evidence B No. 3-33: Japanese Unexamined Patent Application Publication No. H8-192594
Evidence B No. 3-34: Japanese Unexamined Patent Application Publication No. H8-134392
Evidence B No. 3-35: Japanese Unexamined Patent Application Publication No. H8-85772
Evidence B No. 3-36: Japanese Unexamined Patent Application Publication No. H6-313144
Evidence B No. 3-37: Japanese Unexamined Patent Application Publication No. H6-313143
Evidence B No. 3-38: Japanese Unexamined Patent Application Publication No. H6-247093
Evidence B No. 3-39: Japanese Unexamined Patent Application Publication No. H6-248216
Evidence B No. 3-40: Japanese Unexamined Patent Application Publication No. H6-248215
Evidence B No. 3-41: Japanese Unexamined Patent Application Publication No. S60-90276
Evidence B No. 4-1: Material Safety Data Sheet (MSDS) (AIZEN Spilon Violet C-RH)(prepared on May 7, 2012)
Evidence B No. 4-2: Material Safety Data Sheet (MSDS) (AIZEN Spilon Yellow C-2GH)(revised on November 12, 2001)
Evidence B No. 4-3: Material Safety Data Sheet (MSDS) (AIZEN Spilon Yellow C-GNH New)(prepared on July 10, 2009)
Evidence B No. 4-4: Material Safety Data Sheet (MSDS) (Valifast Yellow 1110)(prepared and revised on January 31, 2001)
Evidence B No. 4-5: Material Safety Data Sheet (MSDS) (Aizen Spilon Red C-GH)(prepared on July 10, 2009)
Evidence B No. 4-6: Material Safety Data Sheet (MSDS) (Valifast Red 1360)(Revised on March 17, 2004)
Evidence B No. 4-7: Material Safety Data Sheet (MSDS) (AIZEN S.B.N.

Blue701)(prepared on July 10, 2009)
Evidence B No. 4-8: Material Safety Data Sheet (MSDS) (AIZEN Spilon Blue C-RH)(prepared on May 7, 2012)
Evidence B No. 4-9: Material Safety Data Sheet (MSDS) (AIZEN S.B.N. Yellow530)(Revised on November 12, 2001)
Evidence B No. 4-10: Material Safety Data Sheet (MSDS) (Valifast Blue 1603)(prepared and revised on October 12, 2000)
Evidence B No. 4-11: Material Safety Data Sheet (MSDS) (Valifast Red 1355)(Revised on February 10, 2015)
Evidence B No. 4-12: Material Safety Data Sheet (MSDS) (AIZEN S.P.T. Yellow 510)(prepared on December 1, 2007)
Evidence B No. 4-13: Material Safety Data Sheet (MSDS) (AIZEN S.P.T. Blue111)(prepared on July 10, 2009)
Evidence B No. 4-14: Registration of CAS 63428-00-2, A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on November 15, 2016)
Evidence B No. 4-15: Registration of CAS 94481-55-7, A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on November 15, 2016)
Evidence B No. 4-16: Registration of CAS 115728-93-3, A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on November 15, 2016)
Evidence B No. 4-17: Registration of CAS 108512-51-2, A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on November 15, 2016)
Evidence B No. 4-18: Registration of CAS 547-57-9, A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on November 15, 2016)
Evidence B No. 4-19: Registration of CAS 1934-21-0, A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on November 15, 2016)
Evidence B No. 4-20: Registration of CAS 6375-55-9, A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on November 15, 2016)
Evidence B No. 4-21: "Orient Chemical Industry Co. Ltd. 2010" (Products catalog of Orient Chemical Industry Co. Ltd., prepared on October 1, 2009), Cover page, pages 7 to 9
Evidence B No. 4-22: Japanese Unexamined Patent Application Publication No. H8-48924
Evidence B No. 4-23: Japanese Unexamined Patent Application Publication No. 2003-305985
Evidence B No. 4-24: Japanese Unexamined Patent Application Publication No. H8-134393
Evidence B No. 4-25: Japanese Unexamined Patent Application Publication No. 2002-12806
Evidence B No. 4 -26: United States Patent No. 3912520 Specification and partial translation

Evidence B No. 4-27: Japanese Unexamined Patent Application Publication No. H8-73786
Evidence B No. 4-28: "Colour Index International Pigments and Solvent Dyes," The Society of Dayers and Colourists, 1997, cover page, pp.200, 201, 222, 223, 226-229, 240-243, 248-255, 268-273, and partial translation
Evidence B No. 4-29: Edited by The Society of Synthetic Organic Chemistry, "New Edition Dye Handbook," pages 540, 541, 546, 547, 554, 555, 840, 841, 846, 847, 852 to 857, 860 to 867, 870, 871, 874 to 878, colophon, published by Maruzen publishing Co., Ltd., July 20, 1970
Evidence B No. 5-1: Japanese Unexamined Patent Application Publication No. H9-78021
Evidence B No. 5-2: Japanese Unexamined Patent Application Publication No. H8-134391
Evidence B No. 6-1: Material Safety Data Sheet (MSDS) (AIZEN S.P.T. RED533)(Revised on October 11, 2001)
Evidence B No. 6-2: Registration of Official Gazette Publication Reference Number (Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture) (5)-1947 (CAS 989-38-8), A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on January 12, 2017)
Evidence B No. 6-3: Registration of Official Gazette Publication Reference Number (Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture) (5)-4325 (CAS 61814-58-2), A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on January 12, 2017)
Evidence B No. 6-4: A website of World dye variety http://www.worlddyevariety.com/acid-dyes/acid-red-362.html) (searched on January 12, 2017)
Evidence B No. 7: Makoto OHGAWARA and others, "Handbook of dyes," First printing, pages 30 to 31, colophon, published by Kodansha Ltd. on March 20, 1986
Evidence B No. 8: PENTEL CO., LTD., "Chemistry and materials of pens and pencils," First Edition, First print, cover page, pages 44 to 65, colophon, published by Grace laboratory PLC on January 20, 1995
Evidence B No. 9: "Latest Pigments dispersion technique," pages 219 to 231, published by TECHNICAL INFORMATION INSTITUTE CO., LTD on January 16, 1993
Evidence B No. 10: "Latest Stirring, Mixing, Kneading, Dispersing techniques," cover page, pages 296, 297, 308 to 309, colophon, published by REALIZE Science & Engineering on November 29, 1991
Evidence B No. 11: "Investigation of dispersion and aggregation and application technique," First edition, first printing, pages 238 to 241 and 246 to 259, colophon, published by Kabushikigaisha Techno System on June 19, 1992
Evidence B No. 12: Registration of Official Gazette Publication Reference Number (Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture) (4)-970 (CAS 63428-04-6), A website of National Institute of Technology and Evaluation, URL: http://www.nite.go.jp (searched on January 12, 2017)
Evidence B No. 13: A search result of STN database of CAS number 63428-04-6 (searched on January 20, 2017) and a partial translation thereof
Evidence B No. 14: "Encyclopedia of Pigments," universal edition, second printing, page 438, colophon, published by Asakura Publishing Co., Ltd. on January 25, 2012
Evidence B No. 15: "Handbook of color material engineering," New Edition, First

printing, page 236, colophon, published by Asakura Publishing Co., Ltd. on October 10, 2008

No. 7 Judgment by the body

The body determines that the patent regarding Invention 1 should be invalidated due to Reasons 1 for invalidation, but the patent regarding Invention 2 should not be invalidated since none of Reasons 1 to 3 has a point. The reason is set forth below.

1 The Invention

The invention is set forth as in the above "No. 4."

2 Regarding Evidence

(1) Matters described in Evidence A No. 1

Evidence A No. 1 (Japanese Unexamined Patent Application Publication No. H9-272251) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 1 discloses the following matters:

[1-A] "[Scope of the claims]

[Claim 1] A multi-color stamp consisting of one kind of vehicle, a coloring agent consisting of two color or more of inks and a porous print body with a single rubber elasticitiy in which an ink mixture fluid of said vehicle and said coloring agent is absorbed."

[1-B] "[0001]

[Technical Field of the Invention] The present invention relates to a multi-color stamp capable of stamping with two or more colors."

[1-C] "[0003]

[Problem to be solved by the invention] Accordingly, the present invention has an objective to provide a brand new multiple-color stamp capable of absorbing different inks in multiple colors into a single printing body, and fully expressing a pattern of a seal without compromising the continuity of the pattern, and further capable of expressing a complex pattern."

[1-D] "[0006]

[Mode(s) for carrying out the invention] According to the present invention, the coloring agent comprises at least pigments, and as necessary dyes are added to the coloring agent. Specifically, a major component of the coloring agent is a pigment, and dyes are added as a complementary color. In the present invention, pigments and dyes to be used for a coloring agent may be pigments and dyes commonly used for pens and pencils.

[0007] Pigments may include inorganic pigments or organic pigments such as titanium oxide, carbon black, phthalocyanine-based, azo-based, anthraquinone-based, and quinacridone-based organic pigments, or processed pigments in which these pigments and resins are subjected to surface modification with surfactants.

[0008] Further, dyes may include soluble ones or microcapsules as well as basic dyes and acidic dyes and direct dyes. Dyes may include, for example, in addition to the dyes used in the following examples, "Valifast Black#1802," "Valifast Black#1805,"

"Valifast Black#3820," "Valifast Violet#1701," "Valifast YellowAUM," and "Valifast Yellow#3104," which are manufactured by Orient Chemical Industries Co., Ltd., and "Spilon Violet C-RH," "Spilon Black CMH special," "Spilon Yellow C-GNH," "Spilon Orange GRH," and "Spilon Red BEH," which are manufactured by Hodogaya Chemical Co., Ltd., auramine, and rhodamine."

[1-E] "[0010] An ink component of vehicles other than the above colorant is composed of one dispersive resin and one or two or more solvents. Dispersive resin used herein may include polyvinyl butyral resin and ethylcellulose resin. Further, the solvent includes glycols such as octylene glycol, polyalkyleneglycols such as polyethylene glycol and polypropylene glycol, glycol ethers such as diethyleneglycolmonobutylether, fatty acid esters such as ethylene glycol monoricinoleate and propylene glycol monoricinoleate, castor oil fatty acid methyl esters, oleic acid polyoxyethyleneglycol monoether, and oleic acid polyoxypropyleneglycol monoether. Further, if needed, it may include components other than the above, for example, resins, surfactants, preservatives, and dispersion aids."

[1-F] "[0013]
[Example(s)]
(Example 1) Into a single printing body made of sponge rubber (interconnected cell sponge of NBR with a volume average pore diameter of 5 μm) there were absorbed a red ink A and a blue ink A to manufacture a multi-color stamp of Example 1. ... (omitted)...
[0014] Note that pigment A was "Fast red #2200" manufactured by Fuji Pigment Co., LTD., and pigment B was "chromophthal blue A3R" manufactured by CIBA-GEIGY. Further, dispersive resin A was polyvinyl butyral resin "BL-1" manufactured by SEKISUI CHEMICAL CO., LTD., and solvent A was propylene glycol monoricinoleate "PGMR" manufactured by ITOH OIL CHEMICALS CO., LTD., and solvent C was polyoxypropyleneglycol monoether "LB-65" manufactured by Sanyo Chemical Industries, Ltd. Note that the pigment A, pigment B, dispersive resin A, solvent A, and solvent C used in the following examples and comparative examples were the same as above."

[1-G] "[0017] Example 3
Similarly, into a single printing body as mentioned above there were absorbed a red ink C and a blue ink C to manufacture a multi-color stamp of Example 3. The composition of this red ink C and blue ink C was set forth as in the following. A combination of pigments and dyes was used as a coloring agent. Note that vehicles, which were the ink components other than pigments A and B and dyes A, B, and C in the red ink C and the blue ink C, were the same. Specifically, the vehicles used respectively for red ink C and blue ink C were the same.
Composition of red ink C

Pigment A	10 (weight %)
Dye A	1.5
Dye B	3.5
Dispersive resin A	3
Solvent A	52

Solvent C 30
Composition of blue ink C
Pigment B 10 (weight %)
Dye C 5
Dispersive resin A 3
Solvent A 52
Solvent C 30
[0018] Note that Dye A used herein was "Spilon Yellow C-BH" manufactured by Hodogaya Chemical (Body's note: A consideration is given hereinafter supposing that this be a typographical error of "Spilon Yellow C-GNH"). Dye B was "Spilon red C-BH" manufactured by Hodogaya Chemical Co., Ltd., and Dye C was "Oil blue 613" manufactured by Orient Chemical Industries Co., Ltd. Note that the dye A, dye B, and dye C used in the following examples and comparative examples were the same as above."

[1-H] "[0024] Regarding the respective inks of the above Examples 1 to 4 and Comparative Examples 1 to 4, an evaluation test was conducted for the precipitation of the solid content of the inks and the aggregation of pigments. The evaluation test for precipitation of a solid content of the inks was conducted by observing a surface of a pattern of a seal surface of a printing body, sealing, and examining whether or not the solid content was precipitated. Further, the evaluation test for the aggregation of pigments was conducted by sampling an ink from a printing body and measuring viscosity and particle size. Both tests were conducted after absorbing an ink into the printing body and leaving for one-month under circumstances with 50°C and a humidity of 80%. As a result, the multicolor stamps of Examples 1 to 4 did not show the precipitation of solid content of inks or the aggregation of pigments, but the multicolor stamps of Comparative Examples 1 to 4 did show the precipitation of solid content of inks and the aggregation of pigments."

(2) The invention described in Evidence A No. 1
A Evidence A No. 1 describes an ink composition for multi-color stamp ([1-A] to [1-C], [1-G]).

B Further, Evidence A No. 1 describes a composition of red ink C for multi-color stamp comprising pigment A (10% by weight), dye A (1.5% by weight), dye B (3.5% by weight), dispersive resin A (3% by weight), solvent A (52% by weight), and solvent C (30% by weight) ([1-G]) in Example 3. Here, pigment A, dye A, dye B, dispersive resin A, solvent A, and solvent C are respectively "Fast red #2200" manufactured by Fuji Pigment Co., LTD, "Spilon Yellow C-GNH" manufactured by Hodogaya Chemical Co., Ltd., "Spilon red C-BH" manufactured by Hodogaya Chemical Co., Ltd., polyvinyl butyral resin ("BL-1" manufactured by SEKISUI CHEMICAL CO., LTD.), propylene glycol monoricinoleate ("PGMR" manufactured by ITOH OIL CHEMICALS CO., LTD.), and polyoxypropyleneglycol monoether ("LB-65" manufactured by Sanyo Chemical Industries, Ltd.) ([1-F], [1-G]). Further, the "composition of red ink C for multicolor stamp" may be converted into "ink composition for red stamp." Therefore, it can be said that Evidence A No. 1 describes "a composition of red ink C for multicolor stamp, the composition consisting of 'Fast red #2200' manufactured by Fuji Pigment Co.,

LTD (10% by weight), 'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd. (1.5% by weight), 'Spilon red C-BH' manufactured by Hodogaya Chemical Co., Ltd. (3.5% by weight), polyvinyl butyral resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.) (3% by weight), propylene glycol monoricinoleate ('PGMR' manufactured by ITOH OIL CHEMICALS CO., LTD.) (52% by weight), and polyoxypropyleneglycol monoether ('LB-65' manufactured by Sanyo Chemical Industries, Ltd.) (30% by weight)".

Here, it can be seen from "Dispersive resin used herein may include polyvinyl butyral resin ... (omitted)..." in the above [1-E] of Evidence A No. 1 that the above "polyvinyl butyral resin" serves "as a dispersive resin."

C Further, adding up the weight percents of each component of the above "B" of "'Fast red #2200' manufactured by Fuji Pigment Co., LTD (10% by weight), 'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd. (1.5% by weight), 'Spilon red C-BH' manufactured by Hodogaya Chemical Co., Ltd. (3.5% by weight), polyvinyl butyral resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.) (3% by weight), propylene glycol monoricinoleate ('PGMR' manufactured by ITOH OIL CHEMICALS CO., LTD.) (52% by weight), and polyoxypropyleneglycol monoether ('LB-65' manufactured by Sanyo Chemical Industries, Ltd.) (30% by weight)", it amounts to 100% by weight. Therefore, the above "% by weight" noted in each component is found to be a proportion on a total weight basis of an ink composition for red stamp. It can also be said that "the amount of 'Fast red #2200' manufactured by Fuji Pigment Co., LTD is 10% by weight on a total weight basis of the ink composition, the amount of 'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd. is 1.5% by weight on a total weight basis of the ink composition, the amount of 'Spilon red C-BH' manufactured by Hodogaya Chemical Co., Ltd. is 3.5% by weight on a total weight basis of the ink composition, the amount of polyvinyl butyral resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.) is 3% by weight on a total weight basis of the ink composition, the amount of propylene glycol monoricinoleate ('PGMR' manufactured by ITOH OIL CHEMICALS CO., LTD.) is 52% by weight on a total weight basis of the ink composition, and the amount of polyoxypropyleneglycol monoether ('LB-65' manufactured by Sanyo Chemical Industries, Ltd.) is 30% by weight on a total weight basis of the ink composition."

D Further, as a solvent A and a solvent C included in an ink composition for red stamp of Example 3 of Evidence A No. 1, "propylene glycol monoricinoleate ('PGMR' manufactured by ITOH OIL CHEMICALS CO., LTD.)" and "polyoxypropyleneglycol monoether ('LB-65' manufactured by Sanyo Chemical Industries, Ltd.)" are used. These are organic solvents, and it can thus be said that the "ink composition for red stamp" is "oil-based."

E Furthermore, Evidence A No. 1 describes an oil-based stamp that absorbs an ink composition for red stamp of Example 3 ([1-F], [1-G]).

F As described above, Evidence A No. 1 describes

"an ink composition of red color for oil-based stamp comprising 'Fast red #2200'

manufactured by Fuji Pigment Co., LTD, 'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd., 'Spilon red C-BH' manufactured by Hodogaya Chemical Co., Ltd., polyvinyl butyral resin as a dispersive resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.), propylene glycol monoricinoleate ('PGMR' manufactured by ITOH OIL CHEMICALS CO., LTD.), and polyoxypropyleneglycol monoether ('LB-65' manufactured by Sanyo Chemical Industries, Ltd.),

wherein an amount of 'Fast red #2200' manufactured by Fuji Pigment Co., LTD is 10% by weight on a total weight basis of the ink composition,

wherein an amount of 'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd. is 1.5% by weight on a total weight basis of the ink composition,

wherein an amount of 'Spilon red C-BH' manufactured by Hodogaya Chemical Co., Ltd. is 3.5% by weight on a total weight basis of the ink composition,

wherein an amount of butyral resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.) is 3% by weight on a total weight basis of the ink composition,

wherein an amount of propylene glycol monoricinoleate ('PGMR' manufactured by ITOH OIL CHEMICALS CO., LTD.) is 52% by weight on a total weight basis of the ink composition, and

wherein an amount of polyoxypropyleneglycol monoether ('LB-65' manufactured by Sanyo Chemical Industries, Ltd.) is 30% by weight on a total weight basis of the ink composition." (hereinafter referred to as "A1 invention 1") and

an invention of "An oil-based stamp that absorbs an ink composition for an oil-based red stamp,

wherein an ink composition for an oil-based red stamp comprising 'Fast red #2200' manufactured by Fuji Pigment Co., LTD, 'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd., 'Spilon red C-BH' manufactured by Hodogaya Chemical Co., Ltd., polyvinyl butyral resin as a dispersive resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.), and propylene glycol monoricinoleate ('PGMR' manufactured by ITOH OIL CHEMICALS CO., LTD.), polyoxypropyleneglycol monoether ('LB-65' manufactured by Sanyo Chemical Industries, Ltd.),

wherein an amount of 'Fast red #2200' manufactured by Fuji Pigment Co., LTD is 10% by weight on a total weight basis of the ink composition,

wherein an amount of 'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd. is 1.5% by weight on a total weight basis of the ink composition,

wherein an amount of 'Spilon red C-BH' manufactured by Hodogaya Chemical Co., Ltd. is 3.5% by weight on a total weight basis of the ink composition,

wherein an amount of butyral resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.) is 3% by weight on a total weight basis of the ink composition,

wherein an amount of propylene glycol monoricinoleate ('PGMR' manufactured by ITOH OIL CHEMICALS CO., LTD.) is 52% by weight on a total weight basis of the ink composition, and

wherein an amount of polyoxypropyleneglycol monoether ('LB-65' manufactured by Sanyo Chemical Industries, Ltd.) is 30% by weight on a total weight basis of the ink composition." (hereinafter referred to as "A1 invention 2".)

(3) Matters described in Evidence A No. 2

Evidence A No. 2 (Japanese Unexamined Patent Application Publication No. H6-157966) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 2 discloses the following matters:

[2-A] "[Scope of the claims]
[Claim 1] An oil-based ink composition for ballpoint pen, comprising 4,4'-diaminodicyclohexylmethane in an oil-based ink composition for ballpoint pen comprising an oil-soluble dye or pigment, an oil-soluble resin, and an organic solvent."

[2-B] "[0001]
[Industrially applicable field] The present invention relates to an oil-based ink composition for ballpoint pen. Further more specifically, the present invention relates to an oil-based ink composition for ballpoint pen with excellent lubricity capable of suppressing the abrasion between a socket and a ball at a tip of a ballpoint pen, and smoothing ink flow."

[2-C] "[0003]
[Problem to be solved by the invention] Accordingly, the object of the present invention is to provide an oil-based ink composition for ballpoint pen, which overcomes the defects of the conventional oil-based ballpoint pen, and has excellent lubricity, and rare occurrence of faded lines at the beginning of writing since the composition does not erode copper or copper alloy in contrast to a conventional oleic acid, with no color change caused by rust, and good dispersibility in a pigment ink and excellent temporal stability."

[2-D] "[0006] Oil-soluble dye included in an oil-based ink composition for ballpoint pen of the present invention may be a common dye used for an ink for oil-based ballpoint pen, and may be optionally selected from an oil-soluble dye such as Valifast Black#1805 (manufactured by Orient Chemical Industry Co. Ltd., registered trademark name), Valifast Violet#1701 (manufactured by Orient Chemical Industry Co. Ltd., registered trademark name), Spilon Orange GRH, Spilon Red BEH, and Sudan Blue II base, a free base of basic dye such as auramine, rhodamine, methyl violet, malachite green, crystal violet, and Victoria Blue BOH, and they may be used solely or as a mixture of two or more in combination.
[0007] Various publicly known pigments may be used as a pigment, the specific examples of which may include organic pigments such as azo-based pigments, condensation polyazopigments, phthalocyanine-based pigments, quinacridone-based pigments, anthraquinone-based pigments, dioxazine-based pigments, indigo-based pigments, thioindigo-based pigments, perinone-based pigments, and perylene-based pigments, and inorganic pigments such as titanium oxide, ferrous oxide, and carbon black (Body's note: it is recognized as a typographical error of "carbon black"), and fluorescent pigments. They may be used solely or as a mixture of two or more in combination. The using amount of these coloring agents is 0.1 to 50% by weight, preferably 1 to 30% by weight on a total amount basis of the ink composition. Less using amount results in a thin brushstroke, whereas larger using amount results in increase in viscosity of ink composition and poor writing performance."

[2-E] "[0008] Dispersive agent may be a commonly used resin and a pigment dispersant such as surfactant. The using amount is preferably 1 to 30% by weight on a total amount basis of ink.
[0009] Resin may be an ink for oil-based ballpoint pen. The specific examples may be ketone resin, xylene resin, phenol resin, coumarone-indene resin, polyvinylpyrrolidone, and polyvinyl butyral. These resins may be used solely or in combination of two or more thereof. A using amount of these resins is 1 to 30% by weight on a total amount basis of ink composition."

[2-F] "[0013]
[Example(s)] Subsequently, the present invention will be discussed in detail by reference to the examples. Note that "part" in the following denotes "% by weight."
... (omitted)...
Example 2

Cyanine blue BNRS (manufactured by TOYO INK CO., LTD.)	25.0 parts
Spilon Violet CRH (manufactured by Hodogaya Chemical Co., Ltd.)	10.0 parts
Benzylalcohol	5.0 parts
Tripropylene glycol monomethyl ether	30.0 parts
Hilac#110 (manufactured by Hitachi Chemicals, ketone resin)	10.0 parts
4,4'-diaminodicyclohexylmethane	20.0 parts

Each of the above components was heated to 60 to 70°C, subjected to stirring and dissolved for 4 hours, and filtrated with pressure at 70°C to obtain a blue ink."

