Appeal Decision

Appeal No. 2019-17178

Appellant Schott AG

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The case of appeal against the Examiner's decision of refusal of Japanese Patent Application No. 2015-114059 entitled "Optical Element with High Scratch Resistance and Method for Producing Same" (the application published on December 21, 2015, Japanese Unexamined Patent Application Publication No. 2015-230486) has resulted in the following appeal decision:

Conclusion

The appeal of the case was groundless.

Reason

No. 1 Outline of the case

1. History of the procedures

Japanese Patent Application No. 2015-114059 (hereinafter, referred to as "the Application") is an application written in foreign language whose application date is June 4, 2015 (priority claim under the Paris Convention: June 6, 2014, Germany), and the history of the procedures is as follows:

Dated November 1, 2018 : Notice of Reasons for Refusal
Dated April 8, 2019 : Written Opinion
Dated April 8, 2019 : Written Amendment
Dated August 7, 2019 : Decision of Refusal (hereinafter, referred to as the "Examiner's decision")

Dated December 19, 2019 : Written Request for Trial

2. The Invention

The invention recited in Claim 1 of the Application (hereinafter, referred to the "Invention") is specified by the matters recited in Claim 1 of the scope of claims after the Amendment filed on April 8, 2019 as follows:

"An optical element (1) with high scratch resistance, comprising: a substrate (10) that is transparent in the visible spectral region; and a multi-layer antireflection coating (2) on the substrate (10), wherein the antireflection coating (2) comprises alternating layers: layer having a first refractive index and layer having a second, higher refractive index, wherein the layer having a higher refractive index contains nitride or oxynitride of silicon and at least one other element, and the layer having the first refractive index contains oxide of silicon and at least one other element, and the mole fraction of silicon in the layer having the first refractive index exceeds the mole fraction of the other element, and wherein the uppermost layer of the multi-layer anti-reflection coating (2) is the layer having the first refractive index, and a layer (3) of organic fluorine chain molecules is disposed on the antireflection coating (2), the molecules are bonded at their end sides to the surface of the optical element, wherein the layer (3) of the organic fluorine chain molecules is a monomolecular layer."

3. Reason for Examiner's decision

The reason for refusal stated in the Examiner's decision is outlined as follows: The Invention should not be granted a patent under the provision of Article 29(2) of the Patent Act, since it could have easily been made by persons who have common knowledge in the technical field to which the invention pertains (hereinafter, referred to as "a person skilled in the art"), on the basis of invention(s) disclosed in publication(s) distributed in Japan or foreign countries prior to the priority date of the Application.

Cited Document 1: Japanese Unexamined Patent Application Publication No. 2012-171866

Cited Document 2: National Publication of International Patent Application No. 2011-510904

(Note by the body: Cited Document 1 is a main cited document and Cited Document 2 is a sub cited document).

No. 2 Judgment by the body

1 Descriptions in Cited Documents, and Cited Inventions

(1) Descriptions in Cited Document 1

Cited Document 1 (Japanese Unexamined Patent Application Publication No. 2012-171866), cited in the reasons for refusal in the Examiner's decision, is a publication distributed prior to the priority date for the Invention, and includes the following descriptions. Note that underlines are provided by the body, indicating the portions used for recognition of Cited Invention or for judgement.

A "[Technical Field]

[0001]

The invention generally relates to antireflection coatings or to substrates provided with antireflection coatings. In particular, the invention relates to antireflection coatings with high resistance to scratching and other abrasions.

[Background art]

[0002]

Antireflection coatings are widely used today for improving the transmission of transparent substrates such as sight-glass windows, or for diminishing annoying reflections on the substrate.

... Omitted ...

[0005]

From U.S. patent publication No. 2005/0074591 A1, a transparent substrate with an abrasion-resistant antireflection coating is known. The antireflection coating is composed of four layers with alternating high and low refractive indices. The low refractive index layers comprise silicon oxide (SiO_2), and the high refractive index layers comprise silicon nitride (Si_3N_4) or tin oxide (SnO_2).

[0006]

The top layer of the layer stack (Schichtstapel) is formed by a low refractive index layer. A disadvantage thereof is that the low refractive index silicon oxide layer is very soft compared to the high refractive index materials, especially compared to Si_3N_4. So, it is just the top layer that still tends to wear quickly. "

B "[Problem to be solved by the invention]

[0008]

Therefore, an object of the invention is to further improve abrasion resistance of antireflection coatings.

