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| Patent Right | Date | November 30, 2023 | Court | Intellectual Property High Court, Fourth Division |
| | Case number | 2022 (Gyo-Ke) 10109 | | |
| - A case in which a patent revocation decision that the present patented invention does not comply with the clarity requirement, the support requirement, and the enablement requirement was rescinded. | | | | |

Case type: Rescission of Patent Revocation Decision

Result: Granted

References: Article 36, paragraph (6), item (ii), paragraph (4), item (i), and paragraph (6), item (i) of the Patent Act

Related rights, etc.: Patent No. 6745410

Revocation Decision: Opposition No. 2021-700209

Summary of the Judgment

1 The Opponent filed an opposition to a granted patent with regard to the Plaintiff's patent for an invention titled "ANTI-GLARE FILM" (Patent No. 6745410; Number of claims: 5) on February 26, 2021.

During procedures of the opposition to the granted patent, the Plaintiff filed a request for correction (this correction was intended to delete Claims 2 and 3; Number of claims after the correction: 3). Claims after the correction are as follows.

[Claim 1]

An anti-glare film, comprising an anti-glare layer having a haze value ranging from 50% or more to 99% or less and including a plurality of microparticles of which an average particle diameter is set to a value ranging from 0.5 μm or more to 5.0 μm or less, wherein:

aggregation of the plurality of microparticles is dispersed in the anti-glare layer, in which a distributed structure of asperities is formed on a surface of the anti-glare layer by the aggregation of the plurality of microparticles that are dispersed;

a standard deviation of luminance distribution of an organic EL display is a value ranging from 0 or more to 6 or less when adjusted so as to obtain image data as a gray scale image with an 8-bit gradation display and an average luminance of 170 gradations in a state where the anti-glare film is mounted on a surface of the organic EL display with a pixel density of 441 ppi; and

transmission image clarity at an optical comb width of 0.5 mm is a value ranging from 0% or more to 60% or less.

[Claim 4]

The anti-glare film according to Claim 1, wherein

the anti-glare layer comprises a matrix resin and the plurality of microparticles

dispersed in the matrix resin, and

a refractive index difference between the microparticles and the matrix resin is a value ranging from 0 or more to 0.07 or less.

[Claim 5]

The anti-glare film according to Claim 4, wherein a ratio G2/G1 between a weight G1 of the matrix resin in the anti-glare layer and a total weight G2 of the plurality of microparticles included in the anti-glare layer is a value ranging from 0.07 or more to 0.20 or less.

2 The Japan Patent Office allowed the correction and rendered a decision that the patent having Claims 1, 4, and 5 shall be revoked and the opposition to the granted patent with regard to the patent having deleted Claims 2 and 3 shall be dismissed. This decision was based on the following determinations.

(1) The present patented invention specifies an anti-glare layer by the following numerical ranges of parameters: "haze"; "the present standard deviation (standard deviation of luminance distribution of an organic EL display when adjusted so as to obtain image data as a gray scale image with an 8-bit gradation display and average luminance of 170 gradations in a state where the anti-glare film is mounted on a surface of the organic EL display with a pixel density of 441 ppi)"; and "transmission image clarity at an optical comb width of 0.5 mm." However, with regard to the present standard deviation value, it cannot be considered that it is unambiguously determined what value is specifically set particularly for an object distance and F-number among the measurement conditions, even taking into consideration the statement of the present description and common general technical knowledge. The parameter values, including the standard deviation, are also not unambiguously determined. Therefore, the present patented invention is unclear.

(2) It is difficult for a person ordinarily skilled in the art to understand how to produce various anti-glare films: that meet the condition that the anti-glare films comprise an anti-glare layer including a plurality of microparticles of which an average particle diameter ranges from 0.5 μm or more to 5.0 μm or less, in which a distributed structure of asperities is formed on the surface of the anti-glare layer by aggregation of the plurality of microparticles that are dispersed; and that fully fall within the numerical ranges of the three conditions in the present case (conditions encompassing the condition of haze, the condition of standard deviation, and the condition of transmission image clarity). Therefore, the statement of the present description violates the enablement requirement.

(3) A person ordinarily skilled in the art cannot recognize that the problem of the

present patented invention can be solved even by the statement of the present description, etc. Therefore, the present patented invention violates the support requirement.

3 The court held as follows and rendered a judgment to rescind the portion of the present decision in which the patent having Claims 1, 4, and 5 in the present patent shall be revoked.

(1) The only work required in specifying an F-number is to take several pictures while changing the F-number to check a change in contrast and to determine the F-number with the highest contrast, and no particular difficulty can be found in this work. Regarding an object distance, from the specific statement in [0128] of the present description, a person ordinarily skilled in the art can understand that the object distance should be maintained to the extent that a line bright enough to affect the evaluation of sparkle is not reflected, on the premise that the object distance is made short to the extent that resolution sufficient to grasp luminance distribution can be obtained. Therefore, the present decision erred in determining that the statements of Claims 1, 4, and 5 in the scope of claims in the present patent do not comply with the clarity requirement.

(2) The present patented invention improves an anti-glare property while suppressing sparkle of a display not only by reducing asperities of an anti-glare layer but also by increasing inclination of the asperities on the anti-glare layer to thereby make the asperities steeper and also by increasing the number of the asperities. A first embodiment, which is not disputed in terms of its enablement, and a second embodiment have the common principle mentioned above, and differ in that the former forms the asperities on the anti-glare layer by spinodal decomposition, whereas the latter causes moderate aggregation of microparticles to form a distributed structure of the asperities on the anti-glare layer by using a plurality of the microparticles and selecting materials so as to strengthen repulsive interaction of the microparticles with resins and solvents other than the microparticles when the anti-glare layer is formed. Taking into consideration the statement relating to the first embodiment in combination with other statements of the present description, it can be considered that a person ordinarily skilled in the art will understand that anti-glare films with various properties, including anti-glare films stated in the working examples, can be obtained with regard to the second embodiment by appropriately setting and adjusting conditions in each of production steps. Strict trade-off relationship between making a haze value high and maintaining display performance of the display cannot be found, and it cannot be considered that the present patented

invention does not comply with the enablement requirement unless a method for producing a region with high haze and high clarity is specifically stated. Therefore, the present revocation decision erred in determining that the statement of the present description does not comply with the enablement requirement.

(3) The purpose of the present patented invention is to provide an anti-glare film that can suppress sparkle of a display while having a good anti-glare property and that has a high degree of design freedom in terms of transmission image clarity. In this regard, as held with regard to the enablement requirement, it can be considered that a person ordinarily skilled in the art can recognize that the problem of the present patented invention can be solved within the scope stated in the scope of claims, on the basis of the statement of the present description and common general technical knowledge.

Therefore, the present revocation decision erred in determining that the present patented invention does not comply with the support requirement.

Judgment rendered on November 30, 2023
2022 (Gyo-Ke) 10109, Case of seeking rescission of patent revocation decision
Date of conclusion of oral argument: October 5, 2023

Judgment

Plaintiff: Daicel Corporation

Defendant: Commissioner of the Japan Patent Office

Main text

1. The portion of a decision rendered by the Japan Patent Office (JPO) on September 6, 2022, regarding Opposition No. 2021-700209 that the patent pertaining to Claims 1, 4, and 5 of Patent No. 6745410 shall be revoked shall be rescinded.
2. The Defendant shall bear the court costs.

Facts and reasons

[Abbreviations]
Abbreviations used in this judgment are as defined in Attachment 1 "Abbreviation List." Incidentally, the abbreviations used in the decision in question (the "Decision") are also used in this judgment without change.

No. 1 Claim

Same as the main text.

No. 2 Outline of the case

1. History of procedures at the JPO, etc. (There is no dispute between the parties.)
(1) The Plaintiff filed an international patent application for an invention titled "ANTI-GLARE FILM" on June 25, 2018 (the priority date based on an earlier application is August 4, 2017) and obtained registration establishing a patent right pertaining to the Patent on August 5, 2000 (number of claims: 5). The gazette containing the Patent was published on August 26, 2000.
(2) An opposition to the Patent was filed on February 26, 2021, and the JPO examined it as Opposition No. 2021-700209.
(3) As the Plaintiff received a notice of grounds for revocation (advance notice of a decision) on January 12, 2022, it filed a request for correction to correct the claims (Claims 1 to 5) of the Patent as stated in 2. (1) below (the "Correction") on March 22, 2022, which was within the time limit for submitting a written opinion on the notice (this correction was intended to delete Claims 2 and 3; number of claims after the correction: 3).

(4) On September 6, 2022, the JPO allowed the Correction and then rendered the Decision as follows: "The patent pertaining to Claims 1, 4, and 5 of Patent No. 6745410 shall be revoked. The opposition to the granted patent pertaining to Claims 2 and 3 of Patent No. 6745410 shall be dismissed." The certified copy of the Decision was served to the Plaintiff on September 16, 2022.

(5) On October 14, 2022, the Plaintiff filed the lawsuit in question to seek rescission of the portion of the Decision in which the JPO ruled that the patent pertaining to Claims 1, 4, and 5 of the Patent shall be revoked.

2. Content of the Patented Invention

(1) Statement of the claims

The statement of the claims of the Patent (after the Correction) is as follows.

[Claim 1]

An anti-glare film, comprising an anti-glare layer having a haze value ranging from 50% or more to 99% or less and including a plurality of microparticles of which an average particle diameter is set to a value ranging from 0.5 μm or more to 5.0 μm or less, wherein:

aggregation of said plurality of microparticles is dispersed in said anti-glare layer, in which a distributed structure of asperities is formed on a surface of said anti-glare layer by the aggregation of said plurality of microparticles that are dispersed;

a standard deviation of luminance distribution of an organic EL display with a pixel density of 441 ppi is a value ranging from 0 or more to 6 or less when adjusted so as to obtain image data as a gray scale image with an 8-bit gradation display and an average luminance of 170 gradations in a state where the anti-glare film is mounted on a surface of said organic EL display; and transmission image clarity at an optical comb width of 0.5 mm is a value ranging from 0% or more to 60% or less.

