Trial decision

Invalidation No. 2016-800014

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The case of trial regarding the invalidation of Japanese Patent No. 5717955, titled "BUILDING BOARD" between the parties above has resulted in the following trial decision:

Conclusion

The scope of claims of Patent No. 5717955 shall be corrected with respect to Claims 1 to 3 after the correction as per the corrected scope of claims attached to the written correction request.

The patents regarding the inventions according to Claims 1 to 2 of Patent No. 5717955 shall be invalidated.

The demand for trial regarding the invalidation of a patent according to Claim 3 of Patent No. 5717955 shall be dismissed by a decision.

The costs in connection with the trial shall be borne by the demandee.

Reason

No. 1 History of the procedures

Patent No. 5717955 (hereinafter referred to as "the Patent") was filed on August 26, 2009, and registered on March 27, 2015.

The history of procedure in the Trial of the case is as follows:

February 3, 2016	Demand for Trial
April 18, 2016	Written correction request, written answer of the trial case
May 25, 2016	Written refutation
June 28, 2016	Notification of matters to be examined
August 2, 2016	Oral proceedings statement brief (Demandant), Explanation of evidences (Demandant)
August 30, 2016	Oral proceedings statement brief (Demandee), Explanation of evidences (Demandee)
September 13, 2016	Oral proceeding
September 29, 2016	Written Statement (Demandant), Explanation of evidences (2) (Demandant)
October 12, 2016	Written statement (Demandee)
October 21, 2016	Advance notice of Trial decision
December 26, 2016	Correction request, Written statement (Demandee), Explanation on evidences (2) (Demandee)
February 9, 2017	Written refutation, Explanation of evidences (3) (Demandant)

No. 2 The patent invention (the Invention before the correction (as of the registration of establishment of the patent))

The inventions according to Claims 1 to 3 of the Patent (hereinafter referred to as "Patent Inventions 1 to 3") are specified by the matters described in Claims 1 to 3 of the scope of claims as in the following (the separate description and symbols "A," etc. are attached in Trial decision according to the Demandant's allegation).

"[Claim 1]

A building board patterned with yellow dot of an ink including a yellow pigment, magenta dot of an ink including a magenta pigment, and cyan dot of an ink including a

cyan pigment,

B wherein said yellow pigment is CI pigment yellow 42 or CI pigment yellow 184, said magenta pigment is CI pigment red 101, and said cyan pigment is CI pigment blue 28,

C wherein the ink including said yellow pigment of CI pigment yellow 42 or CI pigment yellow 184, the ink including said magenta pigment of CI pigment red 101 and the ink including said cyan pigment of CI pigment blue 28 are all UV-curable inks,

D characterized by that, regarding a color difference (ΔE*ab) in a CIE1976L*a*b*color space before and after the discoloration caused by an accelerated weatherproof test in a following super-accelerated weatherproof test condition in compliance with JTMG01:2000 of building board patterned with said yellow dot, said magenta dot, and said cyan dot, a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, and cyan component is within 0.99,

E A building board.

F <Super-accelerated weatherproof test condition>

Light source: Water-cooling metal halide lamp

Illuminance: 90 mW/cm^2

Wavelength: 295 to 450 nm

Temperature: 60°C (irradiation), 30°C (bedewing)

Humidity: 50% (irradiation), 90% (bedewing)

Cycle: Irradiation 5 hours, Bedewing 5 hours

Shower: 10 seconds before and after bedewing

[Claim 2]

G The building board of Claim 1, characterized by that it is used for exterior material of a building.

[Claim 3]

H The building board of Claim 1 or Claim 2, wherein said building board is further patterned with a black dot by a UV-curable ink including a black pigment, and said black pigment is an inorganic pigment."

No. 3 Request for correction

The request for correction that Demandee submitted on December 26, 2016 (hereinafter referred to as "the Correction") requests the correction for Claims 1 to 3 after the correction as per the corrected scope of claims attached to the written correction request (hereinafter referred to as "the corrected scope of the claims") with respect to the scope of claims attached to the application of the Patent, and the content of the correction

is as in the following matters (the underlines show the corrected parts.):

Further, the request for correction on April 18, 2016 was deemed to be withdrawn under the provision of Article 134-2(6) of the Patent Act.

1 Content of the request for correction

The Correction requests the correction for each group of claims as per the corrected scope of claims with respect to the scope of claims attached to the application of the Patent.

(1) Correction A

"A building board, patterned ..." of Claim 1 of the scope of claims is corrected to "a building board patterned ... wherein a transparent coat layer is formed on a surface of an ink jet layer formed by these inks".

(2) Correction B

"Are all UV-curable inks, ... of a building board patterned with said yellow dot, said magenta dot, and said cyan dot by all UV-curable inks" of Claim 1 of the scope of claims is corrected to "are all UV-curable inks, ... of a building board patterned with said yellow dot, said magenta dot, said cyan dot, and said black dot, wherein said building board is further patterned with a black dot by a UV-curable ink including black pigment, and said black pigment is CI pigment 7".

(3) Correction C

"A color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, and cyan component falls within 0.99" of Claim 1 of the scope of claims is corrected to "a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, and cyan component is within 0.99, and a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, cyan component, and black component as being within 1.44".

(4) Correction D

Claim 3 of the scope of claims shall be canceled.

2 Suitability of correction

(1) Regarding Correction A

A Correction A specifies "a building board" patterned with yellow dot of an ink including a yellow pigment, magenta dot of an ink including a magenta pigment, and cyan dot of an ink including a cyan pigment, as "a transparent coat layer" being formed on "a surface of an ink jet layer formed by these inks". Thus it is recognized that the correction aims to restrict the scope of claims.

B Further, the specification attached to the application of the Patent (hereinafter also referred to as "the patent specification") discloses that the top coat 550 is formed "On a surface of cured ink jet layer 540 for the purpose of improving weather resistance. Further, a coating (hereinafter also referred to as "additional value coat layer") 560 on a surface of the top coat 550 for imparting, e.g., antifouling function. In addition, the top coat 550 and additional value coat layer 560 are both transparent coat layers, and a pattern of ink jet layer 540 can be observed through the top coat 550 and additional value coat layer 560." (paragraph [0020]), the "sealer 520, base coat 530, top coat 550, and additional value coat layer 560 can be respectively omitted in view of various points" (paragraph [0053]). Thus it is described that a transparent coat layer (top coat 550, additional value coat layer 560) is formed on a surface of ink jet layer 540. Therefore, it is recognized that Correction A was made within a scope of the matter described in the patent specification.

C Furthermore, Correction A adds the matters specifying the invention, but does not change category, subject, or purpose. Thus it neither substantially expands nor changes the scope of claims.

D Further, Demandant alleges that the patent specification fails to describe a building board in which only a top coat 550 or only an additional value coat layer 560 is formed on a surface of an ink jet layer, and alleges that the examples of the patent specification only describes the discoloration (color difference) of building board having a layer structure comprising a top coat and an additional value coat layer, and fails to describe the discoloration (color difference) of building board having the other layer structure (Written refutation on May 25, 2016, page 18, line 7 to page 21, line 3).

Paragraph [0053] of the patent specification discloses, however, that the top coat 550 and additional value coat layer 560 can be omitted. Further, as discussed in detail in the determination about Reasons for invalidation 3 (see the following "No. 7, 3(3)"), it is obvious to a person skilled in the art in view of the common technical knowledge that, should either layer of the top coat or additional value coat layer be omitted, the color difference (ΔE^*ab) after the discoloration can be adjusted within 0.99 or 1.44 by adjusting

the kinds of the other resins or ultraviolet absorber to be added, an amount of photostabilizers, etc., or thickness for the other layer. Thus none of the Demandant's allegation is acceptable.

(2) Regarding Correction B

A Correction B specifies the patterning of building board as being patterned with black dot by UV-curable ink including black pigment in addition to yellow dot, magenta dot, and cyan dot, and specifies the black pigment as CI pigment 7. Thus it is recognized as aiming at restriction of the scope of claims.

B Further, the patent specification discloses that "a third means for solving the problem is ... said building board is further patterned with a black dot by a UV-curable ink including a black pigment, and said black pigment is an inorganic pigment. This further makes all of yellow, magenta, cyan, and black inorganic pigments, and the respective UV-curable inks including them are used to form a patterned building board." (paragraph [0012]). "For black inorganic pigments, CI pigment black 7 is preferable." (paragraph [0018]). "Regarding Examples 1, 2 .... the pigments included in UV-curable ink for forming an ink jet layer 540 are as per in Table 1." (paragraph [0025]). Table 1 describes CI pigment black 7 for a black pigment of Examples 1 and 2. Therefore, it is recognized that Correction B was made within a scope of the matter described in the patent specification.

C Furthermore, Correction B adds the matters specifying the invention, but does not change category, subject, or purpose. Thus it neither substantially expands nor changes the scope of claims.

(3) Regarding Correction C

A Correction C specifies a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, cyan component, and black component as being within 1.44. Thus it is recognized that the correction aims to restrict the scope of claims.

B Further, with respect to the test results of Examples 1 and 2, the patent specification discloses that "the color difference (ΔE) between colors after 600 hours from the start of the test was 2.12 for yellow, 1.27 for magenta, and 1.13 for cyan. The color difference of black (ΔE) was 0.68. Thus the differences in color difference (ΔE) between each color were 1.44 (between yellow and black) at the maximum. Also in this case, it is recognized that the color differences between each color components fall within almost the same range. Focusing on the three colors other than black, the maximum

difference was 0.99 (between yellow and cyan). The difference was further decreased." (paragraph [0045]). Therefore, it is recognized that Correction C was made within a scope of the matter described in the patent specification.

C Furthermore, Correction C adds matters specifying the invention, and does not change category, subject, or purpose. Thus it neither substantially expands nor changes the scope of claims.

(4) Regarding Correction D

Correction D cancels Claim 3 before the correction. Thus it is recognized as aiming at restriction of the scope of claims.

Furthermore, Correction D cancels Claim 3 before the correction, and is made within matters described in the patent specification, and does not change category, target, or purpose. Thus it neither substantially expands nor changes the scope of claims.

(5) Correction of Claim 2

Claims 2 and 3 depend from Claim 1. Thus these claims are substantially corrected by the correction of Claim 1 by Corrections A to C.

Further, as per the above (1) to (3), Corrections A to C aim to restrict the scope of the claims. Thus the correction for Claim 2 also aims to restrict the scope of the claims.

Furthermore, the Correction is made within the scope of matters described in the patent specification and neither expands nor changes the scope of claims.

(6) Regarding the group of claims

The Correction is directed to Claims 1 to 3 after the correction, and made for a group of claims. Thus the Correction conforms to the provision of Article 134-2(3) of the Patent Act.

3 Conclusion of the Correction

As described above, the Correction aims at the matter listed in the item (i) of the proviso to Article 134-2(1) of the Patent Act, and complies with the provisions of Article 126(5) and (6) of the Patent Act as applied mutatis mutandis pursuant to Article 134-2(3) and (9) of the Patent Act.

Therefore, the Correction of the case shall be approved.

No. 4 Corrected invention of the case

As per in the above No. 3, the correction is accepted. Thus the inventions

according to Claims 1 and 2 of the Patent (hereinafter referred to as "Corrected Inventions 1 and 2") are specified by the matters recited in Claims 1 and 2 of the corrected scope of claims as in the following:

"[Claim 1]

A building board patterned with yellow dot of an ink including a yellow pigment, magenta dot of an ink including a magenta pigment, and cyan dot of an ink including a cyan pigment, wherein a transparent coat layer is formed on a surface of an ink jet layer formed by these inks,

B wherein said yellow pigment is CI pigment yellow 42 or CI pigment yellow 184, said magenta pigment is CI pigment red 101, and said cyan pigment is CI pigment blue 28,

wherein the ink including said yellow pigment of CI pigment yellow 42 or CI pigment yellow 184, the ink including said magenta pigment of CI pigment red 101, and the ink including said cyan pigment of CI pigment blue 28 are all UV-curable inks,

wherein said building board is further patterned with a black dot by a UV-curable ink including black pigment, and said black pigment is CI pigment black 7,

characterized by that, with respect to a color difference (ΔE*ab) in a CIE1976L*a*b*color space before and after discoloration caused by an accelerated weatherproof test in the following super-accelerated weatherproof test condition in compliance with JTMG01:2000 of building board patterned with said yellow dot, said magenta dot, said cyan dot, and said black dot, a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, and cyan component is within 0.99, and a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, cyan component, and black component as being within 1.44.

<Super-accelerated weatherproof test condition>

Light source: Water-cooling metal halide lamp

Illuminance: 90 mW/cm^2

Wavelength: 295 to 450 nm

Temperature: 60°C (irradiation), 30°C (bedewing)

Humidity: 50% (irradiation), 90% (bedewing)

Cycle: Irradiation 5 hours, Bedewing 5 hours

Shower: 10 seconds before and after bedewing

[Claim 2]

The building board of Claim 1, characterized by that it is used for exterior material

of a building.
[Claim 3] (Cancelled)"

No. 5 The demandant's allegation and Means of evidence
1 Outline of the demandant's allegation

Demandant claimed a trial decision in the written demand to the effect that the patents for the inventions according to Claims 1 to 3 of the Patent should be invalidated, and the trial costs shall be borne by demandee, and generally alleges the reasons as in the following (see written demand for trial, written refutation on May 25, 2016, oral proceedings statement brief on August 2, 2016, written statement on September 29, 2016, the first oral proceeding record) and submitted Evidence A No. 1 to A No. 42-2 as means of evidence.

Further, Demandant alleges that the following reasons for Invalidation shall apply to Corrected Inventions 1 and 2 (see the written refutation on February 9, 2017) and submits Evidence A No. 43 to A No 52 as means of evidence.

(1) Reason for Invalidation 1 (Lack of Inventive step)

The inventions according to Claims 1 to 3 of the Patent were easily conceivable by a person skilled in the art on the basis of the invention described in Evidence A No. 2 and matters described in Evidence A No. 4 to A No. 7 as well as well-known art, and thus cannot 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 thus should be invalidated.

(2) Reason for Invalidation 2 (Lack of Inventive step)

The inventions according to Claims 1 to 3 of the Patent were easily conceivable by a person skilled in the art on the basis of the invention described in Evidence A No. 3 and matters described in Evidence A No. 2 and Evidence A No. 4 to A No. 7 as well as well-known art, and thus cannot 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 thus should be invalidated.

(3) Reason for Invalidation 3 (Nonconformance to enablement requirement, nonconformance to supporting requirement)

A The Detailed Description of the Invention fails to disclose clearly and sufficiently the inventions according to Claims 1 to 3 of the Patent so as to make them

feasible, thus the Detailed Description of the Invention does not comply with requirements of Article 36(4)(i) of the Patent Act, and the patents correspond to the provision of Article 123(1)(iv) of the Patent Act and should be invalidated.

B The inventions according to Claims 1 to 3 of the Patent encompass matters not described in the patent specification, and thus the recitation of the Claims 1 to 3 of the scope of claims does not comply with requirements of Article 36(6)(i) of the Patent Act. Consequently, the patents correspond to the provision of Article 123(1)(iv) of the Patent Act and should be invalidated.

2 Means of evidence

The means of proof are set forth as below:

Evidence A No. 1: Patent No. 5717955 (the Patent)

Evidence A No. 2: Japanese Unexamined Patent Application Publication No. 2008-63831

Evidence A No. 3: Japanese Unexamined Patent Application Publication No. 2004-107637

Evidence A No. 4: "Research and Study on Weather Resistance of Paints for Building Structure [Report, Part 2]", Japan Paint Manufacturers Association, October 2000, cover page, page 3, page 4, page 10 and colophon

Evidence A No. 5: "Handbook of Paint Raw Materials", 8th Edition, Japan Paint Manufacturers Association, May 31, 2004, cover page, pages 20 to 23, pages 348 to 353, pages 360 to 363, colophon

Evidence A No. 6: Japanese Unexamined Patent Application Publication No. 2009-52030

Evidence A No. 7: Japanese Unexamined Patent Application Publication No. 2008-81594

Evidence A No. 8: Jun TAKAHASHI et al., "Technical Book for Paints and Inks - Materials, Production, and Assessment and Proposal for Environmental Society -", CMC Publishing, June 10, 2004, cover page, pages 40 to 51, page 264, colophon

Evidence A No. 9: Journal of Printing Science and Technology, The Japanese Society of Printing Science and Technology, June 30, 2003, Vol. 40, No. 3, cover page, pages 176 to 203, colophon

Evidence A No. 10: Kyosuke TAKAHASHI, "Ink Jet Technology and Materials", Universal Edition, First Printing, CMC Publishing, May 24, 2007, cover page, pages 107 to 119, colophon

Evidence A No. 11: Kiyoshi AKAMATSU, "Applied Technique of Photosensitive Resin", universal edition, first printing, CMC Publishing, January 25, 2009, cover page, pages 112 to 113, pages 186 to 187, page 248, colophon

Evidence A No. 12: Japanese Unexamined Patent Application Publication No. 2006-7618

Evidence A No. 13: Japanese Unexamined Patent Application Publication No. H7-100431

Evidence A No. 14: Experimental Report 1 on January 14, 2016 prepared by demandant

Evidence A No. 15: Experimental Report 2 on January 14, 2016 prepared by demandant

Evidence A No. 16: Experimental Report 3 on January 14, 2016 prepared by demandant

Evidence A No. 17: Mikio MATSUMOTO et al., "Trend of Development in the Field of Exterior Building Materials", Studies on Paint, No. 145, Kansai Paint Co., Ltd., March 2006, pages 38 to 41

Evidence A No. 18: Toshihiro TAKADA, "Trend of Commercialization of Ceramic Materials for House Building", DNT Coating Technical Report, No. 5, October 2005, pages 23 to 26

Evidence A No. 19: Seishiro ITOH, "Encyclopedia of Pigments", first edition, first printing, published by Asakura Publishing Co., Ltd. on September 25, 2000, cover page, pages 258 to 259, colophon

Evidence A No. 20: JAPAN ASSOCIATION OF PIGMENT TECHNOLOGY, "Revised New Edition Pigments Handbook", SEIBUNDO SHINKOSHA Publishing Co., LTD, March 10, 1988, cover page, pages 14 to 15, pages 26 to 27, pages 446 to 451, colophon