... Omitted ...

[0033]

The layer system of the antireflection coating according to the invention may be

used everywhere, where antireflective coating systems are exposed to mechanical stress. Manufacturing may involve conventional sputtering techniques as well as the HiPIMS technique, for further enhanced mechanical stability. Possible applications include a use for sight-glass windows in the vehicle sector including aircrafts, for cooktops (Kochflaechen) or similar household equipment made of glass or glass ceramics, for applications in the consumer electronics sector, such as covers of electronic displays and touch screens, and also for watch glasses which may have a flat or slightly curved surface."

C "[Description of embodiments]

[0037]

The example of a product 1 with a coated substrate 3 as shown in FIG. 1 is based on an antireflection coating 5 comprising a total of four layers. Typically, the substrate 3 is pane- or plate-shaped, and the antireflection coating 5 is deposited on one side 31 of the substrate 3.

[0038]

In the antireflection coating 5 layers having a higher refractive index alternate with layers having a lower refractive index. Here, layers 52, 54 are composed of silicon oxide with a proportion of aluminum so that the ratio of the amounts of aluminum to silicon is greater than 0.05, preferably greater than 0.08, but with the amount of silicon predominating the amount of aluminum. Preferably, the ratio of the amounts of aluminum to silicon is about 0.075 to 0.125, more preferably about 0.1. Thus, these layers 52, 54 function as low refractive index layers, because they primarily include silicon oxide.

[0039]

Layers 51, 53, on the other hand, are layers having a higher refractive index and comprise silicon nitride, also with a proportion of aluminum. Preferably, the ratio of the amounts of aluminum to silicon is substantially the same in all layers.

[0040]

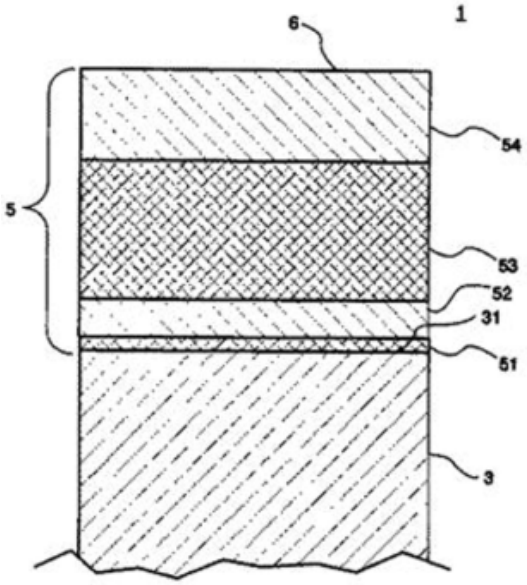
In order to obtain the highest possible mechanical stability, the initial layer is formed by the more mechanically stable component; i.e., silicon nitride or aluminum-doped silicon nitride as a thin layer, since it is this layer that determines the growth of the rest of the alternating layer system. Subsequently, a thin aluminum-doped SiO_2 layer is applied, followed by a thick aluminum-doped Si_3N_4 coating which provides resistance to the outside. A subsequent thinner aluminum-doped SiO_2 layer is deposited so that the desired antireflective effect is provided and at the same time the

rest of the system does not appear visually more conspicuous upon a possible removal of this layer.

[0041]

Such a layer structure with four layers has proved to be very stable and enables a decrease in the reflectance of a glass substrate such as a borosilicate glass to below 1%, in the visible spectral region. In addition, layer systems that include four layers can still be produced cost-efficiently."

D FIG. 1



(2) Cited Invention

In Cited Document 1, [0037] describes together with [FIG. 1] that "a product 1 with a coated substrate 3" on which "an antireflection coating 5" "is deposited." In addition, the above "antireflection coating 5" has a layer structure, which can be recognized from [0038] to [0040] and [FIG.1], and is provided "with high resistance to scratching and other abrasions", and "may be used for" "covers of electronic displays and touch screens" ([0001] and [0033]).