[Claim 4]

The anti-glare film according to Claim 1, wherein said anti-glare layer comprises a matrix resin and said plurality of microparticles dispersed in the matrix resin,

and a refractive index difference between said microparticles and said matrix resin is a value ranging from 0 or more to 0.07 or less.

[Claim 5]

The anti-glare film according to Claim 4, wherein a ratio G2/G1 between a weight G1 of said matrix resin in said anti-glare layer and a total weight G2 of said plurality of microparticles included in said anti-glare layer is a value ranging from 0.07 or more to 0.20 or less.

(2) Extract from the Description and drawings is indicated in Attachment 2 (incidentally,

FIG. 3 is rotated 90 degrees for the purpose of convenience).

According to this, the Description is found to disclose the following matters.

A. The Patented Invention relates to an anti-glare film which prevents reflection of external light onto a surface of a display ([0001]).

B. When an anti-glare film is mounted on a surface of a display, light from the display is affected by the anti-glare film, which may cause a decrease in the display performance of the display through the anti-glare film. Therefore, it is preferable that an anti-glare film has a high degree of design freedom in terms of transmission image clarity ([0005]).

Reducing the size of asperities on a surface of an anti-glare layer to suppress sparkle of a display may cause a decrease in the anti-glare property of the anti-glare film. In addition, it is sometimes difficult to develop an anti-glare film that can effectively suppress sparkle of a display in accordance with objective indicators ([0007]).

C. The purpose of the Patented Invention is to provide an anti-glare film that can suppress sparkle of a display while having a good anti-glare property and that has a high degree of design freedom in terms of transmission image clarity by quantitatively evaluating sparkle of a display and designing the anti-glare film based on the evaluation results ([0008]).

D. Therefore, the Patented Invention adopts the Three Conditions, sets the Standard Deviation as an objective indicator that can be used to quantitatively evaluate sparkle of a display, and sets haze value to a value ranging from 50% or more to 99% or less, thereby ensuring a good anti-glare property while suppressing sparkle of a display. The Patented Invention also ensures a high degree of design freedom in terms of the transmission image clarity of an anti-glare film by setting the transmission image clarity of the anti-glare film at an optical comb width of 0.5 mm to a value ranging from 0% or more to 60% or less ([0009] to [0011]).

E. According to the Patented Invention, it is possible to provide an anti-glare film that can suppress sparkle of a display while having a good anti-glare property and that has a high degree of design freedom in terms of transmission image clarity by quantitatively evaluating sparkle of a display and designing the anti-glare film based on the evaluation results ([0017]).

3. Summary of Reasons for the Decision

(1) The Correction is intended to restrict the claims, and it is allowed as a correction that complies with other statutory requirements.

(2) The Patented Invention cannot be considered to be clear and therefore violates the clarity requirement prescribed in Article 36, paragraph (6), item (ii) of the Patent Act (for details, see Attachment 3 "Reason I for the Decision").

(3) The statement of the detailed explanation of the invention in the Description cannot be considered to be clear and sufficient to enable a person ordinarily skilled in the art to work the Patented Invention and therefore violates the enablement requirement prescribed in paragraph (4), item (i) of the same Article (for details, see Attachment 4 "Reason II for the Decision").
(4) The Patented Invention cannot be considered to be an invention stated in the detailed explanation of the invention and therefore violates the support requirement prescribed in paragraph (6), item (i) of the same Article (for details, see Attachment 5 "Reason III for the Decision").
4. Grounds for Rescission
(1) Error in the determination concerning the clarity requirement (Ground for Rescission 1)
(2) Error in the determination concerning the enablement requirement (Ground for Rescission 2)
(3) Error in the determination concerning the support requirement (Ground for Rescission 3)

(omitted)

No. 4 Judgment of this court
1. Ground for Rescission 1 (error in the determination concerning the clarity requirement)
(1) Article 36, paragraph (6), item (ii) of the Patent Act requires that the invention for which a patent is sought is clear because if the invention stated in the claims is not clear, it may be unreasonably prejudicial to interests of a third party due to, for example, elimination of the predictability of the scope of a right holder's exclusive rights. It is reasonable to determine compliance with this requirement in consideration of not only the statement of the claims but also the statements in the description and drawings attached to the written application and based on common general technical knowledge of persons ordinarily skilled in the art as of the filing of the application from the perspective of whether the statement of the claims is unclear to the extent that it is unreasonably prejudicial to interests of a third party.

The Decision rules as follows: What value is specifically set for an object distance and F-number among the measurement conditions for the Standard Deviation cannot be unambiguously determined, even taking into consideration the statements in the Description and common general technical knowledge as of the filing of the Patent

Application; therefore, the values of the Standard Deviation and the Parameters, including the Standard Deviation, are unclear, and thus, Patented Invention 1 is unclear.

(2) F-number

Shooting in the Patented Invention is intended to find the standard deviation of luminance of a display from image data captured and measure contrast ([0124] of the Description). Therefore, a person ordinarily skilled in the art is expected to shoot an object under a condition enabling reproduction of its contrast as faithfully as possible.

In terms of a general property of lens, it is common general technical knowledge that contrast performance is maximized with a medium F-number (the state where the aperture is narrowed to a certain degree) and tends to decrease if the aperture is opened or narrowed down (Exhibits Ko 19 to 21 and 26 to 39).

Therefore, a person ordinarily skilled in the art is expected to set the aperture value to an F-number that maximizes contrast performance. The only work required in specifying such F-number is to take several pictures while changing the F-number to check changes in contrast and to determine the F-number presenting the highest contrast, and no particular difficulty can be found in this work. Incidentally, aperture adjustment is described on page 7 in the instruction manual of Komatsu's testing equipment (Exhibit Otsu 9) that is cited as a sparkle testing equipment in the Description.

The Defendant alleges that a certain degree of freedom had been allowed for the setting of an F-number as common general technical knowledge in the industry as of the filing of the Application on the grounds that work as mentioned above is not described in Exhibit Ko 7 (JIS regarding the way of finding the degree of sparkle of a display and explanation thereon). However, Exhibit Ko 7 was established on December 20, 2019, after the filing of the application for the Patent, and it does not deny the aforementioned common general technical knowledge concerning the method of setting contrast performance though it indicates the fact that persons ordinarily skilled in the art had not had a common understanding regarding the way of finding the degree of sparkle of a display. In the Patented Invention, the anti-glare layer is "adjusted so as to obtain image data as a gray scale image with an 8-bit gradation display and an average luminance of 170 gradations," and it is not that measurement conditions can be adjusted without restriction on the premise that the aforementioned conditions are met.

(3) Object distance

There is the following specific statement in [0128] of the Description: "Next, an adjustment step is performed to adjust the pixel size of the display 16a mounted with a film, on which image is captured per unit pixel of the imaging element of an imaging device 12. In the adjustment step, the relative distance between the imaging device 12

and the display 16a mounted with the film is adjusted according to the number of effective pixels of the imaging element of the imaging device 12 to the extent that, in the image captured by the imaging device 12, there is no emission line due to pixels, or even with some emission lines due to pixels, they do not affect the evaluation of sparkle of the display 16a." Therefore, a person ordinarily skilled in the art is considered to be able to understand that the object distance should be maintained to the extent that emission lines bright enough to affect the evaluation of sparkle are not reflected, on the premise that the object distance is made short to the extent that resolution sufficient to grasp luminance distribution can be obtained. As the object distance adjusted as such is to be set near the boundary between the range of distance in which emission lines can be seen and the range of relative distance in which they cannot be seen, it can be considered that the object distance is to be determined within a certain range that is not so large. Incidentally, in the Patented Invention, the anti-glare layer is "adjusted so as to obtain image data as a gray scale image with an 8-bit gradation display and an average luminance of 170 gradations," and measurement conditions cannot be adjusted without restriction, as mentioned in (2) above.

The Defendant alleges that the object distance is not unambiguously determined because displays vary in size and a viewing distance differs according to the screen size of the display and the mode of use and because there is also a range in viewing distances. However, even if objects individually vary in size, when adjusted by a method according to [0128] of the Description by using Komatsu's testing equipment, object distance is naturally determined for each object. Therefore, it cannot be said that the statements in the Description are unclear to the extent that they cause disadvantage to a third party.

In addition, by citing Exhibits Otsu 6 and 7, the Defendant alleges that the object distance reasonably selected by a person ordinarily skilled in the art will have a range from "about 160 mm or more to about 410 mm or less." However, in Exhibit Otsu 6, neither the display subject to measurement, nor the anti-glare film nor its property is specified. In Exhibit Otsu 7, the display is specified, but the property of the anti-glare film is not specified, and matters that serve as preconditions for the measurement of the Standard Deviation are not indicated. Therefore, these documents are not appropriate targets for comparison, and it cannot be found that values obtained by combining these documents had been common general technical knowledge.

Furthermore, the Defendant also alleges that the Plaintiff has adopted an object distance of 328 mm to this date. However, there is no sufficient evidence to find that the Plaintiff adopted the aforementioned object distance for shooting as the premise of

measuring the Standard Deviation, and this allegation cannot be considered to provide a basis for the Defendant's allegation regarding whether it can be said that the object distance is unambiguously determined based on the statements in the Description, etc.

(4) Conclusion

As mentioned above, the statement of Claim 1 in the claims of the Patent cannot be considered to be unclear to the extent it is unreasonably prejudicial to interests of a third party, and the invention for which a patent is sought is clear. The same also applies to Claims 4 and 5.

Therefore, the determination in the Decision that the Patented Invention does not comply with the clarity requirement is erroneous, and Ground for Rescission 1 is well-founded.