Evidence A No. 21: Japanese Society of Colour Material, "Handbook of Color Material Engineering", New Edition, published by Asakura Publishing Co., Ltd. on October 10, 2008, cover page, pages 278 to 281, pages 286 to 289, colophon

Evidence A No. 22: Jiro SHIOKAWA, "Kirk-Othmer Concise Encyclopedia of Chemical Technology", Maruzen Publishing Co., Ltd., September 20, 1987, cover page, pages 294 to 297, colophon

Evidence A No. 23: The Imaging Society of Japan, "Series 'Digital Printing Technology' Inkjet", Tokyo Denki University Press, published on September 10, 2008, cover page, pages 102 to 113, colophon

Evidence A No. 24: A company information document of MIMAKI

ENGINEERING CO., LTD., March 1, 2016, cover page, page 37

Evidence A No. 25-1: Notice of the Reasons for Refusal dated March 1, 2013 according to Japanese Patent Application No. 2008-189765

Evidence A No. 25-2: Japanese Unexamined Patent Application Publication No. 2007-119773 (Cited Document 1 of Evidence A No. 25-1)

Evidence A No. 25-3: Japanese Unexamined Patent Application Publication No. 2001-55530 (Cited Document 2 of Evidence A No. 25-1)

Evidence A No. 25-4: Japanese Unexamined Patent Application Publication No. 2003-261799 (Cited Document 9 of Evidence A No. 25-1)

Evidence A No. 25-5: Japanese Unexamined Patent Application Publication No. 2005-178331 (Cited Document 10 of Evidence A No. 25-1)

Evidence A No. 25-6: Decision of Refusal dated May 9, 2013 according to Japanese Patent Application No. 2008-189765

Evidence A No. 26: Shinji IIDA et al., "Accelerated Weatherproof Test", Studies on Paint, No. 145, Kansai Paint Co., Ltd., March 2006, pages 22 to 37

Evidence A No. 27: "JIS Methods of Exposure to Laboratory Light Sources For Polymeric Material of Buildings JIS A 1415", Japanese Standards Association, February 20, 2013, cover page, list of contents, pages 1 to 3, page 8, page 13, page 18, colophon

Evidence A No. 28: "JIS Fiber Reinforced Cement Sidings JIS A 5422", Japanese Standards Association, September 22, 2014, cover page, list of contents, pages 1 to 2, pages 9 to 10, page 19, page 22, colophon

Evidence A No. 29: A website of the Ministry of Economy, Trade and Industry, "Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities", March 31, 2004, <URL: http://www.meti.go.jp/policy/recycle/main/admin_info/law/09/>

Evidence A No. 30: Yasuhiro MATSUDA, "Resistant Coating in External Wall Materials Made of Ceramic", DNT coating technical report, No. 8, October 2008, pages 24 to 27

Evidence A No. 31: Report on May 20, 2016 prepared by demandant

Evidence A No. 32: "A text of 31st introductory course of paints", Japanese Society of Colour Material Kansai branch, July 22, 1998, pages 42 to 43, pages 80 to 81

Evidence A No. 33: Japanese Unexamined Patent Application Publication No. H10-113608

Evidence A No. 34: Japanese Unexamined Patent Application Publication No. 2008-73602

Evidence A No. 35: Shinji IIDA et al., "Accelerated Weatherproof Test (No. 2)",

Studies on Paint, No. 146, Kansai Paint Co., Ltd., October 2006, pages 26 to 39

Evidence A No. 36: Journal of Light Technology "Light Edge", No. 15, USHIO INC., November 1998, pages 65 to 75

Evidence A No. 37: The Color Science Association of Japan, "Encyclopedia of Color Science", published by Asakura Publishing Co., Ltd. on October 20, 1991, cover page, pages 28 to 29, pages 38 to 39, pages 62 to 63, colophon

Evidence A No. 38-1: Specification, the scope of claims, and drawings as of the filing of the Patent

Evidence A No. 38-2: Notice of Reasons for Refusal on July 26, 2013 in relation to the Patent

Evidence A No. 38-3: Written Amendment on September 24, 2013 in relation to the Patent

Evidence A No. 38-4: Written Opinion on September 24, 2013 in relation to the Patent

Evidence A No. 38-5: Notice of Reasons for refusal on March 17, 2014 in relation to the Patent

Evidence A No. 38-6: Written Amendment on May 8, 2014 in relation to the Patent

Evidence A No. 38-7: Written Opinion on May 8, 2014 in relation to the Patent

Evidence A No. 38-8: Decision to Dismiss the Amendment on October 15, 2014 in relation to the Patent

Evidence A No. 38-9: Decision of Rejection on October 15, 2014 in relation to the Patent

Evidence A No. 38-10: Written Amendment on January 23, 2015 in relation to the Patent

Evidence A No. 38-11: Notice of Appeal on January 23, 2015 in relation to the Patent

Evidence A No. 38-12: Notice of Allowance on February 13, 2015 in relation to the Patent

Evidence A No. 39: Japanese Unexamined Patent Application Publication No. H8-19756

Evidence A No. 40: Teruko AKAIKE et al., "Effects on Environment that Affects the Color Change of Pigments (second report)", Journal of the Color Science Association of Japan, Volume 20, Number 2, The Color Science Association of Japan, August 1, 1996, cover page, pages 63 to 72, colophon

Evidence A No. 41: "relevant documents of 'galvanized steel sheet' and 'colored galvanized steel sheet'", Kindai Kenchiku, Vol 43, April 1989, KINDAIKENCHIKU-

SHA CO., LTD., cover page, page 49, pages 115 to 119

Evidence A No. 42-1: "Fundamentals of Color Coordination", 2nd Edition, fourth printing, The Tokyo Chamber of Commerce and Industry, April 20, 2004, cover page, pages 51 to 55, colophon

Evidence A No. 42-2: A website of KONICA MINOLTA, INC., "Variety of Terms of Color", <URL: http://www.konicaminolta.jp/instruments/knowledge/color/part4/06.html>

Evidence A No. 43: Japanese Unexamined Patent Application Publication No. H10-204321

Evidence A No. 44: Japanese Unexamined Patent Application Publication No. 2000-194132

Evidence A No. 45: "Measures for Troubles in Polymer Degradation <for Each Resin> and Latest Modification and Stabilization Technique - Comprehensive Technical Documents -", Publishing Section of Keiei Kaihatsu Center, May 31, 1981, cover page, pages 399 to 405, colophon

Evidence A No. 46: Kanji GAMAIKE et al., "Radical Polymerization Handbook - From Fundamentals to New Development -", first edition, first printing, published by NTS on August 10, 1999, cover page, pages 74 to 77, colophon

Evidence A No. 47: Japanese Society of Colour Material, "Handbook of Color Material Engineering", New Edition, First printing, published by Asakura Publishing Co., Ltd. on November 25, 1989, cover page, list of contents, pages 232 to 235, pages 272 to 277, pages 452 to 463, colophon

Evidence A No. 48: Seishiro ITOH, "Encyclopedia of Pigments", first edition, first printing, published by Asakura Publishing Co., Ltd. on September 25, 2000, cover page, list of contents, pages 226 to 233, colophon

Evidence A No. 49: Takeshi AMARI, "Ink Jet Printer", universal edition, first printing, CMC Publishing, August 19, 2005, cover page, list of contents, pages 252 to 264, colophon

Evidence A No. 50: The Color Science Association of Japan, "Handbook of Color Science (2nd Edition)", First Edition, University of Tokyo Press, June 10, 1998, cover page, list of contents, pages 782 to 789, colophon

Evidence A No. 51: "Technology of Functional Pigments", universal edition, first printing, CMC Publishing, September 24, 2004, cover page, list of contents, pages 246 to 271, colophon

Evidence A No. 52: Isao HASHIMOTO, "Handbook of Organic Pigments", First edition, color office, May 2006, cover page, pages 612 to 615, colophon

3 Demandant's specific allegation

(1) Reason for Invalidation 1

A Regarding Corrected Invention 1 of the case

(A) The patent invention 1 and Invention A-2 are different from each other in the following points:

Different Feature 1: (Constituent elements B, C. Constitutions b, c)

The patent invention 1 is "said yellow pigment is CI pigment yellow 42 or CI pigment yellow 184, said magenta pigment is CI pigment red 101, and said cyan pigment is CI pigment blue 28", and an ink including each pigment is a UV-curable ink, whereas

in Invention A-2, yellow pigment is "yellow ferric oxide", magenta pigment is "red ferric oxide", cyan pigment is "Co-Al-based blue", and an ink including each pigment is an aqueous ink

Different Feature 2: (Constituent elements D, F. the constitutions d, f)

The patent invention 1 is "regarding a color difference (ΔE*ab) in a CIE1976L*a*b*color space before and after the discoloration caused by an accelerated weatherproof test in a following super-accelerated weatherproof test condition in compliance with JTMG01:2000 of building board patterned with said yellow dot, said magenta dot, and said cyan dot, a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, and cyan component is within 0.99", whereas

in Invention A-2 "A result of color degradation proof test by visual inspection in the following test condition for building board patterned with said yellow dot, said magenta dot, and said cyan dot is characterized as '⊙' (no color degradation caused)", and the test condition is a condition of the constitution f

(Written demand, page 23, line 15 to page 24, line 17)

(B) It is described in A4 and A5 that "yellow ferric oxide" of A2 means "CI pigment yellow 42", "red ferric oxide" means "CI pigment red 101", and "Co-Al-based blue" means "CI pigment blue 28".

(Written Demand, page 25, lines 2 to 5)

(C) "Yellow ferric oxide" of A2 means "CI pigment yellow 42", "red ferric oxide" means "CI pigment red 101", and "Co-Al-based blue" means "CI pigment blue 28". There is only a difference in expression between them. Thus Different Feature 1 is not a substantial different feature.

Supposing that the above points are different features, it is obvious from the above descriptions of A4 and A5 that "CI pigment yellow 42", "CI pigment red 101", and "CI pigment blue 28" are respectively representative and typical pigments of "yellow ferric oxide", "red ferric oxide", and "Co-Al-based blue". It is easy for a person skilled in the art to select "CI pigment yellow 42", "CI pigment red 101", and "CI pigment blue 28" as specific pigments of "yellow ferric oxide", "red ferric oxide", and "Co-Al-based blue" of A2.
(Written demand, page 28, line 4 from the bottom to page 29, line 10)

(D) In an experiment that assesses the color degradation resistance of A2 that premises application for industrial products (decorative building board), it is natural to use an ink including synthesized ferric oxide (A22) with excellent "purity, uniformity of particle size, and particle diameter distribution", and not use an ink including "yellow ferric oxide (yellow ocher)" (B1) "including alumina, calcium sulfate, silicate, etc." as impurities with "varied components" (should the components of pigments and an amount of impurities be varied, an experiment that assesses the color degradation resistance would be in vain). It is obvious to a person skilled in the art that A2 does not use the term "yellow ferric oxide" (specification 3, 13, 14) in the sense of including "yellow ferric oxide (yellow ocher)" (B1).
(Written refutation on May 25, 2016, page 25, line 2 from the bottom to page 26, line 7).

(E) As of the filing, the term "yellow ferric oxide" means "CI pigment yellow 42". It is particularly obvious to a person skilled in the art that "yellow ferric oxide" (specification 3, 13, 14) of A2 that premises the application for industrial products (decorative building board), more specifically for an ink jet use, is "CI pigment yellow 42".
(Written refutation on May 25, 2016, page 26, lines 8 to 12)

(F) As of the filing, the term "red ferric oxide" means "CI pigment red 101". It is particularly obvious to a person skilled in the art that "red ferric oxide" (specification 3, 13, 14) of A2 that premises application for industrial products (decorative building board), more specifically for an ink jet use, is "CI pigment red 101".
(Written refutation on May 25, 2016, page 27, line 5 from the bottom to the last line)

(G) A6 and A7 describe the constitution with an ink including an inorganic pigment of "UV-curable ink".
(Written Demand, page 32, lines 18 to 19)

(H) In The patent invention 1, an ink including a pigment is a "UV-curable ink", whereas such ink is an "aqueous ink" in Invention A-2. In this regard, the difference between them is only an ink component in which a pigment is dispersed. It does not require particular trials and errors. Thus it is obvious that a person skilled in the art could have easily conceived of applying the matters described in A6 and A7 to Invention A-2 to make a "UV-curable ink".
(Written demand, page 32, line 4 from the bottom to page 33, line 2)

(I) A difference between aqueous ink and UV-curable ink is a difference in ink component. In general, there is no distinction between "pigments", such as a pigment for aqueous ink or a pigment for UV-curable ink.
(Written Demand, page 33, lines 7 to 9)

(J) It is possible to change an ink including inorganic pigments of A2 from "aqueous ink" to "UV-curable ink", and there is a motivation to do so (A6 and A7). Therefore, it is a technical matter that a person skilled in the art could have easily conceived to replace an aqueous ink of specific pigments of A2 with UV-curable ink by applying the described matters of A6 and A7.
(Written Demand, page 41, lines 1 to 5)

(K) The requirements for the difference in color difference between each component of the patent invention 1 (constituent elements D and F) only describe the effects on a subject naturally caused by fulfilling the other constituent elements (constituent elements A to C and E), or specifies the content to be satisfied at least by implementing the design matter that needs not to be described in the specification in addition to the requirements.
(Written Demand, page 43, lines 10 to 15)

(L) Regardless of the fact that the constitution of the constituent elements A to C has been fulfilled, for any reason, regarding a color difference before and after the discoloration of patterned building board, should a difference between color differences of yellow component, magenta component, and cyan component (ΔE^*ab) of "within 0.99" (Constituent elements D and F) not be caused, in view of the disclosure of the specification, the constituent elements D and F could be fulfilled by implementing the design matter that needs not to be described in the specification in addition to the requirements. The constitution of Different Feature 2 is still easily conceivable.

(Written Demand, page 44, lines 8 to 15)

(M) In the specification and in A2, the constitution of Different Feature 2 is no different, in that the color change of the whole building board is a target for assessment. They only differ in a parameter that becomes a barometer for assessment.

In other words, differences in color difference (ΔE) between each color by "an accelerated weatherproof test in a following super-accelerated weatherproof test condition compliant with JTMG01:2000" of the patent invention 1 are only one parameter that an inventor selected for the quantification of the color change of the whole building board. It is obvious that the selection of the parameter itself cannot be a ground for the inventive step.
(Written Demand, page 49, lines 7 to 15)

(N) "No color degradation occurred" of A2 (or "excellent in color degradation resistance") means no color degradation is observed visually as the whole decorative building board, and no specific component undergoes color degradation. "To prevent a state where a coloring of a specific color component is diminished" (paragraph [0010]) of the patent invention means that no specific component of building board for test patterned with brick-style is degraded by visual inspection.

Specifically, both of "no color degradation occurred" of A2 (or "excellent in color degradation resistance") and "to prevent a state where a coloring of a specific color component is diminished" (paragraph [0010]) of the patent invention mean that no specific component of building board of building board is degraded visually. Thus the two are equivalent.
(Oral proceedings statement brief, page 6, line 1 to line 10).

(O) Even if "no color degradation occurred" of A2 should be construed as meaning that none of colors undergoes color degradation (excellent in color degradation resistance), the Invention excludes Example 3 where three pigments with relatively high discoloration were combined (current reference example 1) from the scope of right by the amendment in the prosecution (A38-1 to -12) to restrict to the combinations of three pigments with good weather resistance used in Example 1 and Example 2 (see the appendix "history of amendment"); i.e., the Corrected Invention has no longer become an invention that combines pigments with good weather resistance. Therefore, even if "no color degradation occurred" of A2 should be construed as above, there is no difference between the Corrected Invention and A2.

(Oral proceedings statement brief, page 6, line 11 to line 19).

(P) In a case of combining a plurality of different color components, it was widely known as of the filing to adjust color degradation resistance of each color component for the purpose of preventing the time-course change in color phase of coating.
(Oral proceedings statement brief, page 13, line 7 to line 9).

(Q) In the business of building materials, ΔE*ab is a typical parameter used as the barometer of color degradation resistance of color components.
(Oral proceedings statement brief, page 13, line 14 to line 15).

(R) For the purpose of obscuring the time-course change in color phase of coating, it is a well-known matter to adjust the maximum value of the difference in ΔE to 0.3 to 1.3, and there is no difficulty in selecting 0.99.
(Oral proceedings statement brief, page 21, line 7 to line 9).

(S) Comparing Corrected Invention 1 with Invention A-2-1, the inventions are different from each other in the following points in addition to Different Features 1 to 3 as the advance notice of trial decision found:
<Different Feature 4>
Regarding an ink jet layer,
it is further patterned with a black dot by an ink including a black pigment of CI pigment black 7 in Corrected Invention 1, whereas
in Invention A-2-1, it is not patterned with a black dot.
<Different Feature 5>
Regarding weather resistance of building board, with respect to a color difference (ΔE*ab) in a CIE1976L*a*b*color space before and after discoloration caused by an accelerated weatherproof test in a following super-accelerated weatherproof test condition in compliance with JTMG01:2000, Corrected Invention 1 further specifies a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, cyan component, and black component as being within 1.44,
whereas Invention A-2-1 does not specify as such.
(Written refutation on February 9, 2017, page 7, line 9 to page 8, line 4).

(T) Evidence A No. 2 discloses that

<Matters described in A2>

"In a decorative building board in which an ink jet layer is formed by use of 'three-color inks without organic pigments, the ink consisting of a yellow ink including a pigment selected from a yellow ferric oxide pigment, Ti-Ni-Ba-based yellow, Ti-Sb-Ni-based yellow, Ti-Nb-Ni-based yellow, and Ti-Sb-Cr-based yellow, a cyan ink including a pigment selected from a Co-Al-based blue and a Co-Al-Cr-based blue ink, a magenta ink including a pigment selected from a red ferric oxide pigment, Fe-Zn-based brown, Fe-Zn-Cr-based brown and Fe-Ni-Al-based brown', and 'a black ink including a pigment selected from black ferric oxide, Cu-Cr-based black, Cu-Cr-Mn-based black, Cu-Fe-Mn-based black, Co-Fe-Cr-based black, and carbon black' is further added 'to make a decorative building board in which an ink jet layer is formed by use of 4-color ink without organic pigments'".