[2-G] "[0014]
... (omitted)...
Example 4

Cyanine Blue #4933 (Dainichiseika Color & Chemicals Mfg. Co., Ltd.)	20.0 parts
S-LEC BL-1 (Polyvinyl butyral resin, manufactured by SEKISUI HEMICAL CO., LTD.)	20.0 parts
Propyleneglycol monophenylether	10.0 parts
Dipropyleneglycol monomethylether	39.8 parts
PVPK-90 (polyvinylpyrrolidone resin, BASF resin)	0.2 part
4,4'-diaminodicyclohexylmethane	10.0 parts

Among the above components, copper phthalocyanine blue, polyvinyl butyral resin, and dipropyleneglycolmonomethylether were dispersed for one hour with a sand mill, and mixed with the remaining components and stirred to dissolve, and filtrated with a pressure at 70°C to obtain a black ink."

[2-H] "[0016]
[Effects] An oil-based ink composition for ballpoint pen obtained in Examples 1 to 4 and Comparative Examples 1 to 4 was fed with pressure into a pen body in which a superhard ball with a diameter of 0.7 mm and a ballpoint pen socket made of albata were equipped with one end of a polypropylene tube. Furthermore, bubbles in an ink were removed by centrifugal separation to obtain a so-called free ink-type writing utensil, which was subjected to the confirmation of the effects by use of a helix-type writing tester. The tester then had a condition of a writing angle of 70 degree, a load of 200 g, and a speed of 4 m/min, and the test paper was JIS P3201 writing paper A, and a

ball sinking after 500 m writing in the condition was measured by use of a tool microscope (Body's note: recognized as a typographical error of "optical microscope"). Further, the writing feeling was sensorially tested by handwriting, and the sample was left for two weeks in a homeothermal constant humidity bath at 50°C and 70% RH, and a degree of rust inside the tip of ballpoint pen was inspected visually. Further, another sample was left for one day in a homeothermal constant humidity bath at 25°C and 65% RH with a cap being taken off, and linear line writing at a writing angle of 70 degrees and a load of 200 g was performed to measure a length of faded lines at that time.

The result is shown in Table 1.

[Table 1]

インキ	ボール沈み量 (μm)	筆記感	錆	カスレ長さ (mm)
実施例1	5．6	滑らか	なし	1
実施例2	3．8	滑らか	なし	1
実施例3	8．6	滑らか	なし	1
実施例4	6．3	滑らか	なし	1
比較例1	26．2	きしむ	緑青発生	5
比較例2	29．3	きしむ	緑青発生	7
比較例3	37．7	きしむ	緑青発生	6
比較例4	34．8	きしむ	緑青発生	10

インキ　Ink
ボール沈み量　Ball Sinking amount
筆記感　Writing feeling
錆　Rust
カスレ長さ　Length of faded lines
実施例　Example
比較例　Comparative Example
滑らか　Smoothness
きしむ　Groaning
なし　None
緑青発生　Generation of green rust

Evaluation criteria of writing feeling: Smooth - Able to write smoothly
Groaning - Unable to write smoothly due to resistance

As mentioned above, the oil-based ink composition for ballpoint pen of the present invention has excellent lubricity, and less abrasion of a socket, as well as excellent durability and fine writing feeling with rare occurrence of faded lines at the beginning

of writing since the composition does not erode copper or copper alloy in contrast to a conventional oleic acid, with no color change caused by rust, and good dispersibility in pigment ink and excellent temporal stability."

(4) The invention described in Evidence A No. 2

A Evidence A No. 2 describes an oil-based ink composition for ballpoint pen ([2-A] to [2-D]).

B Further, Evidence A No. 2 describes an oil-based ink composition for blue ballpoint pen comprising Cyanine blue BNRS (manufactured by TOYO INK CO., LTD.) (25.0% by weight), Spilon Violet CRH (manufactured by Hodogaya Chemical) (10.0% by weight), benzylalcohol (5.0% by weight), tripropylene glycol monomethyl ether (30.0% by weight), Hilac#110 (manufactured by Hitachi Chemicals Co., Ltd., ketone resin)(10.0% by weight), and 4,4'-diaminodicyclohexylmethane (20.0% by weight) in Example 2 ([2-F]). Further, the "oil-based ink composition for blue ballpoint pen" may be restated as "ink composition for oil-based, blue ballpoint pen."

Here, it can be seen that the above "Hilac#110 (manufactured by Hitachi Chemicals, ketone resin)" serves "as a pigment dispersant" according to the above [2-E] of Evidence A No. 2, stating that "Pigment dispersing agent may include ... (omitted)... ketone resin, ... (omitted)...".

C Further, the weight percents of each component of "Cyanine blue BNRS (manufactured by TOYO INK CO., LTD.) (25.0% by weight), Spilon Violet CRH (manufactured by Hodogaya Chemical) (10.0% by weight), benzylalcohol (5.0% by weight), tripropylene glycol monomethyl ether (30.0% by weight), Hilac#110 (manufactured by Hitachi Chemicals Co., Ltd., ketone resin)(10.0% by weight), 4,4'-diaminodicyclohexylmethane (20.0% by weight)" of the above "B" add up to 100% by weight. Therefore, it can be seen that the above "% by weight" noted to each component denotes a proportion on a total weight basis of the ink composition for oil-based ballpoint pen of blue color, and it can also be said that an amount of "Cyanine blue BNRS (manufactured by TOYO INK CO., LTD.) is 25.0% by weight on a total weight basis of the ink composition, an amount of Spilon Violet CRH (manufactured by Hodogaya Chemical) is 10.0% by weight on a total weight basis of the ink composition, an amount of benzylalcohol is 5.0% by weight on a total weight basis of the ink composition, an amount of tripropylene glycol monomethyl ether is 30.0% by weight on a total weight basis of the ink composition, an amount of Hilac#110 (manufactured by Hitachi Chemicals Co., Ltd., ketone resin) is 10.0% by weight on a total weight basis of the ink composition, and an amount of 4,4'-diaminodicyclohexylmethane is 20.0% by weight on a total weight basis of the ink composition."

D Furthermore, Evidence A No. 2 describes a ballpoint pen (oil-based ballpoint pen) filled with an ink composition for an oil-based ballpoint pen of blue color of Example 2 ([2-H]).

E As described above, Evidence A No. 2 describes

"an ink composition of blue for oil-based ballpoint pen, comprising Cyanine blue BNRS (manufactured by TOYO INK CO., LTD), Spilon Violet CRH (Hodogaya Chemical Co., Ltd.), Hilac#110 (manufactured by Hitachi Chemicals Co., Ltd., ketone resin), and 4,4'-diaminodicyclohexylmethane,

wherein an amount of Cyanine Blue BNRS (manufactured by TOYO INK CO., LTD) is 25.0% by weight on a total weight basis of the ink composition,

wherein an amount of Spilon Violet CRH (manufactured by Hodogaya Chemical Co., Ltd.) is 10.0% by weight on a total weight basis of the ink composition,

wherein an amount of benzyl alcohol is 5.0% by weight on a total weight basis of the ink composition,

wherein an amount of tripropylene glycol monomethyl ether is 30.0% by weight on a total weight basis of the ink composition,

wherein an amount of Hilac#110 (manufactured by Hitachi Chemicals, ketone resin) is 10.0% by weight on a total weight basis of the ink composition, and

wherein an amount of 4,4'-diaminodicyclohexylmethane is 20.0% by weight on a total weight basis of the ink composition

." (Hereinafter referred to as "A2 invention 1") and

"An oil-based ballpoint pen filled with an ink composition of blue for oil-based ballpoint pen,

wherein said ink composition of blue for oil-based ballpoint pen comprises Cyanine blue BNRS (manufactured by TOYO INK CO., LTD), Spilon Violet CRH (manufactured by Hodogaya Chemical Co., Ltd.), benzylalcohol, tripropylene glycol monomethyl ether, Hilac#110 (manufactured by Hitachi Chemicals Co., Ltd., ketone resin) as a pigment dispersant, and 4,4'-diaminodicyclohexylmethane,

wherein an amount of Cyanine Blue BNRS (manufactured by TOYO INK CO., LTD) is 25.0% by weight on a total weight basis of the ink composition,

wherein an amount of Spilon Violet CRH (manufactured by Hodogaya Chemical Co., Ltd.) is 10.0% by weight on a total weight basis of the ink composition,

wherein an amount of benzyl alcohol is 5.0% by weight on a total weight basis of the ink composition,

wherein an amount of tripropylene glycol monomethyl ether is 30.0% by weight on a total weight basis of the ink composition,

wherein an amount of Hilac#110 (manufactured by Hitachi Chemicals, ketone resin) is 10.0% by weight on a total weight basis of the ink composition, and

wherein an amount of 4,4'-diaminodicyclohexylmethane is 20.0% by weight on a total weight basis of the ink composition." (Hereinafter referred to as "A2 invention 2")

(5) Matters described in Evidence A No. 3

Evidence A No. 3 (Japanese Unexamined Patent Application Publication No. H11-293174) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 3 discloses the following matters:

[3-A] "[Scope of the claims]
[Claim 1] An oil-based ink composition, comprising nonylphenol-based phosphate ester represented by the following formula (1) in an oil-based ink composition comprising a coloring agent, an organic solvent, a resin, and the other additives.

$[R(CH_2CH_2O)_n]_mP[OH]_{3-m}$ (1)

[where n of formula (1) is an integer of 2 to 50, m is an integer of 1 to 3, and R represents a nonylphenol group.]

... (omitted)...

[Claim 4] An oil-based ballpoint pen filled with the oil-based ink composition according to any one of Claims 1 to 3."

[3-B] "[0001]

[Technical Field of the Invention] The present invention relates to an oil-based ink composition, in particular, an oil-based ink composition suitable for an oil-based ballpoint pen, having extremely excellent lubricity in a wide range of viscosity and large suppressing effects of tip abrasion and smooth writing performance, and to an oil-based ballpoint pen."

[3-C] "[0007]

[Problem to be solved by the invention] Therefore, there is a need for an oil-based ink composition and an oil-based ballpoint pen having higher lubricating effects and smoother writing performance, as well as sustained performance after writing for a long period. The present invention tries to address the above current situation and lies in the provision of an oil-based ink composition and an oil-based ballpoint pen, which have excellent lubricity in a wide range of viscosity and great suppressing effects of tip abrasion at a pen tip and smooth writing performance."

[3-D] "[0012]

[Mode(s) for carrying out the invention] Hereinafter the embodiments of the present invention are elaborated. The oil-based ink composition of the present invention comprises a coloring agent, an organic solvent, a resin, and other additives. The coloring agent used herein may include oil-soluble dyes and pigments used for conventional inks for oil-based ballpoint pen, etc. The oil-soluble dyes may be dyes soluble in an organic solvent used, which includes, for example, Valifast color (Manufactured by Orient Chemical Industries Co., Ltd.), Aizen Spilon dyes, and Aizen SOT dyes (Manufactured by Hodogaya Chemical Co., Ltd.).

(Body's note: the one after the change by [Written Amendment 1] of the written amendment submitted on April 22, 1998)

[3-E] "[0013] Further, pigments may include, for example, inorganic-based pigments such as carbon black, titanium oxide, and metal powders, organic-based pigments such as azo lake, insoluble azo pigments, chelate azo pigments, phthalocyanine pigments, perylenes and perylene pigments, anthraquinone pigments, quinacridone pigments, dye lake, nitro pigments, and nitroso pigments. These coloring agents each may be used alone or in a mixture of two or more kinds thereof. Further, dyes and pigments may be used in combination. The mixing amount of the coloring agent is preferably in a range of 5 to 60% by weight on a total weight basis of the ink composition. If it is 5% by weight or less, the concentration is too low to obtain sufficient quality for ballpoint pen. Further, if it is 60% by weight or more, it is not preferable in terms of storage stability and solubility."

[3-F] "[0015] A resin can be added to the ink composition of the present invention for controlling viscosity of the ink composition. The resin used for a common ink composition for oil-based ballpoint pen may include, for example, ketone resins, sulfamide resins, maleic resins, ester gums, xylene resins, alkyd resins, phenol resins, rosin resins, polyvinylpyrrolidone, polyvinyl butyral resin, and modified resins thereof. These resins each may be used alone or in a mixture of two or more kinds thereof. A content of these resins is 5 to 30% by weight on a total amount basis of ink composition. If it is 5% by weight or less, the bare minimum level of viscosity is not obtained, and thus it is not preferred. On the other hand, if it is 30% by weight or more, the resulting viscosity is elevated too high, and therefore it is not preferred either."

[3-G] "[0020] Here, the ballpoint pen of the present invention is composed of a conventionally known pen tip consisting of a ball and a tip holder, an ink reservoir tube, a pen axis etc., wherein said oil-based ink composition of the present invention is filled in the ink reservoir tube. The ballpoint pen of the present invention allows an ink running off from the inside of a tip due to rotation of a ball at a pen tip to transfer to or penetrate into a recording body such as paper, and in particular draws a brushstroke and a line by transferring. At the moment, even if an excess ink is attached to a circumference of a tip holder, a heavy deposit of ink does not occur at the restart of writing or in the middle of writing, but a clear line is continuously provided."

[3-H] "[0021]
[Examples] The present invention is hereinafter illustrated in detail with examples and comparative examples. It should be noted that the present invention should not be construed as being limited to the following examples. Further, the measurement of ink viscosity, the confirmation of flow rate change, and the assessment of writing performance in the following examples and comparative examples were conducted in the following manner. Further, the obtained ink composition was filled into a ballpoint pen (ink containing tube: polypropylene tube, tip holder: stainless steel, ball: super hard alloy tungsten carbide, a diameter of 0.7 mm) to test the writing performance.
[0025] (4) Time course test (accelerated degradation)
After being left in a homeothermal constant humidity bath at 50°C and 80% RH for three months, the pen was cooled to room temperature, and a helical line was written by hand to confirm writing performance.
⊙: Able to write as before the test
○: Somewhat change compared with before the test
△: Line faded
▲: Line faded severely
×: Unable to write"

[3-I] "[0026] Additionally, the manufacturers of the compounding materials used in the following examples are collectively shown as below:
*1 Manufactured by Orient Chemical Industries Co., Ltd.
*2 Manufactured by Hodogaya Chemical Co., Ltd.
*3 Manufactured by Hitachi Chemicals Co., Ltd.
*4 Manufactured by ISP

*5 Manufactured by TOHO CHEMICAL INDUSTRY Co., Ltd.
*6 Manufactured by BASF
*7 Manufactured by Honshu Chemical Industry Co., Ltd.
*8 Manufactured by SEKISUI CHEMICAL CO., LTD.
*9 Manufactured by DKS Co. Ltd.
*10 Manufactured by SANDOZ
*11 Manufactured by Denka Company Limited
*12 Manufactured by NL Chemicals
*13 Manufactured by KYOEISHA CHEMICAL Co., LTD.
*14 Manufactured by NIPPON AEROSIL CO., LTD."

[3-J] "[0029] Example 3
Dyno-mill dispersion was conducted without the addition of acetophenone resin in the following formulation, followed by the addition of acetophenone resin, and the mixture was filtrated to prepare a black ink composition for oil-based ballpoint pen with a viscosity of 7,500 mPa*s and its writing performance was tested.

Pigments:	Carbon black	15 wt%
Dye:	Spilon Violet C-RH*2	15 wt%
	Spilon Yellow C-2GH*2	6 wt%
Solvent:	phenoxyethanol	43.5 wt%
Resin:	acetophenone resin (Halon 110H)*7	10 wt%
	Polyvinyl butyral (S-LEC BBL-1)	2 wt%
	Polyvinylpyrrolidone (PVPK90)*4	0.5 wt%
Phosphate compound:	Prisurf A207H*9	8 wt%
	(Dinonyl phenol-based, HLB: 7.1)"	

[3-K] "[0039]
[Table 1]

区分 / 項目		実施例 1	2	3	4	5	比較例 1	2	3	4	5	6	7
リン酸エステル化合物	ノニル又はジノニルフェノール系 HLB（配合率wt%）	9.6 (1.0)	9.8 (4.0)	7.1 (8.0)	5.8 (4.0)	7.1 (8.0)	–	–	–	–	–	14.9 (0.5)	11.5 (1.0)
	オレイル又はトリデシルアルコール系 HLB（配合率wt%）	–	–	–	–	–	–	–	–	8.6 (8.0)	9.0 (4.0)	–	–
着色剤		染料	→	染料 顔料	染料	→	→	→	→	→	→	→	→
インキ粘度(mPa·S)		10500	3000	7500	3000	2000	10000	3500	1500	5000	5500	3000	8500
描線状態	初期	◎	◎	◎	◎	◎	△	△	△	○	○	○	○
	筆記後	◎	○	○	◎	○	△	△	△	△	▲	○	○
書き味	初期	○	○	◎	◎	◎	△	△	△	○	○	○	○
	筆記後	○	○	○	◎	◎	▲	△	△	○	×	▲	○
経時変化		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

項目　Items
区分　Section
実施例　Example
比較例　Comparative Example
リン酸エステル化合物　　Phosphate compound
ノニル又はジノニルフェノール系　ＨＬＢ（配合率ｗｔ％）　Nonyl or dinonyl phenol-based HLB (mixing ratio wt%)
オレイル又はトリデシルアルコール系　ＨＬＢ（配合率ｗｔ％）　　Oleyl or tridecyl alcohol-based HLB (mixing ratio wt%)
着色料　Colorant
インキ粘度　　Ink viscosity
描線状態　　Drawing line condition
初期　Initial
筆記後　After Writing
書き味　Writing performance
経時変化　　Time course
染料　Dyes
顔料　Pigments

[0040] As is obvious from the above result of Table 1, the ink composition for oil-based ballpoint pen comprising nonyl(or dinonyl)phenol-based phosphate ester in Examples 1 to 5 of the present invention has a better writing performance, and extremely rare occurrence of faded lines or line break compared to the ink composition of Comparative Examples 1 to 7 free of nonyl(or dinonyl)phenol-based phosphate ester or comprising higher fatty acid alcohol-based phosphate ester."

[3-G] "[0041] Example 6
Filtrating after dispersing in a following formulation with Dyno-mill, a black ink composition for oil-based ballpoint pen with a viscosity of 350 mPa*s was prepared to test the writing performance.

Pigments:	Carbon black	10 wt%
Solvent:	Phenylglycol	25 wt%
	Benzylalcohol	6 wt%
	Dipropyleneglycol monomethylether	54.3 wt%
Resin: Polyvinyl butyral (Denka butyral 2000-L)*11		2.5 wt%
Thickener: BENTONE SD-2		2 wt%
Phosphate compound: Phosphanol RM-410*5 (Dinonyl phenol-based, HLB: 5.8)		0.2 wt%

[0042] Example 7
In a similar manner to Example 6, a blue ink composition for oil-based ballpoint pen with a viscosity of 450 mPa*s was prepared with a following formulation to test the writing performance.

Pigments:	Indanthren Blue RS	15 wt%
Solvent:	Phenylglycol	10 wt%
	Dipropylene glycol monoethyl ether	42.5 wt%

	Triethylene glycol monobutyl ether	20 wt%
Resin: Polyvinyl butyral (S-LEC BBL-1)*8		3 wt%
Thickener:	Aerosil COK-84*13	1 wt%
Phosphate compound:	Phosphanol RM-410*5 (Dinonyl phenol-based, HLB: 5.8)	8.5 wt%

[0043] Example 8

In a similar manner to Example 6, a red ink composition for oil-based ballpoint pen with a viscosity of 860 mPa*s was prepared with a following compounding to test the writing performance.

Pigments:	Lake Red C	6 wt%
Solvent:	Benzylalcohol	5 wt%
	Dipropylene glycol monoethyl ether	25 wt%
	Triethylene glycol monobutyl ether	56.8 wt%
Resin: Polyvinyl butyral (S-LEC BBL-1)*8		2 wt%
Thickener:	Taren VA-100*14	4 wt%
Phosphate compound:	Phosphanol RM-410*5 (Dinonyl phenol-based, HLB: 5.8)"	1.2 wt%

[3-M] "[0051]

[Table 2]

区分 / 項目		実施例 6	7	8	9	10	11	比較例 8	9	10	11
リン酸エステル化合物	ジノニルフェノール系 HLB (配合率wt%)	5.8 (0.2)	5.8 (8.5)	5.8 (1.2)	5.8 (4.0)	7.1 (3.0)	5.8 (3.0)	−	5.8 (18)	5.8 (0.05)	−
	オレイル又はトリデシルアルコール系 HLB (配合率wt%)	−	−	−	−	−	−	8.6 (0.2)	−	−	9.0 (0.8)
着色剤		顔料	→	→	→	染料	染料 顔料	顔料	→	→	→
インキ粘度(mPa・S)		350	450	860	8500	700	500	350	600	330	1680
描線状態	初期	◎	◎	◎	◎	◎	○	○	○	△	△
	筆記後	○	○	○	◎	○	○	▲	○	×	△
書き味	初期	◎	◎	◎	○	◎	◎	○	○	△	△
	筆記後	◎	○	◎	○	◎	◎	▲	○	▲	△
経時変化		◎	◎	◎	◎	◎	◎	◎	▲	◎	◎

項目　Items

区分　Section

実施例　Example

比較例　Comparative Example

リン酸エステル化合物　　Phosphate compound

ジノニルフェノール系　ＨＬＢ（配合率ｗｔ％）　Dinonyl phenol-based HLB (mixing ratio wt%)
オレイル又はトリデシルアルコール系　ＨＬＢ（配合率ｗｔ％）　Oleyl or tridecyl alcohol-based HLB (mixing ratio wt%)
着色料　Colorant
インキ粘度　Ink viscosity
描線状態　Drawing line condition
初期　Initial
筆記後　After Writing
書き味　Writing performance
経時変化　Time course
染料　Dyes
顔料　Pigments

(Body's note: the one after the change by [Written Amendment 3] of the written amendment submitted on April 22, 1998)

(6) The invention described in Evidence A No. 3
A Evidence A No. 3 describes an ink composition for oil-based ballpoint pen ([3-B], [3-J] to [3-L]).

B Further, Evidence A No. 3 discloses in Example 3 a black ink composition for oil-based ballpoint pen, comprising an inorganic pigment of carbon black (15 wt%), a dye of Spilon Violet C- RH (15 wt%), and a dye of Spilon Yellow C-2GH (6 wt%), a solvent of phenoxyethanol (43.5 wt%), a resin of acetophenone resin (Halon 110H) (10 wt%), a resin for adjusting viscosity of polyvinyl butyral (S-LEC BBL -1) (2 wt%), a resin of polyvinylpyrrolidone (PVPK90) (0.5 wt%), and a phosphate ester compound of Prisurf A207H (dinonyl phenol-based, HLB: 7.1) (8 wt%) ([3-J]), wherein "wt%" and "black ink composition for oil-based ballpoint pen" may be restated as "% by weight" and "ink composition for oil-based ballpoint pen of black color," respectively.

Here, regarding the above "resin: polyvinyl butyral," according to the above [3-F] of Evidence A No. 3, it describes "the resin is used for adjusting viscosity of the ink composition. The resin may include ... (omitted)... polyvinyl butyral resin, ... (omitted)... ." Therefore, it is found to be the one "for adjusting viscosity."

C Further, the weight percents of each component of "a pigment of carbon black (15% by weight), a dye of Spilon Violet C-RH (15% by weight), a dye of Spilon Yellow C-2GH (6% by weight), a solvent of phenoxyethanol (43.5% by weight), a resin of acetophenone resin (Halon 110H) (10% by weight), a resin of polyvinyl butyral (S-LEC BBL-1) (2% by weight), a resin of polyvinylpyrrolidone (PVPK90) (0.5% by weight), and a phosphate ester compound of Prisurf A207H (dinonyl phenol-based, HLB: 7.1) (8% by weight) add up to 100% by weight. Therefore, it can be seen that the above "% by weight" attached to each component denotes a proportion on a total weight basis of the ink composition for oil-based ballpoint pen of black color, and it can also be said that "an amount of a pigment of carbon black is 15% by weight on a total weight basis of the ink composition, an amount of a dye of Spilon Violet C-RH is 15% by

weight on a total weight basis of the ink composition, an amount of a dye of Spilon Yellow C-2GH is 6% by weight on a total weight basis of the ink composition, an amount of a solvent of phenoxyethanol is from 43.5% by weight on a total weight basis of the ink composition, an amount of acetophenone resin (Halon110H) is 10% by weight on a total weight basis of the ink composition, an amount of polyvinyl butyral (S-LEC BBL-1) is 2% by weight on a total weight basis of the ink composition, an amount of polyvinylpyrrolidone (PVPK90) is 0.5% by weight on a total weight basis of the ink composition, and an amount of a phosphate ester compound of Prisurf A207H (dinonyl phenol-based, HLB: 7.1) is 8% by weight on a total weight basis of the ink composition."