2. Ground for Rescission 2 (error in the determination concerning the enablement requirement)

(1) Article 36, paragraph (4), item (i) of the Patent Act provides for the enablement requirement in relation to the statement of the detailed explanation of the invention based on a mechanism wherein monopoly of art by patent is granted in return for disclosure of the art by the detailed explanation of the invention. Taking into account such purport of the same item, it is considered that, in order to comply with the enablement requirement, the detailed explanation of the invention must include a statement that is sufficient to enable a person ordinarily skilled in the art to work the invention for which a patent is sought, based on the statement of the detailed explanation of the description and common general technical knowledge as of the filing of the application, without requiring undue trial and error.

(2) We consider the case on this point. As the first premise, there is no dispute between the parties regarding the fact that an anti-glare film that meets the Three Conditions can be manufactured by the first embodiment stated in the Description. The Defendant alleges that the Patented Invention is the invention of an anti-glare film according to the second embodiment and that the first embodiment is not included in the Patented Invention.

However, it can be said that the first embodiment includes an anti-glare film comprising an anti-glare layer, in which a distributed structure of asperities is formed on the surface by both aggregation due to spinodal decomposition and the aggregation of microparticles, taking into account the following statements regarding the first embodiment in the Description: the statement in [0056] "The anti-glare layer 3 may contain a plurality of microparticles (fillers) dispersed in the matrix resin."; the statement in [0058] "The average particle diameter of the microparticles is not

particularly limited, and for example, can be set to a value ranging from 0.5 μm or more to 5.0 μm or less"; and the statement in [0059] "Note that it is difficult to obtain an anti-glare property if the average particle diameter of the microparticles is too small, while sparkle of a display may become large if the average particle diameter of the microparticles is too large." Accordingly, the Patented Invention does not include anti-glare layers in which a distributed structure of asperities is formed on the surface only by aggregation due to spinodal decomposition, but does not exclude anti-glare layers in which a distributed structure of asperities is formed on the surface by both aggregation due to spinodal decomposition and the aggregation of microparticles. Therefore, the Defendant's allegation that the anti-glare film according to the first embodiment is not included in the Patented Invention is not acceptable.

(3) When considering compliance with the enablement requirement on the premise of the above, the first embodiment improves the anti-glare property while suppressing sparkle of a display by not only reducing the size of the asperities on the anti-glare layer but also by increasing inclination of the asperities on the anti-glare layer to make the asperities steeper and also increasing the number of asperities ([0078]). The first embodiment and the second embodiment have the common principle mentioned above, and differ in that the former forms the asperities on the anti-glare layer by spinodal decomposition, whereas the latter causes moderate aggregation of microparticles to form a distributed structure of steep and high-number density asperities on the anti-glare layer by using a plurality of the microparticles and selecting materials so as to strengthen repulsive interaction of the microparticles with resins and solvents other than the microparticles when the anti-glare layer is formed ([0079] and [0080]).

Then, regarding the first embodiment, the Description states that the property of the anti-glare layer pertaining to the Three Conditions can be formed by changing the combination and weight ratio of resin compositions in a solution and execution conditions, etc. of a preparation step, formation step, and curing step ([0068]). Regarding the second embodiment, the Description specifically describes the microparticles and materials for the matrix resin that comprises the anti-glare layer ([0086] to [0094]), refractive index difference between the matrix resin and the microparticles ([0081]), particle diameter ([0082]), ratio of the matrix resin and the microparticles in the anti-glare layer ([0085]), manufacturing process ([0095] to [0102]), and the solvent used for preparation ([0096]) and also states that in Working Example 5, the asperity structure is emphasized as silica particles caused repulsive interaction with butanol ([0188]). Therefore, it can be said that, taking into consideration the statements in [0068] and [0079], in addition to the statements regarding the first embodiment in

[0186] and [0187], a person ordinarily skilled in the art can understand that, regarding the second embodiment, anti-glare films with various properties, including the anti-glare films stated as the working examples, can be obtained by appropriately setting conditions in each production step and by making adjustments, such as ensuring the coexistence of acrylic ultraviolet curable resin and acrylic hard coat composition A. Consequently, it can be said that a person ordinarily skilled in the art can manufacture the anti-glare film according to the Patented Invention even if the Patented Invention is the invention of an anti-glare film comprising an anti-glare layer, in which a distributed structure of asperities is formed on the surface only by the aggregation of microparticles.

The Defendant alleges as follows: If the method (principle) of forming asperities differs, materials suited for the formation of asperities differ, and concomitantly, combination of materials that causes repulsive interaction also differs; therefore, the key to selecting materials so as to strengthen repulsive interaction of the microparticles with resins and solvents other than the microparticles is not disclosed in the Description. However, the shape of the asperity structure formed by the aggregation of microparticles is considered to be the same as the shape of the aforementioned droplet phase structure formed by the progression of aggregation due to spinodal decomposition. It is thus considered that the asperity structure of the first embodiment can be used as a reference. As mentioned above, the Description describes the principle for producing steepness of asperities that serve as the main structure when eliciting the property according to the Patented Invention and its specific method, as well as process for manufacturing from raw materials (in particular, [0079]). Therefore, it should be said that, in the case of forming steeper asperities by using the aggregation of microparticles, a person ordinarily skilled in the art can specifically determine the volume of silica particles and butanol within the range of ordinary trial and error by increasing the parts by weight of the microparticles and increasing the parts by weight of butanol as needed to increase repulsion, and thereby can make a product in which the invention is worked.

(4) The Defendant alleges as follows: The design freedom in terms of transmission image clarity has been constrained due to a trade-off correlation between prevention of reflection of external light (making a haze value high) and maintenance of the display performance of a display (making transmission image clarity high); however, from the statements in [0005] and [0008] of the Description, a person ordinarily skilled in the art can understand that part of the purpose of the Patented Invention, "to provide an anti-glare film that has a high degree of design freedom in terms of transmission image clarity," means to provide an anti-glare film that suppresses sparkle to a predetermined range and has transmission image clarity in the High Haze/High Clarity Range, which

should be considered as a range where the aforementioned constraint is overcome; therefore, it is necessary to describe a manufacturing process in relation to the High Haze/High Clarity Range.

However, first, it is impossible to find the existence of a strict trade-off relationship between prevention of reflection of external light and maintenance of the display performance of a display from the statement in [0005] of the Description. The haze values and transmission image clarity values of the anti-glare films in Working Examples 1 to 4 according to the first embodiment of the Patented Invention, Comparative Examples 2 to 3, 10, and 11, Working Example 5 according to the second embodiment thereof, and Comparative Examples 1 and 4 to 9 ([Table 1] in [0183] of the Description and [Table 2] in [0184] of the same) indicate that it is possible to manufacture anti-glare films that differ in transmission image clarity though they have the same level of haze value and anti-glare films that differ in haze value though they have the same level of transmission image clarity. Incidentally, the Defendant alleges that the Description describes only Working Example 5 as a working example that corresponds to the Patented Invention, but this allegation is based on a false assumption that the first embodiment does not correspond to the Patented Invention. Even based on the Defendant's assumption, the issue here is a correlation between haze value and transmission image clarity. Therefore, there is no reason for eliminating working examples other than Working Example 5. In addition, the Defendant alleges that Comparative Example 1 should not be taken into consideration because it has an anti-glare layer having an nm order surface asperity structure, instead of an anti-glare layer having a μm order surface asperity structure that is a prerequisite for the Patented Invention, in which "average particle diameter is set to a value ranging from 0.5 μm or more to 5.0 μm or less." However, even if Comparative Example 1 is not taken into consideration, the aforementioned finding will not be affected.

Moreover, "Annex (Reference): Image Clarity Measurement Examples" of JIS (K7374) (Exhibit Ko 43) includes "measurement examples of films, including anti-glare films for which image clarity cannot be evaluated by haze value" as examples of transmission measurement of image clarity, and indicates Sample 1-2 "Haze value 14.11; Image clarity: 80.0%" in Table 1 of the Annex and Sample 1-4 "Haze value: 14.67; Image clarity: 5.9%" in the same table. In addition, it also states that image clarity corresponds to visual perception while haze values do not reflect visual perception unlike image clarity. In consideration of these facts, it can be said that there is a certain level of correlation between the haze and transmission image clarity of anti-glare films, but no strong correlation is found, and that they can be adjusted by

manufacturing conditions, etc. and there is thus design freedom.

Furthermore, there is the following statement in [0008] of the Description: "Therefore, the purpose of the present invention is to provide an anti-glare film that can suppress sparkle of a display while having a good anti-glare property and that has a high degree of design freedom in terms of transmission image clarity by quantitatively evaluating sparkle of a display and designing the anti-glare film based on the evaluation results." It is thus considered that the purpose of the Patented Invention is to maintain balance among three conditions, specifically, an anti-glare property, suppression of sparkle, and a high degree of design freedom in terms of transmission image clarity. Then, the following statement in [0011] of the Description indicates that a haze value of an anti-glare film showing a good anti-glare property is 50% or more: "In addition, it is possible to obtain a good anti-glare property while suppressing sparkle of a display by setting said standard deviation to a predetermined value and setting the haze value of the anti-glare layer to a value ranging from 50% or more to 99% or less. Moreover, it is possible to ensure extensive design freedom in terms of transmission image clarity of an anti-glare film by setting transmission image clarity of the anti-glare film at an optical comb width of 0.5 mm to a value ranging from 0% or more to 60% or less." Therefore, haze value may change within the aforementioned numerical range in relation to other conditions, specifically, suppression of sparkle and a high level of transmission image clarity. As mentioned above, a strict trade-off relationship was not found between making a haze value high and maintaining the display performance of a display, and it is indicated on page 3 of the certificate of experimental results attached to Exhibit Ko 13 that the anti-glare films of Sample 1 (haze value: 96%; transmission image clarity: 65%) and Sample 2 (haze value: 45%; transmission image clarity: 2.0%) could be manufactured. Therefore, it cannot be said that the Patented Invention does not comply with the enablement requirement unless a manufacturing process for the High Haze/High Clarity Range is specifically described.