Further, a decorative building board of Invention A-2-1 (specification 3) is a decorative building board patterned with three-color inks (yellow ferric oxide, red ferric oxide, and Co-Al-based blue) of A2. Thus the matters described in A2 are applicable.
(Written refutation on February 9, 2017, page 9, line 7 to page 10, line 1)

(U) Carbon black is one of the most commonly used black pigments with excellent weather resistance, heat resistance, and chemical resistance, and is applicable for "UV ink" and "Jet ink". In fact, there was a specific example of UV ink using CI pigment black 7 (carbon black) (A6, [0071]). Furthermore, it was known that carbon black has a property of protecting a polymer from UV degradation (A47, pages 458 to 460).

Therefore, a person skilled in the art could have easily conceived as necessary the selection of "carbon black" from "pigments selected from black ferric oxide, Cu-Cr-based black, Cu-Cr-Mn-based black, Cu-Fe-Mn-based black, Co-Fe-Cr-based black, and carbon black" of A2.
(Written refutation on February 9, 2017, page 11, line 13 to last line)

(V) "CI pigment black 7" means "carbon black" or "carbon black" produced by a furnace method.
(Written refutation on February 9, 2017, page 12, line 21 to last line)

(W) It is a well-known problem to retain color phase of coating, and 10-year resistance is required for coating of exterior materials. These facts shall apply even if a black component should be added to an ink used for the patterning of building board. Thus the finding of Different Feature 3 shall apply to Different Feature 5.

Consequently, similarly to the fact that the advance notice of trial decision correctly found Different Feature 3, the constitution of Corrected Invention 1 according to Different Feature 5 (imparting resistance so that the color difference between four colors (ΔE*ab) may fall within 1.44) was easily conceivable by a person skilled in the art and the constitution according to Different Feature 5 is easy.
(Written refutation on February 9, 2017, page 14, lines 5 to 12)

(X) Comparing Corrected Invention 1 with Invention A-2-2, the inventions are different from each other in the following points in addition to Different Features A to C of first Corrected Invention 3 and Invention A-2-2 as the advance notice of trial decision found:
<Different Feature D> (a part of Different Feature 1 as Demandee alleges)

Regarding black pigments, Corrected Invention 1 specifies CI pigment black 7, whereas Invention A-2-2 specifies Cu-Fu-Mn-based black or Co-Fe-Cr-based black pigment

<Different Feature E> (a part of Different Feature 3 as Demandee alleges)

Regarding weather resistance of building board, with respect to a color difference (ΔE*ab) in a CIE1976L*a*b*color space before and after discoloration caused by an accelerated weatherproof test in a following super-accelerated weatherproof test condition in compliance with JTMG01:2000, Corrected Invention 1 further specifies a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, cyan component, and black component as being within 1.44,

whereas Invention A-2-2 does not specify as such.
(Written refutation on February 9, 2017, page 14, line 2 from the bottom to page 15, line 14).

(Y) Regardless of the fact that it has been known from old times that most polymers are subjected to heat deterioration by the action of contacting metal included in pigments or dispersant ... and that metal ion proceeds the polymerization reaction, these facts are not supposed to become a barrier for the production of UV ink and the other resin composition including these inorganic pigments (A7, paragraph [0048], A45, A46, etc.). Specifically, the concentration of inorganic pigments in UV ink is approximately 0.1 to 10% (preferably 0.5 to 5%) (A7, paragraph [0017]). Such a level of inorganic pigments does not become a barrier for the commercialization of a product of UV ink (A7). As paragraph [0047] of A6 and paragraph [0032] of A7 describe that a polymerization inhibitor may be added to UV ink, it is sufficient to properly control the reaction as

necessary by the addition of polymerization inhibitor.

Therefore, it is easy to replace an ink of Invention A-2-2 including a black pigment of Cu-Fe-Mn-based black or Co-Fe-Cr-based black with a UV-curable ink, and Demandee's allegation is groundless.
(Written refutation on February 9, 2017, page 17, lines 11 to 25)

(Z) A person skilled in the art who read Invention A-2-2 would have no difficulty in replacing "Cu-Fe-Mn-based black" or "Co-Fe-Cr-based black" with "carbon black" in view of the description of [Claim 1][Claim 2][0009], etc. of A2.
(Written refutation on February 9, 2017, page 19, line 23 to last line)

B Regarding Corrected Invention 2 of the case

A2 discloses in [0012] that "Substrate 1 may be inorganic such as a ceramic substrate or metal substrate, or organic such as a resin substrate. Exterior material of ceramic substrate is used for use in tiles or outer wall materials." Thus A2 discloses constituent element G. (Written Demand, page 51, lines 2 to 6)

(2) Reason for Invalidation 2

A Regarding Corrected Invention 1 of the case

(A) The patent invention 1 and Invention A-3 are different from each other in the following points:

Different Feature 1: (Constituent elements B, C. Constitutions b, c)

The patent invention 1 specifies "said yellow pigment is CI pigment yellow 42 or CI pigment yellow 184, said magenta pigment is CI pigment red 101, and said cyan pigment is CI pigment blue 28", and an ink including each pigment is a UV-curable ink, whereas

Invention A-3 fails to describe the combination, although it describes "CI pigment yellow 42" as a yellow pigment and "CI pigment red 101" as a magenta pigment ([0024]), nor does it describe cyan pigment "CI pigment blue 28", and it is an aqueous-based or an oil-based ink

Different Feature 2: (Constituent elements D, F. Constitutions d, f)

The patent invention 1 is characterized in that, in the "super-accelerated weatherproof test condition" of constituent element F, "regarding a color difference (ΔE*ab) of building board patterned with said yellow dot, said magenta dot and said cyan dot in a CIE1976L*a*b*color space before and after discoloration caused by an accelerated weatherproof test in a following super-accelerated weatherproof test

condition compliance with JTMG01:2000, a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, and cyan component as being within 0.99", whereas

Invention A-3 specifies ratios of rate constants for both forced color degradation rate constants in the test condition of the constitution f as being within 0.5 or more to 2.0 or less

(Written demand, page 57, line 2 from the bottom to page 58, line 2 from the bottom)

(B) Even in the absence of the description of "BLUE28 (Cobalt blue)", A3 describes blue-based (cyan) pigments. Thus there is no difficulty in using the representative pigment of "CI pigment blue 28" (A4, A5). Furthermore, as Demandee points out, Evidence A No. 5 discloses that "CI pigment blue 28" is ... "excellent in weather resistance and heat resistance", and thus there is a sufficient motivation to select "CI pigment blue 28" as a cyan pigment of A3.

(Written refutation, page 56, lines 12 to 18)

(C) The patent invention only selects one kind from two kinds of cyan, two kinds from three kinds of yellow, and one kind from the one kind of magenta from limited combinations, and thus only specifies an extremely usual combination.

(Written Demand, page 61, lines 13 to 16)

(D) A3 discloses suppressing the change of color balance by adjusting color degradation rate of three colors ([Claim 1], [0008]). A2 discloses a combination of three-color pigments as an ink for decorative building board with high color degradation resistance ([Claim 1]) (Specification 3, 13, 14 of 0053), as well as a test result of color degradation resistance "⊙ completely no color degradation" ([0054]). "⊙ completely no color degradation" used herein could suggest no great change in color balance. Thus there is a motivation to apply a combination of three-color pigments ("CI pigment yellow 42", "CI pigment red 101", and "CI pigment blue 28") described in A2 as a candidate for pigments that do not undergo a great change in color balance.

Therefore, it is easy to apply the technical matters of A2 to Invention A-3 to select the above three-color pigments.

(Written demand, page 61, line 4 from the bottom to page 62, line 9)

(E) A3 has an objective to provide an ink for ink jet recording "having excellent fastness

against light, heat, air, water, or chemicals". A2 specifically discloses a combination of inorganic pigments of the patent invention as a combination of pigments "where the color degradation did not occur at all". Therefore, it is extremely natural to select a combination of these pigments "where the color degradation did not occur at all" (A2) for the purpose of adjusting the color degradation resistance of individual inks constituting ink jet.
(Oral proceedings statement brief, page 23, line 16 to line 22).

(F) As is similar to the discussion in Reason for Invalidation 1, it is possible to replace an ink including inorganic pigments of Invention A-3 with "aqueous ink" or "UV-curable ink", and there is a motivation to do so. Therefore, it is a technical matter that a person skilled in the art could have easily conceived to replace an aqueous ink of specific pigments of Invention A-3 with UV-curable ink by applying the described matters of A6 and A7.
(Written Demand, page 62, lines 17 to 21)

(G) On the premise of the disclosure of the specification, the constituent elements D and F only describe the effects naturally caused by satisfying the constituent elements A to C, or at least specify the content to be satisfied by implementing a design matter that needs not to be described in the specification in addition to the requirements. A person skilled in the art could have easily conceived of the constitution of Different Feature 2, since the constitution of selecting "CI pigment yellow 42", "CI pigment red 101", and "CI pigment blue 28" of the Invention for pigments and replacing an aqueous ink of Invention A-3 with UV-curable ink (the constitution of the constituent elements A to C) was easily conceivable.
(Written Demand, page 63, lines 11 to 19)

B Corrected Invention 2

A3 describes "outdoor decoration materials" in paragraph [0221]. Specifically, A3 discloses the constituent element G.
(Written Demand, page 64, lines 5 to 6)

(3) Reason for Invalidation 3

A Nonconformance to Enablement Requirement

(A) "A difference in color difference (ΔE*ab) of within 0.99" as provided in the Patent depends on a comprehensive combination of various factors such as the kind of ink

component (reactive monomer, reactive oligomer, and photopolymerization initiator), the presence or absence and the kind of top coat and properties of pigments, as well as pigments.

In this regard, the specification does not specify any of the kind of ink component (reactive monomer, reactive oligomer, and photopolymerization initiator), the presence or absence and the kind of top coat and properties of pigments, nor even guidance how to select them. Therefore, the specification fails to describe a method for implementing the constituent element D.
(Written demand, page 66, line 2 from the bottom to page 67, line 8)

(B) The specification discloses that a measurement result ([Table 6][Table 7]) of ΔE*ab falling within 0.99 was obtained in Examples 1 and 2. It is only a measurement result in a specific condition. Regardless of the fact that the ΔE*ab requirement as specified in the Patent (constituent elements D, F) depends on a comprehensive combination of various factors including the kind of ink component (reactive monomers, reactive oligomer, and photopolymerization initiator), the kind of top coat, and properties of pigments in addition to the presence or absence of pigment, top coat, and additional value coat layer, the specification does not at all specify the kind of ink component (reactive monomers, reactive oligomer, and photopolymerization initiator), the presence or absence and the kind of top coat and properties of pigments, nor does it provide guidance on how to select them. Therefore, a person skilled in the art could not understand how to implement in a case of implementing the building board that satisfies the constituent elements A to C and E) and had a ΔE*ab falling within 0.99 (constituent elements D and F).

Therefore, it cannot be said that the enablement requirement is satisfied on the basis of the description in the specification that a measurement result of ΔE*ab within 0.99 was achieved in Examples 1 and 2 ([Table 6][Table 7]).
(Written refutation on May 25, 2016, page 62, line 18 to page 63, line 9)

(C) The samples of Experiments 1 and 2 (A14 and 15) include the ones for which a measurement result with ΔE*ab falling within 0.99 was obtained. The ones for such result was obtained is relatively few in comparison to the total sample number, and the specification does not suggest for what kind of samples such result can be obtained.

Therefore, it cannot be said that the enablement requirement is satisfied on the basis of the fact that the samples of Experiments 1 and 2 (A14 and 15) include the measurement result of ΔE*ab within 0.99.

(Written refutation on May 25, 2016, page 63, lines 11 to 17)

B Nonconformance to Supporting Requirement

(A) The examples of the specification do not have specific description of ink components of ink jet layer (reactive monomer, reactive oligomer, photopolymerization initiator, etc.) and the components of top coat and additional value coat layer that could be an important means for solving the problem. Furthermore, in a case of the combination of pigments being the same, it totally fails to study the effect of the ink components and thickness of ink jet layer, specific components and thickness of top coat and additional value coat layer, and the structure of the other specific layers on ΔE*ab, nor does it provide description or suggestion as to what to select for these factors for the realization of ΔE*ab requirement. Ultraviolet light irradiated by "accelerated weatherproof test" (paragraph [0027]) in Examples of the specification reaches pigments via an ink component other than pigments of additional value layer, top coat layer, and ink jet layer (furthermore, the color change or degradation (color difference) of building board to be tested may also be measured via them). Therefore, it is at least obvious that they (particularly the top coat layer) may have an impact on the color change or degradation (color difference) of building board, and thus the measurement results of Examples ([Table 6][Table 7]) in the examples cannot be generalized beyond the specific ink components or layer structures (including thickness) of the examples.

(Written refutation on May 25, 2016, page 7, line 11 to page 8, line 7)

(B) Similarly, it cannot be said that the supporting requirement is satisfied on the basis of the description in the specification that a measurement result of ΔE*ab within 0.99 was achieved in Examples 1 and 2 ([Table 6][Table 7]). Thus the Demandee's allegation is groundless.

(Written refutation on May 25, 2016, page 63, lines 19 to 21)

No. 6 The demandee's allegation and Means of evidence

1 Outline of the demandee's allegation

Demandee demandss a trial decision to the effect that the correction is accepted, and the demand for invalidation trial shall be dismissed, and the cost for trial shall be borne by demandant, and alleges that none of the reasons for invalidation as demandant alleges is reasonable (see the written answer of the trial case, oral proceedings statement brief on August 30, 2016, written statement dated October 12, 2016, and written statement dated December 26, 2016.), and submits Evidence B No. 1 to B No. 5 as means of proof.

2 Means of evidence

The means of evidence are set forth as below:

Evidence B No. 1: Shinji IWAI et al., "Handbook of Paints", Sangyo Tosho Co., Ltd., June 25, 1954, cover page, pages 20 to 21, colophon

Evidence B No. 2: The Color Science Association of Japan, "Handbook of Color Science (2nd Edition)", University of Tokyo Press, June 10, 1998, cover page, pages 773 to 782, 784, colophon

Evidence B No. 3: Yoshito OHTAKE, "Corrosion and Degradation (6) Degradation Assessment and Analytical Method of Synthetic Resins (Rubber/Plastics)", Air Conditioning and Sanitary Engineering, Vol. 80, No. 1, The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan, January 5, 2006, cover page, list of contents, pages 69 to 75, back cover

Evidence B No. 4: Certificate of experimental results prepared on December 12, 2016 by demandee

Evidence B No. 5: "Functional Pigments", universal edition, first printing, CMC Publishing, January 25, 2001, cover page, page 19, colophon

3 Demandee's specific allegation

(1) Reason for Invalidation 1

A The term "yellow ferric oxide" described in Evidence A No. 2 includes at least CI pigment yellow 43. It cannot be said that it only means "CI pigment yellow 42" in Corrected Invention 1.

(Written answer, page 10, lines 20 to 23)

B The term "red ferric oxide" described in Evidence A No. 2 also means at least CI pigment red 102. It cannot be said that it only means "CI pigment red 101" in Corrected Invention 1.

(Written answer, page 11, lines 2 to 5)

C Evidence A No. 6, A No. 7 and A No. 13 only describe the use of UV-curable ink in the invention described in the respective items of Evidence A. As described below, there is neither description nor suggestion to change an aqueous ink of Invention A-2 into a UV-curable ink in view of the content of Invention A-2, let alone any description that can be a motivation to daringly use a UV-curable ink in place of aqueous

ink in order to solve the problem to be solved by the Corrected Invention to "provide a building board that can realize preferable discoloration".

Evidence A No. 8 to A No. 11 only have general description of UV-curable ink. There is no description or suggestion that may become a motivation to daringly use a UV-curable ink in place of aqueous ink in Invention A-2.
(Written answer, page 12, lines 12 to 20)

D When the composition of ink including pigments is to be changed from an aqueous ink into, e.g., a UV-curable ink, a consideration should be given to the whole formulation of pigments, resin, solvent and additives, etc. To change an ink including pigments from an aqueous ink to a UV-curable ink cannot be said to be "only the replacement of an ink component dispersing pigments, and does not require particular trials and errors".
(Written answer, page 13, line 5 from the bottom to last line)

E Evidence A No. 2 specifies comprising "ink receiving layer" in Claim 1, and definitely describes the necessity of the ink receiving layer ([0014]); however, the ink receiving layer is unnecessary in a UV-curable ink (e.g. [0002] of Evidence A No. 7 etc.). Thus a person skilled in the art would not daringly change to a UV-curable ink that does not require an ink receiving layer in such Invention A-2.
(Written answer, page 14, lines 7 to 11)

F Even if there was a fact that "a UV-curable ink is instantly cured so as to make a drying step unnecessary, and make an ink receiving layer unnecessary, and has an advantage of excellent adhesiveness with a substrate", such fact does not motivate a person skilled in the art who tried to solve the problem to be solved by the Corrected Invention to "provide a building board that can realize preferable discoloration" to change from an aqueous ink to a UV-curable ink.
(Written answer, page 15, lines 13 to 18)

G What is described in Evidence A No. 7 is only a difference in weather resistance between "UV-curable resin" and "the other resins" (resins other than UV-curable resin), which means the superiority of "UV-curable resin" to "the other resins" (resins other than UV-curable resin) in terms of weather resistance. In other words, Evidence A No. 7 does not at all teach the superiority of "UV-curable ink" to "aqueous ink" in terms of weather resistance.

Therefore, although Evidence A No. 7 discloses that "in general, UV curable-type resin has excellent weather resistance compared to the other resins", it does not lead to the conclusion that "there is a motivation to change an ink including inorganic pigments of A2 from 'aqueous ink' to 'UV-curable ink'".
(Written answer, page 16, lines 11 to 19)

H Evidence A No. 2 only discloses that "color degradation resistance test" "evaluated a color degradation resistance" "after irradiation of ultraviolet light for 1000 hours" ([0049]). In view of the other description of Evidence A No. 2, the "color degradation resistance test" should be a test in which the discoloration due to "heat" or "water (rain)" at least presumed by the Corrected Invention is not at all taken into account.

Further, Invention A-2 does not mention about the color degradation for each color. Therefore, it is impossible to try to measure the color difference between each of the colors in Corrected Invention 1.

Specifically, the color degradation resistance test of Invention A-2 is fundamentally different in technical meaning from an accelerated weatherproof test in Corrected Invention 1.