Then, the following invention is disclosed in Cited Document 1 (hereinafter referred to as "Cited Invention"). Note that the "SiO_2 layer" and "Si_3N_4 coating" are described as "silicon oxide layer" and "silicon nitride layer," respectively, and are described with reference numerals denoted in the diagram of [FIG. 1].

"A product 1 comprising a coated substrate 3 on which an antireflection coating 5 is deposited, wherein

in the antireflection coating 5, layers having a higher refractive index alternate with layers having a lower refractive index, and in order to obtain the highest possible mechanical stability, the initial layer is an aluminum-doped silicon nitride layer 51 as a thin layer, and subsequently a thin aluminum-doped silicon oxide layer 52 is applied, followed by a thick aluminum-doped silicon nitride layer 53 which provides resistance to the outside, and a subsequent thinner aluminum-doped silicon oxide layer 54 is deposited so that the desired antireflective effect is provided; wherein

the product 1 has high resistance to scratching and other abrasions and can be used for covers of electronic displays and touch screens."

(3) Descriptions in Cited Document 2

Cited Document 2 (National Publication of International Patent Application No. 2011-510904) is a publication distributed prior to the priority date for the Invention and includes the following descriptions. Note that underlines are provided by the body, indicating the portions used for the recognition of Cited Invention or for judgement.

A "[Technical field]

[0002]

The invention relates to an alkali aluminosilicate glass. More particularly, the invention relates to a high strength, down-drawn alkali aluminosilicate glass article for use a protective cover plate. Even more particularly, the invention relates to a high strength, down-drawn alkali aluminosilicate amphiphobic glass for use as a cover plate in mobile electronic devices.

[Background art]

[0003]

Mobile electronic devices, such as personal data assistants, mobile or cellular telephones, watches, laptop computers and notebooks, and the like, often incorporate a cover plate. At least a portion of the cover plate is transparent, so as to allow the user to view a display. For some applications, the cover plate is sensitive to the user's touch. Due to frequent contact, such cover plates must have high strength and be scratch resistant.

... Omitted ...

[0006]

However, there are several critical issues for this alkali aluminosilicate glass (and all competitive cover glass articles) regarding their use in applications such as cover glasses for media/electronic devices. One critical issue is the inability to prevent the transference of and difficulty in removing oils and greases transferred to the surface by

fingerprints. The difficulty in removing the oil and greases is particularly important in applications such as touch screens, where fingerprints are repeatedly applied to the cover glass surface when the device is in-use. The transferred fingerprints, as well as smudges that may arise from other sources, appear on the screen, particularly when a dark or black background appears, for example, when the device is not in use. This leads to concerns about optical interference by the fingerprints/smudges which can impact the picture quality (degrades its appearance) and create negative perceptions of the device in the customer. Included in the fingerprint oils and greases are dirt, cosmetics, and lotions.

[0007]

A second critical issue is glare that can arise from reflections on the display surface. Glare arises from the reflection of light that is not normal to the field of the operator's view. The presence of glare causes the user to tilt the device and continually adjust the screen angle for better viewing. Having to constantly change their angle of viewing is irksome to the user and creates dissatisfaction. Furthermore, any display surface that includes anti-reflection ("AR") properties would make fingerprints more evident, as tilting of non-AR coated surfaces negates out fingerprints with glare. Thus, the need for an "anti-fingerprint" or "easy-to-clean" coating is of higher importance for anti-reflective surfaces."

B "[Means for solving the problem]

[0010]

The invention in one embodiment relates to a product consisting of a transparent, damage resistant, chemically toughened protective cover glass (also called a cover plate or cover screen) that has an exterior coating having fluorine termination groups that impart a degree of hydrophobicity and oleophobicity (i.e., amphiphobicity) to the cover glass such that wetting of the glass surface by water and oils is minimized (amphiphobic substances thus lack an affinity for both oils and water). The coated product has scratch, abrasion, and other damage resistance imparted by the compressive surface DOL of the glass, and additionally has anti-fingerprint, anti-smudge characteristics imparted by the fluorine termination groups that minimize the transport of oils from finger to the glass (fingerprints) and further allows for ease of removal of the oils/fingerprints by means of wiping with a cloth.

... Omitted ...