D Further, Evidence A No. 3 discloses that "pigments: carbon black" of Example 3 is "inorganic-based pigment" ([3-E]), and the "inorganic-based pigment" may be restated as "inorganic pigment."

E Furthermore, it can be said that Evidence A No. 3 describes a ballpoint pen (oil-based ballpoint pen) filled with an ink composition for an oil-based ballpoint pen of black color of Example 3 ([3- H]).

F As described above, Evidence A No. 3 describes:

"A black ink composition for oil-based ballpoint pen, comprising an inorganic pigment of carbon black, a dye of Spilon Violet C-RH, a dye of Spilon Yellow C-2GH, a solvent of phenoxyethanol, a resin of acetophenone resin (Halon 110H), a resin for adjusting viscosity of polyvinyl butyral (S-LEC BBL-1), a resin of polyvinylpyrrolidone (PVPK90) and a phosphate ester compound of Prisurf A207H (dinonyl phenol-based, HLB:7.1),

wherein an amount of inorganic pigments: carbon black is 15% by weight on a total weight basis of the ink composition,

wherein an amount of a dye of Spilon Violet C-RH is 15% by weight on a total weight basis of the ink composition,

wherein an amount of a dye of Spilon Yellow C-2GH is 6% by weight on a total weight basis of the ink composition,

wherein an amount of a solvent of phenoxyethanol is from 43.5% by weight on a total weight basis of the ink composition,

wherein an amount of acetophenone resin (Halon110H) is 10% by weight on a total weight basis of the ink composition,

wherein an amount of resin for adjusting viscosity of polyvinyl butyral resin (S-LEC BBL-1) is 2% by weight on a total weight basis of the ink composition,

wherein an amount of polyvinylpyrrolidone (PVPK90) is 0.5% by weight on a total weight basis of the ink composition, and

wherein an amount of a phosphate ester compound of Prisurf A207H (dinonyl phenol-based, HLB: 7.1) is 8% by weight on a total weight basis of the ink composition." (Hereinafter referred to as "A3 invention 1"); and

"An oil-based ballpoint pen filled with an ink composition for oil-based black ballpoint pen,

wherein said black ink composition for oil-based ballpoint pen comprises an inorganic pigment of carbon black, a dye of Spilon Violet C-RH, a dye of Spilon Yellow C-2GH, a solvent of phenoxyethanol, a resin of acetophenone resin (Halon 110H), a resin for adjusting viscosity of polyvinyl butyral (S-LEC BBL-1), a resin of polyvinylpyrrolidone (PVPK90), and a phosphate ester compound of Prisurf A207H (dinonyl phenol-based, HLB: 7.1),

wherein an amount of inorganic pigments: carbon black is 15% by weight on a total weight basis of the ink composition,

wherein an amount of a dye of Spilon Violet C-RH is 15% by weight on a total weight basis of the ink composition,

wherein an amount of a dye of Spilon Yellow C-2GH (6% by weight) is 6% by weight on a total weight basis of the ink composition,

wherein an amount of a solvent of phenoxyethanol (43.5 weght%) is 43.5% by weight on a total weight basis of the ink composition,

wherein an amount of acetophenone resin (Halon110H) is 10% by weight on a total weight basis of the ink composition,

wherein an amount of resin for adjusting viscosity of polyvinyl butyral resin (S-LEC BBL-1) is 2% by weight on a total weight basis of the ink composition,

wherein an amount of polyvinylpyrrolidone (PVPK90) is 0.5% by weight on a total weight basis of the ink composition, and

wherein an amount of a phosphate ester compound of Prisurf A207H (dinonyl phenol-based, HLB: 7.1) is 8% by weight on a total weight basis of the ink composition." (Hereinafter referred to as "A3 invention 2").

(7) Matters described in Evidence A No. 4

Evidence A No. 4 (Japanese Unexamined Patent Application Publication No. H10-60356) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 4 discloses the following matters:

[4-A] "[Scope of the claims]
[Claim 1] An ink composition for ballpoint pen, comprising a coloring agent, an organic solvent, and a resin, wherein said resin is polyvinyl butyral, rosin-modified phenol resin, and/or α- and β-pinene-phenol polycondensation product."

[4-B] "[0001]
[Technical Field of the Invention] The present invention relates to an oil-based ink composition for ballpoint pen."

[4-C] "[0002]
[Conventional technique] Conventionally, an ink for fluorescent color ballpoint pen including polyvinyl butyral is disclosed (Japanese Patent Publication No. S57-43185). To said ink for fluorescent color ballpoint pen there is added a thickener of polyvinyl butyral to adjust viscosity of ink and obtain a ballpoint pen having a proper ink flow. A general ballpoint pen using oil-based ink, however, has a simple structure composed of a ball, a metal tip holding the ball, and an ink reservoir tube engaged with the tip. Therefore, in a state where a pen tip is directed downward (an inverted state), ink drip might occur from the pen tip. Particularly in an oil-based ballpoint pen with a relatively

low viscosity in which a smooth writing feeling as like an aqueous ballpoint pen is obtained, said ink drip tends to occur. The method for suppressing said ink drip may include means to increase ink viscosity or to narrow a gap between a ball and a tip; however, the increase in ink viscosity may result in heavy writing feeling, which makes it hard to write smoothly. On the other hand, the narrower gap between a ball and a tip may result in poor ink flow and faded lines.
[0003]
[Problem to be solved by the invention] The present invention provides an oil-based ink composition for ballpoint pen without the occurrence of ink drip or poor writing such as faded line, while having a good writing feeling."

[4-D] "[0005] The aforesaid coloring agent may include, for example, an organic solvent soluble dye categorized into a solvent dye in color index. Specific examples of said solvent dye may include Valifast black 3806 (C.I. Solvent black 29), Valifast black 3807 (a trimethylbenzylammonium salt of C.I. Solvent black 29), Spirit black SB (C.I. Solvent black 5), Spilon black GMH (C.I. Solvent black 43), Valifast Red 1308 (a halochromic salt of C.I. Basic Red 1 and C.I. Acid Yellow 23), Valifast yellow AUM (a halochromic salt of C.I. Basic Yellow 2 and C.I. Acid Yellow 42), Spilon Yellow C2GH (an organic acid salt of C.I. Basic Yellow 2), Spilon Violet CRH (C.I. Solvent Violet 8-1), Valifast Violet 1701 (a halochromic salt of C.I. Basic Violet 1 and C.I. Basic Acid Yellow 42), Spilon Red CGH (an organic salt of C.I. Basic Red 1), Spilon Pink BH (C.I. Solvent Red 82), Nigrosine base EX (C.I. Solvent black 7), Oil blue 603 (C.I. Solvent blue 5), Neozapon blue 808 (C.I. Solvent Blue 70), etc."

[4-E] "[0006] Pigments may include, inorganic pigments such as carbon black and titanium dioxide, organic pigments such as azo-based pigments, phthalocyanine pigments, indigo pigments, thioindigo pigments, threne pigments and quinacridone pigments, fluorescent pigments, pearl pigments, metallic pigments such as gold and silver, and luminescence pigments. The coloring agent may be one kind or a mixture of two or more kinds, preferably in a range of 5 to 40% by weight in an ink composition."

[4-F] "[0008] The butyral resin of the aforesaid resin may include Mowital B20H, B30B, B30H, B60T, B60H, B60HH, and B70H manufactured by Hoechst Co., Ltd., or S-LEC B, BH-3, BL-1, BL-2, BL-L, BL-S, BM-1, BM-2, BM-5, and BM-S manufactured by Sekisui Chemical Co., Ltd., and Denka Butyral #2000-L, #3000-1, #3000-2, #3000-3, #3000-4, #3000-K, #4000-1, #5000-A, and #6000-C, manufactured by Denki Kagaku Kogyo Kabushiki Kaisha. Further, said polyvinyl butyral is 0.1 to 15% by weight, preferably 1 to 10% by weight."

[4-G] "[0014] Ink compositions and viscosities of Examples 1 to 3 and Comparative Examples 1 to 4 (Pa*s, a measured value at a temperature of about 25°C) are shown. Note that numerical values in a composition of Table are shown by weight parts.
[Table 1]

原料名		注	実施例 1	実施例 2	実施例 3	比較例 1	比較例 2	比較例 3	比較例 4
着色剤	黒色ソルベント染料	(1)	10.0			10.0			
	紫色ソルベント染料	(2)	15.0			15.0			
	黄色ソルベント染料	(3)	5.0			5.0			
	赤色ソルベント染料	(4)		20.0			20.0	20.0	
	黄色ソルベント染料	(5)		5.0			5.0	5.0	
	カーボンブラック				10.0				10.0
溶剤	フェニルグリコール		36.0	39.0	46.0	35.0	41.0	36.0	56.0
	ベンジルアルコール		10.0	10.0	10.0	10.0	10.0	10.0	10.0
樹脂	ポリビニルブチラール	(6)	1.0	2.0	10.0	1.0			10.0
	ロジン 変性フェノール 樹脂	(7)		18.0	10.0		20.0	10.0	
	α－及びβ－ピネン・フェノール 重縮合物	(8)	20.0		10.0			10.0	
	シンセテックレジン SK	(9)				20.0			10.0
	ポリビニル ピロリドン	(10)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
潤滑剤	オレイン酸		3.0	3.0	3.0	3.0	3.0	3.0	3.0
粘度（Pa・s）			15.0	4.0	3.8	16.0	3.6	4.5	2.5

原料名　Names of raw materials
実施例　Example
比較例　Comparative Example
注　Note
着色剤　Colorant
溶剤　Solvent
樹脂　Resin
潤滑剤　Lubricant
粘度　Viscosity
黒色ソルベント染料　Black solvent dye
紫色ソルベント染料　Violet solvent dye
黄色ソルベント染料　Yellow solvent dye
赤色ソルベント染料　Red solvent dye
カーボンブラック　Carbon black
フェニルグリコール　Phenylglycol
ベンジルアルコール　Benzylalcohol
ポリビニルブチラール　Polyvinyl butyral
ロジン　変性フェノール　樹脂　Rosin　Modified phenol　Resin
α－及びβ－ピネンフェノール　重縮合物　α-　and　β-pinenephenol　Polycondensation product
シンセテックレジン SK　Synthetic Resin SK

ポリビニルピロリドン　　Polyvinylpyrrolidone
オレイン酸　　Oleic acid

Materials in the Table will be explained in the order of note number.
(1) Valifast Black 3806 [Manufactured by Orient Chemical Industries Co., Ltd., C.I. Solvent Black 29]
(2) Spilon Violet CRH [Manufactured by Hodogaya Chemical Co., Ltd., C.I. Solvent Violet 8-1]
(3) Valifast Yellow AUM [Manufactured by Orient Chemical Industries Co., Ltd., a halochromic dye of C.I. Basic Yellow 2 and C.I. Acid Yellow 42]
(4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1]
(5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2]
(6) Polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., Product name: S-LEC BM-1]
(7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135]
(8) α- and β-pinene phenol polycondensation product [Manufactured by Yasuhara Chemical Co., Ltd., Product name: YS PolyesterS145, a copolymer of terpene including a major component of α-pinene (including a small amount of β-pinene) and phenol, a molecular weight of 1050, glass transition temperature of 87°C, a specific gravity of 1.04, a softening point (ring-and-ball method) of 145°C]
(9) Synthetic Resin SK (a product name, manufactured by Hüls AG, Germany)
(10) polyvinylpyrrolidone K-90 (Manufactured by BASF, Germany)"

[4-H] "[0015] An oil-based ink for ballpoint pen of each example and comparative example was prepared by the aforesaid ink preparation method, and filled into a ballpoint pen refill, in which a tip made of stainless steel holding a ball with a diameter of 0.7 mm was engaged with one end of polypropylene pipe, followed by the assembly of the refill into an outer housing to obtain an oil-based ballpoint pen. Additionally, two kinds of tips with a gap between a ball and a tip of 0 to 0.5 μm (tip A) and 12 to 13 μm (tip B) were used to prepare ten pens for each combination of a tip and a sample ink and to conduct the following tests.
[0016] (1) Ink drip test at a pen tip
After confirming that five oil-based ballpoint pens are capable of writing, the pens were left for one month in a humid condition of a relative humidity of 100% and a temperature of 25°C with a pen tip of the pens being directed downward, and then an ink fall from a pen tip (hereinafter noted as ink drip) and an ink pooling at the pen tip were observed (hereinafter noted as an ink pool).
(2) Writing test by writing tester
Five oil-based ballpoint pens were subjected to a writing test in a condition of a load of 100 g, a writing angle of 70 degrees, and a writing speed of 4 m/minute in compliance with JIS S6039, and the observation of the concentration of the obtained brushstroke and the measurement of ink ejection amount (mg) per 100 m writing and the measurement of the writing distance were conducted.
[0017] The test results are shown in the following.

[Table 2]

試験項目		実施例			比較例			
		1	2	3	1	2	2	4
インキ垂れの度合い	チップA	○	○	○	○	○	△	△
	チップB	○	○	○	△	○	×	×
筆跡濃度	チップA	△	○	△	×	○	△	△
	チップB	○	◎	◎	○	◎	◎	◎
インキ吐出量	チップA	18	23	18	13	24	18	17
	チップB	28	39	43	26	39	44	36
筆記性能	チップA	○	○	○	○	×	○	×
	チップB	○	○	○	○	△	○	○

試験項目　Test items
実施例　Example
比較例　Comparative Example
インキ垂れの度合い　Degree of Ink drip
筆跡濃度　Concentration of brushstroke
インキ吐出量　Ink ejection amount
筆記性能　Writing performance
チップA　tip A
チップB　tip B

[0018] Symbols in the Table are explained in the following.
(1) Degree of Ink drip
○: Not observed at all
△: Trace amount of ink pool observed
×: Ink drip observed
Note that the evaluation applied to three or more out of five oil-based ballpoint pens.
(2) Concentration of brushstroke (Determination by sight)
⊙: Somewhat thick
○: Proper concentration
△: Slightly thin
×: Thin
Ink ejection amount
Numerical values are represented as an average value of ink ejection amount (mg) per 100 m writing in five sample pens.
Writing distance
○: Consume all ink included
△: Unable to write at 300 to 500 m
×: Unable to write at 0 to 300 m"

(8) The invention described in Evidence A No. 4
A Evidence A No. 4 describes an oil-based ink composition for ballpoint pen ([4-A] to [4-C]).

B Further, Evidence A No. 4 describes in Example 2 an oil-based ink composition for ballpoint pen comprising a red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1] (20.0 weight parts), a yellow solvent dye of
(5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2] (5.0 weight parts), phenylglycol (39.0 weight parts), benzyl alcohol (10.0 weight parts),
(6) Polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., Product name: S-LEC BM-1] (2.0 weight parts),
(7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135] (18.0 weight parts)
(10) Polyvinylpyrolidone K-90 (Germany, manufactured by BASF) (1.0 weight part) and oleic acid (3.0 weight parts) ([4-G]). Here, said "oil-based ink composition for ballpoint pen" may be restated as "ink composition for oil-based ballpoint pen."

Here, regarding the above "polyvinyl butyral," the above [4-C] of Evidence A No. 4 discloses that "there is added a thickener of polyvinyl butyral to adjust viscosity of ink." Therefore, it is found to be the one serving "as a thickener."

C Further, in the above "B," the weight parts of "a red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1] (20.0 weight parts), a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2] (5.0 weight parts), phenylglycol (39.0 weight parts), benzyl alcohol (10.0 weight parts), (6) Polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., Product name: S-LEC BM-1] (2.0 weight parts), (7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135] (18.0 weight parts) (10) polyvinylpyrrolidone K-90 (Manufactured by BASF, Germany) (1.0 weight parts), oleic acid (3.0 weight parts)" add up to 98.0 weight parts. Therefore, if these are converted into "% by weight," "a red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1] (20.4% by weight), a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2] (5.1% by weight), phenylglycol (39.8 % by weight), benzyl alcohol (10.2 % by weight), (6) Polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., Product name: S-LEC BM-1] (2.0 % by weight), (7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135] (18.4% by weight) an amount of (10) polyvinylpyrrolidone K-90 (Manufactured by BASF, Germany) (1.0% by weight), oleic acid (3.1% by weight)", and it can also be said that "an amount of red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1] is 20.4% by weight on a total weight basis of the ink composition, an amount of yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2] is 5.1% by weight on a total

weight basis of the ink composition, an amount of phenylglycol is 39.8% by weight on a total weight basis of the ink composition, an amount of benzyl alcohol is 10.2% by weight on a total weight basis of the ink composition, an amount of (6) polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., product name: S-LEC BM-1] is 2.0% by weight on a total weight basis of the ink composition, an amount of (7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135] is 18.4% by weight on a total weight basis of the ink composition, an amount of (10) polyvinylpyrrolidone K-90 (Manufactured by BASF, Germany) is 1.0% by weight on a total weight basis of the ink composition, and an amount of oleic acid is 3.1% by weight on a total weight basis of the ink composition."

D Furthermore, Evidence A No. 4 describes an oil-based ballpoint pen filled with an ink composition for an oil-based ballpoint pen of Example 2 ([4-H]).

E As described above, Evidence A No. 4 describes:
"an ink composition for ballpoint pen, comprising a red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1], a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2], phenylglycol, benzyl alcohol, a thickener of (6) Polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., Product name: S-LEC BM-1], (7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135], (10) polyvinylpyrrolidone K-90 (Manufactured by BASF, Germany) and oleic acid,

wherein an amount of red solvent dye of (4) Spilon Yellow CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1] is 20.4% by weight on a total weight basis of the ink composition,

wherein an amount of yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2] is 5.1% by weight on a total weight basis of the ink composition,

wherein an amount of phenylglycol is 39.8% by weight on a total weight basis of the ink composition,

wherein an amount of benzyl alcohol is 10.2% by weight on a total weight basis of the ink composition,

wherein an amount of (6) polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., product name: S-LEC BM-1] is 2.0% by weight on a total weight basis of the ink composition,

wherein an amount of (7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135] is 18.4% by weight on a total weight basis of the ink composition,

wherein an amount of (10) polyvinylpyrrolidone K-90 (Manufactured by BASF, Germany) is 1.0% by weight on a total weight basis of the ink composition, and

wherein an amount of oleic acid is 3.1% by weight on a total weight basis of the ink composition." (Hereinafter referred to as "A4 invention 1"); and

"An oil-based ballpoint pen filled with an ink composition for oil-based ballpoint pen,

wherein said ink composition for oil-based ballpoint pen comprises a red solvent dye of (4) Spilon Yellow CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1], a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2], phenylglycol, benzyl alcohol, a thickener of (6) Polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., Product name: S-LEC BM-1], (7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135], (10) polyvinylpyrrolidone K-90 (Manufactured by BASF, Germany), and oleic acid,

wherein an amount of red solvent dye of (4) Spilon Yellow CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1] is 20.4% by weight on a total weight basis of the ink composition,

wherein an amount of yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2] is 5.1% by weight on a total weight basis of the ink composition,

wherein an amount of phenylglycol is 39.8% by weight on a total weight basis of the ink composition,

wherein an amount of benzyl alcohol is 10.2% by weight on a total weight basis of the ink composition,

wherein an amount of (6) polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., product name: S-LEC BM-1] is 2.0% by weight on a total weight basis of the ink composition,

wherein an amount of (7) Rosin-modified phenol resin [Manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD., Product name: Tamanol 135] is 18.4% by weight on a total weight basis of the ink composition,

wherein an amount of (10) polyvinylpyrrolidone K-90 (Manufactured by BASF, Germany) is 1.0% by weight on a total weight basis of the ink composition, and wherein an amount of oleic acid is 3.1% by weight on a total weight basis of the ink composition." (hereinafter referred to as "A4 invention 2").

(9) Matters described in Evidence A No. 5

Evidence A No. 5 (Japanese Unexamined Patent Application Publication No. H4-342777) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 5 discloses the following matters:

[5-A] "[Scope of the claims]
[Claim 1] An ethanolic black ink composition comprising carbon black, ethanol, polyvinyl butyral resin, and ketone resin."

[5-B] "[0001]
[Field of industrial application] The present invention relates to a black ink composition with high level of safety of an ink solvent for the human body as well as excellent toughness of written line drawn and temporal stability in a writing material commonly referred to as a Marking pen."

[5-C] "[0003]
[Problem to be solved by the invention] The object of the present invention is to solve a

problem in a conventional oil-based marking ink; i.e., to provide an ethanolic black ink composition with less unpleasant smell and less toxicity, good light resistance and toughness of written lines, as well as good dispersion stability of carbon black into ethanol and good temporal stability."

[5-D] "[0010] Polyvinyl butyral resin and ketone resin to be used for the ink composition of the present invention may be combined with each other as a dispersing agent, so that the interaction of two resins may decrease an average particle diameter of carbon black and a viscosity of a composition, and an average particle diameter and a viscosity in an initial stage may not be affected by heat and passage of time, but improved dispersion stability and temporal stability."

(10) Matters described in Evidence A No. 6

Evidence A No. 6 (Japanese Unexamined Patent Application Publication No. H5-279615) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 6 discloses the following matters:

[6-A] "[Scope of the claims]
[Claim 1] An ink composition for writing board, the composition comprising a diketopyrrolopyrrole-based pigment represented by the following general formula [I] with a median integrated value of a Stokes diameter of 0.2 μm or less, an alcohol solvent soluble polymer, a remover, and a surfactant in a medium consisting of or mainly consisting of a lower alcohol-based solvent.
[Chemical 1] ... (omitted)"

[6-B] "[0001]
[Field of industrial application] The present invention relates to an ink composition for a writing board, capable of writing with a marking pen on a writing board such as a whiteboard and capable of peeling (erasing) unnecessary brushstroke."

[6-C] "[0002]
[Conventional technique and problem to be solved] In a marking ink for a writing board capable of writing with a marking pen on a writing board commonly referred to as a whiteboard, and capable of peeling (erasing) the brushstroke when a drawing becomes unnecessary, a mixture of ketone-based solvent and ester-based solvent is mainly used as a solvent. Further, the coloring agent used may include various pigments resistant to these solvents. For example, MAICROLITH RED BR-K or 4C-K from Ciba-Geigy is a processed pigment in which a red azo-based pigment is dispersed into a vinyl chloride-vinyl acetate copolymer resin carrier, and is usable for an ink for writing board in which a mixture of ketone-based solvent and ester-based solvent are used (Patent No. 936873).
[0003] Recently, the use of a lower alcohol-based solvent is required from the viewpoint of odor and toxicity of solvent. Therefore, there is a need for an organic pigment resistant to a lower alcohol-based solvent; however, conventional azo-based pigments generally have a low resistance to alcohols when finely dispersed into a lower alcohol. Therefore, when it is used for an ink for writing board, the peeling (erasing) of brushstroke on a writing board with an eraser, etc. tends to leave a smear, or increase ink viscosity or cause aggregation of pigments during storage, which causes a practical

problem in terms of ink stability and the easiness to erase a brushstroke.
[0004] As an organic pigment excellent in solvent durability (alcohol solvent toughness), which is generally regarded as a high-grade pigment, anthraquinone-based pigments (e.g. C.I. Pigment Red 168, 167), condensed azo-based pigment (e.g. C.I. Pigment Red 144, 166, 220), perylene-based pigment (e.g. C.I. Pigment Red 149, 178, 179, 224), quinacridone-based pigment (e.g. C.I. Pigment Red 122, 207, 209, C.I. Pigment Violet 19) and thioindigo-based pigment (C.I. Pigment Red 38, 88) etc. are known.
[0005] Pigments should be dispersed into a solvent in a hyperfine state in order that these pigments may be stable for a long period in a state of being dispersed into an alcohol-based solvent and being filled into a pen body. As a result, however, alcohol resistance of said pigments decreases, although it is supposed to be good.
[0006] To stably maintain a dispersing system in the state, a resin is required in an amount proportional to a surface area of a pigment increased by ultrafine dispersion. The increased amount of a resin in an ink for writing board using a lower alcohol-based solvent results in the increased viscosity of ink. When the ink is filled into a pen body for use, faded writing is likely to occur, and the detachability (easiness to erase) might be decreased in proportion to the increase in an amount of a resin.
[0007] The present invention has been made in view of the above problems of the conventional technique. The object of the present invention is to provide an ink composition for a writing board, wherein a medium consisting of or mainly consisting of a lower-alcohol-based solvent with almost no problems of odor and toxicities is used, and wherein a pigment dispersed into the medium is resistant to the solvent while it is ultrafine, which allows the ink composition to be stable for a long period in a state of being filled in a pen body even if an amount of a contained resin is such an extent that can avoid the faded writing and the decrease in detachability (easiness to erase)."