Further, Evidence A No. 2 does not at all describe the discoloration due to "heat" or "water (rain)" that the Corrected Invention presumes. Thus there cannot be a motivation in Invention A-2 to focus on the color difference (ΔE*ab) after discoloration by accelerated weatherproof test in Corrected Invention 1 that takes into account the color change or degradation due to not only "light (sunlight)" but also "heat" or "water (rain)", let alone a motivation to adjust the color difference (ΔE*ab) to within 0.99.
(Written answer, page 18, lines 10 to 23)

I "Allows us to obtain a building board capable of realizing a preferable discoloration" ("allows us to prevent significant color degradation in a specific color component") in Corrected Invention and "providing high color degradation resistance" of the invention of Evidence A No. 2 are different from each other in the phenomenon itself regarding the effects; i.e., in whether or not the relationship between each color component is considered. The effects of the Corrected Invention consider the balance between the color components, whereas the effect of the invention described in Evidence A No. 2 means "vividness of color" of the whole ink jet layer in which the balance between the color components is not taken into account at all.

Further, the Corrected Invention accepts the discoloration hard to suppress by the exposure to heat, light, and water for a long period, whereas it prevents the status in which

only any of color components is diminished, whereas in the Invention described in Evidence A No. 2, as described above, the total color is vivid at the beginning, and maintaining the vividness is tried. Thus their problems and effects do not share common ground, and have a different nature from each other.
(Oral proceedings statement brief, page 8, line 12 to line 24).

J The demandant's allegation recognizes that the constitution of Different Feature 1 (constituent elements A to C) was easily conceivable, and recognizes the problem that "weather resistance for 10 years or so is required for building boards for outdoors" in a building board satisfying the constituent elements A to C (an invention different from Invention A-2), and alleges that the adoption of the constitution of Different Feature 2 (constituent elements D and F) was easily conceivable, which makes a determination that an invention was easily conceivable on the basis of so-called "easiness on the basis of easiness".
(Oral proceedings statement brief, page 26, line 3 to line 8).

K Some pigment deteriorates organic materials such as polymer. Thus although it might be applied for an aqueous ink, some pigment may not be applied for a UV-curable ink that includes a larger amount of organic materials such as polymer compared to an aqueous ink. Specifically, the combination of pigments and the use of UV-curable ink are mutually inseparable technical matters, and thus neither of them can be adopted independently and individually. In such circumstances, the Corrected Invention adopts the combination of specific four-color pigments optimal for "obtaining a building board capable of realizing a preferable discoloration" on the premise of using a UV-curable ink.
(Written Statement on December 26, 2016, page 6, last line to page 7, line 6)

L A person skilled in the art would not be motivated to change from an aqueous ink of Invention A-2 in which Cu-Fe-Mn-based black or Co-Fe-Cr-based black including metals such as Co, Mn, Cu and Fe, which have poor compatibility with organic materials such as polymer, is used, to a UV-curable ink that obviously includes a larger amount of organic materials compared to the aqueous ink. Rather, there is a disincentive for such a change.
(Written Statement on December 26, 2016, page 8, lines 10 to 14)

M There is not any motivation at all in Invention A-2 to focus only on black

pigments, and then change only black pigments to CI pigment black 7.
(Written Statement on December 26, 2016, page 9, lines 19 to 20)

(2) Reason for Invalidation 2

A It cannot be said that there is a motivation in Evidence A No. 3 to select "CI pigment yellow 42 or CI pigment yellow 184" and "CI pigment red 101" from a number of exemplified pigments and combine them in order to "provide a building board that can realize preferable discoloration" even in a case of being exposed to heat, light (sunlight), and water (rain), let alone a motivation to further combine "CI pigment blue 28" that is not even described in Evidence A No. 3 for use in addition to these pigments.
(Written answer, page 23, line 7 from the bottom to last line)

B Demandant takes it as given that a person skilled in the art should select from "representative coloring pigments commonly used in the current market" of Evidence A No. 4 in selecting from a number of dyes, organic pigments, and inorganic pigments in Invention A-3. However, there is no reason to find such supposition. When a person skilled in the art selects pigments and dyes in Invention A-3, it is natural understanding that a person skilled in the art should have targeted every pigment and dye described in Evidence A No. 3. Thus there is no reason to restrict the target to "representative coloring pigments commonly used in the current market" and further limit to inorganic pigments therefrom.
(Written answer, page 25, lines 17 to 24)

C Evidence A No. 3 discloses that the invention described therein makes "the dissolution or dispersion of coloring agent into an aqueous or oil-based solvent" an essential constitution ([Claim 1]). Further, it describes that "The ink used for ink set of the present invention is an ink in which dye or pigment is dissolved or dispersed into water or organic solvent. Of these, an aqueous solution-type ink including water-soluble dye is preferable" ([0018]). On the other hand, Evidence A No. 3 neither describes nor suggests UV-curable ink including pigments.

Consequently, a person skilled in the art who read the description of Evidence A No. 3 should positively use a water solution-type ink using an aqueous dye. Even if an ink including pigment should be used, one would at most try to use an ink in which a pigment is dispersed into water or organic solvent. There is no motivation to use a UV-curable ink including pigment in Evidence A No. 3.
(Written answer, page 28, lines 16 to 27)

D "Light radiation test by D65 light" of Evidence A No. 3 is only "a test method that tests the deterioration of color degradation etc." by irradiating predetermined light ([0013]). It is a test in which at least the discoloration due to "heat" or "water (rain)" is not at all considered. Specifically, the light irradiation test by D65 light in Invention A-3 is fundamentally different in technical meaning from an accelerated weatherproof test in Corrected Invention 1.

Further, Evidence A No. 3 could not motivate us to focus on the color difference (ΔE*ab) after discoloration by accelerated weatherproof test in Corrected Invention 1 that takes into account the discoloration due to not only "light (sunlight)" but also "heat" or "water (rain)", let alone a motivation to adjust the color difference (ΔE*ab) to within 0.99. (Written answer, page 31, lines 8 to 16)

E Paragraph [0221] of Evidence A No. 3 cited by demandant discloses that "The ink for ink jet recording of the present invention may be applied for a use other than ink jet recording" and raises "outdoor decorative materials" as one of the exceptional uses, and further only describes "wall materials" as one of the examples. Therefore, even if the description of building board could be found from such description, a major target is an office or home for the use in printing on paper, film and cloth etc. A transparent coated layer to be formed on an ink jet layer of building board could not be presumed. (Written answer, page 32, lines 21 to last line)

(3) Reason for Invalidation 3

A In Corrected Invention, "a combination of three-color pigments" and "a difference in color difference (ΔE*ab) of 'within 0.99'" as the demandant alleges are respectively the individual specified matters. The sufficiency of both of these matters (further the other specified matter) may realize the preferable discoloration.
(Written answer, page 7, lines 3 to 7)

B The specification ([0016] to [0021], [0052] to [0054]) and drawing ([Figure 1]) describe an embodiment for implementing a building board according to the Corrected Invention (production method). Further, the examples of the specification ([0022] to [0049]), in particular Examples 1 and 2, describe the embodiments for implementing a building board according to the Corrected Invention (production method) more concretely.

Further, a person skilled in the art who read the description of the specification could manufacture and use a building board of the Corrected Invention.

Consequently, regarding the Corrected Invention (building board) of product invention, the specification specifically describes a method for producing the product and a method for using the same. Further, a person skilled in the art can make the product and naturally use the product on the basis of the description of the specification and drawings and the common general knowledge as of the filing. Therefore, the Detailed Description of the Invention of the specification "clearly and sufficiently describes the invention to the extent that allows a person who has ordinary knowledge in the technical field to implement the invention".
(Written answer, page 35, lines 22 to page 36, line 5)

C A transparent coated layer is formed on a surface of ink jet layer that is formed by three kinds of pigments of UV-curable ink in Claim 1. Similarly, a building board with a color difference between each color of within 0.99 after 600 hours of super-accelerated weatherproof test including light, temperature, humidity, and water shower specified in Claim 1 may prevent color degradation in a specific color component, as evidenced from Examples 1, 2. A person skilled in the art could recognize that a problem to be solved by the Corrected Invention of providing a building board capable of realizing preferable color change or degradation may be solved by the matters specifying the invention of Claim 1.
(Written answer, page 38, lines 13 to 19)

D In Experimental Report 1 (Evidence A No. 14), it has been demonstrated that Demandant itself could have implemented the Corrected Invention in accordance with the description of the specification.

Further, similarly in Experimental Report 2 (Evidence A No. 15), it has been demonstrated that Demandant itself could have implemented the Corrected Invention in accordance with the description of the specification.

These facts mean that the Detailed Description of the Invention of the specification should "disclose clearly and sufficiently to the extent that allows a person who has ordinary knowledge in the technical field to implement the invention".
(Written answer, page 40, lines 6 to 13)

E If a person skilled in the art who had common general knowledge as of the filing would recognize that the difference in color difference (ΔE*ab) of "within 0.99" as specified in the Corrected Invention should depend on a comprehensive combination of various factors such as the kind of ink component (reactive monomers, reactive oligomer,

and photopolymerization initiator), the kind of top coat, and properties of pigments as Demandant alleges, it is sufficient for a person skilled in the art to select as necessary the kind of ink component (reactive monomers, reactive oligomer, and photopolymerization initiator), the kind of top coat, and properties of pigments so that the difference in color difference (ΔE*ab) might become "within 0.99". The Corrected Invention still conforms to the enablement requirement.
(Written answer, page 40, lines 14 to 21)

No. 7 Judgment by the body
1 Description of Evidence A
(1) Evidence A No. 2

Evidence A No. 2, a publication distributed before the patent application, has the following descriptions (the underlines are provided in the Trial Decision; the same shall apply hereinafter.).

A "[Claim 1]

A decorative building board being formed by laying on a surface of a substrate an undercoat layer, an ink receiving layer, an ink jet layer, a clear layer, an inorganic coat layer, and a photocatalyst coat layer in this order, the ink jet layer being formed by use of three-color inks without organic pigments, the ink consisting of a yellow ink including a pigment selected from a yellow ferric oxide pigment, Ti-Ni-Ba-based yellow, Ti-Sb-Ni-based yellow, Ti-Nb-Ni-based yellow, and Ti-Sb-Cr-based yellow, a cyan ink including a pigment selected from a Co-Al-based blue ink and a Co-Al-Cr-based blue ink, a magenta ink including a pigment selected from a red ferric oxide pigment, Fe-Zn-based brown, Fe-Zn-Cr-based brown, and Fe-Ni-Al-based brown.
[Claim 2]

The decorative building board of Claim 1, in which an ink jet layer is formed by use of 4-color ink without organic pigments, the ink further including a black ink including a pigment selected from black ferric oxide, Cu-Cr-based black, Cu-Cr-Mn-based black, Cu-Fe-Mn-based black, Co-Fe-Cr-based black, and carbon black."

B "[Technical field]
[0001]

The present invention relates to a decorative building board with a desired pattern formed by ink jet printing."

C "[Problem to be Solved by the Invention]

[0004]

However, a conventional decorative building board has a problem of color fade-out in early stage even if an ink jet layer 4 is formed by use of organic pigments in vivid color. Accordingly, the present inventors have tried to form an ink jet layer 4 by use of only inorganic pigments with high weather resistance in an attempt to solve this problem; however, they found that it significantly reduces vividness of color. Further, as a result of further continued study by the present inventors, when an organic pigment and an inorganic pigment (in particular oxide-based inorganic pigment) are mixed for use, it has been found that this inorganic pigment acts as an optical semiconductor, thereby deteriorating the organic pigment.

[0005]

The present invention has been made in view of the above points, and has an objective to provide a decorative building board that achieves high resistance to color degradation."

D "[Advantage of the Invention]

[0008]

According to the building board of Claim 1 of the present invention, the use of combining three-color inks of the predetermined yellow, cyan, and magenta may prevent to an extent possible the decrease in color vividness as compared to the case of using organic pigments. The formation of an ink jet layer by use of three-color inks that do not contain such organic pigments may prevent the deterioration of ink jet layer and achieve color degradation resistance.

[0009]

According to the invention of Claim 2, a vivid black color may be expressed as compared to a black color expressed by three colors of yellow, cyan, and magenta by the addition of predetermined black ink, which makes it unnecessary to express a black color with three colors of yellow, cyan, and magenta by expressing black color by one color of black, and save material cost."

E "[Best Mode for Carrying Out the Invention]

[0010]

Hereinafter, the embodiments of the present invention are elaborated.

[0011]

As shown in Figure 1, a decorative building board of the present invention is

formed by laying an undercoat layer 2, an ink receiving layer 3, an ink jet layer 4, a clear layer 5, an inorganic paint layer 6, and a photocatalyst paint layer 7 on a surface of a substrate 1 in this order.

[0012]

The substrate 1 may be inorganic such as a ceramic substrate or a metal substrate, or organic such as a resin substrate. Exterior material of ceramic substrate is used for the use in tiles or outer wall materials. ...."

F "[0017]

Specifically, in the present invention, an ink for forming the ink jet layer 4 used may be as follows. Specifically, yellow (Y) ink used may include pigments selected from yellow ferric oxide, Ti-Ni-Ba-based yellow, Ti-Sb-Ni-based yellow, Ti-Nb-Ni-based yellow, and Ti-Sb-Cr-based yellow. Further, cyan (C) ink used includes pigments selected from Co-Al-based blue and Co-Al-Cr-based blue. Further, magenta (M) ink used includes pigments selected from red ferric oxide, Fe-Zn-based brown, Fe-Zn-Cr-based brown, and Fe-Ni-Al-based brown. As seen above, the combining of three-color inks of the predetermined yellow, cyan, and magenta may prevent to an extent possible the decrease in color vividness as compared to the case of using organic pigments.

[0018]

Black color may be expressed by three-color inks of the above yellow, cyan, and magenta; however, four-color inks are preferable by the addition of the following black (K) ink. Specifically, a black ink preferably includes a pigment selected from black ferric oxide, Cu-Cr-based black, Cu-Cr-Mn-based black, Cu-Fe-Mn-based black, Co-Fe-Cr-based black, and carbon black."

G "[0024]

Thereafter, the clear layer 5 is formed on a surface of the ink jet layer 4. The clear layer 5 is a layer necessary for protecting the ink jet layer 4 formed beneath, and may be formed by an aqueous paint. As seen above, the formation of the clear layer 5 by an aqueous paint may result in a decreased environmental load."

H "[0027]

Further, the thickness of the clear layer 5 is preferably 3 to 30 μm. Thereby, the occurrence of cracking and the bleeding of aqueous ink may be prevented, in addition to achieving further improved resistance such as weather resistance. If the thickness of clear layer 5 is less than 3 μm, however, improved resistance such as weather resistance

might not be achieved. In contrast, if the thickness of clear layer 5 is greater than 30 μm, crack might occur, or an aqueous ink might bled."

I "[Examples]

[0035]

Hereinafter, the present invention will be concretely explained by use of the examples.

[0036]

As shown in Figure 1, decorative building boards of Examples 1 to 5 and Comparative Examples 1 and 2 were produced by laying the undercoat layer 2, the ink receiving layer 3, the ink jet layer 4, the clear layer 5, the inorganic paint layer 6, and the photocatalyst paint layer 7 on a surface of the substrate 1 in this order.

.....

[0041]

Further, the ink jet layer 4 is formed by subjecting an aqueous ink to ink jet printing on a surface of the ink receiving layer 3 by use of the ink jet apparatus shown in Figure 2.

[0042]

Here, an aqueous ink includes 50 weight% dispersing elements, 10 weight% diethyleneglycol, 20 weight% glycerin, 10 weight% diethyleneglycolmonobutylether, and 10 weight% water. The above dispersing elements include one in which pigments, water-soluble resin (acrylic copolymer) and water were mixed so that a ratio of pigments/water-soluble resin/water might become 10/4/86. Further, for the above pigments there were used the ones shown in the specifications 3, 7, 8, 11, and 12 of the following [Table 1], and an aqueous ink was prepared for each pigment of each color.

[0043]

Further, the clear layer 5 was formed by use of acrylic resin paints with a base of acrylic-based emulsion."

J "[0048]

Further, regarding Examples 1 to 5 and Comparative Examples 1 and 2, a test for the assessment of color degradation resistance was conducted.

[0049]

<Color degradation resistance>

A test for color degradation resistance was conducted in the following manner. Specifically, each decorative building board was subjected to curing for one week, and a

surface of each decorative building board was exposed to UV irradiation for 1000 hours by sunshine weatherometer (SWOM), and each surface of decorative building board was observed by visual inspection to assess color degradation resistance. The color degradation resistance of each decorative building board was determined on the basis of the following criteria: The results are shown in the following [Table 2].

[0050]

"⊙": No color degradation occurred at all

[0051]

"○": Slight color degradation occurred, although it is inconsequential.

[0052]

"×": Color degradation occurred."

K Table 1 respectively describes that the ink jet layer (ink) of the specification 13 uses pigments of Co-Al-based blue, red ferric oxide, yellow ferric oxide, and Cu-Fe-Cr-based black as an ink of cyan (C), an ink of magenta (M), an ink of yellow (Y), and an ink of black (K), and the ink jet layer (ink) of the specification 14 uses pigments of Co-Al-based blue, red ferric oxide, yellow ferric oxide, and Co-Fe-Cr-based black as an ink of cyan (C), an ink of magenta (M), an ink of yellow (Y), and an ink of black (K)

L In view of the description of the above J, it can be seen from Table 2 that no color degradation occurred as a result of the test of color degradation resistance in the decorative building boards of Example 6 with an ink jet layer of the specification 13 and Example 7 with an ink jet layer of the specification 14.

M According to the above A to H (particularly A, B, E, K), Evidence A No. 2 discloses the following invention:

"A decorative building board to be used for tiles and external wall materials, the board being formed by laying on a surface of a substrate an undercoat layer, an ink receiving layer, an ink jet layer, a clear layer, an inorganic coat layer, and a photocatalyst coat layer in this order, the ink jet layer being formed with a desired pattern by use of four-color aqueous inks free of organic pigments, and the aqueous ink consisting of a yellow aqueous ink including a yellow ferric oxide pigment, a cyan aqueous ink including a Co-Al-based blue pigment, a magenta aqueous ink including a red ferric oxide pigment, and a black aqueous ink including Cu-Fe-Mn-based black or Co-Fe-Cr-based black pigment."