[0011]

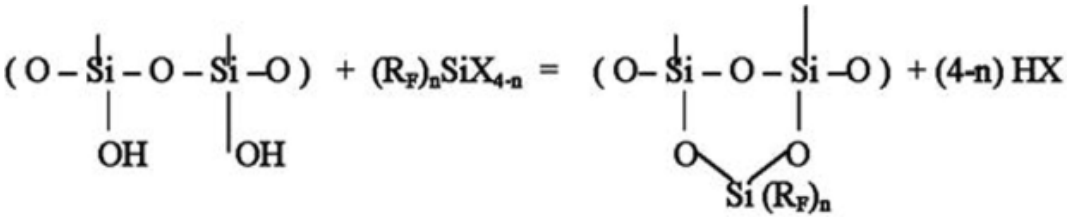
The present invention provides an alkali aluminosilicate glass article having a

thickness of at least approximately 0.3 mm, a surface compressive stress of at least about 200 MPa, a surface compressive layer having a depth of at between approximately 20-70 μm, and having an amphiphobic adsorbed fluorine-based surface layer.

[0012]

The adsorbed fluorine-based surface layer is formed by exchanging the hydrogen of glass terminal OH groups with a fluorine-based moiety, for example a fluorine containing monomer, to form a glass having terminal fluorinated groups. For example, without limitation, the exchange can be carried out according to the reaction:

[Chemical 1]



[0013]

where R_F is a C_1-C_{22} alkyl perfluorocarbon or C_1-C_{22} alkyl perfluoropolyether, preferably C_1-C_{10} alkyl perfluorocarbon and more preferably a C_1-C_{10} alkyl perfluoropolyether; n is an integer in the range of 1-3; and X is a hydrolysable group that can be exchanged with the glass terminal OH groups. Preferably, X is a halogen other than fluorine or an alkoxy group (-OR) where R is a linear or branched hydrocarbon of 1-6 carbon atoms, for example without limitation, $-CH_3$, $-C_2H_5$, $-CH(CH_3)_2$ hydrocarbons. In some embodiments n = 2 or 3, preferably 3. The preferred halogen is chlorine. A preferred alkoxysilane is a trimethoxy silane, $R_FSi(OMe)_3$. Additional perfluorocarbon moieties that can be used in practicing the invention include $(R_F)_3SiCl$, R_F-C(O)-Cl, R_F-C(O)-NH_2, and other perfluorocarbon moieties having a terminal group exchangeable with a glass hydroxyl (OH) group. As used herein the terms "perfluorocarbon," "fluorocarbon," and perfluoropolyether mean a compound having hydrocarbon groups as described herein in which substantially all of the C-H bonds have been converted into C-F bonds.

[0014]

In another embodiment the adsorbed fluorine-based surface layer is comprised of an assembled monolayer of a fluorine-terminating molecular chain. In a still further embodiment the adsorbed fluorine-based surface layer is comprised of a thin, fluoro-polymeric coating. In a final embodiment the adsorbed fluorine-based surface layer is

comprised of silica soot particles having pendent fluorocarbon groups attached to the soot particles.

[0015]

The invention, in a further embodiment, relates to a product consisting of a transparent, damage resistant, chemically toughened protective cover glass that has an anti-reflective layer, for example, without limitation, an anti-reflective SiO_2 or F-SiO_2 (fluorine doped silica or fused silica) layer, and further has an exterior coating having fluorine termination groups that impart a degree of hydrophobicity and oleophobicity (i.e., amphiphobicity) to the cover glass such that wetting of the glass surface by water and oils is minimized. Abrasion resistance is imparted to the anti-reflective article by applying a final coating of an amphiphobic material as described herein. The amphiphobic material coated product has scratch, abrasion, and otherwise damage resistance imparted by the compressive surface DOL of the glass, and additionally has anti-fingerprint, anti-smudge characteristics imparted by the fluorine termination groups that minimize the transport of oils and sweat from finger to the glass (fingerprints) and further allows for ease of removal of the oils/fingerprints by means of wiping with a cloth. The AR coating can have a lower abrasion/scratch resistance than the underlying chemically strengthened base glass. Coating the AR-coated chemically strengthened glass with an amphiphobic material imparts abrasion resistant properties to the AR-coated glass and thus enables the AR-coated glass to regain the performance of the base glass while further giving the AR-coated glass anti-fingerprint, anti-smudge characteristics. In preferred embodiments the exterior (outermost) layer of the AR coating is a SiO_2-containing layer; for example, F-SiO_2, fused silica or silica."