(5) For the reasons described above, the Description is found to contain statements that are sufficient to enable a person ordinarily skilled in the art to manufacture and use a product according to the Patented Invention based on those statements and common general technical knowledge as of the filing of the application without requiring undue trial and error, and the statements in the Description are thus found to be clear and sufficient to enable a person ordinarily skilled in the art to work the Patented Invention.

Therefore, there is an error in the Decision ruling that the Description does not comply with the enablement requirement, and Ground for Rescission 2 is well-founded.

3. Ground for Rescission 3 (error in the determination concerning the support

requirement)

(1) Article 36, paragraph (6), item (i) of the Patent Act provides for the support requirement that the invention stated in the claims must be substantially supported by the detailed explanation of the invention. It is considered that compliance with this requirement should be determined by considering whether the invention stated in the claims is considered to be the invention stated in the detailed explanation of the invention through comparison between the statement of the claims and the statement of the detailed explanation of the invention and whether the relevant invention is within the scope in which a person ordinarily skilled in the art can recognize that the problem of the invention can be solved based on the statement of the detailed explanation of the invention or within the scope in which a person ordinarily skilled in the art can recognize that the problem of the invention can be solved in light of common general technical knowledge as of the filing of the application even without any statement or suggestion in the detailed explanation of the invention.

(2) The purpose of the Patented Invention is to provide an anti-glare film that can suppress sparkle of a display while having a good anti-glare property and that has a high degree of design freedom in terms of transmission image clarity ([0008]).

If haze value is 50% or more, a good anti-glare property can be ensured ([0011]), and there is a certain level of correlation between haze value and transmission image clarity. Therefore, it is also possible to adjust transmission image clarity by appropriately changing haze value.

In order to improve the anti-glare property while suppressing sparkle of a display, it is only necessary to reduce the size of the asperities on an anti-glare layer and to increase inclination of the asperities on the anti-glare layer to make the asperities steeper and increase the number of asperities ([0078]).

As mentioned in 2. (3) above, regarding the anti-glare film as mentioned above, the Description describes the principle for producing steepness of asperities and a specific method thereof, process for manufacturing from raw materials, working examples, etc. Therefore, it can be said that based on those statements in the Description and common general technical knowledge, a person ordinarily skilled in the art can recognize that the problem of the Patented Invention can be solved within the scope stated in the claims.

(3) Consequently, the Decision contains an error in the determination that the Patented Invention does not comply with the support requirement, and Ground for Rescission 3 is well-founded.

4. Conclusion

Based on the above, all Grounds for Rescission 1 to 3 are well-founded. Accordingly,

the Decision shall be rescinded, and the determination is made as indicated in the main text.

Intellectual Property High Court, Fourth Division
Presiding judge: MIYASAKA Masatoshi
Judge: MOTOYOSHI Hiroyuki
Judge: IWAI Naoyuki

Attachment 1 Abbreviation List

(Abbreviation) (Meaning)

· the Patent: Patent No. 6745410 for which the patentee is the Plaintiff

· the Correction: Correction of the claims of the Patent according to the Plaintiff's request for correction dated March 22, 2022

· the Patented Invention: Collective term for the inventions according to Claims 1, 4, and 5 of the Patent (after the Correction)

Those inventions are individually referred to as "Patented Invention 1," "Patented Invention 4," and "Patented Invention 5" according to the numbers assigned to the claims.

· the Description: Description pertaining to the Patent

· the Standard Deviation: Standard deviation of the luminance distribution of an organic EL display with a pixel density of 441 ppi when adjusted so as to obtain image data as a gray scale image with an 8-bit gradation display and an average luminance of 170 gradations in a state where an anti-glare film is mounted on a surface of the organic EL display

· the Parameters: Values of three properties of an anti-glare layer, specifically, "haze," the "Standard Deviation," and "transmission image clarity at an optical comb width of 0.5 mm"

· Object distance: Distance between an imaging device and a display mounted with an anti-glare film

· F-number: F-number of the lens of an imaging device

· the Three Conditions: the requirement including the requirement that the "haze value is a value ranging from 50% or more to 99% or less " (haze condition), the requirement that "a standard deviation of luminance distribution of an organic EL display with a pixel density of 441 ppi is a value ranging from 0 or more to 6 or less when adjusted so as to obtain image data as a gray scale image with an 8-bit gradation display and an average luminance of 170 gradations in a state where the anti-glare film is mounted on a surface of said organic EL display" (standard deviation condition), and the requirement that "transmission image clarity at an optical comb width of 0.5 mm is a value ranging from 0% or more to 60% or less" (transmission image clarity condition)

· Komatsu's testing equipment: "Film sparkle testing equipment" made by Komatsu NTC Ltd.

· the High Haze/High Clarity Range: Combination like an "extremely high haze value of 99% and transmission image clarity at an optical comb width of 0.5 mm of 60%"

Attachment 2 Statements in the Description (Extract)

[Technical Field]

[0001]

The present invention relates to an anti-glare film which prevents reflection of external light onto a surface of a display.

[Background Art]

[0002]

An anti-glare film is, for example, a film having an anti-glare layer in which asperities are formed on a surface by surface roughening, and such a film is mounted on a surface of a display and scatters external light to prevent reflection of the external light onto the surface of the display.

[Outline of the Invention]

[Problem to be Solved by the Invention]

[0005]

When an anti-glare film is mounted on a surface of a display, reflection of external light onto the surface of the display is prevented, but light from the display is affected by the anti-glare film, which may cause a decrease in the display performance of the display through the anti-glare film. Therefore, it is preferable that an anti-glare film has a high degree of design freedom in terms of transmission image clarity.

[0006]

In addition, when an anti-glare film is mounted on a surface of a display, etc. having high-definition pixels, light from the display passing through the anti-glare film is refracted by asperities on the surface of the anti-glare layer, or the pixels of the display appear to be expanded due to a lens effect produced by the asperities on the surface of the anti-glare layer, which may cause sparkle of the display and make it difficult to see the image.

[0007]

A possible method of suppressing sparkle of a display is to reduce the size of asperities on a surface of an anti-glare layer. However, it may cause a decrease in the anti-glare property of the anti-glare film. In addition, sparkle of a display is, in part, difficult to quantitatively evaluate, and it is sometimes difficult to develop an anti-glare film that can effectively suppress sparkle of a display in accordance with objective indicators.

[0008]

Therefore, the purpose of the present invention is to provide an anti-glare film that can suppress sparkle of a display while having a good anti-glare property and that has a

high degree of design freedom in terms of transmission image clarity by quantitatively evaluating sparkle of a display and designing the anti-glare film based on the evaluation results.

[Means for Solving the Problem]

[0009]

In order to solve the aforementioned problem, one embodiment of the present invention comprises an anti-glare layer having a haze value ranging from 50% or more to 99% or less. In the embodiment, in a state of being mounted on a surface of a display, a standard deviation of the luminance distribution of said display is a value ranging from 0 or more to 6 or less, and transmission image clarity at an optical comb width of 0.5 mm is a value ranging from 0% or more to 60% or less.

[0010]

Here, the value of the standard deviation of the luminance distribution of the display indicates the degree of scattering of bright spots on the display and serves as an objective indicator that can be used to quantitatively evaluate sparkle of the display. Therefore, in the aforementioned structure, it is possible to quantitatively evaluate sparkle of a display and design an anti-glare film based on the evaluation results by making up an anti-glare layer while setting the value of said standard deviation to a value ranging from 0 or more to 6 or less. Consequently, it is possible to more stably obtain an anti-glare film that can effectively suppress sparkle of a display than in the case where a tester visually and subjectively evaluates sparkle of a display.

[0011]

In addition, it is possible to obtain a good anti-glare property while suppressing sparkle of a display by setting said standard deviation to a predetermined value and setting the haze value of an anti-glare layer to a value ranging from 50% or more to 99% or less. Moreover, it is possible to ensure extensive design freedom in terms of transmission image clarity of an anti-glare film by setting transmission image clarity of the anti-glare film at an optical comb width of 0.5 mm to a value ranging from 0% or more to 60% or less.

[Effect of the Invention]

[0017]

According to the present invention, it is possible to provide an anti-glare film that can suppress sparkle of a display while having a good anti-glare property and that has a high degree of design freedom in terms of transmission image clarity by quantitatively evaluating sparkle of a display and designing the anti-glare film based on the evaluation results.

[Mode for Carrying out the Invention]

[0019]

Hereinafter, each of the embodiments of the present invention is described with reference to drawings.

[0020]

(First embodiment)

FIG. 1 is a cross-sectional view illustrating the structure of an anti-glare film 1 according to the first embodiment. The anti-glare film 1 is mounted on a surface of a display 16a of a display device 16 (see FIG. 3). The anti-glare film 1 comprises a substrate film 2, an anti-glare layer 3, and an adhesive layer 4.

[0021]

The substrate film 2 is located between the display 16a and the anti-glare layer 3 and supports the anti-glare layer 3. The adhesive layer 4 is located between the display 16a and the substrate film 2 and fixes the anti-glare film 1 onto a surface of the display 16a. The adhesive layer 4 is, for example, optical glue and comprises materials that are unlikely to affect the optical characteristics of the anti-glare film 1.

[0022]

The anti-glare layer 3 is formed on at least either surface of the substrate film 2. The anti-glare layer 3 gives an anti-glare property to the anti-glare film 1 and reflects external light in a scattered way to prevent reflection of external light onto a surface of the display 16a. The anti-glare layer 3 also works as a hard coat (HC) layer that protects the surface of the display 16a. The anti-glare layer 3, for example, includes a plurality of phase-separable resin components.