[6-D] "[0018] A polymer used for an ink composition of the present invention may include ones that may impart the ability to form a coating to an ink, and provide the adhesive property to a surface for writing and the dispersion stability of pigments, and have solubility in a lower alcohol-based solvent to be used.
[0019] Specific examples of usable polymer may include polyvinyl butyral, polyvinylpyrrolidone, vinyl acetate resin, polyacrylic acid ester, shellac, and ethylcellulose. These polymers may be used solely or in a mixture of two or more thereof. The using amount of these polymers is usually 1 to 20% by weight, preferably 2 to 10% by weight on a total amount basis of the ink composition. Additionally, in order to decrease ink viscosity, the use of a polymer with a relatively low degree of polymerization is preferable.
[0020] The polymer particularly suitable for the ink of the present invention is a terpolymer of polyvinyl butyral consisting of three moieties of polyvinyl acetal moiety, polyvinyl alcohol moiety, and polyvinyl acetate moiety. This terpolymer includes proper proportions of butyral group, hydroxyl group, and acetyl group, and thus a small amount of this terpolymer may make an ink composition of the present invention stable for a long period. Commercially available products could provide good results when S-LEC BM-S (a product name of polyvinyl butyral) manufactured by Sekisui Chemical Co., Ltd. or Denka butyral #4000-1 manufactured by Denki Kagaku Kogyo Kabushiki Kaisha (a product name of polyvinyl butyral) was used."

(11) Matters described in Evidence A No. 7

Evidence A No. 7 (Japanese Unexamined Patent Application Publication No. H8-199105) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 7 discloses the following matters:

[7-A] "[Scope of the claims]
[Claim 1] An ink composition for writing board, the composition comprising at least carbon black, a lower alcohol-soluble polymer, and a remover in a medium, wherein said medium consists of or mainly consists of a lower alcohol-based solvent, and said carbon black has a toluene coloring transmittance of 85% or more, and an ash content of 0.5% by weight or less."

[7-B] "[0001]
[Field of industrial application] The present invention relates to an ink composition for writing board, capable of writing with a marking pen on a writing board, etc. such as whiteboard and capable of erasing unnecessary brushstroke."

[7-C] "[0002]
[Conventional technique and problem to be solved] In a marking ink for writing board capable of writing with a marking pen on a writing board commonly referred to as a whiteboard, and capable of erasing (peeling) the brushstroke when it becomes unnecessary, pigments are conventionally used as a colorant from the viewpoint of easiness to erase, brushstroke performance, and safety. Particularly in a case of a black pigment ink for writing board, carbon black is used as a pigment, and this is dispersed into an alcohol-based solvent by use of a resin, etc., while providing erasing performance by the addition of a remover and a surfactant, etc. Carbon black is produced by subjecting a material of natural gas or liquid hydrocarbons (heavy oil, tar etc.) to thermal decomposition or incomplete combustion. For this kind of ink colorant, channel black or furnace black is supposed to be suitable.
[0003] The performance required for this kind of pigment ink for writing board is generally easiness to erase (easiness to erase brushstroke even immediately after writing or even after time has passed), non-dryness (no occurrence of faded lines without a pen tip being dried), brushstroke performance (the brushstroke has a sufficient strength and a vivid color), etc. Many proposals have been made and put into practice for the improvement on these performances.
[0004] Practically, however, in addition to this, the stability of ink for heating and the temporal stability; i.e., storage stability, are required. When a pen filled with an ink or an ink itself is stored for a long period, or a pen is used over a long period, or when a pen filled with an ink is left in direct sunlight or inside a car where a temperature has been elevated by direct sunlight to the extent that elevates the ink temperature beyond, e.g., 50°C or more, the increase of ink viscosity causes a faded line, whereas the increase in an average particle diameter of finely-dispersed pigments causes poor writing due to the clogging inside the pen or a pen tip. Here, there is a need for a pigment ink with less change in an ink viscosity and a pigment particle diameter of an ink during a long-term storage in a high-temperature condition.
[0005] Conventional pigment ink for writing board prepared by carbon black has

insufficient stability under a high-temperature condition (e.g. 50°C or more), and has a problem of causing the increase in viscosity of the ink and the aggregation of pigments during the storage for a long period, which could not be solved regardless of what composition the ink has, and the obtained inks have different levels of fine dispersion stability depending on the kinds of carbon black used and the difference in quality.
[0006] The present invention has been made in view of the above problem present in the conventional technique, and the object is to provide a black ink composition for writing board with less change in an ink viscosity or a particle diameter of carbon black in an ink, even at a high temperature or in storage for a long period."

[7-D] "[0023] Polymers used for an ink composition of the present invention impart the ability to form a coating to an ink, and provide the adhesive property to a surface for writing and the dispersion stability of pigments, and have solubility in a main solvent of a lower alcohol.
[0024] Specific examples of usable polymers may include polyvinyl butyral, polyvinylpyrrolidone, vinyl acetate resin, polyacrylic acid ester, shellac, and ethylcellulose. These polymers may be used solely or in a mixture of two or more thereof. A using amount of these resins is preferably 1 to 20% by weight on a total amount basis of the ink composition, more preferably 2 to 10% by weight or so. Additionally, in order to decrease ink viscosity, the use of a polymer with a relatively low degree of polymerization is preferable.
[0025] The polymer particularly suitable for the present invention is a terpolymer of polyvinyl butyral consisting of three moieties of polyvinyl acetal moiety, polyvinyl alcohol moiety, and polyvinyl acetate moiety. This terpolymer includes proper proportions of butyral group, hydroxyl group, and acetyl group, and thus a small amount of this terpolymer may make an ink of the present invention stable for a long period. Commercially available products could provide good results when S-LEC BM-S (a product name of polyvinyl butyral) manufactured by Sekisui Chemical Co., Ltd. or Denka butyral # 4000-1, #2000-L manufactured by Denki Kagaku Kogyo Kabushiki Kaisha (a product name of polyvinyl butyral) was used. Remover (eraser) is an additive for peeling (erasing) a brushstroke from a writing board when characters and drawings (brushstroke) drawn on the writing board by the ink composition of the present invention become unnecessary. This remover may surround the circumference of a particle and erase the written characters when said polymer and pigment are dried to precipitate as the particle. If the remover and the polymer are completely compatible, it remains as a smear in peeling (erasing). Further, if they are totally incompatible, brushstroke on a writing board is hard to remove as time goes by. Therefore, it is preferable that the remover is properly compatible with a polymer to be used."

(12) Matters described in Evidence A No. 8

Evidence A No. 8 (Japanese Unexamined Patent Application Publication No. H11-343444) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 8 discloses the following matters:

[8-A] "[Scope of the claims]
[Claim 1] An oil-based ink composition for utensil in which 5 to 30% by weight of an organic white pigment consisting of at least one kind selected from the group consisting

of alkylenebismelamine derivates in a total amount of the ink composition in the oil-based ink composition comprising a coloring agent, a resin, and at least one kind of solvent selected from alcohol-based solvent, glycol-based solvent, and glycol ether-based solvent that are not compatible with water."

[8-B] "[0001]
[Technical Field of the Invention] The present invention relates to an oil-based ink composition for writing material suitable for the use in an oil-based ballpoint pen."

[8-C] "[0006]
[Problem to be solved by the invention] The object of the present invention is to solve the above conventional problem and provide an oil-based ink composition for utensil capable of recognizing the color in appearance through a transparent container tube of ink, further through an axis of a transparent main body, and has the same appearance color and a draw line color, as well as excellent temporal stability without the occurrence of clogging of a pen tip even when stored for a long period."

[8-D] "[0015] The resin used for the present invention is not particularly limited as long as it exhibits temporal stability of the above organic white pigment, but may preferably include at least one kind selected from melamine-alkylsulfonamide-formaldehyde polycondensation resin and polyvinyl butyral. Melamine-alkylsulfonamide-formaldehyde polycondensation resin may include, for example, melamine-phenylsulfonamide-formaldehyde polycondensation resin, melamine-benzylsulfonamide-formaldehyde polycondensation resin, and melamine-tolylsulfonamide-formaldehyde polycondensation resin. At least one kind selected from these melamine-alkylsulfonamide-formaldehyde polycondensation resin and polyvinyl butyral is preferably contained in 10 to 30% by weight on an amount basis of the aforesaid organic white pigments. Furthermore, the present invention may be a resin used for a common oil-based ink for utensil for controlling the viscosity of the ink composition and improving the adhesion of the coloring agent, waterproof property, and pigment dispersion stability. The resin may include, for example, ketone resin, sulfonamide resin, maleic acid resin, ester gum, xylene resin, alkyd resin, phenol resin, rosin and polyvinylpyrrolidone solely, or a mixture of two or more. A total content of these resins is from 5 to 40% by weight on a total amount basis of ink composition. If the amount of a resin is less than 5% by weight, it becomes impossible to maintain a stable ink flow, whereas the content beyond 40% by weight results in a poor following of an ink, which causes the decrease in the writing performance such as a faded line, and is thus not preferable.
... (omitted)...
[0018] A container of ink may include a container for utensil in which an ink is directly filled in a transparent ink container tube molded from a plastic, etc., so that an oil-based ink composition of the present invention may bring the effects. Further, when an oil-based ink for utensil of the present invention configured in such a way is used for an utensil equipped with a transparent ink container tube, since an organic white pigment in the ink has a crystal structure different from a polymer fine particle or a polymer hollow fine particle, ink color is reflected on the organic white pigment even in a thick color ink such as blue, mazarine, or violet, so that the original color of the ink may be

distinguished in appearance. Furthermore, an organic white pigment has a smaller specific gravity than titanium oxide (the organic white pigment=1.4, titanium oxide=3.9), and at least one kind of melamine-alkylsulfonamide-formaldehyde polycondensation resin and/or polyvinyl butyral resin helps the organic white pigment stably disperse and makes it hard to precipitate, which provides an ink with excellent temporal stability despite the presence of a large amount of coloring materials. Furthermore, when dyes and organic white pigments are used for a coloring agent, the organic white pigments have good dispersion stability, and it is particularly effective in an ink composition using a large amount of pigments for a coloring agent where dispersion stability is required."

(13) Matters described in Evidence A No. 9

Evidence A No. 9 (Japanese Unexamined Patent Application Publication No. H10-120962) is a publication distributed before the priority date of the application according to the Patent. Evidence A No. 9 discloses the following matters:

[9-A] "[Scope of the claims]
[Claim 1] An oil-based ink composition comprising: at least one kind of solvent selected from alcohols, ethers, and esters with a vapor pressure at 20°C of 0.005 to 45 mmHg, a dispersion term δd in Hansen 3D dissolution parameter of 13.0 to 20.0, a polar term δp of 1.0 to 10.0, and a hydrogen bonding term δh of 5.0 to 20.0; an additive for suppressing evaporation of the solvent comprising an ester derivative of a polyvalent alcohol; at least one kind of additives selected from the group consisting of a resin and a surfactant soluble in the solvent; and a coloring agent."

[9-B] "[0001]
[Technical Field of the Invention] The present invention relates to an oil-based ink composition to be used for an ink for recording such as a stamp ink and an inkjet ink, and an ink for pens and pencils such as an ink for a ballpoint pen and an ink for a marking pen."

[9-C] "[0003]
[Problem to be solved by the invention] As aforementioned, the present invention tries to solve the problems of the easiness to dry of an oil-based ink to be used for utensil inks and recording inks and the ink bleeding on a surface to which an ink attaches. In an ink for stamp, for example, the object of the invention is to provide an oil-based ink composition having good dryness of a seal by stamping, a clear stamping performance, an ability to suppress drying of an ink pad surface for a stamp, and excellent dryness of ink on a poorly ink-absorbing stamped surface such as art paper and coat paper, and capable of providing a vivid seal on a paper surface having thin and crude fibers such as tracing paper without compromising the sealing performance even in a condition where a lid of a stamp ink pad is opened. Further, in an ink for marking, the object is to provide an oil-based ink composition without the occurrence of writing inability due to drying up at a pen tip. Furthermore, there are similar problems with respect to an ink for ballpoint pen and an ink for inkjet printer."

[9-D] "[0008]

[Mode for carrying out the invention] The solvent used for an oil-based ink composition of the present invention is a solvent consisting of at least one kind selected from alcohols, ethers, and esters with a vapor pressure at 20°C of 0.005 to 45 mmHg, a dispersion term δd in Hansen 3D dissolution parameter of 13.0 to 20.0, a polar term δp of 1.0 to 10.0, and a hydrogen bonding term δh of 5.0 to 20.0. Alcohols may include, for example, polyvalent alcohols having two or more carbons in a molecule such as ethanol, 1-propanol, 2-propanol, 1-butanol, and 2-butanol; and polyvalent alcohols having two or more carbons and two or more hydroxyl groups in a molecule such as ethyleneglycol, diethyleneglycol, 3-methyl-1,3-butanediol, triethyleneglycol, dipropyleneglycol, 1,3-propanediol, 1,3-butanediol, 1,5-pentanediol, hexylyleneglycol, and octyleneglycol.
[0009] Further, ethers include, for example, dialkylethers such as methylisopropylether, diethylether, ethylpropylether, ethylbutylether, 2-ethylhexylether, diisopropylether, dibutylether, and dihexylether; and glycolethers such as ethyleneglycolmonomethylether, ethyleneglycolmonoethylether, ethyleneglycolmonobutylether, ethyleneglycolmonohexylether, ethyleneglycolmonophenylether, ethyleneglycolmono-2-ethylbutylether, ethyleneglycoldibutylether, diethyleneglycolmonomethylether, diethyleneglycolmonoethylether, diethyleneglycolmonobutylether, diethyleneglycoldiethylether, diethyleneglycoldibutylether, propyleneglycolmethylether, dipropyleneglycolmethylether, tripropyleneglycolmethylether, propyleneglycolethylether, propyleneglycolbutylether, dipropyleneglycol n-butylether,tripropyleneglycol n-butylether, propyleneglycol tertiary-butyl ether, propyleneglycolphenylether, and 3-methyl-3-methoxy-1-butanol.
[0010] Further, esters may include, for example, fatty acid esters such as methl formate, ethyl formate, propyl formate, isobutyl formate, isoamyl formate, methyl acetate, ethyl acetate, propyl acetate, butyl acetate, isopropyl acetate, isobutyl acetate, isoamyl acetate, methyl propionate, ethyl propionate, propyl propionate, isobutyl propionate, isoamyl propionate, methyl butyrate, ethyl butyrate, methyl isobutyrate, ethylisobutyrate, and propylisobutyrate; and glycol esters such as propyleneglycolmethylether acetate, propyleneglycoldiacetate, 3-methyl-3-methoxybutylacetate, propyleneglycolethylether acetate and ethyleneglycolethyletheracetate. These alcohols, polyvalent alcohols, ethers, esters etc. may be used solely, or in a combination of two or more.
[0011] the amount of these solvents in an oil-based ink composition of the present invention is 20 to 95% by weight, preferably 30 to 90% by weight, further preferably 40 to 90% by weight."

[9-E] "[0016] The coloring agent used for oil-based ink composition of the present invention is mainly dyes and pigments. Dyes are not particularly limited as long as they can dissolve into the aforementioned solvent in an amount of 3.0% by weight or more, and may include direct dye, acidic dye, basic dye, mordant/acidic mordant dye, azoic dye, sulfur/sulfur vat dye, vat dye, disperse dye, oil dye, food dye and metal complex dye, which are commonly used for dye ink composition. Further, pigments used herein may be any one from inorganic or organic pigments used for a common pigments ink composition. the amount of a colorant in an oil-based ink composition of the present invention is 1 to 50% by weight, preferably 2 to 40% by weight, further preferably 2 to 35% by weight. Preferable ranges are 2 to 25% by weight for dyes, and 5 to 35% by

weight for pigments."

[9-F] "[0017] Resins in at least one kind of additives selected from the group consisting of a resin and a surfactant used in the composition of the present invention may be everything if it can be dissolved into the above solvent in 3.0% by weight or more, and may include, for example, natural resins such as glue, gum arabic, and rosins, semisynthetic resins such as hydroxyethyl cellulose and derivatives thereof, synthetic resins such as polyvinyl alcohol, polyvinylpyrrolidone, polyvinyl butyral, polyvinyl ether, styrene-maleic acid copolymer, ketone-based resin, and styrene-acrylic acid copolymer. Two or more of these resins may be used in combination. the amount of these resins is 0.5 to 30% by weight, preferably 1.0 to 20% by weight, further preferably 1.5 to 18% by weight on a total amount basis of the composition. These resins have effects of strengthening the toughness of a seal and controlling the viscosity of a stamp ink. When a pigment is used as a coloring agent, the resins may be used for the purpose of a pigment-dispersing agent in some cases."

(14) Matters described in Japanese Unexamined Patent Application Publication No. H11-335614

Japanese Unexamined Patent Application Publication No. H11-335614 (suggested by the body. Hereinafter referred to as "reference document A") is a publication distributed before the priority date of the application according to the Patent. Reference document A discloses the following matters:

[A-A] "[Scope of the claims]

[Claim 1] An ink composition for oil-based ballpoint pen, comprising at least one kind of organic solvents selected from the group consisting of alcohols and glycol ethers, a carboxyvinyl polymer, an amine, and a coloring agent."

[A- B] "[0001]

[Technical Field of the Invention] The present invention relates to an ink composition for oil-based ballpoint pen. More specifically, it relates to an ink composition for oil-based ballpoint pen with a light writing feeling."

[A-C] "[0018] Pigments may include inorganic pigments and organic pigments without processing, or processed pigments and dispersed toners in which these pigments and resins are subjected to surface modification with surfactants, etc. Specific examples of the pigments may include, for example, titanium oxide, carbon black, phthalocyanine-based, azo-based, anthraquinone-based, quinacridone-based, Microlease Color (made by Ciba-Geigy), and Fuji AS Color (made by Fuji Dyestuff Co., Ltd.), Aluminum paste, and Fuji FastRed."

[A-D] "[0022] Resins are not particularly limited insofar as they are commonly used as an ink composition for oil-based ballpoint pen, and may include, for example, ketone resins, toluenesulfamide resins, maleic resins, ester gums, xylene resins, alkyd resins, phenol resins, terpenephenol resin, rosin, polyvinylpyrrolidone, polyvinyl butyral, ethylcellulose, and rosin alcohols. These resins each may be used alone or in a mixture of two or more kinds thereof."

[A-E] "[0026]
[Example(s)] The present invention shall be explained below in further detail with reference to examples, comparative examples, and test examples in the present invention, but the present invention shall by no means be restricted by these examples. Note that numerical values in the examples and comparative examples represent weight parts.

[0027] Example 1.

Coloring agent:	Carbon black	15.0
Resin:	Polyvinyl butyral	3.0
Organic solvent:	Benzylalcohol	16.8
	2-phenoxyethanol	58.5
Carboxyvinylpolymer:	HybisWako104	0.9
Amine:	di-n-butylethanolamine	3.8
Lubricant:	Oleic acid	2.0

[0028] Example 2.

Coloring agent: Carbon black	15.0
Resin: Polyvinyl butyral	3.0
Organic solvent: Benzylalcohol	16.2
2-phenoxyethanol	61.0
Carboxyvinylpolymer: Junron PW-150	1.8
Amine: di-n-butylethanolamine	3.0

[0029] Example 3.

Coloring agent: Fuji FastRed1010	11.0
Resin: Polyvinyl butyral	2.7
Organic solvent: Benzylalcohol	17.5
2-phenoxyethanol	65.4
Resin: Polyvinylpyrrolidone K-30	1.0
Carboxyvinylpolymer: Hibis Wako 105	0.8
Amine: di-n-butylethanolamine	1.6"

(15) Matters described in Japanese Unexamined Patent Application Publication No. H11-80455

Japanese Unexamined Patent Application Publication No. H11-80455 (suggested by the body; Hereinafter referred to as "reference document B") is a publication distributed before the priority date of the application according to the Patent. Reference document B discloses the following matters:

[B-A] "[0034] Inorganic pigments other than titanium oxide
Inorganic pigments other than titanium oxide may include the following ones. Specifically, it may include white pigments such as white zinc flower, lithopone, and white lead; red pigments such as red oxide, pigment red, molybdenum red, and cadmium red; yellow pigments such as chrome yellow, titan yellow, and yellow iron oxide; orange pigments such as chrome orange and cadmium orange, green pigments such as chrome green, chrome oxide, viridian, and green spinel; brown pigments such as zinc ferrite; blue pigments such as iron blue, ultramarine blue, and cobalt blue; violet pigments such as manganese violet, cobalt violet, and Bengal violet; and black pigments such as carbon black and iron black.

[0035] Organic pigments
Organic pigments preferably have a total content of no more than 0.1% by weight in a propylene-based resin composition. Specific examples of organic pigments may include red-based pigments such as lake red C, lake red D, brilliant carmine 6B, lithol red, permanent red 4R, watching red, thioindigored, alizarin red, quinacridone red, rhodamine lake, orange lake, benzimidazolone red, pyrazolone red, condensed azo red, perylene red, permanent carmine FB, and quinacridone magenta; yellow-based pigments such as isoindolinone yellow, benzidine yellow, fast yellow, flavone throne yellow, naphthol yellow, quinoline yellow, benzimidazolone yellow, HR yellow, and condensed azo yellow; orange-based pigments such as benzimidazolone orange and perinone orange; green-based pigments such as phthalocyanine green, pigment green B, naphthol green, acid green lake, and malachite green lake, blue-based pigments such as phthalocyanine blue, indane threne blue RS, fast sky blue lake, alkali blue lake, and Victoria blue lake; and violet-based pigments such as Fast Violet B, methyl violet lake, and dioxazine violet."

(16) Matters described in Japanese Unexamined Patent Application Publication No. H9-59554

Japanese Unexamined Patent Application Publication No. H9-59554 (suggested by the body; hereinafter referred to as "reference document C") is a publication distributed before the priority date of the application according to the Patent. Reference document C discloses the following matters:

[C-A] "[0032] (Example 7)

Insoluble azo red (FujiFastRed1010, manufactured by Fuji Pigments)	10.0 parts
N-vinylpyrrolidone, acrylic acid copolymer (Molecular weight: 8000)	6.0 parts
2-pyrolidone	25.0 parts
Diethyleneglycol	9.0 parts
Water	49.8 parts
Proxel GXL (preservatives, ICI)	0.2 part

Mixing in the above formulation, a mixture was subjected to a dispersion treatment in a ball mill, and removing coarse particles by centrifugal separation to obtain an ink for a red felt pen."

(17) Matters described in Japanese Unexamined Patent Application Publication No. H11-21491

Japanese Unexamined Patent Application Publication No. H11-21491 (suggested by the body; hereinafter referred to as "reference document D") is a publication distributed before the priority date of the application according to the Patent. Reference document D discloses the following matters:

[D-A] "[Scope of the claims]
[Claim 1] An ink composition for utensil, comprising an organic solvent with an SP value of 5 to 15 and a vapor pressure at 20°C of 0.01 mmHg to 45 mmHg, a coloring agent of pigments and/or dyes, and a resin with a solubility to water and ethanol at 25°C

of 7% or less."

[D-B] "[0001]
[Technical Field of the Invention] The present invention relates to an ink composition for utensil suitable for a marking pen, felt pen, or ballpoint pen with excellent draw line dryness on a non-absorbing surface, draw line adhesiveness (toughness), waterproof property, and alcohol resistance, capable of writing on various kinds of surfaces such as a resin surface, a glass surface, and a metal surface."

[D-C] "[0017] The coloring agent used herein may include pigments and/or dyes. Dyes are preferably dyes with a low solubility to water and ethanol. Pigments may be organic pigments or inorganic pigments, and preferably are ones hard to dissolve into an organic solvent used. In a case of organic pigments, the average particle diameter after dispersing is preferably 30 nm to 700 nm, whereas in a case of inorganic pigments, the average particle diameter after dispersing is preferably 30 nm to 10 μm. Dyes are not particularly limited as long as they have a low solubility to the above water and ethanol. The solubility is 10% or less at room temperature, and 3% or more at room temperature to a main solvent. Further, in particular, the combination of dyes and pigments is allowable unless it causes poor solubility due to pigment precipitation and viscosity increase. The mixing amount of pigments is from 0.5 to 25% by weight, preferably 0.5 to 20% by weight on a total weight basis of the ink composition; dyes may be mixed as necessary in a range of 0.1 to 35% by weight, preferably 0.5 to 20% by weight. Usable inorganic pigments may include, for example, inorganic pigments such as carbon black, titan black, zinc flower, rouge, titanium oxide, chromium oxide, iron black, cobalt blue, yellow iron oxide, veridian, zinc sulfide, lithopone, cadmium yellow, vermilion, cadmium red, chrome yellow, molybdate orange, zinc chromate, strontium chromate, white carbon, clay, talc, ultramarine, barium sulfate, baryta powder, calcium carbonate, flake white, ferric hexacyanoferrate, manganese violet, aluminum powder, and brass powder."