C "[Description of embodiments]

[0019]

... Omitted ...

[0020]

Referring now to Figure 1, it will be understood that the illustration is for the purpose of describing a particular embodiment of the invention and is not intended to limit the invention thereto.

[0021]

In general, what is disclosed is a transparent, protective cover glass article that has enhanced damage resistance and amphiphobic properties, thus providing a scratch resistance surface that exhibits minimal fingerprint adherence and ease of fingerprint removal.

[0022]

Figure 1 specifically illustrates an alkali aluminosilicate glass article 100 having a thickness of at least 0.3 mm, surface compressive stress layers 104 having a surface compressive stress of at least 200 MPa, and a middle glass layer 106. The surface compressive layer 104 has a thickness in the range of 20-70μm; typically achieved through an ion-exchange process as described below. In addition to the surface compressive layer 104 and the non ion-exchanged middle layer glass portion 106, the article 100 has an amphiphobic adsorbed fluorine-based surface layer 102.

[0023]

The adsorbed fluorine-based surface layer or coating can be achieved in any number of ways and can be selected from the group consisting of: (1) -OH group terminated active surface sites exchanged with a fluorine-based monomer; (2) an assembled monolayer of a fluorine-terminating molecular chain; (3) a thin, fluoro-polymeric coating; (4) silica soot particles which have been previously derived with or treated to have fluorine termination groups. The coating can be applied to the surface by dipping, vapor coating, spraying, application with a roller, or other suitable method. Dipping or spraying is preferred. After the coating has been applied it is "cured" at a temperature in the range of 25-150°C, preferably 40-100°C, a time in the range of 1-4 hours, in an atmosphere containing 40-95% moisture.

... Omitted ...

[0060]

The chemically strengthened, anti-reflective, amphiphobic glass has the following advantages over present commercially available cover glasses.

[0061]

1. The anti-reflective coating applied to the base glass prior to treatment with a fluorine containing amphiphobic-imparting moiety acts to present optical interference due to reflection, thus eliminating glare. The anti-reflective coating is versatile and its performance includes controlling the angle of optical interference (or visibility) and thus provides an option for a "privacy" effect by means of structuring a multi-layer coating that enhances this effect.

[0062]

2. After the anti-reflective coated is treated with a fluorine-containing moiety the resulting surface is non-polar, minimizing hydrogen (that is, Van der Walls) bonding between foreign particles and oils and the treated glass surface. The resulting treated surface has a very low surface energy and a low coefficient of friction. The effect and performance of the placement of fluorine-containing moieties as the final "coating" is of

added benefit to anti-reflection coatings and surfaces, because the elimination of glare means that any noticeable fingerprints become the only source of optical interference, and these can be wiped away.

[0063]

3. Fingerprint removal is typically carried out under either wet or dry conditions by wiping the surface with a cloth. These cloths are often reused and contain dirt and particles that scratch the surface. The fluorinated surface enhances the ease of fingerprint removal while minimizing smudges and reducing the number and frequency of events that cause damage which in turn can lead to either immediate or pre-mature failure through fracturing of the glass.

[0064]

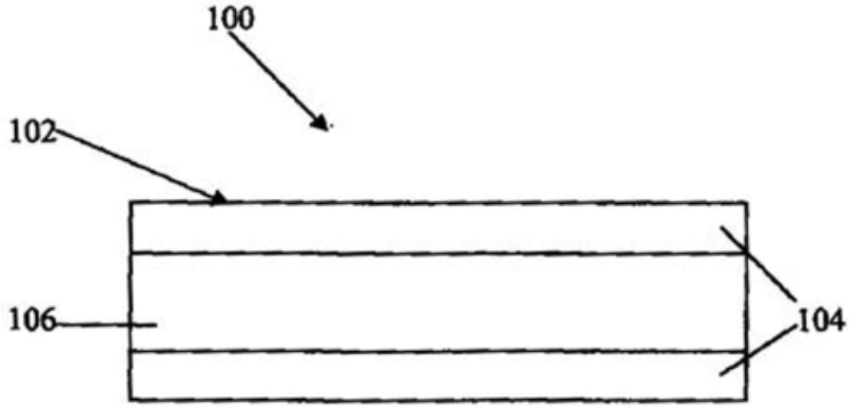
4. The scratch resistance of the glass is also improved. The high hardness of the chemically strengthened glass and its high compressive surface DOL (for example, 30-80 μm deep) work to both prevent damage and prevent failure from damage that might occur through repeated wiping. Scratch resistance was then measured using a glass article, one-half of which was coated with an amphiphobic coating and the other half uncoated. Scratching was performed as described above. Haze was then measured on both areas on both sides of the article, where haze is a measure of optical clarity in terms scattered light versus the sum of all scattered and transmitted light. The test results indicate that for the uncoated glass $\mu_K = 0.25$ and for the coated glass $\mu_K = 0.05$, thus signifying that there is an 80% reduction in kinetic friction due to the presence of the amphiphobic coating. The coefficient of kinetic friction μ_K was also measured. An 80% reduction in friction was found for the coated side versus the uncoated side.