[0023]

Regarding the anti-glare film 1, the standard deviation of the luminance distribution of the display 16a is set to a value ranging from 0 or more to 6 or less, and transmission image clarity at an optical comb width of 0.5 mm is set to a value ranging from 0% or more to 60% or less, in a state where the anti-glare film 1 is mounted on a surface of the display 16a. Regarding the anti-glare layer 3, haze value is set to a value ranging from 50% or more to 99% or less.

[0024]

The haze value indicated in the present embodiment is a value measured by a method conforming to JIS K7136.

[0025]

The value of said standard deviation can be appropriately set within the aforementioned range, but is more preferably a value ranging from 0 or more to 5.5 or

less and is further preferably a value ranging from 0 or more to 5.0 or less. In addition, the value of transmission image clarity at an optical comb width of 0.5 mm (image clarity) can also be appropriately set within the aforementioned range, but is more preferably a value ranging from 0% or more to 55% or less and is further preferably a value ranging from 0% or more to 50% or less.

[0026]

Moreover, the haze value of the anti-glare layer 3 can be appropriately set within the aforementioned range, but is more preferably a value ranging from 50% or more to 90% or less and is further preferably a value ranging from 50% or more to 85% or less.

[0027]

As described above, in the present embodiment, it is possible to quantitatively evaluate sparkle of the display 16a and design the anti-glare film 1 based on the evaluation results by making up the anti-glare film 1 in such a way that the value of the standard deviation of the luminance distribution of the display 16a is set to a value ranging from 0 or more to 6 or less based on the fact that the value of said standard deviation indicates the degree of scattering of bright spots on the display 16a and serves as an objective indicator that can be used to quantitatively evaluate sparkle of the display 16a.

[0028]

Therefore, it is possible to stably obtain the anti-glare film 1 that can suppress sparkle of the display 16a more effectively than the anti-glare film 1 that is obtained, for example, in the case where a tester visually and subjectively evaluates sparkle of the display 16a.

[0029]

In addition, it is possible to obtain a good anti-glare property while suppressing sparkle of the display 16a by setting said standard deviation of the anti-glare film 1 to a predetermined value and setting the haze value of the anti-glare layer 3 to a value ranging from 50% or more to 99% or less. Moreover, it is possible to ensure extensive design freedom in terms of transmission image clarity of the anti-glare film 1 by setting transmission image clarity of the anti-glare film 1 at an optical comb width of 0.5 mm to a value ranging from 0% or more to 60% or less.

[0056]

The anti-glare layer 3 may contain a plurality of microparticles (fillers) dispersed in the matrix resin. The microparticles may be either organic microparticles or inorganic microparticles. The plurality of microparticles may include a plurality of types of microparticles.

[0057]

Cross-linked acrylic particles and cross-linked styrene particles can be presented as examples of organic microparticles. In addition, silica particles and alumina particles can be presented as examples of inorganic microparticles. Furthermore, refractive index difference between the microparticles and matrix resin contained in the anti-glare layer 3 can be, for example, set to a value ranging from 0 or more to 0.2 or less. This refractive index difference is more preferably a value ranging from 0 or more to 0.15 or less and is further preferably a value ranging from 0 or more to 0.07 or less.

[0058]

The average particle diameter of the microparticles is not particularly limited, and for example, it can be set to a value ranging from 0.5 μm or more to 5.0 μm or less. This average particle diameter is more preferably a value ranging from 0.5 μm or more to 3.0 μm or less and is further preferably a value ranging from 0.5 μm or more to 2.0 μm or less.

[0059]

Incidentally, the average particle diameter mentioned here is a 50% volume average particle diameter according to the Coulter counter method (the same also applies to the average particle diameter referred to hereinafter). The microparticles may be solid or hollow. Note that it is difficult to obtain an anti-glare property if the average particle diameter of the microparticles is too small, while sparkle of a display may become large if the average particle diameter of the microparticles is too large.

[0068]

Here, the haze value of the anti-glare layer 3, the transmission image clarity of the anti-glare film 1, and the value of the standard deviation of the luminance distribution of the display 16a where the anti-glare film 1 is mounted on the surface (sparkle value) can differ depending on the combination and weight ratio of resin compositions in a solution or execution conditions, etc. of a preparation step, formation step, and curing step. Therefore, it is possible to obtain an anti-glare film with targeted physical properties by forming anti-glare layers while changing each condition and by measuring and understanding the physical properties of the anti-glare layers obtained through these trials in advance.

[0078]

Here, a possible method of suppressing sparkle of the display 16a is, for example, to reduce the size of asperities on a surface of an anti-glare layer, but it may cause a decrease in the anti-glare property of the anti-glare film. However, it is possible to improve the anti-glare property while suppressing sparkle of a display by not only

reducing the size of the asperities on the anti-glare layer but also by increasing inclination of the asperities on the anti-glare layer to make the asperities steeper and also increasing the number of asperities.

[0079]

Such asperities can be formed on an anti-glare layer by spinodal decomposition mentioned above in the first embodiment, but such asperities can also be formed on an anti-glare layer by other methods. For example, even where a plurality of microparticles are used to form asperities on a surface of an anti-glare layer as in the second embodiment, it is possible to form a distributed structure of steep and high-number density asperities on the anti-glare layer by selecting materials so as to strengthen repulsive interaction of the microparticles with resins and solvents other than the microparticles when the anti-glare layer is formed to cause moderate aggregation of the microparticles. Anti-glare layers in other embodiments are explained below with a focus on differences from the first embodiment.

[0080]

(Second embodiment)

The anti-glare layer of the anti-glare film according to the second embodiment comprises matrix resin and a plurality of microparticles dispersed in the matrix resin. The microparticles are formed in a perfectly spherical shape, but the shape of the microparticles is not limited to this, and the microparticles may be formed in a substantially spherical or ellipsoidal shape. In addition, the microparticles are formed in a solid form but may also be formed in a hollow form. When the microparticles are formed in a hollow form, the hollow part of the microparticles may be filled with air or other gas. In the anti-glare layer, each of the microparticles may be dispersed as a primary particle, or a plurality of secondary particles formed by aggregation of a plurality of the microparticles may be dispersed.

[0081]

The refractive index difference between the matrix resin and the microparticles is set to a value ranging from 0 or more to 0.20 or less. This refractive index difference is more preferably a value ranging from 0 or more to 0.15 or less and is further preferably a value ranging from 0 or more to 0.07 or less.

[0082]

The average particle diameter of the microparticles is set to a value ranging from 0.5 μm or more to 5.0 μm or less. The average particle diameter of the microparticles is more preferably a value ranging from 0.5 μm or more to 3.0 μm or less and is further preferably a value ranging from 0.5 μm or more to 2.0 μm or less.

[0085]

The ratio between the weight of the matrix resin and the total weight of a plurality of microparticles in the anti-glare layer can be set appropriately. In the present embodiment, a ratio G2/G1 between a weight G1 of the matrix resin in the anti-glare layer and a total weight G2 of said plurality of microparticles contained in the anti-glare layer is set to a value ranging from 0.07 or more to 0.20 or less. The ratio G2/G1 is preferably a value ranging from 0.10 or more to 0.20 or less and is more preferably a value ranging from 0.12 or more to 0.20 or less.

[0086]

The microparticles dispersed in the matrix resin may be either organic microparticles or inorganic microparticles but preferably have good transparency. Plastic beads can be presented as an example of organic microparticles. Styrene beads (refractive index: 1.59), melamine beads (refractive index: 1.57), acrylic beads (refractive index: 1.49), acrylic-styrene beads (refractive index: 1.54), polycarbonate beads, polyethylene beads, etc. can be presented as examples of plastic beads. Styrene beads may be cross-linked styrene beads, and acrylic beads may be cross-linked acrylic beads. Plastic beads are preferably those having a hydrophobic group on the surface. Styrene beads can be presented as an example of such plastic beads.

[0087]

At least any of light curing resins that are cured by active energy line, solvent drying resins that are cured by drying of a solvent added at the time of coating, and thermosetting resins can be presented as an example of matrix resins.

[0088]

Resins having an acrylate functional group, for example, relatively low-molecular-weight polyester resins, polyether resins, acrylic resins, epoxy resins, urethane resins, alkyd resins, spiroacetal resins, polybutadiene resins, and polythiol-polyene resins, as well as oligomers, prepolymers, and reactive diluents of (meth)acrylate, etc. of a multifunctional compound, such as polyalcohol, can be presented as examples of light curing resins.

[0089]

Monofunctional monomers and polyfunctional monomers of ethyl (meth)acrylate, ethylhexyl (meth)acrylate, styrene, methylstyrene, N-vinylpirrolidone, etc., for example, polymethylol propane tri(meth)acrylate, hexanediol (meth)acrylate, tripropylene glycol di(meth)acrylate, diethylene glycol di(meth)acrylate, pentaerythritol tri(meth)acrylate, dipentaerythritol hexa(meth)acrylate, 1,6-hexanediol di(meth)acrylate, and neopentylglycol di(meth)acrylate can be presented as specific examples of these resins.

[0090]

When the light curing resin is an ultraviolet curing resin, it is preferable to use a photopolymerization initiator. Acetophenones, benzophenones, Michler's benzoyl benzoate, α-amyloxime ester, tetramethylthiuram monosulfide, and thioxanthones can be presented as examples of photopolymerization initiator. In addition, it is also preferable to use photosensitizer by mixing it in light curing resin. N-butylamine, triethylamine, poly-n-butylphosphine, etc. can be presented as examples of photosensitizer.

[0091]

Publicly known thermoplastic resins can be presented as examples of solvent drying resins. Styrene resins, (meth)acrylic resins, vinyl acetate resins, vinyl ether resins, halogen-containing resins, alicyclic olefin resins, polycarbonate resins, polyester resins, polyamide resins, cellulose derivatives, silicone resins, and rubber or elastomer, etc. can be presented as examples of such thermoplastic resins. A solvent drying resin is preferably a resin that is soluble in an organic solvent and is excellent, in particular, in moldability, a film-forming property, transparency, and weatherability. Styrene resins, (meth)acrylic resins, alicyclic olefin resins, polyester resins, and cellulose derivatives (cellulosic esters, etc.) can be presented as examples of such solvent drying resins.