(2) Evidence A No. 3

Evidence A No. 3, a publication distributed before the patent application, has the following descriptions:

A "[Claim 1]
An ink set for ink jet recording composed of at least three kinds of inks for ink jet dissolving or dispersing a coloring agent into an aqueous or an oil-based medium and having maximum absorption spectra in mutually different spectral absorption regions, wherein, regarding any two of forced color degradation rate constant by D65 light of the respective inks calculated for a printed region of at least three kinds of inks printed by use of the ink set on a reflection-type image receiving medium, the ratio of the rate constants falls within a range of 0.5 or more to 2.0 or less.
[Claim 2]
The ink set for ink jet recording of Claim 1, wherein the ink set consists of at least one kind of cyan, at least one kind of magenta, and at least one kind of yellow.
[Claim 3]
The ink set for ink jet recording of Claim 1 or 2, wherein the ink set includes at least one kind of black ink.
.....
[Claim 5]
The ink set for ink jet recording of any one of Claims 1 to 3, wherein the coloring agent is a pigment."

B "[0001]
[Technical Field of the Invention]
The present invention relates to an ink set for ink jet having excellent image storage stability in which the quality of recorded image is not affected by storage environment, and a method for ink jet recording. Particularly, the present invention relates to an ink set for ink jet having excellent image storage stability in outdoor exhibition or in a condition susceptible to sunlight, and a method for ink jet recording.

C "[0004]
For color image forming agent with excellent durability, pigment is generally superior to dye. In contrast, in a dispersed-type ink using pigments, the transparency of an image (particularly high level part) and image quality are inferior. Therefore, neither dyes nor pigments can balance fastness with high image quality... Particularly in a case that a reflection image of ink jet drawing is placed outdoors with large sunlight component, not

only is an image level decreased as the color degradation proceeds by light during exhibition (color degradation in a narrow sense), but also the color balance of an image collapses since the progression of the color degradation differs for each coloring agent constituting the image.

[0005]

Such time course image quality deterioration of recorded image is promoted by high temperature, high humidity, high luminance lighting, and the exposure to oxidation atmosphere. Thus, needless to say, it is essential that heat stability, light fastness, and oxidation resistance of ink in an ink composition are excellent; however, the aforementioned color balance collapse by the irradiation of outdoor light would not be solved only by hardening a coloring agent of specific ink.

[0006]

[Problem to be Solved by the Invention]

In view of the above background, a problem to be solved by the present invention is to provide an ink set for ink jet and a method for ink jet recording capable of maintaining an image quality with high quality recording image and further less change in color balance even when the obtained image is placed in a bright place, particularly outdoors with a strong sunlight component."

D "[0011]

[Embodiments of the Invention]

Hereinafter, the present invention is elaborated.

Let's begin with an explanation on a forced color degradation rate constant by D65 light representing fastness of each ink of an ink set of the present invention against outdoor light. D65 light is a term prescribed by International Commission on Illumination that denotes an average daylight of sun.

The forced color degradation rate constant of each ink by D65 light in the specification is calculated as in the following: a colored region at a reflection level of 0.90 to 1.10 measured through a status A filter with a color of major spectral absorption region of the ink of the resultant image obtained by printing only the ink in an ink set on a reflection-type image receiving medium is selected as an initial level, and this initial level is set to a starting level (=100%). Subsequently, this image is subjected to color degradation by xenon light irradiation compliant with the provision of the International Standard (ISO18909: Stability test method for dye image), 5.9 (D65 outdoor sunlight condition) to measure a time for the level becoming 80% of an initial level. Given that the relationship between color degradation level and time is compliant with the rate formula

of primary reaction, the color degradation reaction rate constant by D65 light is calculated from this time... Therefore, color degradation rate constant to be calculated is a color degradation rate constant of coloring region to be printed by the ink, whereas the specification uses this value as a color degradation rate constant of an ink.

.....

[0013]

In the present invention, the light irradiation test by D65 light as provided in the above International Standard, 5.9 to be used for the measurement of forced color degradation rate constant is a test method for testing the deterioration such as color degradation by irradiating 6.5 klux light, which imitates average daylight (D65, i.e. 6500K) as specified by CIE (International Commission on Illumination) by a passing high-pressure xenon lamp (protected by a thick borosilicate glass with an inner housing of 1.5 mm and an outer housing of 2.5 mm) through a 6.0 mm-thick thick borosilicate glass, on an image surface in a test condition representing outdoors rich with sunlight component.

The high-pressure xenon lamp used for the above test may include weatherometer Ci65A manufactured by Atlas electric device (United States, Atlas Electric Devices, Inc.) as well as a combination of a xenon lamp compliant with JIS Z 8902 (Xenon standard white light source) with a soda glass for UV absorption calibration. ...

[0014]

Subsequently, an explanation is given to an ink set of the present invention and each ink constituting the ink set. An ink set for ink jet of the present invention includes at least three kinds of inks. Each ink includes a coloring component, and preferably includes at least one kind from three colors of cyan, magenta, and yellow. Further, it may preferably include black ink. Further preferably, it may include any two kinds of color inks of cyan, magenta, and yellow.

[0015]

When stored or exhibited in a light place, an image recorded by use of such an ink set causes distortion in color balance due to the difference in color degradation rate by concentration, color tone, and contrast of the respective regions of an image, which involves difficulty to maintain the excellent image quality immediately after the formation of an image.

Particularly, in a case according to the present invention that causes an image to be formed on a reflection-type image receiving medium, the Lambert-Beer law in transparent materials does not apply. Particularly in a low concentration region, a divergence between an amount of dye in color degradation and a decreased amount in concentration becomes greater. Specifically, there is a broad region in which there is no linear

relationship between an amount of dye present and its concentration.
In addition, in a case where two or more kinds of inks for forming an ink set are used, a difference in color degradation rate between inks with different levels in the same color phase or similar color phase causes significant variation in the color tone.
Therefore, in a case where an image is exposed to lighting rich in the whole visible light region and ultraviolet light representative of outdoor sunlight, not only the decrease in level associated with photochemical color degradation of dyes but also the deterioration of an image and the decreased image lifetime due to distortion of color balance are caused.
[0016]
However, the present invention is characterized by adjusting the ratio of the rate constants to a range of 0.5 or more to 2.0 or less for any two of forced color degradation rate constant of the respective inks against ozone gas calculated for a printing region of at least three kinds of inks with different color phases constituting an ink set. An ink set designed as such resists collapse of color balance of an image and degradation of the total quality of the image even in a case of the image being exposed to lighting rich in visible light and ultraviolet light representative of the aforementioned outdoor sunlight.
Specifically, according to the ink for ink jet recording and ink jet recording method of the present invention, a ratio of the forced color degradation rate constants by D65 light calculated for each color ink constituting ink set falls within 0.5 to 20, preferably 0.7 to 1.4, further preferably 0.8 to 1.25 for the random selection of any two colors. Adjustment within such a range may perform the effect of the present invention."

E "[0024]
The ink set of the present invention may use pigments, which include commercially available ones, and publicly known ones described in various documents. ... Specifically, ... inorganic pigments include CI pigment yellow 34, 37, 42, and 53 for yellow pigments, CI pigment red 101 and 108 for red pigments, CI pigment blue 27, 19, and 17:1 for blue pigments, CI pigment black 7, magnetite for black pigments, and CI pigment white 4, 6, 18, and 21 for white pigments."

F "[0028]
Black pigment may preferably include inorganic pigments (preferable examples include carbon black and magnetite) and aniline black. In addition, orange pigments (CI pigment orange 13, 16, etc.) and green pigments (CI pigment green 7, etc.) may be used."

G "[0221]

The ink for ink jet recording of the present invention may be applied for uses other than ink jet recording. It may include, for example, materials for display imaging, image formation materials for interior decorative materials, and image formation materials for outdoor decorative materials."

H "[0224]
Outdoor decorative materials may include various articles such as wall materials, roofing materials, signboards, gardening materials, outdoor decorative goods (such as stationary articles and figures), and outdoor lighting device members. In a case of using dyes of the present invention as image formation materials, the image may include not only an image in a narrow sense but also all the patterns using dyes recognizable by humans such as abstract designs, characters, and geometric patterns."

I According to the above A to H (particularly A, G, H), Evidence A No. 3 discloses the following invention (hereinafter referred to as "Invention A-3"):

"An outdoor decorative material such as wall materials and roofing materials in which an abstract design or a geometric pattern, etc. is formed by use of an ink set for ink jet recording constituting at least four kinds of ink for ink jet having maximum absorption spectra in mutually different spectral absorption regions in which a pigment is dissolved or dispersed into an aqueous or oil-based solvent,

wherein the ink set consists of at least one kind of cyan, at least one kind of magenta, at least one kind of yellow, and at least one kind of black ink,

wherein, regarding any two of forced color degradation rate constant by D65 light of the respective inks calculated for a printed region of at least four kinds of inks printed by use of the ink set on a reflection-type image receiving medium, the ratio of the rate constants falls within a range of 0.5 or more to 2.0 or less."

(3) Evidence A No. 4

Evidence A No. 4, the publication distributed before the patent application, has the following descriptions:

A "A color system was divided into 8 kinds including achromatic color (white), and a representative coloring pigment commonly used in the current market was selected in the respective color phase region. Further, in paint industries, the decrease in lead and chrome is strongly needed from environmental and safety aspects, but a lead/chrome-based pigment is still commonly used from the viewpoint of its vivid color tone, and

weather resistance and cost aspects. In view of the current situation, many pigment species are selected for the replacement. Tint color pigment mixing ratio is not a uniform mixing ratio, but adjusted with a goal of luminosity of about 70.

The outline of pigments used in the test is shown in Table 2-2 at the end of Chapter 2.4." (page 4, lines 2 to 7)

B "Table 2-2 List of pigment species" on page 10 discloses that "cobalt blue", which is a pigment specimen of color system of "blue", has a C.I. Generic Name of "BLUE28", "yellow ferric oxide", which is a pigment specimen of color system of "yellow", has a C.I. Generic Name of "YELLOW42", and "colcothar", which is a pigment specimen of color system of "red", has a C.I. Generic Name of "RED101".

(4) Evidence A No. 5

Evidence A No. 5, a publication distributed before the patent application, has the following descriptions:

A "4.1.3.2 colcothar

General name: Colcothar, red ferric oxide, ferric oxide, hematite

.....

C.I. Number: C.I. Pigment Red 101 (C. I. 77491)

.....

[Properties] Colcothar is a reddish pigment with a major component of α-Fe2O3, and a particle profile of pigment is a particulate and indefinite shape. ... It is stable in acid and alkaline, has good heat resistance and weather resistance, and is a low-cost, fast, and harmless colorant pigment." (page 348, lines 3 to 11 from the bottom)

B "4.1.4.2 Yellow iron oxide

General name: yellow ferric oxide, yellow iron oxide, hydrated ferric oxide .....

.....

C.I. Number, C.I. Pigment Yellow 42 (C. I. 77492)

.....

[Properties] Yellow ferric oxide is a yellow pigment with a major component of α-FeO(OH). Its color tone varies from a powder in brownish dark orange to a powder in slightly greenish light yellow. ... Stable in acid and alkaline, and excellent weather resistance." (page 352, lines 11 to 25)

C "4.1.6. 3 Cobalt aluminum blue (composite oxide pigments) General name: Cobalt blue, Thenard's blue, cobalt aluminate

.....

C. I. Number C. I. Pigment Blue 28 (C. I. 77346)

.....

Chemical formula CoO-Al2O3

[Properties] Cobalt blue is a blue sintered pigment with a spinel type crystalline structure consisting of cobalt oxide and aluminum oxide. It may include MgO, ZnO, and SiO2 as color tone adjusters. ... It is a pigment having excellent fastness, heat resistance, chemical resistance, and weather resistance ...

[Paint Use] Paints for exterior use requiring resistance, heat resistant paints, inorganic paints, etc." (page 362, pages 14 to 28)

(5) Evidence A No. 6

Evidence A No. 6, a publication distributed before the patent application, has the following descriptions:

A "[Claim 1]

An ink set for ink jet comprising orange pigment ink (a) and red pigment ink (b), wherein said orange pigment ink (a) consists of an iron oxide of orange pigment and a solvent, and said red pigment ink (b) consists of one kind or more pigments selected from an iron oxide of red pigment and a condensed polycyclic pigment, and a solvent.

[Claim 2]

The ink set for ink jet of Claim 1, wherein said orange pigment of ferric oxide is CI pigment red 101.

.....

[Claim 5]

The ink set for ink jet of any one of Claims 1 to 4, wherein said solvent is a reactive monomer and/or reactive oligomer.

[Claim 6]

An ink jet coloring method in which a coloring medium is patterned by use of the ink set for ink jet of any one of Claims 1 to 5.

[Claim 7]

An outdoor colored product obtained by utilizing the ink jet coloring method of Claim 6."

B "[0017]

An ink set of the present invention enables provision of materials for outdoor use such as siding material with brick-effect or wood-effect color expression. Furthermore, there is provided an outdoor colored product with excellent warm color-type color expression frequently used in siding materials, in particular deep orange color, brown color, brick color expression and weather resistance."

C "[0020]

Orange pigment ink (a) includes at least an iron oxide of orange pigment. For such iron oxide, CI pigment red 101 is preferable. CI pigment red 101 has a feature of changing color phase by particle diameter. A smaller particle diameter exhibits yellow, whereas a larger particle diameter exhibits purple.

D [0030]

"An ink set for ink jet of the present invention may include an ink set with combined use of inks consisting of: blue organic pigments such as phthalocyanine compounds (CI pigment blue 15, CI pigment blue 15:1, CI pigment blue 15:2, CI pigment blue 15:3, CI pigment blue 15:4, CI pigment blue 15:6, and CI pigment blue 16); blue inorganic pigments such as iron blue (CI pigment blue 27), cobalt blue (CI pigment blue 28, CI pigment blue 36), and ultramarine blue (CI pigment blue 29); black inorganic pigments such as carbon black (CI pigment black 7); white inorganic pigments such as titanium oxide (CI pigment white 6); yellow inorganic pigments such as bismuth vanadate (CI pigment yellow 184) and yellow ferric oxide (CI pigment yellow 42); and yellow organic pigments such as azomethine compounds (CI pigment yellow 129, CI pigment yellow 150)."

E "[0034]

A solvent to be used in the present invention may include water, organic solvents, reactive monomer and/or reactive oligomer. Of these, reactive monomer and/or reactive oligomer are preferable.

[0035]

Reactive monomer and reactive oligomer are not particularly limited, but one to be cured by irradiation of ultraviolet light, a so-called UV curable resin, is preferable. This ultraviolet light curable-type resin has a feature of a resin being cured instantly by ultraviolet light irradiation. Therefore, there is an advantage of not requiring an ink receiving layer for recording substrate, and the cured product has excellent adhesiveness

with a substrate."

F "[0068]

Example 1

[Production of orange color pigment ink]

There were added 3 weight parts of an inorganic pigment of Sicotrans Red L2818 (C.I. pigment red 101, ferrous oxide, manufactured by BASF Japan), 3 weight parts of a dispersing agent (Disperbyk-168, manufactured by Byk Chemie), 20 weight parts of a reactive oligomer (CN985B88, aliphatic urethane acrylate, bifunctional, manufactured by Sartomer), 69 weight parts of a reactive monomer (SR238F, 1,6-hexanedioldiacrylate, bifunctional, manufactured by Sartomer) and 5 weight parts of a photopolymerization initiator (Irgacure 2959, 1-[4-(2-hydroxyethoxy)-phenyl]2-hydroxy-2-methyl-1-propan-1-on, manufactured by Ciba Specialty Chemicals), and after dispersing by use of a bead mill dispersing machine, filtration was conducted to remove impurities and produce a uniform orange pigment ink. An average particle diameter of inorganic pigments used was 79 nm.

.....

[0072]

The resultant orange pigment ink, red pigment ink, blue pigment ink, and black pigment ink were combined as an ink set, and applied to a coloring medium in the following condition by an ink jet printer to obtain a colored material after curing inks by a UV lamp."

(6) Evidence A No. 7

Evidence A No. 7, a publication distributed before the patent application, has the following descriptions:

A "[Claim 1]

A UV-curable type ink for ink jet comprising a pigment, a reactive monomer and/or a reactive oligomer and a photopolymerization initiator, wherein the pigment is an inorganic pigment, and the photopolymerization initiator is hydroxyketones or acylphosphineoxides."

B "[0002]

In recent years, as a technique other than aqueous or solvent-based ink jet printing, ink jet printing by use of UV-curable resin is studied. This ultraviolet light curable-type

resin has a feature of a resin being cured instantly by ultraviolet light irradiation. Therefore, there is an advantage of not requiring an ink receiving layer for a recording substrate. For this advantage, use of said UV-curable resin is not only coloring on paper, but also application for coloring material on various materials including film, plastic, metal, and glass.

[0003]

Further, the UV-curable type resin becomes a cured film having excellent scratch resistance and adhesiveness to a substrate. Thus the recording product may be used both outdoors and indoors. However, in a comparison with indoor use, excellent resistance corresponding to every natural condition is required for outdoor use such as building materials and signage. As one example, light resistance, heat resistance, water resistance, and acid resistance are included. Further, the recording product must retain the image without color change or degradation for a certain period. In general, a UV-curable resin has excellent weather resistance compared to other resins, but it is insufficient.

[0004]

Therefore, daily study is made on an ink for ink jet to be used outdoors. As a coloring agent, organic pigments with excellent light resistance are beginning to be used as a coloring agent as opposed to a dye. For outdoor use, however, the recording product is exposed to sunlight for a long period. Thus, even in a case of using organic pigments, color degradation may fail to be avoided. In a case of outdoor use, it is required to have a light resistance with almost no color degradation even after the exposure in outdoors for 5 to 10 years. Thus inorganic pigments with more excellent light resistance compared to organic pigments are used as a coloring agent."

C "[0016]

Pigments used in the present invention are not particularly limited so long as they are inorganic pigments. They may include, for example, oxides, hydroxides, sulfides, ferrocyanides, chromates, carbonates, silicates, phosphates, carbons (carbon black), and metal powders. Of these, oxides, hydroxides and ferrocyanides are preferable in terms of their vividness, coloring power, and harmlessness.