[D-D] "[0024] To produce an ink composition for utensil of the present invention, various publicly-known methods may be adopted. The ink composition may be easily obtained by formulating the above components, mixing and stirring by a stirring machine such as dissolver, etc., or mixing and grinding by a ball mill, a triple roll mill, a bead mill, or a sand mill and then subjecting to centrifugal separation or filtration to remove a coarse particle of pigment particle or titanium oxide particle, as well as undissolved residue or a mixed solid."

[D-E] "[0050] The inks obtained in the above Examples 1 to 14 and Comparative Examples 1 to 9 were subjected to the measurement of physical properties such as surface tension, viscosity, and average particle diameter after dispersing (in a case of using a pigment) of the inks by the following test method. Further, evaluation tests of draw line dryness and toughness, water resistance, and alcohol resistance were conducted for several kinds of writing surfaces for the assessment of pen bodies of the prepared inks. These results are shown in the following Tables 1 and 2.
... (omitted)...
[0053] (Measurement of average particle diameter of pigment ink) After the preparation

of ink, an average particle diameter was measured by Submicron Particle Sizer (manufactured by Coulter), [Use average value of three trials]"

[D- F] "[0058]
[Table 1]

			実施例													
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
有機溶剤	ＳＰ値	①	7.5	9.6	12.0	9.6	9.6	9.6	9.6	12.0	9.6	10.5	9.6	9.6	9.6	9.6
		②			8.4		11.2				8.4	11.2			9.9	
	([cal／cm^3]$^{1/2}$)	③										12.2				
	蒸気圧(mmHg)	①	1.7	3.7	0.45	3.7	3.7	3.7	3.7	0.45	3.7	0.01	3.7	3.7	3.7	3.7
	[20℃]	②			0.4		0.6				0.4	0.6			0.06	
		③										9.0				
樹脂	水への	①	<1	<1	<1	<1	<1	<1	<1	<1	<3	<1	<1	<3	<3	<1
	溶解度(%)[25℃]	②											<1	<1		
	エタノールへの	①	<1	<1	<1	<1	<1	<1	<1	<1	<3.5	<1	<1	<4	<3.5	<1
	溶解度(%)[25℃]	②											<1	<1		
インキ表面張力(dyn/cm)			28.2	27.5	28.6	27.4	27.5	27.5	27.4	26.3	27.6	27.9	27.5	27.6	21.6	27.4
インキ粘度 (mPa･s)			8.9	4.5	23.0	10.3	7.5	6.4	12.0	17.2	14.4	8.3	6.7	7.0	6.9	4.7
平均粒子径 (nm)			281	310	283	180	185	280	396	300	322	－	－	555	328	276
描線乾燥性	ＰＰＣ		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	ＰＳ		○	◎	○	◎	◎	◎	◎	○	◎	○	◎	◎	○	◎
	アクリル		○	◎	○	◎	◎	◎	◎	○	◎	○	◎	◎	○	◎
	ＰＥＴ		○	◎	○	◎	◎	◎	◎	○	◎	△	◎	◎	△	◎
	ＡＢＳ		○	◎	○	◎	◎	◎	◎	○	◎	○	◎	◎	○	◎
	銅板		○	◎	○	◎	◎	◎	◎	○	◎	△	◎	◎	△	○
	アルミ板		○	◎	○	◎	◎	◎	◎	○	◎	△	◎	◎	△	○
	真鍮板		○	◎	○	◎	◎	◎	◎	○	◎	△	◎	◎	△	○
	ステンレス板		○	◎	△	◎	◎	◎	◎	○	◎	△	◎	◎	△	○
	ガラス		○	◎	○	◎	◎	◎	◎	○	◎	△	◎	◎	△	○
描線堅牢性	ＰＰＣ		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	ＰＳ		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
	アクリル		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
	ＰＥＴ		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
	ＡＢＳ		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
	銅板		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
	アルミ板		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
	真鍮板		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
	ステンレス板		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
	ガラス		○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○
耐水性	ＰＰＣ		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	コート紙		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
耐アルコール性	ＰＰＣ		◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	◎	◎
	コート紙		◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	○	◎

実施例　Examples
有機溶剤　Organic Solvent
樹脂　Resin
インキ表面張力　Ink Surface Tension
インキ粘度　Ink viscosity
平均粒子径　Average particle size
描線乾燥性　Line dryness
描線堅牢性　Line toughness
耐水性　Water resistance
耐アルコール性　Alcohol resistance
ＳＰ値　SP value
蒸気圧　Vapor pressure
水への溶解度（％）（２５℃）　Solubility to water (%) (25°C)
エタノールへの溶解度（％）（２５℃）　Solubility to ethanol (%) (25°C)
アクリル　Acryl
銅板　Copper sheet
アルミ板　Aluminum sheet

真鍮板　Brass sheet
ステンレス板　　Stainless sheet
ガラス　Glass
コート紙　　Coat sheet

[0059]
[Table 2] ... (omitted)"

3 Reasons 1(1) for Invalidation (Violation of support requirement)
(1) Construction of Article 36(6)(i) of the Patent Act

The determination of whether or not the recitation of the Claims might conform to the requirement of "an invention for which a patent is sought should be described in the Detailed Description of the Invention" of Article 36(6)(i) of the Patent Act; i.e., the support requirement, should follow the steps of: comparing the recitation of the Claims with the description of the Detailed Descriptions of the Invention; and considering whether or not the Invention recited in the Claims might be the invention described in the Detailed Description of the Invention and fall within the range in which those skilled in the art could recognize that the problem to be solved by the Invention might be solved, or considering whether or not the Invention recited in the Claims might fall within the range in which those skilled in the art could recognize without the explicit description or suggestion in view of the common technical knowledge as of the filing that the problem to be solved by the Invention might be solved (the IP High Court Decision, Special Division, made on Heisei 17-nen (gyo-ke) No.10042).

Accordingly, a consideration is given first to the problem to be solved by the patent invention, and then as to whether a person skilled in the art could solve the problem on the basis of the Detailed Description of the Invention, and finally as to whether a claimed invention falls within a range that allows a person skilled in the art to recognize from the Detailed Description of the Invention that the problem may be solved.

(2) The description of the specification

The specification has the following descriptions:

A "[0001]
[Field of industrial application] The present invention relates to an oil-based ink composition of chromic color, in particular an oil-based composition of chromic color suitable for oil-based ballpoint pen having excellent temporal stability using dyes and organic pigments in combination as a color material, and to an oil-based ballpoint pen."

B "[0002]
[Background Art]
An ink for oil-based ballpoint pen using butyral resin as a pigment dispersant and/or viscosity-controlling agent is disclosed in Japanese Patent Publication No. S57-43185, Japanese Unexamined Patent Application Publication No. H6-192612, Japanese Unexamined Patent Application Publication No. H6-248217, Japanese Unexamined Patent Application Publication No. H6-313144, Japanese Unexamined Patent Application Publication No. H6-313145, Japanese Unexamined Patent Application

Publication No. H7-70504, Japanese Unexamined Patent Application Publication No. H8-41407, Japanese Unexamined Patent Application Publication No. H8-41408, Japanese Unexamined Patent Application Publication No. H8-120206, Japanese Unexamined Patent Application Publication No. H8-134393, Japanese Unexamined Patent Application Publication No. H9-78021, and Japanese Unexamined Patent Application Publication No. H10-60356.

[0003]

However, most of these cases only exemplify the case where only a dye or only a pigment is used as a color material. Further, although these cases mention in main text that dyes and pigments may be used in combination, they fail to refer to the problem in combining dyes and organic pigments. Therefore, even in a combined system of dyes and organic pigments, alcohol-soluble type dyes are usable no matter what kind of structure they have. There is a problem of insufficient temporal stability in a combined use of dyes and organic pigments in an oil-based ink composition of chromatic color at least comprising butyral resin.

[0004]

Here, the advantage of using dyes and organic pigments in combination as color materials lies in that the following problem hard to be overcome solely may be easily overcome by utilizing the advantages of one another. For example, the use of dyes only results in the elution or chromatic loss of a draw line written on a paper surface by an alcohol-based solvent (alcohol resistance) or a redox agent (chemical resistance) in many cases, or the toughness of a draw line is somewhat inferior due to color loss in a short time when exposed under sunlight (light resistance). Further, to obtain a good draw line toughness, in particular good light resistance, a large amount of a metal-containing dye including a heavy metal of chromium in a dye skeleton structure is required, which poses an environmental problem such as the release of chromium by incineration, while it has a small amount.

[0005]

On the contrary, the use of only an organic pigment results in a poor temporal stability or a writing inability in an extremely short period in a case where an ink contains the organic pigment in an amount to obtain a practically sufficient draw line concentration, or makes it practically difficult to industrially produce a high level of an organic pigment dispersant. In a case where the cost or the temporal stability is prioritized, it is often the case that the intensity of a draw line is small and not practical, since a sufficient amount of pigments is not contained in an ink. This phenomenon is particularly significant in a cold color/achromatic color system such as black and blue.

[0006]

Further, the advantages of the case where butyral resin is used as a pigment dispersant and a viscosity-controlling agent may include the improvement on the dispersibility and the stability of pigments and a good writing feeling. In particular, the effects are significant from the viewpoint of improving dispersibility and stability of organic pigments. It is often the case that the dispersion of the other resin or the dispersion with a surfactant results in the failure to obtain a sufficient dispersibility, or lacks temporal stability though it is initially dispersed, or a disperse system often collapses in a case of adding lubricants, anticorrosives, and viscoelasticity modifier necessary for an ink of a ballpoint pen; however, a pigment dispersant and a viscosity-controlling agent provide a dispersion satisfying them all."

C "[0007]
[Problem to be solved by the invention]
The present invention tries to solve the aforementioned problem and thus has an objective to provide an ink composition of chromatic color for an oil-based ballpoint pen with extremely excellent temporal stability even in a case of using butyral resin as a pigment dispersant and a viscosity-controlling agent in a combined system of dyes and organic pigments, and to provide an oil-based ballpoint pen using the same."

D "[0008]
[Means for solving the problem]
The inventors have intensively investigated to solve the above problem and finally found that the above goal may be achieved in a case where dyes used for a coloring agent have a specific structure, and thus completed the present invention.
The present invention is
(1) an oil-based ink composition of a chromatic color comprising at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a butyral resin; and
(2) an oil-based ballpoint pen filled with an oil-based ink composition of a chromatic color according to (1).
[0009]
In the above present invention, chromic color means any color excluding achromatic color, including black and white. Further, if an organic pigment is used in combination with a halochromic dye of a basic dye and an organic acid as color materials, and a butyral resin is contained as a pigment dispersant and a viscosity-controlling agent, it is uncertain as to why excellent temporal stability is obtained, differing from the case of using the other alcohol-soluble type dye. However, butyral resin is a condensed product of butylaldehyde and PVA, and thus it contains an OH group of PVA in a molecular chain. It is assumed that this moiety might undergo a certain reaction with an acidic component of an alcohol-soluble type dye. In a case of bearing a relatively small organic acid as an acidic component such as a halochromic dye of a basic dye and an organic acid of the present invention, the effects on the solubility of butyral resin are small even if the reaction proceeds, whereas in a case of bearing an acidic dye with a relatively large molecular chain as an acidic component such as the other alcohol-soluble type dye, it is supposed to have adverse effects of a decrease in the solubility of butyral resin. As a result, if a halochromic dye of a basic dye and an organic acid is used, even if there should be a butyral resin as a pigment dispersant and a viscosity-controlling agent, good temporal stability is obtained, differing from the case of using the other alcohol-soluble type dye. Therefore, an alcohol-soluble dye is preferably not contained in an oil-based ink composition of the present invention, since it deteriorates temporal stability."

E "[0010]
[Embodiments for carrying out the Invention]
Hereinafter, embodiments of the present invention are elaborated.
Dyes used herein are halochromic dyes of a basic dye and an organic acid. The examples thereof include Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Red C-BH, Aizen Spilon Violet C-RH, Aizen Spilon

Blue C-RH, Aizen S.B.N Blue 701, Valifast Red 1360, and Valifast Yellow 1110. These dyes each may be used alone or in a mixture of two or more kinds thereof. These halochromic dyes of basic dyes and organic acids are added preferably in a range of 5 to 40% by weight on a total weight basis of the ink composition."

F "[0011]
Organic pigments used for an ink composition of the present invention may include various pigments, for example, organic-based pigments such as azo lake, insoluble azo pigments, chirate azo pigments, phthalocyanine pigments, anthraquinone pigments, quinacridone pigments, dye lake, nitro pigments, condensed azo pigments, isoindolinone, quinacridone, diketopyrrolo, and anthraquinone.
[0012]
Further more specifically, organic pigments as a blue coloring agent may include various blue pigments, ... (omitted)...
[0016] Organic pigments as a red coloring agent may include various red pigments, ... (omitted)...
[0020] Organic pigments as a yellow coloring agent may include various yellow pigments, ... (omitted)...
[0023] Organic pigments as a green coloring agent may include various green pigments, ... (omitted)...
[0026] These organic pigments each may be used alone or in a mixture of two or more kinds thereof. Furthermore, the use of butyral resin is preferable as a dispersing agent of these organic pigments. A blending amount of the coloring materials of these dyes and organic pigments in terms of the total of the dyes and the pigments falls preferably in a range of 5 to 60% by weight on a total weight basis of the ink composition, and a blending amount of the organic pigments is preferably 30% by weight or less on a total weight basis of the ink in a combined use formulation of dyes and organic pigments. If a blending amount of the coloring material is less than 5% by weight, intensity of the drawn lines in writing is low and is not practical. On the other hand, if it amounts to 60% by weight, loss of the solvent due to volatilization causes a large problem in the temporal stability deriving from a rise in the viscosity and a shortage in the solubility."

G "[0028]
The butyral resin includes Mowital B20H, B30B, B30H, B60T, B60H, B60HH, B70H, and B20H manufactured by Hoechst Co., Ltd., S-LEC B, BH-3, BL-1, BL-2, BL-L, BL-S, BM-1, BM-2, BM-5, BM-S, and BX-L manufactured by Sekisui Chemical Co., Ltd. and Denka Butyral #2000-L, #3000-1, #3000-2, #3000-3, #3000-4, #3000-K, #4000-1, #5000-A, and #6000-C manufactured by Denki Kagaku Kogyo Kabushiki Kaisha.
[0029]
Further, the other resins can be added to the ink composition of the present invention as a viscosity-controlling agent using in combination with the butyral resin, and capable of being given as examples thereof are resins used for a conventional oil-based ink composition for a ballpoint pen, for example, ketone resins, acetophenone resins, sulfamide resins, maleic resins, ester gums, xylene resins, alkyd resins, phenol resins, rosin resins, polyvinylpyrrolidone resins, and modified resins thereof. These resins may be used alone or in a mixture of two or more kinds thereof, as long as they are used in combination with the butyral resin. A content of these resins is 5 to 30% by weight on a

total ink composition basis. If it is 5% by weight or less, the viscosity of a required lowest possible limit is not obtained, and therefore it is not preferred. On the other hand, if it is 30% by weight or more, the resulting viscosity is elevated too high, and therefore it is not preferred either.

[0030]

Capable of being added, if necessary, to the ink composition of the present invention are, in addition to the essential components described above, the other additives used for a conventional oil-based ink for a ballpoint pen; for example, fatty acids, phosphoric acid ester base lubricants, surfactants, corrosion preventives, antioxidants, and lubricating oils. The ink composition of the present invention can suitably be used for ballpoint pens, fountain pens, felt-tip pens, and marking pens. In particular, the ballpoint pen of the present invention is preferably assembled into a ballpoint pen after filling the oil-based ink composition into a refill having a polypropylene tube and a stainless tip (a ball is made of hard metal)."

H "[0031]

[Example(s)]

The present invention shall be explained below in further detail with reference to examples, comparative examples, and test examples in the present invention, but the present invention shall by no means be restricted by these examples.

[0032]

Examples 1 to 4, Comparative Examples 1 to 6

Produced by the following production process were oil-based ink compositions in which there were combined the respective ink components comprising colorants comprising various organic pigments and dyes, solvents, resins, and lubricants. In producing the ink compositions, the pigments were first dispersed by a well-known method, for example, by means of a ball mill or a triple roll mill, and transferred into a vessel equipped with a reflux condenser and a stirrer, and then the other components were added thereto and stirred at 60°C for 10 hours. Impurities were removed by pressure filtration to prepare oil-based ink compositions of Examples 1 to 4 and Comparative Examples 1 to 6 shown in Table 1. Numerical values in the compositions shown in Table 1 show parts by weight.

[0033]

[Table 1]

原料名			注	1	2	3	4	1	2	3	4	5	6
着色剤	顔料	C.I.ピグメントレッド254		10.0					10.0				10.0
		C.I.ピグメントレッド170			8.0								
		C.I.ピグメントブルー60				8.0	8.0			8.0		10.0	
	塩基性染料と有機酸の造塩染料	アイゼンスピロンバイオレットC－RH	＊1			5.0							
		アイゼンスピロンイエローC－2GH	＊1								5.0		
		アイゼンスピロンイエローC－GNH	＊1	5.0									5.0
		バリファーストイエロー1110	＊2		6.0								
		アイゼンスピロンレッドC－GH	＊1	10.0							20.0		10.0
		バリファーストレッド1360	＊2		8.0								
		アイゼンS．B．N．ブルー701	＊1			10.0				10.0			
		アイゼンスピロンブルーC－RH	＊1				15.0						
	その他のアルコール可溶染料	アイゼンS．B．N．イエロー530	＊1						5.0				
		アイゼンS．P．T．レッド533	＊1						10.0				
		バリファーストブルー1603	＊2					15.0					
		サビニールブルーGLS	＊3					15.0		5.0			
溶剤		ベンジルアルコール		12.0	10.0	8.0	8.0	4.0	12.0	8.0	11.0	11.0	12.0
		2－フェノキシエタノール		45.5	42.5	52.2	43.2	57.0	45.5	52.2	40.0	40.0	45.5
		トリプロピレングリコール－n－ブチルエーテル			5.0		5.0						
		ジプロピレングリコール				5.0	5.0			5.0			
樹脂	ブチラール樹脂	デンカブチラール#2000－L	＊4		2.0								
		エスレックB BL－1	＊5	2.0			2.5		2.0		2.0	2.0	
		エスレックB BX－L	＊5			3.0		6.0		3.0			
	その他の樹脂	シンセテックレジンSK	＊6	15.0	15.0	5.5			15.0	5.5	18.0	33.0	17.0
		YP90L	＊7				10.0						
		PVP K90	＊8		0.5	0.3				0.3	1.0	1.0	
		PVP K120	＊8	0.5			0.3		0.5				0.5
潤滑剤		オレイン酸			3.0	3.0	3.0	3.0		3.0	3.0	3.0	
合計				100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

注 ＊1 保土谷化学工業㈱製
＊2 オリエント化学工業㈱製
＊3 Clariant社製
＊4 電気化学工業㈱製
＊5 積水化学工業㈱製
＊6 ISP社製
＊7 ヤスハラケミカル㈱製
＊8 BASF社製

原料名　Names of raw materials
注　　Note
着色剤　Colorant
溶剤　Solvent
樹脂　Resin
潤滑剤　Lubricant
顔料　Pigment
塩基性染料と有機酸の造塩染料　　Halochromic dye of a basic dye and an organic acid
その他のアルコール可溶染料　　The other alcohol-soluble type dyes
ブチラール樹脂　Butyral resin
その他の樹脂　　Other resin
Ｃ．Ｉ．ピグメントレッド２５４　C.I. Pigment red 254
Ｃ．Ｉ．ピグメントレッド１７０　C.I. Pigment red 170
Ｃ．Ｉ．ピグメントブルー６０　　C.I. Pigment blue 60
アイゼンスピロンバイオレットＣ－ＲＨ　　Aizen Spilon Violet C-RH
アイゼンスピロンイエローＣ－２ＧＨ　　Aizen Spilon Yellow C-2GH
アイゼンスピロンイエローＣ－ＧＮＨ　　Aizen Spilon Yellow C-GNH
バリファーストイエロー１１１０　Valifast Yellow 1110
アイゼンスピロンレッドＣ－ＧＨ　Aizen Spilon Red C-GH
バリファーストレッド１３６０　　Valifast Red 1360
アイゼンＳ．Ｂ．Ｎ．ブルー７０１　　Aizen S.B.N. Blue 701
アイゼンスピロンブルーＣ－ＲＨ　Aizen Spilon Blue C-RH

アイゼンＳ．Ｂ．Ｎ．イエロー５３０　Aizen S.B.N. Yellow 530
アイゼンＳ．Ｐ．Ｔ．レッド５３３　Aizen S.P.T. Red 533
バリファーストブルー１６０３　Valifast Blue 1603
サビニールブルーＧＬＳ　Savinyl Blue GLS
ベンジルアルコール　benzylalcohol
２－フェノキシエラノール　2-phenoxyethanol
トリプロピレングリコール－ｎ－ブチルエーテル　Tripropyleneglycol-n-butylether
ジプロピレングリコール　Dipropyleneglycol
デンカブチラール＃２０００－Ｌ　Denka Butyral#2000-L
エスレックＢ　ＢＬ－１　S-LEC B BL-1
エスレックＢ　ＢＸ－１　S-LEC B BX-1
シンセテックレジンＳＫ　Synthetic Resin SK
オレイン酸　Oleic acid
合計　Total
保土谷化学工業（株）製　Manufactured by Hodogaya Chemical Co., Ltd.
オリエント化学工業（株）製　Manufactured by Orient Chemical Industries Co., Ltd.
Ｃｌａｒｉａｎ社製　Manufactured by Clarian Co., Ltd.
電気化学工業（株）製　Manufactured by Denka Company Limited
積水化学工業（株）製　Manufactured by SEKISUI CHEMICAL CO., LTD.
ヤスハラケミカル（株）製　Manufactured by Yasuhara Chemical Co., Ltd.
ＩＳＰ社製　Manufactured by ISP Co., Ltd.
ＢＡＳＦ社製　Manufactured by BASF

[0034] Each oil-based ink composition prepared by the above method was filled into a refill having a polypropylene tube and a stainless tip (a ball is a superhard steel alloy with a diameter of 0.7 mm), and embedded into an oil-based ballpoint pen as an axis of a commercially available SA-R manufactured by Mitsubishi Pencil. The refill and oil-based ballpoint pen were subjected to the following tests.

[0035]

1) Temporal stability test (substituted by accelerated degradation test)

The aforesaid 15 refills were stored for 3 months in a high-temperature, high humidity bath at 50°C and 80% RH for each ink, 5 refills were taken out every month, and the refills were cooled to room temperature to test writing performance with the following criteria by writing a helical line.

⊙: Able to write as before the test.
○: Have some change compared with before the test.
△: Line faded.
□: Line faded severely.
×: Unable to write.

[0036]

2) Line concentration

Writing with five oil-based ballpoint pens by a writing machine in a condition of a load

of 200 g, a writing angle of 70 degrees, and a writing speed of 4.5 m/min to observe the concentration of the obtained brushstroke by visual inspection.
○: Proper concentration
×: Thin
[0037]
3) Line toughness (Alcohol resistance test)
A piece of paper cut out from draw line obtain in the above 2) was immersed into ethanol overnight and taken out and dried to observe the state of draw line by visual inspection.
⊙: Solid draw line observable
△: Pale draw line remained
×: Draw line flow off, not observable These evaluation results are shown in Table 2.
[0038]
[Table 2]

		経時安定性試験			描線濃度	描線堅牢性
		1M	2M	3M		
実施例	1	◎	◎	◎	○	○
	2	◎	◎	◎	○	○
	3	◎	◎	◎	○	○
	4	◎	◎	◎	○	○
比較例	1	△	□	×	○	△
	2	○	○	△	○	○
	3	○	□	×	○	○
	4	◎	◎	◎	○	×
	5	◎	◎	◎	×	○
	6	×	×	×	○	○

経時安定性試験　Temporal stability test
描線濃度　Line concentration
描線堅牢性　Line toughness
実施例　Example
比較例　Comparative Example

"

I "[0039]
[Advantageous Effects of Invention]
As is obvious from the above results, the ink composition of chromic color for oil-based ballpoint pen can provide an oil-based ink composition of chromatic color suitable for oil-based ballpoint pen having extremely excellent temporal stability even in a case of using butyral resin as a pigment dispersant and a viscosity-controlling agent, as well as an oil-based ballpoint pen using the same."