[0092]

Here, when the material of the substrate film 2 is a cellulose resin, such as triacetylcellulose (TAC), a cellulose resin can be presented as an example of thermoplastic resins that are used for a solvent drying resin. Cellulose derivatives, such as nitrocellulose, acetylcellulose, acetyl butyl cellulose, ethylcellulose, methylcellulose, cellulose acetate propionate, and ethyl hydroxyethyl cellulose, can be presented as examples of such cellulose resins. By using a cellulose resin as a solvent drying resin, it is possible to successfully stick the substate film 2 and the anti-glare layer 3 together and to obtain the anti-glare film 1 with excellent transparency.

[0093]

In addition, vinyl resins, acetal resins, acrylic resins, polystyrene resins, polyamide resins, and polycarbonate resins, etc. can be presented as examples of solvent drying resins.

[0094]

Phenol resins, urea resins, diallyl phthalate resins, melamine resins, guanamine resins, unsaturated polyester resins, polyurethane resins, epoxy resins, amino alkyd resins, melamine-urea co-condensation resins, silicone resins, polysiloxane resins, etc. can be presented as examples of thermoplastic resins. When using a thermoplastic resin

as a matrix resin, at least any of a curing agent, such as cross-linking agent and polymerization initiator, polymerization accelerator, solvent, and viscosity modifier, etc. may also be used in combination with the thermoplastic resin.

[0095]

The anti-glare film manufacturing process in the second embodiment has, for example, a preparation step in which a solution that is used as a raw material for the anti-glare layer 3 is prepared, a coating step in which the solution prepared in the preparation step is coated onto a surface of a predetermined support (the substrate film 2 in the present embodiment), and a curing step in which resin in the coated solution is cured.

[0096]

[Preparation step]

In the preparation step, a solution containing a solvent, resin composition to make up an anti-glare layer, and microparticles is prepared. At least any of alcohols (isopropyl alcohol, methanol, ethanol, etc.), ketones (methyl ethyl ketone (MEK), methyl isobutyl ketone (MIBK), cyclohexanone, etc.), esters (methyl acetate, ethyl acetate, butyl acetate, etc.), halogenated hydrocarbons, and aromatic hydrocarbons (toluene, xylene, etc.) can be presented as an example of solvents. Furthermore, a publicly known leveling agent may be added to the solution. For example, it is possible to give good abrasion resistance to an anti-glare layer by using a fluorine or silicone leveling agent.

[0097]

[Coating/curing steps]

In the coating step, a solution prepared in the preparation step is cast or coated onto a surface of a support (here, for example, the substrate film 2) by the same method as in the first embodiment. The solvent is removed from the solution cast or coated onto the surface of the support by evaporating it through drying.

[0098]

When the matrix resin is a light curing resin, a curing process, for example, by ultraviolet light or electron beam is performed after the coating step. Light from various mercury lamps, ultraviolet carbon-arc lamps, black lights, and metal halide lamps can be presented as examples of ultraviolet light sources. In addition, a wavelength region ranging from 190 nm or more to 380 nm or less can be presented as an example of a wavelength region of ultraviolet light.

[0099]

Moreover, publicly known electron beam accelerators can be presented as examples of electron beam sources. Specifically, a variety of electron beam accelerators, such as

Van de Graaff, Cockcroft-Walton, resonance transformer, insulated core transformer, linear, dynamitron, and radio frequency accelerators, can be presented as examples.

[0100]

The positions of microparticles in a matrix resin contained in a solution are fixed as a result of curing of the matrix resin. This causes dispersion of a plurality of the microparticles in the matrix resin, and an anti-glare layer with a structure in which asperities are formed on the surface by the aggregation of the microparticles is formed.

[0101]

According to the anti-glare film of the second embodiment, it is possible to suppress sparkle of the display 16a while ensuring a good anti-glare property and to prevent coloring of the anti-glare film by setting refractive index difference between a matrix resin and microparticles to a value within a predetermined range and by dispersing a plurality of microparticles in the matrix resin.

[0102]

In addition, as a ratio G2/G1 of the anti-glare layer is set to a value ranging from 0.07 or more to 0.20 or less, it is possible to successfully manufacture an anti-glare film having an anti-glare layer with a structure in which a plurality of microparticles are dispersed in a matrix resin.

[0103]

(Third embodiment)

An anti-glare layer 33 of the anti-glare film according to the third embodiment has a structure in which an asperity shape is formed on a surface opposite to the substrate film side. The anti-glare layer 33 comprises a resin layer. This resin layer comprises, for example, materials similar to those of the matrix resin of the second embodiment.

[0104]

Specifically, the anti-glare film according to the third embodiment is manufactured by forming a coating layer containing a curable resin on a substrate film and shaping a surface of this coating layer into an asperity shape and then curing the coating layer. FIG. 2 is a diagram illustrating a process of manufacturing the anti-glare film according to the third embodiment. In the example illustrated in FIG. 2, an ultraviolet curable resin is used as a curable resin.

[0105]

As illustrated in FIG. 2, in this manufacturing process, a substrate film 20a is unrolled from an unrolling roll that is not illustrated in the figure and is conveyed in a predetermined direction. The downstream end in the conveyance direction of the substrate film 20a is inserted into a nip point N1 between a pair of rolls 21 and 22.

[0106]

An ultraviolet curable resin precursor is attached to the circumferential surface of the roll 22 from the circumferential surface of the roll 23 that is pivotally supported adjacent to the roll 22. When the substrate film 20a passes through the nip point N1, this ultraviolet curable resin precursor is coated onto a surface of the substrate film 20a.

[0107]

The layer of the ultraviolet curable resin precursor coated onto the substrate film 20a (hereinafter referred to as the "coating layer") is pressed together with the substrate film 20a at the nip point between the rolls 21 and 24. The roll 24 is a roll-shaped mold (embossing roll) having fine asperities formed on the circumferential surface and transfers an asperity shape to the surface of the coating layer when the film passes through the nip point N2 between the rolls 21 and 24.

[0108]

The coating layer having the asperity shape transferred to the surface by the roll 24 is cured by ultraviolet light irradiated from an ultraviolet lamp 26 that is provided below the rolls 21 and 24. Thereby, the anti-glare layer 33 is formed. The anti-glare film 33 manufactured in this manner is released from the roll 24 by a roll 25, which is pivotally supported adjacent to the roll 24, and is conveyed in a predetermined direction.

[0109]

Here, the asperities on the surface of the roll 24 are formed by striking blast particles having a predetermined particle diameter by a blasting method. It is possible to adjust the asperity shape formed on the coating layer of the anti-glare film 33 by adjusting the blast particle diameter.

[0110]

A PET (polyethylene terephthalate) film, TAC (triacetyl cellulose) film, COP (cycloolefin polymer) film, acrylic resin film, and polycarbonate resin film can be preferably used for the substrate film 20a.

[0111]

In this manner, the process of producing an anti-glare film according to the third embodiment has step (a) in which a curable resin precursor is coated onto a substrate film, step (b) in which a roll-shaped mold having an asperity shape on the surface is produced by striking blast particles, step (c) in which the asperity shape is transferred, by the use of the roll-shaped mold, to the surface of the curable resin precursor which was coated onto the substrate film, and step (d) in which an anti-glare layer having the asperity shape on the surface is formed by curing the curable resin precursor to which the asperity shape was transferred.

[0112]

The average particle diameter of blast particles used in step (b) can be appropriately set, but for example, it can be set to a value ranging from 10 μm or more to 50 μm or less. The average particle diameter of the blast particles is more preferably a value ranging from 20 μm or more to 45 μm or less and is further preferably a value ranging from 30 μm or more to 40 μm or less. Thereby, the anti-glare layer 33 having an asperity shape formed on the surface can be obtained.

[0113]

Incidentally, a mold used in the third embodiment may not necessarily be roll-shaped. For example, a plate-shaped mold (embossing plate) can also be used. In addition, the anti-glare layer 33 may be formed by first forming a coating layer (resin layer) on either surface of a substrate film and then forming an asperity shape on the surface of this coating layer with a mold and curing the coating layer. In addition, in the aforementioned example, the coating layer was cured after forming an asperity shape on the surface of the coating layer, but formation of an asperity shape and curing of the coating layer may be concurrently performed.

[0114]

For example, metal, plastic, and wood can be presented as examples of materials for a mold. A coating may be provided on a surface where a mold is in contact with a coating layer in order to improve durability (abrasion resistance) of the mold. For example, metal, silica, alumina, and glass can be presented as examples of materials for blast particles. The blast particles can be, for example, struck against a surface of a mold by pressure of gas or liquid. In addition, if the curable resin precursor is an electron beam curable type, an electron beam source, such as electron beam accelerator, can be used instead of the ultraviolet lamp 26. If the curable resin precursor is thermosetting, a heat source, such as a heater, can be used instead of the ultraviolet lamp 26.

[0115]

In the anti-glare film of the third embodiment, it is not necessary to disperse microparticles in the anti-glare layer 33. Therefore, light incident on the anti-glare film is scattered at a wide angle due to refractive index difference between the matrix resin and the microparticles in the anti-glare layer, and thereby, it is possible to successfully prevent coloring of the anti-glare film.

[0118]

(Sparkle testing equipment)

… The sparkle testing equipment 10 is a device for evaluating sparkle of the display 16a in the display device 16 where a film, such as an anti-glare film, is mounted on the

surface … "Film sparkle testing equipment" made by Komatsu NTC Ltd. can be cited as the sparkle testing equipment 10.