[0017]

Said pigments may be contained preferably in an amount of 0.1 to 10 weight%, more preferably 0.5 to 5 weight%. If the content of pigments is less than 0.1 weight%, an ink level tends to be insufficient, and if it exceeds 10 weight%, injection from a nozzle tends to be difficult."

D "[0041]

The ink of the present invention includes pigments, and has excellent light resistance, and is thus preferably used for exterior materials of building materials, signboards, and signs, particularly for outdoor use."

E "[0047]

Example 1

there were added 3 weight parts of an inorganic pigment of Sicotrans Yellow L1100 (C.I. pigment yellow 184, bismuth vanadate, manufactured by BASF) , 3 weight parts of a dispersing agent (Disperbyk-168, polymer compound, manufactured by Byk Chemie), 20 weight parts of a reactive oligomer (CN985B88, aliphatic urethane acrylate, bifunctional, manufactured by Sartomer), 69 weight parts of a reactive monomer (SR238F, 1,6-hexanedioldiacrylate, bifunctional, manufactured by Sartomer), and 5 weight parts of a photopolymerization initiator (hydroxyketones, 1-[4-(2-hydroxyethoxy)-phenyl]2-hydroxy-2-methyl-1-propan-1-on, manufactured by Ciba Specialty Chemicals), and after dispersing by use of a bead mill dispersing machine, filtration was conducted to remove impurities and produce a uniform yellow ink. The resultant ink was evaluated in the following evaluation method. The results are shown in Table 1.

[0048]

Example 2

A blue ink was produced in a similar manner to Example 1, except for the use of DAIPYROXIDE BLUE 9410 (CI pigment blue 28, composite oxides, manufactured by Dainichiseika Color & Chemicals Mfg. Co., Ltd.) for inorganic pigments and the use of acylphosphineoxides, bis(2,4,6-trimethylbenzoyl)-phenylphosphineoxide (Ciba Specialty Chemicals) for photopolymerization initiator. The resultant ink was evaluated in a similar manner to Example 1. The results are shown in Table 1."

(7) Evidence A No. 12

Evidence A No. 12, a publication distributed before the patent application, has the following descriptions:

A "[Claim 1]

A decoration method of metal building materials, characterized by printing a surface pattern of a metal material with an aqueous ink comprising an inorganic-based

pigment by an ink jet printer.
[Claim 2]
A decoration method of metal building materials, characterized by printing an aqueous ink and forming a protective film with weather resistance."

B "[0009]
Further, the invention of Claim 2 is characterized by printing an aqueous ink and forming a protective film with weather resistance of the invention of Claim 1.
[0010]
Such constitution may suppress the aging degradation of metal building materials and its printed part."

C "[0027]
Furthermore, printing with this aqueous-based ink, a transparent protective film having weather resistance may be coated and formed. The protective film is an aqueous-based acrylic clear film or fluorine-based or solvent-based clear film, and has an effect of shielding ultraviolet light. To suppress aging degradation of the aqueous ink, the above aqueous ink using inorganic pigments may further suppress aging degradation."

(8) Evidence A No. 13
Evidence A No. 13, a publication distributed before the patent application, has the following descriptions:

A "[Claim 1] A method of forming a stereoscopically patterned coat, comprising the steps of applying a UV-curable paint including a coloring pigment to the whole surface or a partial surface of an article to be coated; irradiating Ultraviolet light to form a patterned cured paint; and subsequently applying a transparent or opaque paint with a binder of fluorine-containing paint to be cured."

B "[0016]
The paints with a binder of fluorine-containing resin to be used in the present invention are applied on the coat for compensating the poor weather resistance and antifouling property of said UV-curable paint, and the form of paint is not particularly limited to organic solvent-type, aqueous-type, non-aqueous dispersion type, powder-type etc., and the drying form may be any of room temperature drying-type, bake hardening-type, or UV curable-type."

(9) Evidence A No. 17

Evidence A No. 17, a publication distributed before the patent application, has the following descriptions:

A "2. Trend of exterior building materials field

2. 1 Ceramic siding

.....

Most of ceramic siding is intended for new independent housing use, and the number of housing starts is directly reflected on its needs. For demand expansion and differentiation, sophisticated design concept and high resistance are further required. ... For paints, 10-year warranty coating products have been increasingly seen in the market, an attempt has been made to apply high weatherproof paint such as acrylic resin paint and silicone-modified acrylic resin paint, along with an attempt to further improve weather resistance by the topping of a clear paint on the finishing of an enamel paint." (page 38, the left column, lines 9 to 26)

B "3. 4 Top coat paint

Top coat paint has an ultimate functional goal for appearance and protection.

.....

As discussed in the introduction, guarantee of 10-year or longer protection has been required. Thus the change of materials of paints themselves has been actively implemented. Acrylic resin paint is gradually replaced by silicone-modified acrylic resin paint, urethane resin paint, and fluorine resin paint.

Further, although an enamel coating was previously sufficient, the topping of a clear paint makes it further weatherproof. Clear topping of an inorganic-based paint has been implemented.

Clear paint requires the utilization of a technique to add UVA (ultraviolet absorbers) and HALS (photostabilizer) for the suppression of transmittance of ultraviolet light. It seems that their development and application are suitable for an aqueous paint." (page 40, right column, line 4 from the bottom to page 41, left column, line 14)

(10) Evidence A No. 18

Evidence A No. 18, a publication distributed before the patent application, has the following descriptions:

"2. 1 High resistance

After implementation of the Act Relating to the Promotion of Quality Control of House Construction in 2000, in ceramic exterior materials, 10-year warranty coating products have recently increased. ...

In the current situation where every company announces 10-year warranty coating and increased target products are making companies hardly differentiated from each other, a trend of 15-year to 20-year warranty can be observed as a further extension of maintenance cycle." (page 24, the left column, lines 1 to 13)

(11) Evidence A No. 19

Evidence A No. 19, a publication distributed before the patent application, has the following descriptions:

In "Table II. 3. 51 List of inorganic pigments" of page 258, a metal oxide-based pigment of "yellow ferric oxide (goethite)" has a C.I.G.N of "P. Yellow 42".

(12) Evidence A No. 20

Evidence A No. 20, a publication distributed before the patent application, has the following descriptions:

A List of yellow pigments on page 15 discloses that "yellow ferric oxide" is "Pig. Yellow 42", and "Heating results in a loss of crystal water (nH2O) at 300°C or more to become colcothar".

B In the list of pigments' name of red pigments on page 26, "Colcothar" is described as "Pig. Red 101".

C "Colcothar is a stable red iron oxide with a main component of Fe2O3." (page 447, lines 2 to 3)

D "1. Natural ferric oxide

From the historical view of the production method, when human beings used colcothar as one of red pigments for the first time, it is supposed that hematite (natural ferric oxide) was weathered and elutriated, and the resultant deposited product was obtained for application for red paint in ancient wall painting.

Further, currently the amount is less, and natural ferric oxide obtained in such a

form is used." (page 447, lines 13 to 22)

(13) Evidence A No. 21

Evidence A No. 21, a publication distributed before the patent application, has the following descriptions:

A "3. 4. 2 Colcothar, red ferric oxide

.....

Natural colcothar includes 70 to 95% α-Fe2O3, and is widely used for paints, cements, and ceramics, whereas synthesized products were produced in a large amount and at a low cost, and have been becoming more popular in recent years." (page 279, lines 14 to 23)

B "3. 5. 3 Yellow ferric oxide, yellow ocher

Yellow pigments consisting of iron oxyhydroxydes as shown by α-FeO(OH) or α-Fe2O3·H2O, are natural ones and synthetic ones.

.....

Natural yellow ferric oxide is classified into ocher, sienna, and umber. Ocher is light yellow, sienna is made of fine particles and is highly transparent, and umber contains a large amount of manganese." (page 287, line 7 from the bottom to page 288, line 1)

(14) Evidence A No. 22

Evidence A No. 22, a publication distributed before the patent application, has the following descriptions:

"Chromatic inorganic pigments

Ferric oxides Ferric oxides have a low chroma and excellent weather resistance without toxicity, and are inexpensive. .... Synthesized ferric oxides include red, yellow, brown, and black. They are superior to natural oxides in terms of purity, uniformity of particle diameter, and particle diameter distribution. They may be used as a vehicle preliminarily dispersed by flashing technique." (page 297, the right column, lines 5 to 20)

(15) Evidence A No. 23

Evidence A No. 23, a publication distributed before the patent application, has the following descriptions:

A "4.2.1 Properties required for ink

(1) Ejecting properties

Ink jet ink is printed by ejecting ink drops from a nozzle with a diameter of several dozen μm. When an ink drop is not ejected due to clogging of a nozzle, or an ink drop is poorly ejected in the right direction, ink landing precision deteriorates, which causes the deterioration of image quality even if it is a problem of only one nozzle. Therefore, the most important aspect in various properties required for ink jet recording is to cause a constantly stable ink drop to be ejected from a nozzle without clogging of the nozzle in various use environments (ejection stability) and constant ejecting direction, rate, and volume of ink drop." (page 107, line 3 from the bottom to page 108, line 7)

B "4.2.2. Constituent elements of ink

(1) Color materials (Colorant)

.....

In fact, ink includes many impurities as well as industrial dyes and pigments. These impurities often affect ink properties (deterioration of storage stability of ink, nozzle clogging, the occurrence of burnt ink in thermal ink jet). Therefore, it is often necessary to purify color materials and remove impurities for the use of pigments in ink jet." (page 109, lines 16 to 25)

(16) Evidence A No. 30

Evidence A No. 30, a publication distributed before the patent application, has the following descriptions:

"3. 1 Development of highly resistant aqueous paint

For a goal of the improved resistance of exterior materials and reduced environmental load developed on 1997 ahead of other companies, there was developed an aqueous enamel clear paint for outer wall materials.

This aqueous enamel clear paint is based on an aqueous acrylic emulsion resin having water resistance, and formed by coating an upper layer of aqueous acrylic emulsion resin clear coat having high water resistance on a bottom layer of enamel coat using a high weatherproof coloring pigment that has a long-term market performance.

.....

The paints have been adopted as a top clear having high resistance from a result of outdoor exposure test for a long period, and they are becoming appreciated for their excellent resistance from long-year market performance." (page 26, the left column, line

7 to last line)

(17) Evidence A No. 32

Evidence A No. 32, a publication distributed before the patent application, has the following descriptions:

A "In a case of selecting pigments for paints, a designer should first consider the type of paint and final use in issue. Paints should be generally considered according to a market of use, including paint for building, paint for automobiles, paint for automobile repair, and paint for general industry." (page 42, lines 2 to 4)

B "For simplifying the paint mixture as much as possible, the kinds of pigments to be used are preferably minimal. Ideally, pigments with similar properties and durability should be blended together. As a consequence, should the paint color be degraded or darkened in exposure, the color phase of a coated film may be retained to some extent." (page 43, lines 17 to 20)

C "In a case of combining a plurality of pigments, a part of pigments therein has significantly different durability compared to the other pigments, and the color of coating largely varies depending on time... Therefore, if a part of pigments should be changed, for a goal of paint design with less color change and obscuring the color change, the colors of pigments to be combined must be close to each other, and further have a similar durability." (page 81, lines 32 to 41)

(18) Evidence A No. 33

Evidence A No. 33, a publication distributed before the patent application, has the following descriptions:

"[0169]

Light resistance: For a coating surface of a test coated plate, a 2,000-hour accelerated exposure test was conducted by an accelerated weatherproof testing machine of sunshine weatherometer manufactured by Suga Test Instruments Co., Ltd. to measure a color difference (ΔE*) between an initial coat and a coat after the test by colorimeter. The smaller the color difference (ΔE*) is, the better it is. Further, the gloss change was inspected visually. The assessment of gloss change was compliant with the following standard."

(19) Evidence A No. 34

Evidence A No. 34, a publication distributed before the patent application, has the following descriptions:

"[0075]

Further, for building boards obtained in Example 5 and Comparative Example 1, an accelerated weatherproof test for spraying water for 12 minutes every one hour was conducted while irradiating continuous light on the surface by use of a sunshine weatherometer (manufactured by Suga Test Instruments Co., Ltd., open frame carbon arc lamp). The change of color difference of each surface of building boards was measured by use of CR-200 manufactured by KONICA MINOLTA, INC. The measurement of color difference was conducted for regions of each building board where each color of black, magenta, cyan, and yellow is coated. The results are shown in Figure 2.

[0076]

As shown in the result of figures, it can be seen from Example 5 that the change in color difference is smaller than in Comparative Example 1 for each color of black, magenta, cyan, and yellow."

(20) Evidence A No. 35

Evidence A No. 35, a publication distributed before the patent application, has the following descriptions:

A "2. Weatherproof properties testing machine equipped with metal halide lamp

The name of 'weather resistance testing machine equipped with metal halide lamp' is used herein; however, various names are used by users and manufacturers for this kind of accelerated weatherproof testing machine. There is no generally certificated name. This might be affected by this kind of accelerated weatherproof testing machine being developed in the late 1980's uniquely in Japan, and thus it has a relatively shorter history as a weatherproof testing machine compared to other testing machines, and international awareness is still insufficient. Here, the above-captioned name of JTM-G01:2000 'Metal halide lamp testing machine' as provisioned as an original standard of Japan Testing Machine Association is used as a reference." (page 26, left column, line 5 from the bottom to right column, line 8)

B "2. 3 Test condition

A temperature in lamp irradiation is generally set to a black panel temperature (BPT) of 63°C after the other accelerated weatherproof test, and may be set to a range of 50 to 80°C for ultraviolet light irradiation, and to a range of 35 to 75°C for black and bedewing. In a metal halide lamp, time and temperature and humidity may be freely set for the conditions of irradiation intensity, shower condition, and black/bedewing condition. Various test conditions are set by the respective users according to their test purposes for their know-how.

Meanwhile, it is often the case to set a cycle of ultraviolet light irradiation -> shower (short time) -> black/bedewing -> stop in 6 to 12 hours and generally repeat this cycle several to several dozen times, which allows a test result to be obtained in a relatively short time." (page 31, the left column, lines 14 to 24)

C "2.4 Related Standards

Public standards include 'JTM-G01:2000 metal halide lamp type testing machine' (2000) of Japan Testing Machine Association, which is only a fundamental standard of lamp and filter.

This is because of not a small difference in test condition depending on manufacturers and models. It is not finely specified or unified as one test method. Thus it is better to recognize it as an answer book for test method or test apparatus." (page 31, left column, line 2 from the bottom to right column, line 6)

D "Japan Paint Manufacturers Association designates test conditions of metal halide in 'Research and Study on Various Kinds of Weatherproof Testing Machines' (technical committee, weather resistance group) and proposes this for a future standard; however, this is not strictly unified. (See Table 5)" (page 31, the right column, lines 21 to 24)

E Table 5 on page 31 is shown as below.

表5 (社)日本塗料工業会の指定サイクル試験条件

メーカー＼試験条件	放射照度 (W/m²)	照射時間 (hr)	結露-暗黒 (hr)	噴 霧 (sec/min)	フィルター	使用機種
D社	850	4	4	5/15	KF-1	KU-R5型
I 社	1000	4	4	5/18	#500	MV3000型
S社	1240	4	4	5/18	ブルーフィルター	M6T型

表５ （社）日本塗料工業会の指定サイクル試験条件

Table 5 Designated cycle test condition of Japan Paint Manufacturers

Association

メーカー	Manufacturer
試験条件	Test condition
放射照度	Irradiation illuminance
照射時間	Irradiation time
結露・暗黒	Bedewing/blackness
噴霧	Spraying
フィルター	Filter
使用機種	Model used
Ｄ社	Company D
Ｉ社	Company I
Ｓ社	Company S
ブルーフィルター	Blue Filter
ＫＵ－Ｒ５型	KU-R5-type
ＭＶ３０００型	MV3000-type
Ｍ６Ｔ型	M6T-type

(21) Evidence A No. 37

Evidence A No. 37, a publication distributed before the patent application, has the following descriptions:

"56. Permissible tolerance of color

In a case where a human is presented two colors, the human can visually observe said two colors and determine whether said two colors are the same color. Further, similarly in a case where two colors are not the same, the difference between these colors can be determined. A perceptive difference between these two colors is quantitatively represented as color difference. In industrial color reproduction, it is rare to make an industrial color completely equal to a target color presented by users, etc., but it is common that a small color difference is caused. In such a case, what matters is the tolerable level of color difference.

When two slightly different colors are placed side by side and an experiment is made as to whether the difference between these colors is distinct, the color difference is known to be ΔEab* of about 0.3. In a similar experiment, as a result of whether the difference between two colors can be permitted as a product, it was reported that about 50% answered "intolerable" with a ΔEab* of about 0.6, and 100% answered "intolerable"

with a ΔEab* of about 1.2. Industrially, a permissible tolerance of ΔEab* such as 0.3, 0.6, 1.2, or 2.5 is set according to the requirements." (page 28, lines 18 to 29)

(22) Evidence A No. 39

Evidence A No. 39, a publication distributed before the patent application, has the following descriptions:

"[0035]

The bending processability and weather resistance of the resultant coated steel sheet were evaluated by the following test method. Test Methods

.....

(2) Weatherproof test

After a sample piece was exposed to ultraviolet light for 500 hours by a sunshine weatherometer, a color difference ΔE of coated surface and a gloss retained rate G (%) were measured to evaluate the following criteria.

⊙: $0 < \Delta E < 0.5$; $80 < G \leq 100$

○: $0.5 \leq \Delta E < 1.5$; $60 < G \leq 80$

Δ: $1.5 \leq \Delta E < 2$; $40 < G \leq 60$

×: $2 \leq \Delta E$; $G \leq 40$"

(23) Evidence A No. 41

Evidence A No. 41, a publication distributed before the patent application, has the following descriptions:

"In addition, the relationship between color difference value and the determination by visual inspection varies depending on the kinds of colors, and also varies depending on individual difference, it cannot be said definitely. It is supposed that, if a color difference value exceeds approximately 1.3, the color difference can be determined visually." (page 119, the right column, lines 9 to 11)

(24) Evidence A No. 43

Evidence A No. 43, a publication distributed before the patent application, has the following descriptions:

A "[0001]

[Technical Field of the Invention] The present invention relates to a black pigment

composition, a black radiosensitive resin composition, and a high resistance black cured film, and particularly relates to a resin composition for the formation of black matrix to be used for display materials such as a liquid crystal display device, an electronic display device, etc."