(3) Problem to be solved by the Invention
It can be seen from the description of the above "(2)B" and "(2)C" that there is a problem of lacking temporal stability if dyes and organic pigments are used in combination for an oil-based ink composition of chromic color comprising at least butyral resin as a pigment dispersant and a viscosity-controlling agent. It is recognized

that the problem to be solved by the claimed invention of Claims 1 and 2 of the Patent is "to provide an ink composition of chromatic color for an oil-based ballpoint pen with extremely excellent temporal stability even in a case of using butyral resin as a pigment dispersant and a viscosity-controlling agent in a combined system of dyes and organic pigments, and to provide an oil-based ballpoint pen using the same."

Additionally, the above problem is as found in "No. 4 1" of Notice of Matters to be Examined on September 29, 2016. There is no dispute between both parties.

Here, the above "temporal stability" means whether the writing performance is unchanged, or changed to cause a faded line or the writing inability, regardless of whether the color material is a combined system of dyes and organic pigments, or a single system from any of them, in view of the fact that the writing performance was tested in a temporal stability test of the same condition and criteria (substituted by accelerated degradation test) for any case of a color material being a combined system of dyes and organic pigments (Examples 1 to 4, Comparative Examples 2 and 3, Comparative Example 6), a color material being only a dye (Comparative Examples 1 and 4), and a color material being only an organic pigment (Comparative Example 5).

Further, it can be seen that a temporal stability might cause a great problem depending on a color material according to the above "(2)D" and "(2)E," and depending on a content of a color material consisting of dyes and organic pigments according to the above "(2)F." Further, as discussed in the advance notice of a trial decision (second, pages 65 and 69), the specification fails to disclose the dispersed state of pigments (in particular, average particle diameter), which causes a great problem in temporal stability.

(4) Judgment

A Solution to the problem to be solved by the Invention

When it comes to the description of Examples 1 to 4, and Comparative Examples 2, 3, and 6, in which a color material is a combined system of dyes and organic pigments, the temporal stability test (1M, 2M, 3M) showed "⊙, ⊙, ⊙" (⊙: Able to write as before the test.) for an ink composition for oil-based ballpoint pen of Examples 1 to 4 comprising dye including a halochromic dye of a basic dye and an organic acid but not including an alcohol-soluble type dye other than the halochromic dye, an organic pigment, and butyral resin, whereas the temporal stability test (1M, 2M, 3M) showed "○, ○, △" (○: Somewhat change compared with before the test.; △: Line faded) for an ink composition for oil-based ballpoint pen of Comparative Example 2 comprising dyes including only an alcohol-soluble type dye other than a halochromic dye, an organic pigment, and butyral resin; further, the temporal stability test (1M, 2M, 3M) showed "○, □, ×" (□: Line faded severely.; ×: Unable to write.) for an ink composition for oil-based ballpoint pen of Comparative Example 3 comprising dyes including a halochromic dye of a basic dye and an organic acid and an alcohol-soluble type dye other than the halochromic dye, an organic pigment, and butyral resin, and furthermore the temporal stability test (1M, 2M, 3M) showed "×, ×, ×" for an ink composition for oil-based ballpoint pen of Comparative Example 6 comprising a dye including a halochromic dye of a basic dye and an organic acid but not including an alcohol-soluble type dye and an organic pigment. Therefore, supposing that the composition includes a butyral resin as a pigment dispersant and a viscosity-controlling agent and an organic pigment, the effects of "extremely excellent temporal stability" may be prima facie confirmed in a composition described in "Examples" of the

specification by use of a dye including a halochromic dye of a basic dye and an organic acid but not including an alcohol-soluble type dye.

(A) Kinds of halochromic dye of a basic dye and an organic acid

Inventions 1 and 2 after the correction specify that "a halochromic dye of a basic dye and an organic acid" is "selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, and Valifast Yellow 1110, and combinations thereof". Further, these specific "halochromic dyes of a basic dye and an organic acid" were used in Examples 1 to 3 of the specification, and "extremely excellent temporal stability" thereof is sufficiently demonstrated (the above "(2)H"). Therefore, it is demonstrated that the use of them may solve the above problem.

Therefore, Inventions 1 and 2 specify that "a halochromic dye of a basic dye and an organic acid" is "selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and combinations thereof" as one of the matters specifying the invention. Thus, it can no longer be said that the Inventions 1 and 2 go beyond the scope in which a person skilled in the art may recognize that the problem to be solved by the Invention described in the specification may be solved.

(B) the amount of halochromic dye, organic pigments, pigments dispersant, and a viscosity-controlling agent of butyral resin in an ink composition for oil-based ballpoint pen.

Regarding the amount of halochromic dye, organic pigments, pigments dispersant, and a viscosity-controlling agent of butyral resin in an ink composition for oil-based ballpoint pen, the Detailed Description of the Invention of the specification discloses that "These halochromic dyes of basic dyes and organic acids are added preferably in a range of 5 to 40% by weight on a total weight basis of the ink composition." (the above "(2)E"), "a blending amount of the coloring materials of these dyes and organic pigments in terms of the total of the dyes and the pigments falls preferably in a range of 5 to 60% by weight on a total weight basis of the ink composition, and a blending amount of the organic pigments is preferably 30% by weight or less on a total weight basis of the ink in a combined use formulation of dyes and organic pigments. If a blending amount of the coloring material is less than 5% by weight, intensity of the drawn lines in writing is low and is not practical. On the other hand, if it amounts to 60% by weight,, loss of the solvent due to volatilization causes a large problem in the temporal stability deriving from a rise in the viscosity and a shortage in the solubility."
(The above item "(2) F"), "The butyral resin includes ... (omitted)... S-LEC B, BH-3, BL-1, BL-2, BL-L, BL-S, BM-1, BM-2, BM-5, BM-S, and BX-L manufactured by Sekisui Chemical Co., Ltd. and Denka Butyral #2000-L, #3000-1, #3000-2, #3000-3, #3000-4, #3000-K, #4000-1, #5000-A, and #6000-C manufactured by Denki Kagaku Kogyo Kabushiki Kaisha. ... (omitted)... the other resins can be added to the ink composition of the present invention as a viscosity-controlling agent using in combination with the butyral resin, and capable of being given as the examples thereof are resins used for a conventional oil-based ink composition for a ballpoint pen, for example, ketone resins, acetophenone resins, sulfamide resins, maleic resins, ester gums,

xylene resins, alkyd resins, phenol resins, rosin resins, polyvinylpyrrolidone resins, and modified resins thereof. A content of these resins is 5 to 30% by weight on a total ink composition basis. If it is 5% by weight or less, the viscosity of a required lowest possible limit is not obtained, and therefore it is not preferred. On the other hand, if it is 30% by weight or more, the resulting viscosity is elevated too high, and therefore it is not preferred either." (The above "(2)G"). Note that the above "5 to 30% by weight" is a total amount of butyral resin resin and the other resins. Although the amount of "butyral resin" alone is not described, it can be seen from the above Examples 1 to 3 described in the specification that the amount of "butyral resin" alone is "2 to 3% by weight" on a total weight basis of the ink composition (See the above "(2)H").

Further, it can be clearly seen from the Detailed Description of the Invention of the specification that a halochromic dye, an organic pigment, and a butyral resin are used in all the Examples 1 to 3 where "a halochromic dye of a basic dye and an organic acid" is "selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and combinations thereof," and the amount of the halochromic dyes are 15.0% by weight, 14.0% by weight, and 5.0% by weight in this order, the amount of organic pigments are 10.0% by weight, 8.0% by weight, and 8.0% by weight in this order, the total contents of the halochromic dye and organic pigments are 25.0% by weight, 22.0% by weight, and 13.0% by weight in this order, and the amount of butyral resin are 2.0% by weight, 2.0% by weight and 3.0% by weight in this order, and "extremely excellent temporal stability" has been sufficiently confirmed in these Examples 1 to 3 as discussed in the above "(A)" (the above "(2)H"). Therefore, in a case that "an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition, and

an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition, and

a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition, and

an amount of said butyral resin is from 2 to 3% on a total weight basis of the ink composition," it can be said that the above problem may be prima facie solved.

In addition, according to the Detailed Description of the Invention of the specification, "a halochromic dye of a basic dye and an organic acid" is "selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360 Valifast Yellow 1110, and combinations thereof," and a halochromic dye, an organic pigment, and a butyral resin are used; however, there are no comparative examples where the amount of each constituent are out of the above numerical range.

a Invention 1

In Invention 1, "a halochromic dye of a basic dye and an organic acid" is "selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and combinations thereof," and a halochromic dye, an organic pigment, and a butyral resin as a pigment dispersant and viscosity-controlling agent are used, and it further specifies each content of a halochromic dye and an organic pigment; however, it does not explicitly specify the amount of a butyral resin as a

pigment dispersant and viscosity-controlling agent.

Here, the specification discloses in [0029] of the above "(2)G" that "the other resins may be added to the ink composition of the present invention as a viscosity-controlling agent using in combination with the butyral resin, including resins used for a conventional ink composition for an oil-based ballpoint pen, e.g. ketone resins, ... (omitted)... . These resins may be used alone or in a mixture of two or more kinds thereof as long as they are used in combination with the butyral resin. The amount of these resins is 5 to 30% by weight on a total ink composition basis." Therefore, it is recognized from the specification that the amount of butyral resin as a pigment dispersant and a viscosity-controlling agent can be 30% by weight or so at the maximum, although it depends on the amount of the other resins to be combined.

As discussed in the above "A," however, it is the composition whose mount is "2 to 3% by weight" on a total amount basis of the ink described in the examples of the specification that achieves the effect of "an extremely excellent temporal stability" of the Invention. Further, it is a matter of common technical knowledge for a person skilled in the art that the characteristics of temporal stability, etc. are affected by the amount of butyral resin resin as a pigment dispersant and a viscosity-controlling agent. Thus it is not recognized that a similar function and effect would be achieved over the whole range of ink composition in which the amount of "butyral resin as a pigment dispersant and a viscosity-controlling agent of the Invention 1" is not specified, although desired function and effect should be caused in a case where the amount of "butyral resin as a pigment dispersant and a viscosity-controlling agent of the Invention 1" in an ink composition is "2 to 3% by weight."

Consequently, it cannot be said that Invention 1 falls within a range that allows a person skilled in the art to recognize from the description of the Detailed Description of the Invention that the problem to be solved by the Invention may be solved, nor can it be said that the amount disclosed in the Detailed Description of the Invention can be extended or generalized to the scope of the Invention 1 in view of the common technical knowledge as of the filing date.

Further, Demandee mentions on page 5 of the written statement on January 19, 2018 that

"Secondly Corrected Invention 1 (body's note: corresponding to "Invention 1") specifies that an ink composition for oil-based ballpoint pen includes butyral resin "as a pigment dispersant and a viscosity-controlling agent," and thus it is obvious from the recitation of Claim 1 that an amount of the butyral resin is an amount that functions as a pigment dispersant and a viscosity-controlling agent. The butyral resin present in an amount that does not function as a pigment dispersant and a viscosity-controlling agent can never be originally said to be a pigment dispersant or a viscosity-controlling agent. Specifically, this secondly Corrected Invention 1 does not encompass an embodiment including an excessively small amount or large amount of butyral resin to the extent that does not cause the effects of pigment dispersant and viscosity-controlling agent." and argues that Invention 1 does not encompass butyral resin present in an amount that does not function as a pigment dispersant and a viscosity-controlling agent. As aforementioned, the amount of butyral resin resin as a pigment dispersant and a viscosity-controlling agent that can perform its function is 30% by weight or so at the maximum. It cannot be recognized that the problem to be solved by the Invention may be solved over the

whole range of ink composition mixing "butyral resin as a pigment dispersant and a viscosity-controlling agent."

Therefore, the above Demandee's argument cannot be a ground for overcoming the reason for Invalidation 1(1) for Invention 1.

b Invention 2

In Invention 2, "a halochromic dye of a basic dye and an organic acid" is "selected from the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and combinations thereof," and a halochromic dye, an organic pigment, and a butyral resin are used, and it mentions about the amount of each constituent that "an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition, and

an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition,

a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition, and

an amount of the butyral resin is 2 to 3% by weight on a total weight basis of the ink composition." Therefore, as in the above "A," the specification it is obvious from the examples of the specification that the Invention causes a desired effect of "extremely excellent temporal stability."

Accordingly, with the above Correction, it can no longer be said that Invention 2 go beyond the scope that allows a person skilled in the art to recognize that the problem to be solved by the Invention described in the specification will be solved.

(C) Dispersed state of pigments

The Detailed Description of the Invention of the specification discloses that "Produced by the following production process were oil-based ink compositions in which combined were the respective ink components comprising colorants comprising various organic pigments and dyes, solvents, resins, and lubricants. In producing the ink compositions, the pigments were first dispersed by a well-known method, for example, by means of a ball mill or a triple roll mill, and transferred into a vessel equipped with a reflux condenser and a stirrer, and then the other components were added thereto and stirred at 60°C for 10 hours. Impurities were removed by pressure filtration to preparation, to reproduce oil-based ink compositions of Examples 1 to 4 and Comparative Examples 1 to 6 shown in Table 1." (the above "(2)H") It is recognized that a dispersed state of an oil-based ink composition is sufficient if it should be dispersed by use of a commonly known method such as a ball mill and a triple roll in the Invention. As discussed in the above "(3)," the specification fails to describe the dispersed state (in particular, average particle diameter) that causes a great problem in temporal stability.

In this regard, Demandee mentions on page 11 of the written statement on January 26, 2017 that "Example 1, Example 2, and Comparative Example 2 of the specification realize a good pigment dispersed state in preparing an ink by determining an end point of the pigment dispersion on the basis of a passage of the average particle diameter." Further, the specific numerical value of the average particle diameter of "249

nm" is exemplified. Further, Demandee mentions on page 7 of the same written statement on May 26, 2017 that "The good dispersed state of pigments in preparing an ink composition (initial stage) is a precondition for an ink composition for oil-based ballpoint pen used for oil-based ballpoint pen. It can never be said to be 'an ink composition for oil-based ballpoint pen' if such precondition is not satisfied.

Therefore, 'an ink composition for oil-based ballpoint pen' to be used in 'oil-based ballpoint pen' of the Invention does not encompass the ones in a poor dispersed state of pigments in preparing the ink composition. It is natural that 'an ink composition for oil-based ballpoint pen' specified in secondly Corrected Inventions 1 and 2 (body's note: corresponding to 'Invention 1 and 2'.) has a good dispersed state of pigment. Thus it is submitted that a person skilled in the art could understand that the problem to be solved by the Invention of 'extremely excellent temporal stability' might be solved." Furthermore, Demandee mentions on pages 7 and 8 of the written opinion on October 13, 2017 that "in an ink composition for oil-based ballpoint pen, a preferable average particle diameter after the dispersion of organic pigments falls within a range well-known to a person skilled in the art." "It is submitted that the average particle diameter after the dispersion of organic pigments should not have been specified as matters specifying the invention in the Corrected Inventions 1 and 2."

The body determines as follows.

The "average particle diameter" for a good dispersed state of pigments during the preparation of an ink is only an item to be specified as a precondition for design by a person skilled in the art. It is recognized that a person skilled in the art realizes an ink composition "with extremely excellent temporal stability" by considering how to improve a dispersed state in view of the existing "average particle diameter." Further, in this regard, although the specification fails to describe specific numerical values of average particle diameter of pigments, for example, as reference document D describes "The average particle diameter after dispersion is preferably 30 nm to 700 nm in the case of organic pigments" (see "D-C"), the average particle diameter may be set as necessary on the basis of common technical knowledge. Thus it cannot be recognized that the provision of the particle size of pigments is required for the solution to the problem to be solved by the Invention.

In addition, Demandant argues on pages 2 to 3 of the written opinion dated October 13, 2017 that "If a common numerical range to the extent that is described in reference document D is presumed, as pointed out by the body, it is natural in such an ink composition to adjust an average particle diameter to such a value for good dispersed state. It goes without saying that the average particle diameter was adjusted to such a value in the experimentation conditions of the Certificate of experimental results on December 9, 2016 and the Certificate of experimental results (2) on November 15, 2016 submitted by Demandant. (First of all, as described in the written statement, (1) of (1) on January 12, 2017 submitted by Demandant (Body's note: it is recognized as a typographical error of "Written statement (1), 5.(1)"), the 'pigment dispersing liquid' of pigments manufacturer was purchased for pigment dispersion of test examples submitted by Demandant. As mentioned above, it is impossible to deliberately deteriorate dispersion.)." Furthermore, Demandant mentions on page 7 of the written refutation on March 2, 2018 submitted by Demandant that "The condition of

Demandant's experimentation (Evidence A No. 19-1 to -3) is not at all problematic (Body's note: it is recognized as a typographical error of 'Evidence A No. 19 to Evidence A No. 19-3')" and argues that the Demandant's experimentation is reliable.

Demandant's experimentation (Evidence A No. 19 to Evidence A No. 19-3) caused pigments to be dispersed by use of "a triple roll" in a pigment's manufacturer according to page 2 of the written statement (1) on January 12, 2017 submitted by Demandant, whereas the examples of the Invention caused pigments to be dispersed by use of "a lateral-type bead mill" according to pages 3 to 4 of the written statement on January 12, 2017 submitted by Demandee. Thus at least the means for dispersion is different from each other.

Further, according to pages 6 and 7 of the written refutation on March 2, 2018, Demandant mentions that "In an experimentation of Evidence A No. 19, a pigment dispersion prepared by pigments, butyral resin, and organic solvents was purchased from a pigment's manufacturer. Immediately after purchasing, (approximately within several months at the longest), oil-based ink compositions of Test examples 1 to 13 were prepared by use of the 'pigment dispersion.' Therefore, the 'pigment dispersion' used in this experimentation was used at the timing when there was totally no problem with the dispersibility." Thus it is recognized that at least "several months" had passed from the timing of dispersing with a dispersing means in a pigment's manufacturer to the timing of preparing an oil-based ink composition by Demandant, whereas it is not recognized in the examples of the Invention that no particular time was required from the timing of dispersing with a dispersing means to the timing of preparing an oil-based ink composition in view of the fact that Demandee itself implemented the above dispersion and preparation. It cannot be recognized that both pigment dispersions have completely the same dispersed state in preparation [the possibility cannot be ruled out that the aggregation of pigments takes place depending on, e.g., the storage state from the timing of dispersing to the timing of preparation to cause an average particle diameter to deviate from the above range (30 nm to 700 nm).].

As described above, it can be said that the certificate of experimental results (Evidence A No. 19 to Evidence A No. 19-3) does not necessarily reproduce the examples according to the Invention faithfully. Further, the experimentation of the above certificate of experimental results by Demandant fails to specify the average particle diameter of pigments in the above "pigment dispersing liquid." Therefore, it cannot be recognized that the experimental condition of such certificate of experimental results has no problem. Therefore, Demandant's argument is not acceptable.

Therefore, it cannot be said that Inventions 1 and 2 may not solve the problem to be solved by the invention even if these inventions should not include the matters specifying the average particle diameter of pigments in preparing an ink composition.

(5) Summary

As described above, for the reason of the above "(B)a," it cannot be recognized that Invention 1 is described in the Detailed Description of the Invention, nor does the recitation of the Claims conform to Article 36(6)(i) of the Patent Act, and thus the Patent was granted for a patent application that did not satisfy the requirement of Article 36(6)(i) of the Patent Act.

In contrast, the recitation of the Claims according to Invention 2 conforms to Article 36(6)(i) of the Patent Act.

4 Reasons 1(2) for invalidation (Violation of Ministerial Ordinance requirement)
(1) Article 36(4) of the Patent Act specifies that "the Detailed Description of the Invention of the item (iii) of the preceding paragraph should disclose definitely and sufficiently to the extent that allows those who has an expert knowledge in the technical field to implement the invention pursuant to the Ordinance of Ministry of International Trade and Industry." The Ordinance of Ministry of International Trade and Industry is Article 24-2 of Regulations under the Patent Act. It specifies that "the Detailed Description of the Invention should disclose definitely and sufficiently to the extent that allows those who have an expert knowledge in the technical field to implement the invention pursuant to the Ordinance of Ministry of International Trade and Industry of Article 36(4) of the Patent Act." Therefore, the violation of Ministerial Ordinance Requirement shall be applied to a case where the specification fails to sufficiently describe matters necessary for a person who has ordinary knowledge in a technical field to which the invention belongs to understand a technical significance of the invention, wherein the matters include a problem to be solved by the invention and a means for solving the problem. Therefore, a consideration is given hereinafter as to whether the specification describes "a problem to be solved by the invention," "a means for solving the problem," and "matters necessary for a person who has ordinary knowledge in a technical field to which the invention belongs to understand a technical significance of the invention."

(2) "Problem to be solved by the invention"
First, as discussed in the above "3(3)," it is recognized that the problem to be solved by the Invention is "to provide an ink composition of chromatic color for an oil-based ballpoint pen with extremely excellent temporal stability even in a case of using butyral resin as pigment dispersant and a viscosity-controlling agent in a combined system of dyes and organic pigments, and to provide an oil-based ballpoint pen."

(3) "Means for solving the problem"
As is formulated in the above "No. 4 2" of Notice of Matters to be Examined on September 29, 2016, it is recognized that means for solving the problem described in the specification is "to use 'a halochromic dye of a basic dye and an organic acid' as a dye in a case of using butyral resin as pigment dispersant and a viscosity-controlling agent in a combined system of dyes and organic pigments, and to provide an oil-based ballpoint pen."
It should be noted that, regarding the above means for solving the problem, there is no dispute between the parties.

(4) "Matters necessary for a person skilled in the art to understand the technical significance of an invention"
In view of the fact that the specification describes "an ink composition for oil-based ballpoint pen of the Invention" and relates to "an oil-based ink composition of chromic color, in particular an oil-based composition of chromic color suitable for oil-based ballpoint pen having excellent temporal stability using dyes and organic pigments

in combination as a color material, and an oil-based ballpoint pen using the same" (the above "3(2)A"), and the examples and comparative examples of the specification include "temporal stability," "draw line concentration," and "draw line toughness" as a barometer on their properties (the above "3(2)H"), it can be seen as essential for an ink composition for oil-based ballpoint pen to have at least properties of "temporal stability," etc. As discussed in the above "3(4)A," in a halochromic dye of a basic dye and an organic acid, the effects of "extremely excellent temporal stability" are prima facie confirmed, although it is limited to a composition described in "Examples" of the specification.

(5) Further, as discussed in the above "3(4)A(A) to (C)," in an ink composition for oil-based ballpoint pen comprising at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a butyral resin, and not comprising an alcohol-soluble type dye other than halochromic dye, as long as "a halochromic dye of a basic dye and an organic acid" is limited to "Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, and Valifast Yellow 1110," which were used in the above Examples 1 to 3 of the specification, and in a condition that "an amount of said halochromic dyes is from 5 to 40% by weight on a total weight basis of the ink composition, and

an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition,

a total amount of said halochromic dyes and said organic pigments is from 5 to 60% by weight on a total weight basis of the ink composition, and

an amount of said butyral resin is from 2 to 3% by weight on a total weight basis of the ink composition," it is technically clarified that the effects of "extremely excellent temporal stability" is achieved, which allows a person skilled in the art to recognize that the problem to be solved by the Invention of the above "3(3)" may be solved. Therefore, reason for Invalidation 1(2) is groundless.

(6) Summary

As described above, the Detailed Description of the Invention of the specification sufficiently describes matters necessary for a person ordinarily skilled in the art to understand the technical significance of Inventions 1 and 2, including a problem to be solved by the invention and a means for solution. Therefore, the patent was granted for a patent application that conforms to the provision of Article 36(4) of the Patent Act.

5 Reason 2 for Invalidation (1) (Lack of novelty on the basis of Evidence A No. 1) and Reason 3 for Invalidation (Lack of Inventive Step on the basis of Evidence A No. 1)

(1) Comparison and Judgment

A Invention 1

Invention 1 and the A1 invention are compared with each other.