[0124]

An image processing device 17 performs data processing of image data captured by the imaging device 12. Specifically, the image processing device 17 calculates the standard deviation of the luminance of the display 16a from image data captured by the imaging device 12.

[0128]

Next, an adjustment step is performed to adjust the pixel size of the display 16a mounted with a film on which image is captured per unit pixel of the imaging element of the imaging device 12. In the adjustment step, the relative distance between the imaging device 12 and the display 16a mounted with the film is adjusted according to the number of effective pixels of the imaging element of the imaging device 12 to the extent that, in the image captured by the imaging device 12, there is no emission line due to pixels, or even with some emission lines due to pixels, they do not affect the evaluation of sparkle of the display 16a.

[0129]

Incidentally, it is preferable that relative distance between the imaging device 12 and the display device 16 is set in consideration of the mode of use of the display device 16 (for example, relative distance between a user's eyes and the surface of the display 16a).

[0130]

After performance of the adjustment step, a setting step is performed to set a measurement area for evaluating sparkle of the display 16a mounted with the film. In the setting step, the measurement area is appropriately set according to the size, etc. of the display 16a.

[0131]

After performance of the adjustment step, an imaging step is performed to capture an image of the measurement area of the display 16a mounted with the film by means of the imaging device 12. At this time, for example, at least either the exposure time of the imaging device 12 or the luminance of all pixels of the display 16a is adjusted so that image data can be obtained as a gray scale image with an 8-bit gradation display and an average luminance of 170 gradations. The image data captured in the imaging step is input into the image processing device 17.

[0132]

After the imaging step, the image processing device 17 performs a calculation step to determine luminance variation in the measurement area of the display 16a mounted

with the film by using image data. In this calculation step, luminance variation is converted into a numerical value as a standard deviation of luminance distribution.

[0133]

Here, the larger the luminance variation of the display 16a mounted with a film is, the larger the sparkle of the display 16a mounted with a film. Based on this, it can be quantitatively evaluated that the smaller the value of the standard deviation of luminance distribution is, the smaller the sparkle of the display 16a. In addition, in the adjustment step, adjustment is made to the extent that emission lines on the display 16a mounted with a film do not affect the evaluation of sparkle of the display 16a. Therefore, it is possible to suppress unevenness of luminance caused by emission lines and accurately evaluate sparkle of the display 16a.

[0134]

Through the steps mentioned above, it is possible to determine the standard deviation of the luminance distribution of the display 16a where a film is mounted on the surface, and to evaluate sparkle of the display 16a based on the value of the standard variation.

[0138]

[Raw materials]

The following materials were used as raw materials for the working examples and comparative examples.

Acrylic copolymer A having a polymerizable group: "Cyclomer-P" made by Daicel-Allnex Ltd.; refractive index: 1.51

Cellulose acetate propionate: "CAP-482-20" made by Eastman; acetylation degree = 2.5%; propionyl degree = 46%; number average molecular weight converted to polystyrene: 75,000; and refractive index: 1.49

Silicone acrylate: "EB1360" made by Daicel-Allnex Ltd.; refractive index: 1.52

Urethane acrylate: "UA-53H" made by Shin-Nakamura Chemical Co., Ltd.

Dipentaerythritol hexaacrylate: "DPHA" made by Daicel-Allnex Ltd.: refractive index: 1.52

Pentaerythritol tetraacrylate: "PETRA" made by Daicel-Allnex Ltd.: refractive index: 1.52

Nano-silica-containing acrylic ultraviolet curable compound A: "UVHC-7800" made by Momentive Performance Materials Japan (LLC)

Silica (refractive index: 1.46)-containing acrylic ultraviolet curable compound: "Z-753-11R" made by Aica Kogyo Company, Limited; refractive index: 1.52

Acrylic hard coat composition A: "FA-3155 Clear" made by Nippon Kako Toryo

Co., Ltd.; containing acrylic microparticles (refractive index: 1.50) and matrix resin (refractive index: 1.46)

Acrylic hard coat composition B: "FA-3155M" made by Nippon Kako Toryo Co., Ltd.; refractive index: 1.46

Fluorine compound A having a polymerizable group: "KY-1203" made by Shin-Etsu Chemical Co., Ltd.

Fluorine compound B having a polymerizable group: "Ftergent 602A" made by Neos Company Limited

Zirconia microparticle dispersion (refractive index: about 2.0): "Lioduras TYZ" made by Toyo Ink Co., Ltd.

Photoinitiator A: "Irgacure 184" made by BASF Japan Ltd.

Photoinitiator B: "Irgacure 907" made by BASF Japan Ltd.

Polyethylene terephthalate (PET) film: "Diafoil" made by Mitsubishi Plastics, Inc.

Cellulose triacetate (TAC) film: "Fujitack TG60UL" made by FUJIFILM Corporation

[0152]

[Working Example 5]

A solution was prepared by mixing 25 parts by mass of acrylic hard coat composition A, 25 parts by mass of silica-containing acrylic ultraviolet curable compound, and 50 parts by mass of 1-butanol. An about 7 μm-thick coating layer was formed by first casting this solution on a PET film (substrate film 2) by means of a wire bar (#16) and then leaving it in an 80°C oven for one minute to evaporate the solvent. After that, the anti-glare layer 3 was formed through ultraviolet curing treatment by irradiating ultraviolet light to the coating layer for about 5 seconds by means of an ultraviolet lamp, and thereby, the anti-glare film of Working Example 5 was obtained.

[0178]

Next, the anti-glare films of Working Examples 1 to 5 and Comparative Examples 1 to 11 were measured and evaluated with regard to the following items. The adhesive layers were omitted when measuring haze, all light transmission, transmission image clarity, and 60-degree gloss.

[0179]

[Haze and all light transmission]

Haze and all light transmission were measured by using a haze meter (NDH-5000W made by Nippon Denshoku Industries Co., Ltd.) in conformity to JIS K7136. Haze was measured by placing the anti-glare films in a manner that the surfaces of the anti-glare layers having an asperity structure are located on the side of an optical receiver.

[0180]

[Transmission image clarity]

Transmission image clarity was measured by using a mapping measuring instrument (ICM-1T made by Suga Test Instruments Co., Ltd.) in conformity to JIS K7105, while placing the anti-glare films in a manner that the film-forming direction of the anti-glare films and the direction of the teeth of an optical comb are parallel to each other. The optical comb width was set to 0.5 mm.

[0181]

[60-degree gloss]

Gloss was measured at 60 degrees by using a gloss meter (IG-320 made by Horiba, Ltd.) in conformity to JIS K7105.

[0182]

[Standard deviation of luminance distribution of a display (sparkle value)]

A smartphone ("Galaxy S4" made by Samsung Electronics Co., Ltd.) was used as a display device 16, and the anti-glare film of each sample was attached to the surface of the display 16a of the display device 16 using an adhesive layer (optical glue). The standard deviation of the luminance distribution of the display 16a (sparkle σ: sparkle value) was measured through the anti-glare film of each sample by using sparkle testing equipment 10 made by Komatsu NTC Ltd. In this measurement, at least either the exposure time of the imaging device 12 or the luminance of all pixels of the display 16a was adjusted so that image data can be obtained as a gray scale image with an 8-bit gradation display and an average luminance of 170 gradations.

Measurement results are shown in Tables 1 and 2.

[0183]

[Table 1]

| | Working Example 1 | Working Example 2 | Working Example 3 | Working Example 4 | Working Example 5 |
|---|---|---|---|---|---|
| Haze (%) | 79.5 | 67.8 | 93.0 | 76.8 | 55.5 |
| All light transmission (%) | 94.0 | 94.5 | 89.0 | 93.9 | 90.8 |
| Transmission image clarity (%) | 8.4 | 24.7 | 24.2 | 40 | 55 |
| 60-degree gloss (%) | 3 | 8 | 0.9 | 9 | 30 |
| Sparkle σ (standard deviation of luminance distribution) | 4.5 | 6.0 | 4.2 | 5.0 | 5.5 |

[0184]

[Table 2]

| | Comparative Example 1 | Comparative Example 2 | Comparative Example 3 | Comparative Example 4 | Comparative Example 5 | Comparative Example 6 | Comparative Example 7 | Comparative Example 8 | Comparative Example 9 | Comparative Example 10 | Comparative Example 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Haze | 78.3 | 8.0 | 17.0 | 7 | 17 | 7.6 | 31.2 | 36.7 | 48.7 | 48.6 | 36.9 |
| All light transmission (%) | 94.5 | 91 | 91 | 92 | 94 | 91.7 | 92.4 | 92.2 | 92.5 | 92.3 | 91.6 |
| Transmission image clarity (%) | 84 | 83 | 93 | 91 | 80 | 67.4 | 29.1 | 36.7 | 27 | 63.5 | 81.4 |
| 60-degree gloss (%) | 92 | 55 | 74 | 71 | 33 | 63.7 | 50 | 52 | 65 | 19.5 | 36 |
| Sparkle σ(standard deviation of luminance distribution) | 4.2 | 7.21 | 5.2 | 7.2 | 8.7 | 15.6 | 10.9 | 9.3 | 7.7 | 6.6 | 7.3 |

[0185]

As shown in Table 1, in the anti-glare films 1 of Working Examples 1 to 5, transmission image clarity at an optical comb width of 0.5 mm is set to a value ranging from 3% or more to 40% or less, and the haze value of the anti-glare layer 3 is set to a value ranging from 55.5% or more to 93.0% or less. In addition, in the anti-glare films of Working Examples 1 to 5, sparkle value (sparkle σ) of the display 16a is suppressed to a value ranging from 4.2 or more to 6.0 or less. That is, it was found that in the anti-glare films 1 of the Working Examples 1 to 5, a good anti-glare property can be obtained while suppressing the sparkle value of the display.