B "[0008]
[Means for Solving the problem] The present invention
(1) A black pigment composition comprising a polymeric compound, a dispersion aid, and a composite metal oxide pigment consisting of two or more kinds of metal oxides
.....
(7) The black pigment composition of any one of the items (1) to (6), wherein said composite metal oxide is selected from oxides of copper, iron, chrome, manganese, and cobalt.
(8) The black pigment composition of any one of the items (1) to (7), wherein said composite metal oxide is selected from oxide of copper-chrome, oxide of copper-chrome-manganese, oxide of copper-iron-manganese, and oxide of cobalt-iron-manganese.
.....
(11) A high resistance black radiosensitive resin composition consisting of a compound that can undergo a crosslinking reaction by radioactive ray, a photopolymerization initiator, and the black pigment composition of any one of the items (1) to (10)"

C "[0062] A high resistance black cured film obtained by a high resistance black radiosensitive resin composition of the present invention is usually prepared in the following manner. ... Subsequently, radioactive ray (e.g. X-ray, electron beam, ultraviolet light, visible light, preferably ultraviolet light) is irradiated onto the whole surface and the film is subjected to a treatment such as post baking to obtain a black cured film."

(25) Evidence A No. 44

Evidence A No. 44, a publication distributed before the patent application, has the following descriptions:

A "[0001]
[Field of the Invention] The present invention relates to a photosensitive resin composition useful for UV-curable ink or photoresist, and particularly relates to a coloring photosensitive resin composition suitable for resist for the formation of a colored

image (also referred to as pixel) to be used for a color LCD or imaging element."

B "[0010] A colored photosensitive resin composition of the present invention is to be used mainly as a pigment dispersing resist. In a solvent (F), a coloring material (A), usually a pigment, is dispersed. Further, a carboxyl group-containing (meth)acrylic copolymer (B) called a binder resin, a photopolymerizable monomer (C), a photopolymerization initiator (D), a copolymer (E) having oxyalkylene backbone at a side chain, and the other additives optionally are dissolved or dispersed into a solvent (F). [0011] Coloring materials (A) are usually pigments, and may be inorganic pigments or organic pigments commonly used for pigment dispersing resist. Inorganic pigments may include metal oxides and metal complexes, specifically may include oxides of metal or composite metal oxides of metal such as iron, cobalt, aluminum, cadmium, lead, copper, titanium, magnesium, chromium, zinc, or antimony. ... Further, black pigments include CuO-Cr2O3 and CuO-Fe2O3-Mn2O3."

(26) Evidence A No. 45

Evidence A No. 45, a publication distributed before the patent application, has the following descriptions:

"(1) Heat deterioration by the contact action of metal included into pigments or dispersant

Most polymers are subjected to heat deterioration by the contact action of metal. A source of metal is mostly pigments and dispersant. A major cause is metal-containing pigments (inorganic pigments, organic metal pigments such as phthalocyanine, azo lake pigments) and metallic soap.

Takahashi et al. have studied an impact of various inorganic pigments and PP such as phthalocyanine blue on heat deterioration. As a result, it has been found that iron blue (Fe), phthalocyanine blue (Cu), cobalt violet (Co), cobalt blue (Co), phthalocyanine green (Cu), mineral violet (Mn), and colcothar (Fe) accelerate the deterioration, whereas ultramarine blue (Na, Al), ghromium green (Cr) (note by the body: this is recognized as a misprint of "chromium green"), titanium white (Ti), indane threne blue, cadmium red (Cd), and cadmium yellow (Cd) do not accelerate the deterioration. Further, chloride, oxides of these metals, as well as elemental metal show a tendency similar to that of pigments." (page 399, lines 12 to 21)

(27) Evidence A No. 46

Evidence A No. 46, a publication distributed before the patent application, has the following descriptions:

"It is reported that carbon-metal bond occurs between a free radical and a sort of transition metal ion, and they are in dynamic equilibrium. For example, it has been found that the use of a porphyrin complex of a divalent cobalt radical in the polymerization of acrylic acid ester results in carbon-cobalt (III) that becomes a dormant specimen to cause endless polymerization. ... Further, a reaction of a proper halogenated alkyl being subjected to radical dissociation by a transition metal complex such as ruthenium, copper, nickel, or iron to be added to alkene is known. When this is applied to radical polymerization, a polymer having a halogenated alkyl-type terminal is produced. It has been clarified that polymerization is repeated at the terminal with an activating agent of a coexistent transition metal complex to proceed living radical polymerization." (page 76, the right column, lines 2 to 17)

(28) Evidence A No. 47

Evidence A No. 47, a publication distributed before the patent application, has the following descriptions:

A "Pigments turn black or undergo color degradation by sunlight exposure. ... Carbon black or ferric oxide has a great ultraviolet shielding effect, and thus is widely used for outdoor paints, ... commonly inorganic pigments have a great light resistance. Further, one subjected to a treatment at a higher temperature causes greater light resistance. For example, it may include titanium oxide, carbon black, or colcothar." (page 233, lines 12 to 21)

B "3.3.1 Carbon black
... having high coloring power and excellent weather resistance as a black pigment, and thus it has been used as a coloring agent such as printing ink and paints from long ago." (page 273, lines 12 to 17)

C "The effect of pigments on plastics is categorized into the following three patterns. Pigments raised as an example for each pattern are examples of polyolefins in which these phenomena are most intensively studied. It is considered that the other plastics share a common ground, although there are exceptions. Pigments protect polymer from ultraviolet light deterioration. (Example) Carbon black, ..." (page 458, lines

26 to 30)

(29) Evidence A No. 48

Evidence A No. 48, a publication distributed before the patent application, has the following descriptions:

A "Carbon black includes channel black, furnace black, thermal black, and acetylene black according to the difference in raw materials and production methods." (page 227, left column, line 2 from the bottom to right column, line 2)

B "Currently, the most common method is a furnace method, and ..." (page 227, the right column, lines 32 to 33)

C "As a black pigment with excellent weather resistance and weatherproof property, it is used in a large amount for ink, paint, resin coloring, printing, fiber mass coloration, and cement coloration.

Ink: letterpress ink, ... UV ink, ... jet ink ..." (page 230, right column, line 5 from the bottom to page 231, left column, line 3)

(30) Evidence A No. 49

Evidence A No. 49, a publication distributed before the patent application, has the following descriptions:

"Most commonly used black pigment is carbon black. Carbon black is categorized by production method (incomplete combustion method, heat decomposition method), or physical and chemical properties (specific surface area, structure, primary particle size, surface condition). ... Currently, 95% or more of the total carbon black production is produced by a furnace method." (page 255, line 4 from the bottom to page 256, line 10)

(31) Evidence A No. 50

Evidence A No. 50, a publication distributed before the patent application, has the following descriptions:

In "Table 20.4(2) Inorganic pigments (2)" of page 784, it is described that a Colour Index Generic Name of a pigment in "No. 60" with a general name of "furnace black" is

"Black 7".

(32) Evidence A No. 51

Evidence A No. 51, a publication distributed before the patent application, has the following descriptions:

Following "Appendix table List of pigments" on page 268, it is described that the pigments with a C.I. Name of "PBk 7" has a pigment name of "carbon black".

(33) Evidence A No. 52

Evidence A No. 52, a publication distributed before the patent application, has the following descriptions:

A "Pigment Black 7
Structural name: Inorganic pigments, General name: carbon black" (page 613, line 4 from the bottom to line 2 from the bottom)

B "Initially, a channel method to blow flame burning natural gas onto a steel plate called a channel and collect carbon produced by incomplete combustion was used; however, due to poor yield and pollution problem, it had been progressively replaced with a furnace method." (page 614, lines 8 to 10)

2 Description of Evidence B

(1) Evidence B No. 1

Evidence B No. 1, a publication distributed before the patent application, has the following descriptions:

"Yellow ferric oxide (yellow ocher)

It is a natural pigment that elutriates an iron-rich soil. Ochre widely used belongs to this. Its content is not constant, with ferric oxide of around 20%, and further including alumina, calcium sulfate, and silicate." (page 21, lines 15 to 18)

(2) Evidence B No. 2

Evidence B No. 2, a publication distributed before the patent application, has the following descriptions:

A In "Table 20.4(1) Inorganic pigments (1)" on page 782, it is described that "yellow ferric oxide" has a Colour Index Generic Name of "Pigment Yellow 42", and "ocher (natural)" has a Colour Index Generic Name of "Pigment Yellow 43".

B In "Table 20.4(2) Inorganic pigments (2)" on page 784, it is described that "colcothar (synthesized)" has a Colour Index Generic Name of "Pigment Red 101", and "colcothar (natural)" has a Colour Index Generic Name of "Pigment Red 102".

3 Reasons for Invalidation

(1) Reason for Invalidation 1

A Regarding Corrected Invention 1 of the case

(A) Comparison

Corrected Invention 1 and Invention A-2 are compared with each other.

a "Yellow ferric oxide pigments", "red ferric oxide pigments", "Co-Al-based blue pigments", "Cu-Fe-Mn-based black or Co-Fe-Cr-based black pigment", "ink jet layer" and "decorative building board" of Invention A-2 correspond to "yellow pigment", "magenta pigment", "cyan pigment", "black pigment", "ink jet layer", and "building board", respectively.

b It is an obvious matter to a person skilled in the art that "the pattern" of "ink jet layer (by ink jet printing)" "patterned" "with four-color inks" of Invention A-2 is patterned with four-color ink dots. Thus, "the ink jet layer being formed with a desired pattern by use of four-color aqueous inks free of organic pigments, and the aqueous ink consisting of a yellow aqueous ink including a yellow ferric oxide pigment, a cyan aqueous ink including a Co-Al-based blue pigment, a magenta aqueous ink including a red ferric oxide pigment, and a black aqueous ink including Cu-Fe-Mn-based black or Co-Fe-Cr-based black pigment" of Invention A-2 corresponds to "an ink jet layer patterned with" "yellow dot by an ink including yellow pigment, magenta dot by an ink including magenta pigment, and cyan dot by an ink including cyan pigment", and further "black dot by an ink" "including black pigment" and "formed by these inks" of Corrected Invention 1.

c It is an obvious matter to a person skilled in the art that "clear layer" of Invention A-2 is a transparent coat layer. Thus, "clear layer" to be "laid" on "an ink jet layer" of Invention A-2 corresponds to "a transparent coat layer" "formed" "on a surface

of ink jet layer" of Corrected Invention 1.

d Evidence A No. 4 discloses that cobalt blue has a C.I. Generic Name of BLUE 28 (see the above 1(3)B.), Evidence A No. 5 discloses that the chemical formula of cobalt blue is CoO-Al2O3 with a C.I. number of C.I. pigment blue 28 (see the above 1(4)C.). In view of these descriptions, "Co-Al-based blue pigment" of Invention A-2 corresponds to "CI pigment blue 28" of Corrected Invention 1.

e As described above, the two inventions share the following corresponding feature:

<Corresponding Feature>

"A building board patterned with yellow dot of an ink including a yellow pigment, magenta dot of an ink including a magenta pigment, and cyan dot of an ink including a cyan pigment, wherein a transparent coat layer is formed on a surface of an ink jet layer formed by these inks,

wherein said cyan pigment is CI pigment blue 28,

and wherein said building board is further patterned with a black dot by an ink including a black pigment."

f On the other hand, these inventions are different from each other in the following points:

<Different Feature 1>

Regarding yellow pigment and magenta pigment, Corrected Invention 1 includes a yellow pigment of CI pigment yellow 42 or CI pigment yellow 184, and a magenta pigment of CI pigment red 101, whereas Invention A-2 includes a yellow pigment of yellow ferric oxide pigment and a magenta pigment of red ferric oxide pigment.

<Different Feature 2>

Regarding black pigments, Corrected Invention 1 specifies CI pigment black 7, whereas Invention A-2 specifies Cu-Fu-Mn-based black or Co-Fe-Cr-based black pigment.

<The Different Feature 3>

Regarding ink, inks of Corrected Invention 1 are all UV-curable inks, whereas inks of Invention A-2 are aqueous inks.

<Different Feature 4>

Regarding weather resistance of building board, with respect to a color difference (ΔE*ab) in a CIE1976L*a*b*color space before and after discoloration caused by an accelerated weatherproof test in a following super-accelerated weatherproof test condition in compliance with JTMG01:2000, Corrected Invention 1 specifies a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, and cyan component as being within 0.99, and a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, cyan component, and black component as being within 1.44, whereas Invention A-2 fails to specify as such.

<Super-accelerated weatherproof test condition>

Light source: Water-cooling metal halide lamp

Illuminance: 90 mW/cm^2

Wavelength: 295 to 450 nm

Temperature: 60°C (irradiation), 30°C (bedewing)

Humidity: 50% (irradiation), 90% (bedewing)

Cycle: Irradiation 5 hours, Bedewing 5 hours

Shower: 10 seconds before and after bedewing

(B) Judgment

a Regarding Different Feature 1

(a) Comprehensively taking into account the descriptions of Evidence A No. 4, Evidence A No. 5, Evidence A No. 19, Evidence A No. 20, Evidence B No. 1 and Evidence B No. 2 (see the above 1(3), (4), (11), (12) and 2(1), (2).), the yellow ferric oxide as a pigment has a narrow sense and a broad sense. The yellow ferric oxide in the narrow sense is only a synthesized one with a CI number of CI Pigment Yellow 42, and the yellow ferric oxide in the broad sense includes a natural one with a CI number of CI Pigment Yellow 43, and similarly the red ferric oxide as a pigment has a narrow sense and a broad sense. The red ferric oxide in the narrow sense is only a synthesized one with a CI number of CI Pigment Red 101, whereas the red ferric oxide in the broad sense includes a natural one with a CI number of CI Pigment Red 102.

On the other hand, it is necessary to purify and remove impurities for purification in order to prevent clogging of nozzles, etc. for the use of pigments in ink jet (Evidence A No. 23. See the above 1(15).) In view of the fact that pigment of synthesized ferric oxide has superiority in impurities, uniformness of particle size, and particle diameter

distribution to natural oxides (Evidence A No. 22, see the above 1(14)) and that synthesized ferric oxide is mass producible at low cost (Evidence A No. 21, see the above 1(13)) and is suitable for a pigment of industrial products including a building board, it is highly probable that "yellow ferric oxide pigment" and "red ferric oxide pigment" contained in an ink that forms "ink jet layer (by ink jet printing)" of Invention A-2-1 are the ones in the narrow sense; i.e., "CI pigment yellow 42" and "CI pigment red 101".

Consequently, the above Different Feature 1 is not a substantial different feature.

(b) Further, should "yellow ferric oxide pigment" and "red ferric oxide pigment" of Invention A-2-1 have broad meanings, and these are used for ink jet, are mass-producible at low cost, and are suitable for pigments of an industrial product of building board. In view of these facts, a person skilled in the art could have easily selected "CI pigment yellow 42" and "CI pigment red 101"; i.e., conceived the constitution of Corrected Invention 1 according to the above Different Feature 1.

b Regarding Different Feature 2

(a) Evidence A No. 2 discloses that "a black ink preferably includes a pigment selected from black ferric oxide, Cu-Cr-based black, Cu-Cr-Mn-based black, Cu-Fe-Mn-based black, Co-Fe-Cr-based black, and carbon black" (see the above item 1(1)F) and discloses that carbon black is used as a black pigment. Further, the invention recited in Claim 2 of the scope of claims of Evidence A No. 2 encompasses the combination of yellow ferric oxide pigment, Co-Al-based blue pigment, red ferric oxide pigment, and carbon black as four-color pigments (see the above 1(1)A.).

Furthermore, as described in Evidence A No. 47 to A No. 49 (see the above 1(28) to (30)), carbon black is a black pigment that is the most commonly used. It is well-known that carbon black has excellent weather resistance.

(b) On the other hand, comprehensively taking into account Evidence A No. 6, Evidence A No. 48 to A No. 52 (see the above 1(5)D, (29) to (33)), it is recognized that C.I. Name of carbon black or carbon black produced by furnace method is CI pigment black 7. Further, Evidence A No. 48, A No. 49, and A No. 52 disclose that most of carbon blacks are produced by a furnace method.

(c) Consequently, a person skilled in the art could have conceived as necessary using carbon black or carbon black of CI pigment black 7 produced by a furnace method in place of Cu-Fe-Mn-based black or Co-Fe-Cr-based black pigment in Invention A-2; i.e., the constitution of Corrected Invention 1 according to the above Different Feature 2.

c Regarding Different Feature 3

As described in Evidence A No. 6 to A No. 7, it is well-known in building materials that a UV-curable ink is used as an ink including inorganic pigments, and that the use of UV-curable ink makes an ink-receiving layer unnecessary (see the above 1(5), (6)). In particular, Evidence A No. 6 exemplifies CI pigment yellow 42, CI pigment red 101, CI pigment blue 28, and CI pigment black 7 as pigments included into UV-curable ink.

Further, it is a well-known problem to reduce production cost in the technical field of building board. Thus a person skilled in the art could have easily conceived of omitting "ink receiving layer" in Invention A-2 and using "UV-curable ink" as "ink"; i.e., the constitution of Corrected Invention 1 according to the above Different Feature 3.

d Regarding Different Feature 4

As described in Evidence A No. 3 and A No. 32, it is a well-known problem in general paints including ones for building to retain the color phase of coating (see the above 1(2), (17)).

Further, as described in Evidence A No. 18, it is well-known to require 10-year resistance for coating of exterior materials (see the above 1(10).).

On the other hand, in Corrected Invention 1, the technical significance of the color differences (ΔE*ab) between yellow component, magenta component, and cyan component being within 0.99 and the color differences (ΔE*ab) between yellow component, magenta component, cyan component, and black component being within 1.44 after discolorationn caused by the weatherproof test is nothing more than the setting of an upper limit necessary for design with regard to the color differences between each color components in a state that has been exposed outdoors for 10 years, in view of the descriptions of the patent specification that "The color difference between each color component is within almost a same range (the applicant empirically found it preferable to be within a range of almost 5)." (paragraph [0029]) and "the color difference (ΔE*ab) between colors after 600 hours corresponding to the state exposed outside for 10 years is ..." (paragraph [0030]).