(A) The "ink composition for oil-based ballpoint pen" of Invention 1 and the "ink composition for oil-based stamp" of the A1 invention 1 have in common that they are each an "oil-based ink composition."

(B) Further, it can be said that "Spilon Yellow C-GNH (Manufactured by Hodogaya Chemical Co., Ltd.)" of A1 invention 1 is included in "the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and combinations thereof" as defined in Invention 1 as a halochromic dye. Therefore, "ink composition" of the Invention 1 and "ink composition" of A1 invention 1 have in common that "said halochromic dye" "is selected by" "Aizen Spilon Yellow C-GNH."

(C) Further, "Spilon red C-BH" manufactured by Hodogaya Chemical Co., Ltd. of A1 invention 1 is not encompassed into the above group; however, it can be seen as a halochromic dye of a basic dye and an organic acid, according to [0010] of the specification (the above "3(2)E"), stating that "The dye used in the present invention is a halochromic dye of a basic dye and an organic acid. Examples thereof include Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Red C-BH ... (omitted)... ."

Further, the dye of A1 invention 1 is only "'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd. and 'Spilon red C-BH' manufactured by Hodogaya Chemical Co., Ltd.". These are "halochromic dyes of a basic dye and an organic acid" as mentioned above. The ink composition of A1 invention 1 can be seen as "not comprising an alcohol-soluble type dyes other than halochromic dye." Thus "ink composition" of the Invention 1 and "ink composition" of A1 invention 1 are in common in "not comprising an alcohol-soluble type dyes other than halochromic dye."

(D) Further, it is obvious to a person skilled in the art that "'Fast red #2200' manufactured by Fuji Pigment Co., LTD" of A1 invention 1 corresponds to "organic pigments" and "red organic pigments" of Invention 1 (see the above [C-A].) and thus the "ink composition" of Invention 1 and the "ink composition" of A1 invention 1 have in common that "the organic pigments" are "selected from" "red organic pigments."

(E) Further, "polyvinyl butyral resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.)" of A1 invention 1 corresponds to "butyral resin" of Invention 1, according to the description of [0028] of the specification (the above "3(2)G"): "The butyral resin includes ... (omitted)... S-LEC B, BH-3, BL-1, BL-2, BL-L, BL-S, BM-1, BM-2, BM-5, BM-S, and BX-L manufactured by Sekisui Chemical Co., Ltd. ..."

(F) Further, the "red color" of A1 invention 1 is a kind of "chromic color" as discussed in the following "7(1)A(G)," and thus corresponds to "chromic color" of Invention 1.

(G) Further, regarding the amounts of organic pigments, an organic pigment of A1 invention 1 of "'Fast red #2200' manufactured by Fuji Pigment Co., LTD" is "10% by weight" "on a total weight basis of the ink composition." Therefore, "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition" of the Invention 1 and "an amount of 'Fast red #2200' manufactured by Fuji Pigment Co., LTD is 10% by weight on a total weight basis of the ink composition" of A1 invention 1 have in common that "an amount of said organic pigments is 10% by weight on a total weight basis of the ink composition."

(H) Further, regarding an amount of a halochromic dye, a halochromic dye of A1 invention 1 of "'Spilon Yellow C-GNH' manufactured by Hodogaya Chemical Co., Ltd." is "1.5% by weight" (corresponding to "Aizen Spilon Yellow C-GNH" of Invention 1) on a total weight basis of the ink composition. Therefore, it can be said that a total amount of a halochromic dye and an organic pigment of A1 invention 1 is "11.5% by weight (=10% by weight+1.5% by weight)" on a total weight basis of the ink composition. Therefore, "a total amount of said halochromic dyes and said organic pigment is 5% to 60% by weight on a total weight basis of the ink composition" of Invention 1 and "a total amount of a halochromic dye and an organic pigment is '11.5% by weight' on a total weight basis of the ink composition" of A1 invention 1 have in common that "a total amount of a halochromic dye and an organic pigment is '11.5% by weight' on a total weight basis of the ink composition."

(I) Therefore, Invention 1 and A1 invention 1 have a common point in that

they comprise at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a butyral resin, and do not comprise an alcohol-soluble type dyes other than halochromic dye,

said halochromic dye is selected from Aizen Spilon Yellow C-GNH,

said organic pigment is selected from red organic pigments,

an amount of said organic pigment is 10% by weight on a total weight basis of the ink composition, and

a total amount of said halochromic dyes and said organic pigments is 11.5% by weight on a total weight basis of the ink composition."

but they are at least different from each other in the following features:

<Different Feature 1>

Regarding the use of "oil-based ink composition," Invention 1 is "for ballpoint pen," whereas A1 invention 1 is "for stamp."

<Different Feature 2>

Regarding "butyral resin," Invention 1 specifies "as a pigment dispersant and viscosity-controlling agent," whereas A1 invention 1 specifies "as a dispersive resin."

<Different Feature 3>

Regarding "an amount of said halochromic dyes," Invention 1 is "5 to 40% by weight," whereas A1 invention 1 is "1.5% by weight."

(J) Regarding the above Different Features 1 to 3, Different Feature 1 is firstly considered in the following.

(K) Invention 1 is "for ballpoint pen." The properties necessary "for ballpoint pen" include "temporal stability," "line concentration," and "line toughness," as considered in the above "4(4)."

(L) On the other hand, Evidence A No. 1 relates to a stamp ([1-B]). Here, "stamp"

means a porous printing body with a single rubber elastic body absorbing an ink mixed fluid (oil-based ink composition). Evidence A No. 1 only describes an ink composition for stamp. Further, Evidence A No. 1 includes "the preparation of ink solid" and "aggregation of pigments" as the properties necessary for "stamp."

(M) Further, Evidence A No. 1 fails to disclose that an oil-based ink composition serves for a ballpoint pen. Further, the properties listed in Evidence A No. 1 are for stamp, and do not suggest the properties of ballpoint pen.

(N) Further, the problem described in Evidence A No. 1 is "to provide a brand new multiple-color stamp capable of absorbing different inks of multiple colors into a single printing body, and fully expressing a pattern of a seal without compromising the continuity of the pattern, and further capable of expressing a complex pattern," which is in common with the problem to be solved by the Invention 1 [The above "3(3)"].

(O) Further, even if a reference is made to the description of Evidence A No. 2 to A No. 9 in view of common general knowledge, it cannot be said that "for ballpoint pen" and "for stamp" are equivalent as a use, nor can it be said as obvious to a person skilled in the art that an ink composition for oil-based stamp of A1 invention 1 may be used for the use in ballpoint pen.

(P) Consequently, there is Different Feature 1 between Invention 1 and A1 invention 1. Thus, without considering the other different features, it cannot be said that Invention 1 is A1 invention 1. Further, it cannot be recognized that a person skilled in the art could have easily conceived of using an oil-based ink composition of A1 invention 1 for ballpoint pen instead of stamp use, nor can it be said that Invention 1 was easily conceivable by a person skilled in the art on the basis of A1 invention 1 in terms of Different Feature 1.

(Q) Summary

Therefore, it cannot be said that Invention 1 is A1 invention 1, nor was it easily conceivable by a person skilled in the art on the basis of A1 invention 1 and the description of Evidence A No. 1 to 9.

B Invention 2

Invention 2 and A1 invention 2 are compared with each other.

(A) Since Invention 2 comprises "ink composition for an oil-based ballpoint pen" of Invention 1, whereas A1 invention 2 also comprises "ink composition for an oil-based stamp" of A1 invention 1, Invention 2 and A1 invention 2 have in common that "they comprise at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a butyral resin, and do not comprise an alcohol-soluble type dye other than halochromic dye,

said halochromic dye is selected from Aizen Spilon Yellow C-GNH,

said organic pigment is selected from red organic pigments,

an amount of said organic pigment is 10% by weight on a total weight basis of the ink composition,

and a total amount of said halochromic dyes and said organic pigments is 11.5% by weight on a total weight basis of the ink composition" as similar to the ones compared in the above "A(A) to (I)."

(B) Further, regarding an oil-based ink composition, "filled" of Invention 2 and "absorbed" of A1 invention 2 have in common that they both "have" an oil-based ink composition.

(C) Further, the "oil-based ballpoint pen" of Invention 2 and the "oil-based stamp" of A1 invention 2 have in common that they are both one kind of "desk equipment."

(D) Furthermore, regarding an amount of butyral resin, an amount of butyral resin of A1 invention 2 of "polyvinyl butyral resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.)" is "3% by weight" on a total weight basis of the ink composition. Therefore, "an amount of said butyral resin is from 2 to 3% by weight on a total weight basis of the ink composition" of Invention 2 and "an amount of butyral resin of A1 invention 2" of "polyvinyl butyral resin ('BL-1' manufactured by SEKISUI CHEMICAL CO., LTD.)" is "3% by weight" "on a total weight basis of the ink composition" have in common that "an amount of said butyral resin is 3% by weight on a total weight basis of the ink composition."

(E) Therefore, Invention and A1 invention have common points in that they are

"desk equipment comprising an oil-based ink composition of a chromatic color,

and said oil-based ink composition for ballpoint pen comprising at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a butyral resin, and not comprising an alcohol-soluble type dye other than halochromic dye,

said halochromic dye is selected from Aizen Spilon Yellow C-GNH,

said organic pigment is selected from red organic pigments,

an amount of said organic pigment is 10% by weight on a total weight basis of the ink composition, and

a total amount of said halochromic dyes and said organic pigment is 11.5% by weight on a total weight basis of the ink composition, and an amount of the butyral resin is 3% by weight on a total weight basis of the ink composition."

but they are at least different from each other in the following features:

<Different Feature 1'>

Regarding the use of "oil-based ink composition," Invention 2 is "for ballpoint pen," whereas A1 invention 2 is "for stamp."

<Different Feature 3'>

Regarding "an amount of said halochromic dyes," Invention 1 is "5 to 40% by weight," whereas A1 invention 1 is "1.5% by weight."

<Different Feature 4'>

Regarding "desk equipment," the Invention 2 is an "oil-based ballpoint pen," whereas A1 invention 2 is "oil-based stamp."

(F) Regarding the above Different Features 1', 3', and 4', Different Feature 1' is firstly considered in the following.

(G) As aforementioned, there is Different Feature 1' between Invention 2 and A1 invention 2. Different Feature 1' is identical to Different Feature 1 of the above item "A(I)."

(H) Consequently, similar to the one considered in the above "A(J) to (P)," there is Different Feature 1' between Invention 2 and A1 invention 2. Thus, without considering the other different features, it cannot be said that Invention 2 is A1 invention 2. Further, it cannot be recognized that a person skilled in the art could have easily conceived of using an oil-based ink composition of A1 invention 2 for ballpoint pen instead of stamp use, nor can it be said that Invention 2 was easily conceivable by a person skilled in the art on the basis of A1 invention 2 in terms of Different Feature 1'.

(I) Summary

Therefore, it cannot be said that Invention 2 is A1 invention 2, nor was it easily conceivable by a person skilled in the art on the basis of A1 invention 2 and the description of Evidence A No. 1 to 9.

C As for the Demandant's argument

In view of the description of the written refutation on March 2, 2018 submitted by Demandant, Demandant fails to present any counterargument on the above Judgment by the body ["A(Q)" and "B(I)"].

6 Reason 2(2) for Invalidation (Lack of novelty on the basis of Evidence A No. 2) and Reason 3(2) for Invalidation (Lack of Inventive Step on the basis of Evidence A No. 2)

(1) Comparison and Judgment

A Invention 1

Invention 1 and A2 invention 1 are compared with each other.

(A) It can be said that "Spilon Violet C-RH (Manufactured by Hodogaya Chemical Co., Ltd.)" of A2 invention 1 is included in "the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360 Valifast Yellow 1110, and combinations thereof" as defined in Invention 1 as a halochromic dye. Therefore, "ink composition for oil-based ballpoint pen" of Invention 1 and "ink composition for oil-based ballpoint pen" of A2 invention 1 have in common that "said halochromic dye" "is selected by" "Aizen Spilon Violet C-RH."

(B) Further, the dye of A2 invention 1 is only "Spilon Violet CRH (manufactured by Hodogaya Chemical Co., Ltd.)" This is "a halochromic dye of a basic dye and an organic acid" as mentioned above. The ink composition for oil-based ballpoint pen of A2 invention 1 can be seen as "not comprising an alcohol-soluble type dye other than halochromic dye." Thus the "ink composition for oil-based ballpoint pen" of Invention

1 and the "ink composition for oil-based ballpoint pen" of A2 invention 1 have in common that they are "not comprising an alcohol-soluble type dye other than halochromic dye."

(C) Further, it is obvious to a person skilled in the art that "Cyanine Blue BNRS (Manufactured by TOYO INK CO., LTD)" of A2 invention 1 corresponds to "organic pigments" and "blue organic pigments" of Invention 1 (see the above [B-A].). Therefore, the "ink composition" of Invention 1 and the "ink composition" of A2 invention 1 have in common that "the organic pigments" are "selected from" "blue organic pigments."

(D) Further, "Hilac #110 (manufactured by Hitachi Chemicals Co., Ltd., ketone resin) as a pigment dispersant" of A2 invention 1 is a ketone resin. Thus "butyral resin as a pigment dispersant and a viscosity-controlling agent" of Invention 1 and "Hilac #110 (manufactured by Hitachi Chemicals Co., Ltd., ketone resin) as a pigment dispersant" of A2 invention 1 have in common that they are "resins as a pigment dispersant."

(E) Further, the "blue color" of A2 invention 1 is a kind of "chromic color" as discussed in the following "7(1)A(G)," and thus corresponds to "chromic color" of Invention 1.

(F) Further, regarding an amount of halochromic dye, an amount of a halochromic dye of A2 invention 1 of "Spilon Violet CRH (manufactured by Hodogaya Chemical Co., Ltd.)" is 10.0% by weight on a total weight basis of the ink composition. Therefore, "an amount of said organic pigments is 5 to 40% by weight on a total weight basis of the ink composition" of Invention 1" and "an amount of 'Spilon Violet CRH (manufactured by Hodogaya Chemical Co., Ltd.) is 10.0% by weight on a total weight basis of the ink composition" of A2 invention 1 have in common that "an amount of said organic pigments is 10% by weight on a total weight basis of the ink composition."

(G) Further, regarding the amounts of organic pigments, an amount of an organic pigment of A2 invention 1 of "Cyanine Blue BNRS (Manufactured by TOYO INK CO., LTD)" is "25.0% by weight" "on a total weight basis of the ink composition." Therefore, "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition" of Invention 1 and "an amount of Cyanine Blue BNRS (Manufactured by TOYO INK CO., LTD) is 25.0% by weight on a total weight basis of the ink composition" of A2 invention 1 have in common that "an amount of said organic pigments is 25% by weight on a total weight basis of the ink composition."

(H) Furthermore, it can be seen from the above "(F)" and "(G)" that a total amount of the halochromic dyes and organic pigments of A2 invention 1 is "35% by weight (=10.0% by weight + 25.0% by weight)" on a total weight basis of the ink composition. Therefore, "a total amount of said halochromic dyes and said organic pigment is 5% to 60% by weight on a total weight basis of the ink composition" of Invention 1 and "a total amount of a halochromic dye and an organic pigment is 35.0% by weight on a total weight basis of the ink composition" of A2 invention 1 have in common that "a total amount of a halochromic dye and an organic pigment is 35% by weight on a total weight basis of the ink composition."

(I) Therefore, Invention 1 and A1 invention 1 have a common point in that

"An oil-based ink composition of a chromatic color, the ink composition comprising at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a resin as a pigment dispersant, and not comprising an alcohol-soluble type dye other than said halochromic dye,

said halochromic dye is selected from Aizen Spilon Violet C-RH,

said organic pigment is selected from blue organic pigments,

an amount of said halochromic dyes is 10% by weight on a total weight basis of the ink composition,

an amount of said organic pigment is 25% by weight on a total weight basis of the ink composition, and

a total amount of said halochromic dyes and said organic pigments is 35% by weight on a total weight basis of the ink composition." but they are at least different from each other in the following features:

<Different Feature 5>

Regarding "a resin as a pigment-dispersing agent," Invention 1 is "butyral resin," whereas A2 invention 1 is "ketone resin."

(J) The above Different Feature 5 is considered in the following.

(K) When it comes to the above "butyral resin," Evidence A No. 2 describes "polyvinyl butyral" as one of the examples of a resin of a pigment dispersant to be used for an ink composition for oil-based ballpoint pen ([2-E]). Here, it is obvious to a person skilled in the art that "polyvinyl butyral" is "butyral resin" as mentioned in the above "5(1)A(E)." Therefore, the "butyral resin" is one of resins listed as a pigment dispersant to be used for an ink composition for oil-based ballpoint pen in Evidence A No. 2, and may be selected from the resins. Further, disclosed is Example 4 in which "butyral resin" is used as a resin of a pigment dispersant to be used for an ink composition for oil-based ballpoint pen ([2-G]).

(L) Making a comparison between Example 2 corresponding to A2 invention 1 and the above Example 4 in Evidence A No. 2, however, they are comparable in terms of "writing feeling," "rust," and "length of faded line." In terms of "Ball Sinking amount," the numerical value of Example 4 is larger than that in Example 2. Here, referring to the numerical values of the comparative examples, it can be seen that a larger numerical value indicates poor performance. Thus it can be seen that Example 4 including a butyral resin has inferior performance to Example 2 including a ketone resin.

(M) In contrast, as discussed in the above "3(4)A," supposing that the composition includes a butyral resin and an organic pigment, the effects of "extremely excellent temporal stability" may be confirmed only in a composition described in "Examples" of the specification by use of a dye including a halochromic dye of a basic dye and an organic acid but not including an alcohol-soluble type dye for Invention 1.

(N) Further, Evidence A No. 2 only discloses as above. It is thus recognized that a

person skilled in the art would not conceive of using butyral resin which is expected to have a poor performance in place of ketone resin of A2 invention 1. Further, Evidence A No. 3 to Evidence A No. 8 fail to suggest the use of butyral resin in place of ketone resin of A2 invention 1. Further, Evidence A No. 5 discloses that the combination of ketone resin and butyral resin may improve the dispersion stability of pigments and temporal stability; however, this applies to the case of using an inorganic pigment of "carbon black," and does not mean an organic pigment of the Invention 1.

(O) Consequently, there is Different Feature 5 between Invention 1 and A2 invention 1. Thus, it cannot be said that Invention 1 is A2 invention 1. Further, it cannot be recognized that a person skilled in the art could have easily conceived of using a butyral resin instead of a ketone resin as a resin for pigment dispersant included in an ink composition of A2 invention 1 for oil-based ballpoint pen, nor can it be said that Invention 1 was easily conceivable by a person skilled in the art on the basis of A2 invention 1 in terms of Different Feature 5.

(P) Summary

Therefore, it cannot be said that Invention 1 is A2 invention 1, nor that Invention 1 was easily conceivable by a person skilled in the art on the basis of A2 invention 1 and the description of Evidence A No. 2 to 8.

B Invention 2

Invention 2 and A2 invention 2 are compared with each other.

(A) Since Invention 2 comprises the "ink composition for an oil-based ballpoint pen" of Invention 1, whereas A2 invention 2 also comprises the "ink composition for an oil-based stamp" of A2 invention 1, Invention 2 and A1 invention 2 have in common that "they comprise at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a resin, and do not comprise an alcohol-soluble type dye other than halochromic dye,

wherein said halochromic dye is selected from Aizen Spilon Violet C-RH,

wherein said organic pigment is selected from blue organic pigments,

wherein an amount of said halochromic dyes is 10% by weight on a total weight basis of the ink composition,

wherein an amount of said organic pigment is 25% by weight on a total weight basis of the ink composition,

wherein a total amount of said halochromic dyes and said organic pigments is 35% by weight on a total weight basis of the ink composition," similar to the ones compared in the above "A(A) to (F)."

(B) Therefore, the two inventions have a common point in that

"An oil-based ballpoint pen filled with an ink composition of a chromatic color for oil-based ballpoint pen,

wherein said ink composition of a chromatic color for oil-based ballpoint pen comprises at least a halochromic dye of a basic dye and an organic acid, an organic pigment, and a resin, and does not comprise an alcohol-soluble type dye other than halochromic dye,

wherein said halochromic dye is selected from Aizen Spilon Violet C-RH,

wherein said organic pigment is selected from blue organic pigments,

wherein an amount of said halochromic dyes is 10% by weight on a total weight basis of the ink composition,

wherein an amount of said organic pigment is 25% by weight on a total weight basis of the ink composition,

wherein a total amount of said halochromic dye and said organic pigment is 35% by weight on a total weight basis of the ink composition."

but they are at least different from each other in the following features:

<Different Feature 5'>

Regarding a kind of "resin," Invention 2 is "butyral resin," whereas A2 invention 2 is "ketone resin."

<Different Feature 6>

Invention 2 specifies that "an amount of said butyral resin is from 2 to 3% by weight on a total weight basis of the ink composition," whereas A2 invention 2 fails to specify such a point.

(C) Regarding the above Different Features 5', 6, a consideration is given to Different Feature 5'.

(D) As aforementioned, there is Different Feature 5' between Invention 2 and A2 invention 2. Different Feature 5' is identical to Different Feature 5 of the above item "A(I)."

(E) Consequently, similar to the one considered in the above "A(J) to (O)," there is Different Feature 5' between Invention 2 and A2 invention 2. Thus, without considering the other Different Feature, it cannot be said that Invention 2 is A2 invention 2. Further, it cannot be recognized that a person skilled in the art could have easily conceived of using a butyral resin instead of a ketone resin as a resin for pigment dispersant included in an ink composition of A2 invention 2 for oil-based ballpoint pen, nor can it be said that Invention 2 was easily conceivable by a person skilled in the art on the basis of A2 invention 2 in terms of Different Feature 5'.

(F) Summary

Therefore, it cannot be said that Invention 2 is A2 invention 2, nor was it easily conceivable by a person skilled in the art on the basis of A2 invention 2 and the description of Evidence A No. 2 to 8.

C As for the Demandant's argument

In view of the description of the written refutation on March 2, 2018 submitted by Demandant, Demandant fails to present any counterargument on the above Judgment by the body ["A(P)" and "B(F)"].

7 Reasons 2(3) for Invalidation (Lack of novelty on the basis of Evidence A No. 3) and

Reasons 3(3) for Invalidation (Lack of Inventive Step on the basis of Evidence A No. 3)

(1) Comparison and Judgment
A Invention 1
Invention 1 and A3 invention 1 are compared with each other.

(A) It can be said that "Dye: Spilon Violet C-RH" and "Dye: Spilon Yellow C-2GH" of A3 invention 1 are respectively included in "the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110, and combinations thereof" as defined in Invention 1 as a halochromic dye. Therefore, "ink composition for oil-based ballpoint pen" of Invention 1 and "ink composition for oil-based ballpoint pen" of A3 invention 1 have in common that "said halochromic dye" "is selected by" "a combination of" "Aizen Spilon Yellow C-2GH" and "Aizen Spilon Violet C-RH."

(B) Further, dyes of A3 invention 1 are only "Dye: Spilon Violet C-RH" and "Dye: Spilon Yellow C-2GH." These are "halochromic dyes of a basic dye and an organic acid" as mentioned above. The ink composition for oil-based ballpoint pen of A3 invention 1 can also be seen as "not comprising an alcohol-soluble type dye other than halochromic dye." Thus the "ink composition for oil-based ballpoint pen" of Invention 1 and the "ink composition for oil-based ballpoint pen" of A3 invention 1 have in common that they are "not comprising an alcohol-soluble type dye other than halochromic dye."

(C) Further, "organic pigments" of Invention 1 and "inorganic pigments: carbon black" of A3 invention 1 have in common that they are "pigments."

(D) Further, it is obvious to a person skilled in the art that the "resin: polyvinyl butyral resin (S-LEC BBL-1)" of "resin: acetophenone resin (Halon 110H), a resin for adjusting viscosity: polyvinyl butyral (S-LEC BBL-1), and a resin: polyvinylpyrrolidone (PVPK90)" of A3 invention 1 corresponds to "butyral resin" of Invention 1, according to the description of [0028] of the specification (the above "3(2)G"), disclosing that "The butyral resin includes ... (omitted)... S-LEC B, BH-3, BL-1, ... (omitted)... manufactured by Sekisui Chemical Co., Ltd. ..."