[0186]

A possible reason for this result is as follows: In the anti-glare layers 3 of Working Examples 1 to 4, phase separation occurred between acrylic copolymer A and cellulose acetate propionate, and the phase separation structure was emphasized by nano-silica-containing acrylic ultraviolet curable compound A and urethane acrylate; thus, it is considered that the surface of the anti-glare layer 3 could be formed into a very steep structure or a structure with a height difference.

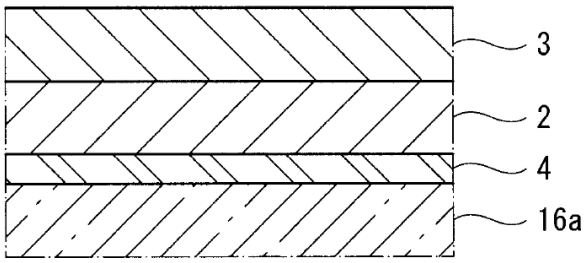
[0187]

That is, it is considered that nano-silica-containing acrylic ultraviolet curable compound A and urethane acrylate have a high degree of affinity for acrylic copolymer A and produced repulsive interaction with cellulose acetate propionate, which led to emphasize the phase separation structure of the anti-glare layers 3 of Working Examples 1 to 4.

[0188]

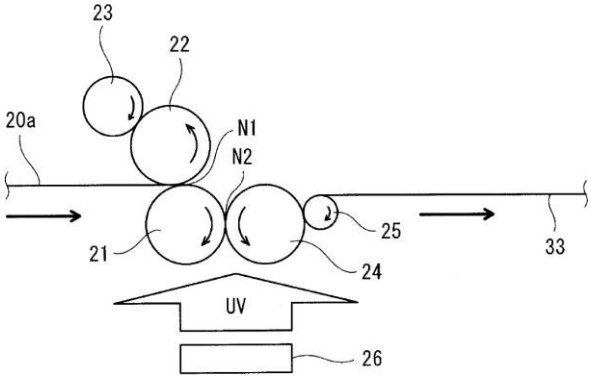
In addition, it is considered that, in the anti-glare layer 3 of Working Example 5, addition of a huge quantity of butanol, which is a solvent with a low affinity for silica particles in a silica-containing acrylic ultraviolet curable compound, caused intense aggregation of silica particles and that thereby, the surface of the anti-glare layer 3 could be formed into a very steep structure or a structure with a height difference. That is, it is considered that an asperity structure formed on the surface of the anti-glare layer 3 was emphasized to the extent that is unlikely in the case of using a solvent with a high affinity due to repulsive interaction with butanol caused by silica particles. Furthermore, in the anti-glare layer 3 of Working Example 5, optical performance could be adjusted within a range shown in Table 1 by having acrylic ultraviolet curable resin and acrylic hard coat composition A coexist.

1

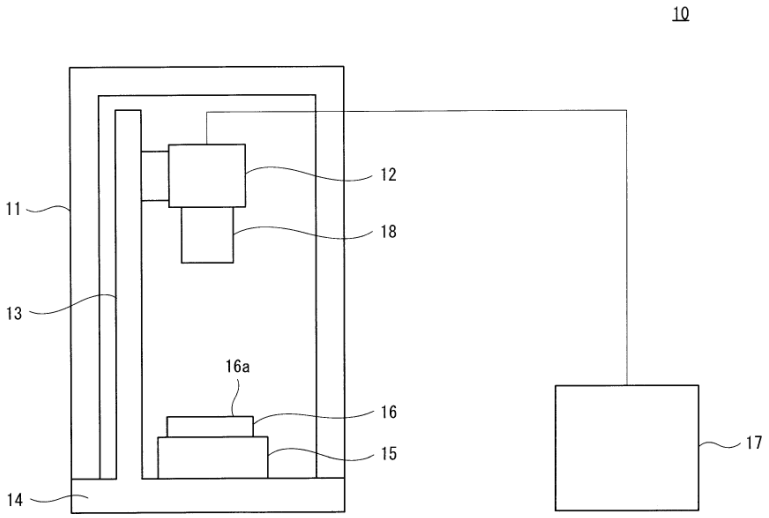



[FIG. 1]

[FIG. 2]



[FIG. 3]



Attachment 3 Reason I for the Decision

Patented Invention 1 specifies an anti-glare layer including a plurality of microparticles of which an average particle diameter ranges from 0.5 μm or more to 5.0 μm or less, wherein a distributed structure of asperities is formed on a surface of the anti-glare layer by the aggregation of the plurality of microparticles that are dispersed, by the numerical ranges of the Parameters, specifically, "haze," the "Standard Deviation," and "transmission image clarity at an optical comb width of 0.5 mm."

With regard to the value of the Standard Deviation, it cannot be considered possible to unambiguously determine what value is specifically set particularly for an object distance and F-number, among the measurement conditions, even taking into consideration the statements in the Description and common general technical knowledge as of the filing of the Patent Application. The values of the Parameters, including the Standard Deviation, are also not unambiguously determined.

As long as those values are not unambiguously determined, a person ordinarily skilled in the art cannot understand whether a specific anti-glare film falls within the technical scope of the Patented Invention. Therefore, Patented Invention 1 is unclear to the extent that it causes unanticipated disadvantage to a third party. The same also applies to Patented Inventions 4 and 5.

Attachment 4 Reason II for the Decision

Even taking into consideration common general technical knowledge, it is difficult for a person ordinarily skilled in the art to understand how to manufacture various anti-glare films that meet the following conditions based on the general statements regarding the second embodiment and the statements regarding Working Example 5 and Comparative Examples 1 and 4 to 9: comprising an anti-glare layer including a plurality of microparticles of which an average particle diameter ranges from 0.5 μm or more to 5.0 μm or less, wherein a distributed structure of asperities is formed on a surface of the anti-glare layer by the aggregation of the plurality of microparticles that are dispersed; and falling in the numerical ranges of all the Three Conditions other than the specific three conditions of Working Example 5. For example, it is considered difficult to manufacture [i] an anti-glare film comprising an anti-glare layer which shows an extremely high haze value of 99%, transmission image clarity at an optical comb width of 0.5 mm of 60%, and a standard deviation ranging from 0 to 6, and includes a plurality of microparticles of which an average particle diameter ranges from 0.5 μm or more to 5.0 μm or less, wherein a distributed structure of asperities is formed on a surface of the anti-glare layer by the aggregation of the plurality of microparticles that are dispersed and [ii] an anti-glare film comprising an anti-glare layer which shows a haze value of 50%, an extremely low transmission image clarity at an optical comb width of 0.5 mm of 0%, and a standard deviation ranging from 0 to 6, and includes a plurality of microparticles of which an average particle diameter ranges from 0.5 μm or more to 5.0 μm or less, wherein a distributed structure of asperities is formed on a surface of the anti-glare layer by the aggregation of the plurality of microparticles that are dispersed. It is thus difficult for a person ordinarily skilled in the art to understand how to manufacture optical anti-glare films like the films mentioned in [i] and [ii] above without disclosure of sufficient specific examples, and it is clear that a person ordinarily skilled in the art never recognizes that the aforementioned anti-glare films can be obtained only by adjusting the type and content of microparticles to be added or that considerable trial and error are required to obtain those anti-glare films.

Even from the perspective of the condition of standard deviation, it cannot be said that it is clear how a person ordinarily skilled in the art can manufacture the anti-glare film of Patented Invention 1. Even based on the statements regarding the second embodiment and Working Example 5, it is impossible to understand the degree of aggregation of microparticles in the anti-glare film according to Patented Invention 1, the degree of steepness and number density of asperities formed by moderate aggregation, refractive index difference between the microparticles and the matrix resin,

and ratio G2/G1 between the weight G1 of the matrix resin and the total weight G2 of the plurality of the microparticles, as well as "causal relationship" between the structure of an anti-glare layer and the Three Conditions. Therefore, a person ordinarily skilled in the art cannot understand what asperity structure and internal structure of an anti-glare layer is required to manufacture an anti-glare film that falls in the range of the Standard Deviation. Even if such asperity structure and internal structure are understood by subsequently analyzing the anti-glare films manufactured in the working examples and comparative examples, causal relationship between those structures and the Three Conditions are not clear. Consequently, it cannot be said that it is clear how a person ordinarily skilled in the art can manufacture the anti-glare film of Patented Invention 1. The same also applies to Patented Inventions 4 and 5.

Even supposing that the Patented Invention is not limited to the structure corresponding to the second embodiment, the statements in the Description cannot be considered to be clear and sufficient to enable a person ordinarily skilled in the art to work the Patented Invention, taking into consideration the fact that no working example corresponding to the third embodiment is disclosed.

Attachment 5 Reason III for the Decision

The problem to be solved by the Patented Invention is to "provide an anti-glare film that can suppress sparkle of a display while having a good anti-glare property and that has a high degree of design freedom in terms of transmission image clarity by quantitatively evaluating sparkle of a display and designing the anti-glare film based on the evaluation results." ([0008]).

However, it is difficult for a person ordinarily skilled in the art to understand how to manufacture an anti-glare film according to the second embodiment that meets the Three Conditions based on the statements in [0009] to [0011] and [0014] to [0016] of the Description relating to the means for solving the problem, the general statements regarding the second embodiment, the statements regarding Working Example 5, the statements regarding Working Examples 1 and 4 to 9, and common general technical knowledge as of the filing of the Application.

Therefore, it cannot be said that the content disclosed in the detailed explanation of the invention can be enlarged or generalized to the scope of the invention according to Claim 1 (scope covering all numerical ranges pertaining to the Three Conditions) even in light of common general technical knowledge as of the filing of the application. The same also applies to Claims 4 and 5.

In addition, granted that Invention 1 includes an embodiment other than the second embodiment in its technical scope, it cannot be said, for example, regarding part of the Invention corresponding to the third embodiment, that the content disclosed in the detailed explanation of the invention can be enlarged or generalized to the scope of the invention according to Claim 1. The same also applies to Claims 4 and 5.