Further, Invention A-2 has an objective to provide a decorative building board with high color degradation resistance (see the above 1(1)C.). A person skilled in the art could have solved the above well-known problem to retain color phase together in view of the fact that the increased color degradation resistance generally decreased the change of color phase. In the meantime, with regard to 10-year resistance, as a result, a person skilled in the art could have easily conceived of the constitution of Corrected Invention 1 according to the above Different Feature 4, i.e., a color difference (ΔE*ab)

after the discoloration in the weatherproof test between each color of yellow component, magenta component, and cyan component being within 0.99 and a color difference (ΔE*ab) between each color of yellow component, magenta component, cyan component, and black component being within 1.44.

Further, JTM G01:2000 is a public standard by the Japan Testing Machine Association, and the super-accelerated weatherproof test condition of the weatherproof test is generally similar to the condition of a common weatherproof test (Evidence A No. 35. See the above 1(20)). Thus it is not recognized as particularly significant to adopt the weatherproof test in Corrected Invention 1. Further, the use of color difference (ΔE) as a barometer of discoloration is nothing more than a matter of common technical knowledge as described in Evidence A No. 33, Evidence A No. 34, Evidence A No. 37, and Evidence A No. 39 (see the above 1(18), (19), (21), (22)).

e Effects of the Corrected Invention 1

Taking into account the whole effects caused by Corrected Invention 1 of the present application, the effects do not go beyond the extent that can be naturally expected by a person skilled in the art on the basis of Invention A-2 and well-known art, and thus they cannot be said to be particularly significant effects.

f The demandee's allegation

Demandee alleges that

(a) To change an ink including pigments from an aqueous ink to a UV-curable ink cannot be said as "only the replacement of an ink component dispersing pigments, and does not require particular trials and errors", and

(b) There is a disincentive to change from an aqueous ink of Invention A-2 in which Cu-Fe-Mn-based black or Co-Fe-Cr-based black including metals such as Co, Mn, Cu and Fe, which have poor compatibility with organic materials such as polymer, to a UV-curable ink, and

(c) Invention A-2 comprises an "ink receiving layer"; however, the ink receiving layer is unnecessary in a UV-curable ink, and thus a person skilled in the art would not daringly change into a UV-curable ink that does not require an ink receiving layer in such Invention A-2, and

(d) The color degradation resistance test of Evidence A No. 2 is fundamentally different in technical meaning from an accelerated weatherproof test in the Corrected Invention 1.

Regarding (a), however, it is well-known in building materials to use UV-curable

ink as an ink including inorganic pigments. It cannot be said to be particularly difficult even if consideration should be given as to the whole formulation of pigments, resin and additives, etc. Regarding (b), as described in Evidence A No. 43 and Evidence A No. 44 (see the above 1(24) and (25)), it is common to incorporate Cu-Fe-Mn-based black and Co-Fe-Cr-based black pigment into a UV-curable resin. Heat deterioration due to metal included in pigments is not recognized as a particular difficulty. Thus it cannot be said that there is a disincentive to replace an aqueous ink with a UV-curable ink in Invention A-2. Regarding (c) and (d), a discussion about the above c, d shall apply. Therefore, none of the demandee's argument is acceptable.

(C) Summary

Therefore, Corrected Invention 1 was easily conceivable by a person skilled in the art on the basis of Invention A-2-1 and well-known techniques.

B Regarding Corrected Invention 2 of the case

Corrected Invention 2 depends on Corrected Invention 1 and further confines the scope so as to use an "building board" as "an exterior material of building".

Comparing Corrected Invention 2 and Invention A-2, "decorative building board" "to be used for the use in tiles and external wall materials" of Invention A-2 corresponds to "building board" "to be used for an exterior material of building" of Corrected Invention 2. The two differ from each other in Different Features 1 to 4 of the above A(A), whereas they have common grounds in the remaining points.

Therefore, as per the judgementn of the above A(B), Corrected Invention 2 was easily conceivable by a person skilled in the art on the basis of Invention A-2 and well-known techniques.

(2) Reason for Invalidation 2

A Regarding Corrected Invention 1 of the case

(A) Comparison

Corrected Invention 1 and Invention A-3 are compared with each other.

a "Pigments" "dispersed" into "ink for ink jet" of "one kind of cyan" of Invention A-3 correspond to "cyan pigment" of Corrected Invention 1. Similarly, "pigments" "dispersed" into "ink for ink jet" of "one kind of magenta" is "magenta pigment", "pigments" "dispersed" into "ink for ink jet" of "one kind of yellow" is "yellow pigment", and "pigments" "dispersed" into "ink for ink jet" of "one kind of black" is "black pigment",

respectively.

b "At least four kinds of ink for ink jet having a maximum absorption spectrum in mutually different spectral absorption regions" and "dispersed" "pigments" "of at least one kind of cyan, at least of magenta, at least one kind of yellow, and at least one kind of black ink" of Invention A-3 correspond to "an ink including yellow pigment", "an ink including magenta pigment", "an ink including cyan pigment", and "an ink" "including black pigment" of Corrected Invention 1.

c It is an obvious matter to a person skilled in the art that "an abstract design or a geometric pattern, etc." "formed" "by use of an ink set for ink jet recording constituting at least four kinds of inks for ink jet" "of at least one kind of cyan, at least of magenta, at least one kind of yellow, and at least one kind of black ink" of Invention A-3 are patterned with a dot of an ink for ink jet, and thus it corresponds to "an ink jet layer" "patterned with yellow dot of an ink including a yellow pigment, magenta dot of an ink including a magenta pigment, and cyan dot of an ink including a cyan pigment" and "further patterned with black dot of an ink" "including black pigment" and "formed by these inks" of Corrected Invention 1.

d "Outdoor decoration materials including wall materials and roofing materials" of Invention A-3 corresponds to "building board" of Corrected Invention 1.

e As described above, the two inventions share the following corresponding feature:

<Corresponding Feature>

"A building board patterned with yellow dot of an ink including a yellow pigment, magenta dot of an ink including a magenta pigment, and cyan dot of an ink including a cyan pigment, wherein an ink jet layer is formed by these inks,

and further patterned with a black dot by an ink including a black pigment."

f On the other hand, these inventions are different from each other in the following features :

<Different Feature A>

Corrected Invention 1 forms a transparent coat layer on a surface of an ink jet layer, whereas Invention A-3 fails to specify as such.

<Different Feature B>

Regarding pigments, Corrected Invention 1 specifies that yellow pigment is CI pigment yellow 42 or CI pigment yellow 184, magenta pigment is CI pigment red 101, cyan pigment is CI pigment blue 28, and black pigment is CI pigment black 7, whereas Invention A-3 fails to specify pigments.

<Different Feature C>

Regarding ink, the inks of Corrected Invention 1 are all UV-curable inks, whereas inks for ink jet consist of aqueous or oil-based medium in Invention A-3.

<Different Feature D>

Regarding the resistance to discoloration of building board, with respect to a color difference (ΔE*ab) in a CIE1976L*a*b*color space before and after discoloration caused by an accelerated weatherproof test in a following super-accelerated weatherproof test condition in compliance with JTMG01:2000, Corrected Invention 1 specifies a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, and cyan component being within 0.99, and a color difference (ΔE*ab) after discoloration caused by an accelerated weatherproof test for a test period of 600 hours between each color of yellow component, magenta component, cyan component, and black component being within 1.44, whereas in Invention A-3, for any two of forced color degradation rate constant of the respective inks by D65 light calculated for a printing region of at least four kinds of inks printed by use of the ink set on a reflection-type image receiving medium, including at least one kind of cyan, at least one kind of magenta, at least one kind of yellow, and at least one kind of black ink, a ratio of the rate constants falls within a range of 0.5 or more to 2.0 or less.

<Super-accelerated weatherproof test condition>

Light source: Water-cooling metal halide lamp
Illuminance: 90 mW/cm^2
Wavelength: 295 to 450 nm
Temperature: 60°C (irradiation), 30°C (bedewing)
Humidity: 50% (irradiation), 90% (bedewing)
Cycle: Irradiation 5 hours, Bedewing 5 hours
Shower: 10 seconds before and after bedewing

(B) Judgment

a Regarding Different Features A and C

As described in Evidence A No. 12 and A No. 13, it is well-known in building materials to form a transparent coat layer on a surface of a layer patterned by an ink and improve weather resistance (see the above 1(7), (8).).

Further, as described in Evidence A No. 6 to A No. 7, it is well-known in building materials that a UV-curable ink is used as an ink including inorganic pigments, and that the use of UV-curable ink makes an ink-receiving layer unnecessary (see the above 1(5), (6).).

Further, it is a well-known problem to improve weather resistance and reduce production cost in the technical field of building board. Thus a person skilled in the art could have easily conceived of applying the above well-known technique to Invention A-3, and using "UV-curable ink" in place of aqueous or oil-based medium as "an ink for ink jet", and forming "a transparent coat layer" on a surface of "abstract design and geometric pattern etc."; i.e., the constitution of the Corrected Invention 1 according to the above Different Features A to C.

b Regarding Different Feature B

(a) It is recognized that a problem to be solved by the invention of Evidence A No. 3 is "to provide an ink set for ink jet and a method for ink jet recording capable of maintaining an image quality with high quality recording image and further less change in color balance even when the obtained image is placed in a bright place, particularly outdoors with a strong sunlight component" (see the above 1(2)C).

Further, Evidence A No. 3 discloses that pigment to be dispersed into an ink for ink jet may include commercially available ones and publicly known ones, including CI pigment yellow 42, CI pigment red 101, and carbon black as specific examples. There is neither description nor suggestion of adopting CI pigment yellow 42 or CI pigment yellow 184, CI pigment red 101, CI pigment blue 28, and CI pigment black 7 as a combination of pigments that solves the above problem (see the above 1(2)E, F).

(b) Although a decorative building board of Invention A-2 forms an ink jet layer by use of four-color aqueous inks consisting of a yellow aqueous ink including a yellow ferric oxide pigment, a cyan aqueous ink including a Co-Al-based blue pigment, a magenta aqueous ink including a red ferric oxide pigment, and a black aqueous ink including Cu-Fe-Mn-based black or Co-Fe-Cr-based black pigment (see the above 1(1)), Evidence A No. 2 fails to disclose the combination of pigments of Corrected Invention 1 according to the above Different Feature B.

Furthermore, on the basis of the findings that when mixing organic pigments and

inorganic pigments for use, inorganic pigments act as an optical semiconductor to cause organic pigments to be deteriorated, and the findings that the formation of an ink jet layer by use of only inorganic pigments with high weatherproof characteristics results in a great loss in color vividness, Invention A-2 includes specific inorganic pigments of Invention A-2 and forms an ink jet layer by use of an aqueous ink free of organic pigments to prevent to the extent possible the decrease in color vividness as compared to the case of using organic pigments, and prevent the deterioration of the ink jet layer and increase color degradation resistance (see the above 1(1)C, D.). It does not teach the combination of specific inorganic pigments of Invention A-2 resulting in an ink set which color balance is not greatly changed.

Consequently, there is no motivation to apply Invention A-2 to Invention A-3, nor can it be said that it was easily conceivable by a person skilled in the art to conceive of the constitution of Corrected Invention 1 according to the above Different Feature B in Invention A-3 in view of the description of Evidence A No. 2.

(c) Evidence A No. 4 and Evidence A No. 5 were submitted to show that "yellow ferric oxide", "red ferric oxide", and "Co-Al-based blue" meant "CI pigment yellow 42", "CI pigment red 101", and "CI pigment blue 28", respectively. Evidence A No. 6 and Evidence A No. 7 were submitted to show that it was well-known to use a UV-curable ink as an ink including inorganic pigments in the building materials. None of them teaches adopting the constitution of Corrected Invention 1 according to the above Different Feature B in Invention A-3.

c Different Feature D

As considered in the above (1)A(B)d, JTM G01:2000 is a public standard by the Japan Testing Machine Association, and the super-accelerated weatherproof test condition of the weatherproof test is generally similar to the condition of a common weatherproof test. In Corrected Invention 1, the technical significance of the color differences (ΔE*ab) between yellow component, magenta component, and cyan component being within 0.99 and the color differences (ΔE*ab) between yellow component, magenta component, cyan component, and black component being within 1.44 after discoloration caused by the weatherproof test is nothing more than the setting of an upper limit necessary for design with regard to the color differences between each color component in a state of having been exposed outdoors for 10 years.

On the other hand, as per the above b(a), the problem to be solved by the invention of Evidence A No. 3 is "to provide an ink set for ink jet and a method for ink jet recording capable of maintaining an image quality with high quality recording image and further

less change in color balance even when the obtained image is placed in a bright place, particularly outdoors with a strong sunlight component".

Further, Invention A-3 adopts the constitution of a ratio of the rate constants falling within a range of 0.5 or more to 2.0 or less for any two of forced color degradation rate constant of the respective inks by D65 light calculated for a printing region of at least four kinds of inks printed by use of the ink set on a reflection-type image receiving medium as means for solving the above problem.

Consequently, even if the super-accelerated weatherproof test condition of the weatherproof test is generally similar to a common one, and the technical significance of the color differences (ΔE*ab) by the weatherproof test is nothing more than the setting of an upper limit necessary for design, there is no motivation to adopt the weatherproof test and the values of the color differences (ΔE*ab) in place of the above test and the range of the ratios of forced color degradation rate constants as its result in Invention A-3.

d Demandant's allegation

Demandant alleges that Evidence A No. 2 discloses the combination of three-color pigments of yellow, magenta, and cyan of Corrected Invention 1, and in view of the fact that no color degradation at all occurred as a result of color degradation resistance test, color balance is not greatly changed, and thus there is a motivation to apply the combination of three-color pigments of Evidence A No. 2 as pigments for which color balance is not greatly changed to Invention A-3. As per the above b, the Demandant's allegation is not acceptable.

(C) Summary

As seen above, it cannot be said that Corrected Invention 1 was easily conceivable by a person skilled in the art on the basis of Invention A-3 and the matters described in Evidence A No. 2, Evidence A No. 4 and Evidence A No. 7 as well as well-known technique.

Therefore, the patent according to Corrected Invention 1 shall not be invalidated on the grounds of the Reason for Invalidation 2 as Demandant alleges.

B Regarding Corrected Invention 2 of the case

Corrected Invention 2 depends on Corrected Invention 1 and further limits the constitution.

Therefore, similarly to the judgement about Corrected Invention 1, it cannot be said that Corrected Invention 2 was easily conceivable by a person skilled in the art on

the basis of Invention A-3 and the matters described in Evidence A No. 2, Evidence A No. 4 and Evidence A No. 7 as well as well-known technique.

Therefore, the patent according to Corrected Invention 2 shall not be invalidated on the grounds of the Reason for Invalidation 2 as Demandant alleges.

(3) Reason for Invalidation 3

A Demandant's allegation

Demandant alleges that the examples of the patent specification do not have specific description of ink components of ink jet layer (reactive monomer, reactive oligomer, photopolymerization initiator, etc.) and the components of top coat and additional value coat layer that could be an important means for solving the problem. Furthermore, in a case of the combination of pigments being the same, it totally fails to study the effect of the ink components and thickness of ink jet layer, specific components and thickness of top coat and additional value coat layer, and the structure of the other specific layers on ΔE*ab, nor does it have description or suggestion as to what to select for these factors for the realization of ΔE*ab requirement, and thus one cannot see how to implement a building board in a case that a person skilled in the art tries to implement a building board with a ΔE*ab within 0.99 or 1.44, nor can a person skilled in the art generalize the measurement results in the examples beyond the specific ink components and layer structures (see No. 5, 3(3)).

B Judgment

For example, as described in Evidence A No. 12, Evidence A No. 13, Evidence A No. 17 and Evidence A No. 30, it is a well-known art to improve weather resistance of patterned coat by forming a transparent coat layer such as clear layer on a surface of patterned coat (ink jet layer) of building materials. It is also a well-known matter to achieve desired weather resistance by adjusting the kinds and thickness of a resin of the transparent coat layer, ultraviolet absorbers to be added, and an amount of photostabilizers, etc. (see the above 1(7) to (9), (16)).

Consequently, in Corrected Inventions 1 and 2, a person skilled in the art could have done appropriately of adjusting the kinds and thickness of a resin of the transparent coat layer, ultraviolet absorbers to be added, and an amount of photostabilizers, etc. in view of the common technical knowledge so that the color differences (ΔE*ab) between yellow component, magenta component, and cyan component may be within 0.99 and the color differences (ΔE*ab) between yellow component, magenta component, cyan component, and black component may be within 1.44 after color change or degradation

caused by the weatherproof test. Therefore, the patent specification substantially describes the constitution of the color differences (ΔE*ab) between yellow component, magenta component, and cyan component being within 0.99 and the color differences (ΔE*ab) between yellow component, magenta component, cyan component, and black component being within 1.44 after color change or degradation caused by the weatherproof test for implementing Corrected Inventions 1 and 2. Further, it can be said that Corrected Inventions 1 and 2 describe the Detailed Description of the Invention of the Corrected specification.

Further, it is deducible from the experimental report of Evidence A No. 14 and Evidence A No. 15 that Corrected Inventions 1 and 2 are feasible.

Therefore, the Reasons for Invalidation 3 as Demandant argues cannot invalidate the patents according to Corrected Inventions 1 and 2.

No. 8 A demand for trial with respect to Claim 3 before the Correction

As per the above No. 3, the Correction is accepted and Claim 3 was canceled.

As a result, a claim for the patent according to Claim 3 before the Correction of the case in a demand for trial by demandant has lost the object.

A demand for trial with respect to the patent according to Claim 3 before the Correction of the case in the demandant's demand for trial is a non-compliant demand that cannot be amended, and thus shall be dismissed by a decision under the provision of Article 135 of the Patent Act.

No. 9 Closing

As seen above, Corrected 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 as well as well-known art, 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 thus shall be invalidated.

The demand for trial with respect to Claim 3 before the Correction of the case shall be dismissed by a decision under the provision of Article 135 of the Patent Act.

The costs in connection with the trial shall be borne by the demandee under the provisions of Article 61 of the Code of Civil Procedure as applied mutatis mutandis to the provision Article 169(2) of the Patent Act.

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

March 22, 2017

Chief administrative judge: AKAGI, Keiji

Administrative judge: NAKADA, Makoto

Administrative judge: SUMIDA, Hidehiro