(E) Further, regarding an amount of a halochromic dye, it can be seen that the amounts of the halochromic dyes of A3 invention 1 of "Dye: Spilon Violet C-RH" and "Dye: Spilon Yellow C-2GH" are respectively "15% by weight" and "6% by weight" on a total weight basis of the ink composition, which add up to "21% by weight." Therefore, "an amount of said halochromic dyes is 5 to 40% by weight on a total weight basis of the ink composition" of Invention 1 and "an amount of Dye: Spilon Violet C-RH is 15% by weight, and an amount of Dye: Spilon Yellow C-2GH (6% by weight) is 6% by weight on a total weight basis of the ink composition" of A3 invention 1 have in common that "an amount of said halochromic dyes is 21% by weight on a total weight basis of the ink composition."

(F) Furthermore, regarding an amount of pigments, an amount of a pigment of A3

invention 1 of "inorganic pigment: carbon black" is 15% by weight, and an amount of a halochromic dye of A3 invention 1 is 21% by weight as in the above "(E) on a total weight basis of the ink composition." Therefore, it can also be said that an amount of inorganic pigments: carbon black is 15% by weight in an ink composition for oil-based ballpoint pen of A3 invention 1 on a total weight basis of the ink composition, and a total amount of the halochromic dyes and the pigments is 36% by weight (=15% by weight+21% by weight) on a total weight basis of the ink composition.

(G) Therefore, these inventions have a common point in that they are

"an ink composition for oil-based ballpoint pen of chromic color, comprising at least a halochromic dye of a basic dye and an organic acid, pigments and a butyral resin, and not comprising an alcohol-soluble type dye other than halochromic dye,

wherein said halochromic dye is selected from a combination of Aizen Spilon Yellow C-2GH, and Aizen Spilon Violet C-RH,

wherein an amount of said halochromic dye is 21% by weight on a total weight basis of the ink composition."

but they are at least different from each other in the following features:

<Different Feature 7>

Invention 1 is an ink composition of "a chromatic color" for oil-based ballpoint pen including "organic pigments," and "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof," whereas A3 invention 1 is an ink composition for oil-based ballpoint pen of "black color" including "inorganic pigments: Carbon black."

<Different Feature 8>

Regarding "pigments," Invention 1 specifies that "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition,

a total amount of said halochromic dyes and said organic pigment is 5% to 60% by weight on a total weight basis of the ink composition," whereas A3 invention 1 specifies that "an amount of inorganic pigment:carbon black is 15% by weight on a total weight basis of the ink composition,

a total amount of said halochromic dye and said pigment is 36% by weight on a total weight basis of the ink composition."

<Different Feature 9>

Regarding "butyral resin," Invention 1 specifies "as a pigment dispersant and viscosity-controlling agent," whereas A3 invention 1 specifies "one for adjusting viscosity."

(H) Regarding the above Different Features 7 to 9, Different Feature 7 is firstly considered in the following.

(I) Regarding "chromatic color" of Invention 1, the specification discloses in [0009] (the above "3(2)D") that "In the above present invention, chromic color means any color

excluding achromatic color, including black and white." Thus it is "any color excluding achromatic color, including black and white." It can be seen that the specific example of the color may include, for example, "blue color," "red color," "yellow color," and "green color" according to paragraphs [0012], [0016], [0020], and [0023] (the above "3(2)F"). Further, it can also be seen from the above description that "black color" is one of "achromatic color."

(J) On the other hand, an ink composition for oil-based ballpoint pen of A3 invention 1 uses Spilon Violet C-RH and Spilon Yellow C-2GH as a dye, and an inorganic pigment of carbon black as a pigment. Here, regarding the above dyes, Demandee mentioned on page 10 of the written statement submitted on May 26, 2017 by Demandant that "'Spilon Violet C-RH' (Violet) and 'Spilon Yellow C-2GH' (Yellow) are complementary to each other, and a mixture thereof exhibits black color" (Demandant did not raise this as an issue according to page 10 of the written refutation on July 19, 2017 submitted by Demandant). Further, it is obvious to a person skilled in the art that "carbon black" is an inorganic pigment of "black color" (achromatic color) (see the above [B-A].).

Consequently, A3 invention 1 comprises a combination of "black color" of a halochromic dye of "Spilon Violet C-RH and Spilon Yellow C-2GH" and an inorganic pigment of "black color." Here, the coloring agent is two kinds of "black color" consisting of a "black" dye and a "black" pigment. Thus it is natural to see that these two kinds of the coloring agents emphasize the "black color" of the ink composition for oil-based ballpoint pen. It is recognized as an ink composition for oil-based ballpoint pen that emphasizes "black color (achromatic color)" of the combination of inorganic pigments of "black" halochromic dye and "black" inorganic pigment. A person skilled in the art who recognized a black (achromatic) ink composition for oil-based ballpoint pen of A3 invention 1 comprising a halochromic dye of "Spilon Violet C-RH and Spilon Yellow C-2GH," which was a combination of "black color," and read Evidence A No. 3 would have at the most conceived of replacing a black inorganic pigment with a black "organic pigment." There is no motivation in Evidence A No. 3 to replace a black inorganic pigment with an organic pigment selected from the group consisting of "blue" organic pigments, "red" organic pigments, "yellow" organic pigments, "green" organic pigments, and a combination thereof to weaken the highlighting of black color.

In addition, it is only an ink composition for oil-based ballpoint pen using only a pigment as a coloring agent that can be read from Examples 6 to 8 of Evidence A No. 3 (see the above [3-K], [3-L].), which were the working examples of the same group including butyral resin. It is not an ink composition for oil-based ballpoint pen in which a combination of a pigment and "a halochromic dye of Spilon Violet C-RH and Spilon Yellow C-2GH" is used as a coloring agent as in Invention 1. Thus it cannot be taken into account [The same can apply to Examples 1 to 3 (see the above [A-E]), which were the working examples of the same group including butyral resin of reference document A.].

Further, Evidence A No. 2 and Evidence A No. 4 to Evidence A No. 8 do not suggest replacing a black inorganic pigment of A3 invention 1 including a halochromic dye of "Spilon Violet C-RH and Spilon Yellow C-2GH" with an organic pigment selected from the group consisting of "blue" organic pigments, "red" organic pigments, "yellow" organic pigments, "green" organic pigments, and a combination thereof.

(K) Further, in Evidence A No. 22 attached to the written refutation submitted on July 19, 2017 from Demandant, it only describes five color ballpoint pens of "blue black," "green black," "brown black," "Bordeaux black," and "lavender black," and is thus indefinite as to what kind of coloring agent is used (a sole pigment, a sole dye, or a combination of a pigment and a dye are supposed.). Therefore, it cannot be considered.

Further, in view of the description of the written refutation on March 2, 2018 submitted by Demandant, Demandant fails to present any clarification or explanation on the above indefinite point.

Evidence A No. 23 (Japanese Unexamined Patent Application Publication No. 2001-271018) attached similarly is a publication distributed before the priority date of the application according to the Patent. Thus this cannot be considered.

(L) Consequently, there is Different Feature 7 between Invention 1 and A3 invention 1. Thus, without considering the other Different Features, it cannot be said that Invention 1 is A3 invention 1. Further, it cannot be recognized that a person skilled in the art could have easily conceived of replacing a "black" (achromatic color) "inorganic pigment: carbon black" with an organic pigment selected from the group consisting of "blue" organic pigments, "red" organic pigments, "yellow" organic pigments, "green" organic pigments, and a combination thereof for an ink composition for oil-based ballpoint pen of A3 invention 1 including a halochromic dye of "Spilon Violet C-RH and Spilon Yellow C-2GH." In terms of this Different Feature 7, Invention 1 was not easily conceivable by a person skilled in the art on the basis of A3 invention 1.

(M) Summary

Therefore, it cannot be said that Invention 1 is A3 invention 1, nor that Invention 1 was easily conceivable by a person skilled in the art on the basis of A3 invention 1 and the description of Evidence A No. 2 to 8.

B Invention 2

Invention 2 and A3 invention 2 are compared with each other.

(A) Since Invention 2 comprises "ink composition for an oil-based ballpoint pen" of Invention 1, whereas A3 invention 2 also comprises "ink composition for an oil-based stamp" of A3 invention 1, Invention 2 and A3 invention 2 have in common that "they comprise at least a halochromic dye of a basic dye and an organic acid, a pigment, and a butyral resin, and do not comprise an alcohol-soluble type dye other than halochromic dye,

and said halochromic dye is selected from a combination of Aizen Spilon Yellow C-2GH and Aizen Spilon Violet C-RH,

and an amount of said halochromic dye is 21% by weight on a total weight basis of the ink composition,"

as similar to the ones compared in the above "A(A) to (G)."

(B) Further, regarding an amount of butyral resin, an amount of butyral resin of A3 invention 2 of "a resin for adjusting viscosity: polyvinyl butyral (S-LEC BBL-1)" is "2% by weight" on a total weight basis of the ink composition. Therefore, "an amount of said butyral resin is from 2 to 3% by weight on a total weight basis of the ink

composition" of Invention 2 and "an amount of a resin for adjusting viscosity: polyvinyl butyral (S-LEC BBL-1) is 2% by weight on a total weight basis of the ink composition" of A3 invention 2 have in common that "an amount of said butyral resin is 2% by weight on a total weight basis of the ink composition."

(C) Therefore, these inventions have common that they are

"an oil-based ballpoint pen filled with an ink composition for oil-based ballpoint pen,
wherein said oil-based ink composition for ballpoint pen comprises at least a halochromic dye of a basic dye and an organic acid, an pigment, and a butyral resin, and does not comprise an alcohol-soluble type dyes other than halochromic dye,
wherein said halochromic dye is selected from a combination of Aizen Spilon Yellow C-2GH and Aizen Spilon Violet C-RH,
wherein an amount of said halochromic dyes is 21% by weight on a total weight basis of the ink composition,
wherein an amount of said butyral resin is 2% by weight on a total weight basis of the ink composition."

but they are at least different from each other in the following features:

<Different Feature 7'>
Invention 2 is an ink composition of "a chromatic color" for oil-based ballpoint pen including "organic pigments," and "said organic pigment is selected from the group blue pigments, red pigments, yellow pigments, green pigments, and a combination thereof," whereas A3 invention 2 is an ink composition for oil-based ballpoint pen of "black color" including "inorganic pigments: Carbon black."

<Different Feature 8'>
Regarding "pigments," Invention 2 specifies that "an amount of said organic pigments is 30% by weight or less on a total weight basis of the ink composition,
a total amount of said halochromic dyes and said organic pigment is 5% to 60% by weight on a total weight basis of the ink composition," whereas A3 invention 2 specifies that "an amount of inorganic pigment:carbon black is 15% by weight on a total weight basis of the ink composition, and
a total amount of said halochromic dye and said pigment is 36% by weight on a total weight basis of ink composition."

(D) Regarding the above Different Features 7' and 8', a consideration is first given to Different Feature 7'.

(E) As aforementioned, there is Different Feature 7' between Invention 2 and A3 invention 2. Different Feature 7' is identical to Different Feature 7 of the above item "A(G)."

(F) Consequently, similar to the one considered in the above "A(H) to (L)," there is Different Feature 7' between Invention 2 and A3 invention 2. Thus, without considering the other Different Feature, it cannot be said that Invention 2 is A3 invention 2. Further,

it cannot be recognized that a person skilled in the art could have easily conceived of replacing a "black" (achromatic color) "inorganic pigment: carbon black" with an organic pigment selected from the group consisting of "blue" organic pigments, "red" organic pigments, "yellow" organic pigments, "green" organic pigments, and a combination thereof for an ink composition for oil-based ballpoint pen of A3 invention 2 including a halochromic dye of "Spilon Violet C-RH and Spilon Yellow C-2GH." In terms of this Different Feature 7', Invention 2 was not easily conceivable by a person skilled in the art on the basis of A3 invention 2.

(G) Summary

Therefore, it cannot be said that Invention 2 is A3 invention 2, nor that Invention 2 was easily conceivable by a person skilled in the art on the basis of A3 invention 2 and the description of Evidence A No. 2 to 8.

C As for the Demandant's argument

According to pages 9 to 10 of the written refutation on March 2, 2018 submitted by Demandant, it mentions that "Evidence A No. 3 discloses ... (omitted)... in paragraph [0013] that 'Pigments may include, for example, inorganic-based pigments such as carbon black, titanium oxide, and metal powders, organic-based pigments such as azo lake, insoluble azo pigments, chelate azo pigments, phthalocyanine pigments, perylenes and perylene pigments, anthraquinone pigments, quinacridone pigments, dye lake, nitro pigments, and nitroso pigments. These coloring agents each may be used alone or in a mixture of two or more kinds thereof. Further, dyes and pigments may be used in combination.' As is evident from this, carbon black and red or blue organic pigments such as chelate azo pigments and phthalocyanine pigments are specified as a species of the same genus, and these may be used alone or in a mixture of two or more kinds thereof."

These pigments are only described as a species of the same genus; however, it is not a black color (achromatic color) or any other color (chromatic color) as the premise. Therefore, they cannot be seen as interchangeable with each other without the premise of black color (achromatic color) or any other color (chromatic color).

Further, in view of the description of the written refutation on March 2, 2018 submitted by Demandant, it only mentions about the parallel description in Evidence A No. 3 as described above. It fails to present any specific counterargument against the Judgment by the body in the advance notice of a trial decision on November 22, 2017 (second) "There is no motivation in Evidence A No. 3 to weaken the highlighting of black color."

8 Reasons 2(4) for Invalidation (Lack of novelty on the basis of Evidence A No. 4) and Reasons 3(4) for Invalidation (Lack of Inventive Step on the basis of Evidence A No. 4)

(1) Comparison and Judgment

A Invention 1

Invention 1 and A4 invention 1 are compared with each other.

(A) "A red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1]" and "a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an

organic acid salt of C.I. Basic Yellow 2]" of A4 invention 1 are respectively encompassed into the group consisting of Aizen Spilon Yellow C-2GH, Aizen Spilon Yellow C-GNH, Aizen Spilon Red C-GH, Aizen Spilon Violet C-RH, Valifast Red 1360, Valifast Yellow 1110 and combinations thereof," which is defined as a halochromic dye of Invention 1. Therefore, "an ink composition for oil-based ballpoint pen" of Invention 1 and "an ink composition for oil-based ballpoint pen" of A4 invention 1 have in common that "said halochromic dye" "is selected from" "a combination of" "Aizen Spilon Yellow C-2GH and Aizen Spilon Red C-GH."

(B) Further, dyes of A4 invention 1 are only "a red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1]" and "a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2]." These are "halochromic dyes of a basic dye and an organic acid" as mentioned above. The ink composition for oil-based ballpoint pen of A4 invention 1 can be seen as "not comprising an alcohol-soluble type dyes other than halochromic dye." Thus the "ink composition for oil-based ballpoint pen" of Invention 1 and the "ink composition for oil-based ballpoint pen" of A4 invention 1 have in common that they are "not comprising an alcohol-soluble type dye other than halochromic dye."

(C) Further, "(6) polyvinyl butyral resin (S-LEC BM-1 manufactured by SEKISUI CHEMICAL CO., LTD.)" of A4 invention 1 corresponds to "butyral resin" of Invention 1, according to the description of [0028] of the specification (the above "3(2)G"): "The butyral resin includes ... (omitted)... S-LEC B, BH-3, BL-1, BL-2, BL-L, BL-S, BM-1, BM-2, BM-5, BM-S, and BX-L manufactured by Sekisui Chemical Co., Ltd. ..."

(D) Further, A4 invention 1 uses "a red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1," and "a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2]" as a coloring agent of an ink composition for an oil-based ballpoint pen. Here, the "red" and "yellow" are a kind of "chromic color" as discussed in the above "7(1)A(F)", and thus correspond to "chromic color" of Invention 1.

(E) Furthermore, it can be seen that the amounts of halochromic dyes of "a red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Red 1" and "a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2]" respectively correspond to "20.4% by weight" and "5.1% by weight" on a total weight basis of the ink composition, which add up to "25.5% by weight." Therefore, "an amount of said halochromic dyes is 5 to 40% by weight on a total weight basis of the ink composition" of Invention 1 and "an amount of a red solvent dye of (4) Spilon Red CGH [Manufactured by Hodogaya Chemical Co., Ltd., an amount of an organic acid salt of C.I. Basic Red 1] is 20.4% by weight, and a yellow solvent dye of (5) Spilon Yellow C2GH [Manufactured by Hodogaya Chemical Co., Ltd., an organic acid salt of C.I. Basic Yellow 2] is 5.1% by weight on a total weight basis of the ink composition" of A4 invention 1 have in common that "an amount of the halochromic

dye is 25.5% by weight on a total weight basis of the ink composition."

(F) Therefore, Invention and A4 invention 1 have a common point in that they are

"an ink composition for oil-based ballpoint pen of chromic color, comprising at least a halochromic dye of a basic dye and an organic acid, and a butyral resin, and not comprising an alcohol-soluble type dye other than halochromic dye,

wherein said halochromic dye is selected from Aizen Spilon Yellow C-2GH and Aizen Spilon Red C-GH,

wherein an amount of said halochromic dyes is 25.5% by weight on a total weight basis of the ink composition."

but they are at least different from each other in the following features:

<Different Feature 10>

Regarding "an oil-based ballpoint pen filled with an ink composition of a chromatic color for oil-based ballpoint pen," Invention 1 includes "organic pigments," and "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof," whereas A4 invention 1 does not comprise "organic pigments" itself.

<Different Feature 11>

Regarding "butyral resin," Invention 1 specifies "as a pigment dispersant and viscosity-controlling agent," whereas A4 invention 1 specifies "as a thickener."

(G) Regarding the above Different Features 10 to 11, Different Feature 10 is firstly considered in the following.

(H) When it comes to the above "organic pigments," Evidence A No. 4 describes "organic pigments" as one of the examples listed as a coloring agent to be used for an ink composition for oil-based ballpoint pen ([4-E]). The organic pigments can be selected from a coloring agent.

(I) However, when it comes to the description of Examples of Evidence A No. 4, Example 2 corresponding to A4 invention 1 as a coloring agent describes the use of a halochromic dye of a basic dye and an organic acid only, and further Example 3 describes the use of an inorganic pigment of carbon black only. Thus there is no disclosure or suggestion to use a halochromic dye of a basic dye and an organic acid and an organic pigment in combination.

(J) In contrast, as discussed in the above "3(4)A," supposing that the composition includes a butyral resin and an organic pigment, the effects of "extremely excellent temporal stability" may be confirmed only in a composition described in "Examples" of the specification by use of a dye including a halochromic dye of a basic dye and an organic acid but not including an alcohol-soluble type dye for Invention 1. Further, the evaluation items of the working examples and the comparative examples of Evidence A

No. 4 include only "Degree of Ink drip," "Concentration of brushstroke," "ink ejection amount," and "writing performance" as test items, and do not include "temporal stability."

(K) Further, Evidence A No. 4 only discloses as above. It is thus recognized that a person skilled in the art would not conceive of including an organic pigment in an ink composition for oil-based ballpoint pen of A4 invention 1. Further, Evidence A No. 2, Evidence A No. 3, and Evidence A No. 5 to Evidence A No. 8 fail to suggest including an organic pigment in an ink composition for ballpoint pen of A4 invention 1.

(L) Consequently, there is Different Feature 10 between Invention 1 and A4 invention 1. Thus, without considering the other Different Feature, it cannot be said that Invention 1 is A4 invention 1. Further, it cannot be recognized that a person skilled in the art could have easily conceived of including an organic pigment into an ink composition for oil-based ballpoint pen of chromic color of A4 invention 1. In terms of this Different Feature 10, Invention 1 was not easily conceivable by a person skilled in the art on the basis of A4 invention 1.

(M) Summary

Therefore, it cannot be said that Invention 1 is A4 invention 1, nor was it easily conceivable by a person skilled in the art on the basis of A4 invention 1 and the description of Evidence A No. 2 to 8.

B Invention 2

Invention 2 and A4 invention 2 are compared with each other.

(A) Since Invention 2 comprises "ink composition for an oil-based ballpoint pen" of Invention 1, whereas A4 invention 2 also comprises "ink composition for an oil-based stamp" of A4 invention 1, Invention 2 and A4 invention 2 have in common that "they comprise at least a halochromic dye of a basic dye and an organic acid, and a butyral resin, and do not comprise an alcohol-soluble type dye other than halochromic dye,

said halochromic dye is selected from Aizen Spilon Yellow C-2GH and Aizen Spilon Red C-GH,

and an amount of said halochromic dyes is 25.5% by weight on a total weight basis of the ink composition," similar to the ones compared in the above "A(A) to (F)."

(B) Regarding an amount of butyral resin, an amount of butyral resin of A4 invention 2 of "(6) polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., product name: S-LEC BM-1]" is 2.0% by weight on a total weight basis of the ink composition. Therefore, "an amount of said butyral resin is from 2 to 3% by weight on a total weight basis of the ink composition" of Invention 2 and "an amount of butyral resin of A4 invention 2 of '(6) polyvinyl butyral [Manufactured by SEKISUI CHEMICAL CO., LTD., product name: S-LEC BM-1]' is 2.0% by weight on a total weight basis of the ink composition" have in common that "an amount of said butyral resin is 2% by weight on a total weight basis of the ink composition."

(C) Therefore, these inventions have in common that each is

"An oil-based ballpoint pen filled with an ink composition of a chromatic color for oil-based ballpoint pen,

wherein said ink composition for oil-based ballpoint pen comprises at least a halochromic dye of a basic dye and an organic acid, and a butyral resin, and does not comprise an alcohol-soluble type dye other than halochromic dye,

wherein said halochromic dye is selected from Aizen Spilon Yellow C-2GH and Aizen Spilon Red C-GH,

wherein an amount of said halochromic dyes is 25.5% by weight on a total weight basis of the ink composition,

wherein an amount of said butyral resin is 2% by weight on a total weight basis of the ink composition."

but they are at least different from each other in the following features:

<Different Feature 10'>

Regarding "an oil-based ballpoint pen filled with an ink composition of a chromatic color for oil-based ballpoint pen," Invention 2 includes "organic pigments," and "said organic pigment is selected from the group consisting of blue organic pigments, red organic pigments, yellow organic pigments, green organic pigments, and a combination thereof," whereas A4 invention 2 does not comprise "organic pigments" itself.

(D) The above Different Feature 10' is considered in the following.

(E) As aforementioned, there is Different Feature 10' between Invention 2 and A4 invention 2. Different Feature 10' is identical to Different Feature 10 of the above item "A(E)."

(F) Consequently, similar to the one considered in the above "A(F) to (K)," there is Different Feature 10' between Invention 2 and A4 invention 2. Thus, without considering the other Different Feature, it cannot be said that Invention 2 is A4 invention 2. Further, it cannot be recognized that a person skilled in the art could have easily conceived of including an organic pigment into an ink composition for oil-based ballpoint pen of chromic color of A4 invention 2. In terms of this Different Feature 10', Invention 2 was not easily conceivable by a person skilled in the art on the basis of A4 invention 2.

(G) Summary

Therefore, it cannot be said that Invention 2 is A4 invention 2, nor was it easily conceivable by a person skilled in the art on the basis of A4 invention 2 and the description of Evidence A No. 2 to 8.

C Regarding the Demandant's argument

In view of the description of the written refutation on March 2, 2018 submitted by Demandant, Demandant fails to present any counterargument on the above Judgment by the body ["A(M)" and "B(G)"].

9 Other arguments from Demandant

According to pages 8 to 9 of the written refutation on March 2, 2018 submitted by Demandant, Demandant mentions about the clarity requirement and the enablement requirement that "the specification does not totally disclose the criteria or the definition of 'an amount to function as a pigment dispersant (viscosity-controlling agent)' and 'an amount that does not function as a pigment dispersant (viscosity-controlling agent),'" and alleges no new reason for invalidation as a result of the Correction. However, the allegation of the "function" is based on neither the recitation of the Claims nor the description of the specification, and is thus not acceptable.

No. 8 Closing

As seen above, the patent according to Invention 1 was granted in violation of the provision of Article 36(6)(i) of the Patent Act. Therefore, the patent corresponds to the provision of Article 123(1)(iv) of the Patent Act, and thus should be invalidated.

Further, the patent according to Invention 2 may not be invalidated on the basis of the reasons for invalidation and means of proof argued by Demandant.

Half the costs in connection with the trial shall be borne by Demandant and the remaining half shall be borne by Demandee under the provisions of Article 64 of the Code of Civil Procedure as applied mutatis mutandis to the provision of Article 169(2) of the Patent Act.

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

April 17, 2018

Chief administrative judge: FUJI, Yoshihiro
Administrative judge: KUNISHIMA, Akihiro
Administrative judge: INOUE, Yoshihiro