... Omitted ...

[0071]

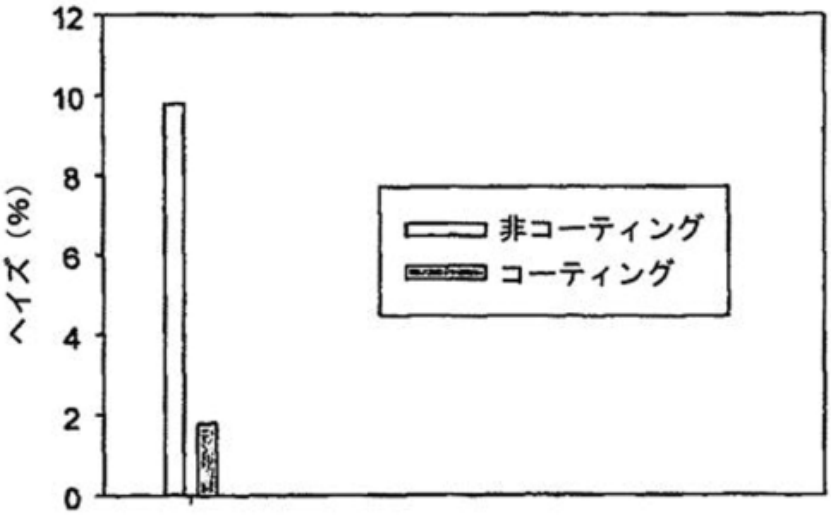
Figure 6 illustrates the haze (loss of optical clarity) generated by abrasion with 150 grit sandpaper using coated glass and non-coated glass. One half of a glass sample was coated with an amphiphobic coating and 50/50 cured (50/50= 50°C and 50% moisture for 2 hours and then rinsed to remove unbound coating) and the other half was uncoated. The sample was then abraded across both the coated and non-coated surfaces. The data indicate that the non-coated surface had - 9.8% haze and the coated surface had - 1.76% haze, respectively. Coating thus represents a 75% reduction in haze generated by scratching damage over the non-coated surface."

D Figure 1



(Note by the body: The tilt of the drawing has been corrected.)

E Figure 6



ヘイズ Haze
非コーティング Non-coated
コーティング Coated

2 Comparison and judgment

(1) Comparison

The comparison between the Invention and the Cited Invention results in the following:

A Optical element (1)

The "product 1" in the Cited Invention is one "comprising a coating substrate 3

on which an antireflection coating 5 is deposited," where "in the antireflection coating 5, layers having a higher refractive index alternate with layers having a lower refractive index," and which "has high resistance to scratching and other abrasions and can be used for covers of electronic displays and touch screens."

In view of the above "high resistance to scratching and other abrasions," the "product 1" in the Cited Invention is understood to be a member having high scratch resistance. In addition, in view of the configuration of "a coating substrate 3 on which the antireflection coating 5 is deposited," the "antireflection coating 5" in the Cited Invention is a multi-layered film formed on the "coating substrate 3." Furthermore, from the fact that it "can be used for covers of electronic displays and touch screen," it is obvious that the "coating substrate 3" of the Cited Invention is a transparent optical member in the visible spectral region.

Then, the "coating substrate 3," "antireflection coating 5," and "product 1" in the Cited Invention correspond to the "substrate (10)," "antireflection coating (2)," and "optical element (1)" of the Invention, respectively.

In addition, the "product 1" in the Cited Invention satisfies the following requirement for the "optical element (1)" of the Invention: the optical element "with high scratch resistance" and "comprising: a substrate (10) that is transparent in the visible spectral region; and a multi-layer antireflection coating (2) on the substrate (10)."

(Note by the body: The number of layers of the "antireflection coating 5" of the Cited Invention is four, however, the Invention also includes such an aspect of "antireflection coating (2)" in the scope of the invention ([0019], [0034], and [FIG.1]). Therefore, it can be said that the "antireflection coating 5" in the Cited Invention satisfies the requirement of "multi-layer" in the Invention.)

B Antireflection coating (2)

In the "antireflection coating 5" in the Cited Invention, "layers having a higher refractive index alternate with layers having a lower refractive index, and in order to obtain the highest possible mechanical stability, the initial layer is an aluminum-doped silicon nitride layer 51 as a thin layer, and subsequently, a thin aluminum-doped silicon oxide layer 52 is applied, followed by a thick aluminum-doped silicon nitride layer 53 which provides the resistance to the outside, and a subsequent thinner aluminum-doped silicon oxide layer 54 is deposited so that the desired antireflective effect is provided."

It is common technical knowledge that the "aluminum-doped silicon oxide layer" and "aluminum-doped silicon nitride layer" have different refractive indexes which can

be said as "first" one and "second" one, and that the latter refractive index is higher than the former. Similarly, it is also common technical knowledge that the "aluminum-doped silicon nitride layer" in the Cited Invention contains silicon and aluminum nitrides, and that the "aluminum-doped silicon oxide layer" in the Cited Invention contain silicon and aluminum oxides, wherein the mole fraction of silicon exceeds the mole fraction of aluminum.
(Note by the body: These matters can also be confirmed from the descriptions in [0038] and [0039] of Cited Document 1.)

In view of the above layer structure, the "antireflection coating 5" in the Cited Invention is composed of "aluminum-doped silicon oxide layers" and "aluminum-doped silicon nitride layers," which are alternately disposed. Further, the uppermost layer of the "antireflection coating 5" in the Cited Invention is an "aluminum-doped silicon oxide layer."

Then, the "aluminum-doped silicon oxide layer" and "aluminum-doped silicon nitride layer" in the Cited Invention correspond to the "layer having a first refractive index" and "layer having a second refractive index," respectively. Furthermore, the "antireflection coating 5" in the Cited Invention satisfies the requirement for the "antireflection coating (2)" in the Invention that "the antireflection coating (2) comprises alternating layers: layer having a first refractive index and layer having a second, higher refractive index, wherein the layer having a higher refractive index contains nitride or oxynitride of silicon and at least one other element, and the layer having the first refractive index contains oxide of silicon and at least one other element, and the mole fraction of silicon in the layer having the first refractive index exceeds the mole fraction of the other element, and wherein the uppermost layer of the multi-layer antireflection coating (2) is the layer having the first refractive index."

(2) Corresponding Feature and Different Feature

A Corresponding Feature

The Invention and the Cited Invention correspond to each other in the following configuration:
"An optical element (1) with high scratch resistance, comprising: a substrate (10) that is transparent in the visible spectral region; and a multi-layer antireflection coating (2) on the substrate (10), wherein the antireflection coating (2) comprises alternating layers: layer having a first refractive index and layer having a second, higher refractive index, wherein the layer having a higher refractive index contains nitride or oxynitride of silicon and at least one other element, and the layer having the first refractive index

contains oxide of silicon and at least one other element, and the mole fraction of silicon in the layer having the first refractive index exceeds the mole fraction of the other element, and wherein the uppermost layer of the multi-layer antireflection coating (2) is the layer having the first refractive index."

B Different Feature

The Invention and the Cited Invention differ from each other in the following point.

(Different Feature)

In the "optical element" of the Invention, "a layer (3) of organic fluorine chain molecules is disposed on the antireflection coating (2), the molecules are bonded at their end sides to the surface of the optical element, wherein the layer (3) of the organic fluorine chain molecules is a monomolecular layer." On the other hand, the Cited Invention does not include such a configuration.

(3) Judgment

The different feature is judged as below.

From the descriptions in [0003], [0006], [0007], [0010],[0014], [0015], [0022], [0023], [0060] to [0064], and [0071] of Cited Document 2, it can be recognized that [A] regarding a product consisting of a transparent, damage resistant, chemically toughened protective cover glass that has an anti-reflective layer and further has an exterior coating having fluorine termination groups that impart amphiphobicity to the cover glass, [B] coating the antireflection-coated chemically strengthened glass with an amphiphobic material imparts abrasion resistant properties to the antireflection-coated glass, and thus enables the antireflection-coated glass to regain the performance of the base glass while further giving the antireflection-coated glass anti-fingerprint, anti-smudge characteristics, and [C] an example of the fluorine-based surface layer or coating may be an assembled monolayer of a fluorine-terminating molecular chain (hereinafter, referred to as "the art described in Cited Document 2.")

Here, the "product 1" in the Cited Invention is said to have "high resistance to scratching and other abrasions and can be used for covers of electronic displays and touch screens."

Then, when a person skilled in the art uses the "product 1" of Cited Invention 1 as "covers of electronic displays and touch screens," it is within the ordinary creativity for a person skilled in the art to dispose "an assembled monolayer of a fluorine-terminating molecular chain" (Note by the body: it can be obtained by using fluorinated

alkyltrimethoxysilane, etc., to bond the fluorine-terminal molecular chain to the surface of the antireflection coating) on the surface of the "antireflection coating 5" in Cited Invention 1 to improve "high resistance to scratching and other abrasions."

(4) Appellant's allegation

In the written request for trial, based on [0060] to [0063] of the Description of the Application, the Appellant alleges that the effect of the Invention using the layer of the organic fluorine chain molecule with the antireflection coating is unpredictable and prominent compared to the effect of the case using the layer of the organic fluorine chain molecule without antireflection coating. [Table 1] of [0061] is as follows, and is a measurement result in the case where the "substrate (10)" of the Invention is tempered glass, such as borosilicate glass.

	曇り度の増加 層3 有り	曇り度の増加 層3 無し	曇り度の増加における改善
反射防止コーティング無し	0.04	0.07	43%
反射防止コーティング有り	0.06	0.3	80%

曇り度の増加　Haze Increase
層３　有り　With layer 3
層３　無し　Without layer3
曇り度の増加における改善　Improvement in the haze increase
反射防止コーティング無し　Without antireflection coating
反射防止コーティング有り　With antireflection coating

However, [0015] of Cited Document 2 describes as follows: "The AR coating can have a lower abrasion/scratch resistance than the underlying chemically strengthened base glass. Coating the AR-coated chemically strengthened glass with an amphiphobic material imparts abrasion resistant properties to the AR-coated glass and thus enables the AR-coated glass to regain the performance of the base glass while further giving the AR-coated glass anti-fingerprint, anti-smudge characteristics. In preferred embodiments the exterior (outermost) layer of the AR coating is a SiO_2-

containing layer; for example F-SiO_2, fused silica or silica." A person skilled in the art who refers the above description would notice that coating an AR-coated chemically strengthened glass with an amphiphobic material imparts abrasion-resistant properties to the AR-coated glass, and that since the AR-coating has a lower abrasion resistance than chemically strengthened glass, the effect is more pronounced in AR-coated glass than in glass without AR-coating.

Consequently, it cannot be said that the effect alleged by the Appellant was unpredictable by a person skilled in the art. Also, it cannot be said that the effect alleged by the Appellant is prominent beyond the range of effect that could be predicted by a person skilled in the art.

No. 3 Closing

As stated above, the Invention would have been easily made by a person who has ordinary skill in the field of the the Invention before the priority date for the Invention, based on the invention disclosed in Cited Document 1 and the art described in Cited Document 2, and accordingly, the patent should not be granted under the provisions of Article 29(2) of the Patent Act.

Thus, the Application should be rejected without examining inventions recited in other claims

Therefore, the appeal decision is made in accordance with the conclusion.

November 27, 2020

Chief administrative judge: SATOMURA, Toshimitsu
Administrative judge: HIGUCHI, Nobuhiro
Administrative judge: KAWAHARA, Tadashi