PATENT COURT OF KOREA

SECOND DIVISION

DECISION

Case No.	2015Heo4408 Invalidation (Patent)
Plaintiff	A CEO B Counsel for Plaintiff Dana Patent Law Firm Patent Attorney in Charge Hyeongjun SON Subagent Attorney for Plaintiff IPCJ Patent & Law Firm Patent Attorney in Charge Hyeongdal PARK
Defendant	C Counsel for Defendant Leechae Intellectual Property Patent Attorneys in Charge Junho LEE, Jaewon CHOI
Date of Closing Argument	July 25, 2019
Decision Date	September 26, 2019

ORDER

1. The plaintiff's claim is dismissed.

2. The cost arising from this litigation shall be borne by the plaintiff.

PLAINTIFF'S DEMAND

The IPTAB Decision 2013Dang2894 dated May 14, 2015 shall be revoked.

OPINION

1. Background

A. Plaintiff's Patented Invention at Issue (hereinafter the "Subject Invention") (Plaintiff's Exhibits 1 and 2)

1) Title of invention: Adhesive composition, protective film for a polarizing plate, polarizing plate, and liquid crystal display

2) Filing date of application/ date of registration/ registration number: July 1, 2009/ July 31, 2013/ No. 1293902

3) Claims (Corrected and confirmed by the IPTAB decision for correction as to 2016Jeong28, dated November 30, 2018)[1)]

【Claim 1】 A protective film for polarizing plates, comprising: a base film whose absolute value of a photoelastic coefficient is 3 brewster or less[2)] (hereinafter, "**Element 1**"); and an adhesive layer that is formed on one or both sides of the base film, is a cured product of an adhesive composition which contains acrylic resin, silicone resin, rubber resin, or EVA resin as a base resin, and meets the conditions of Formula 1 shown below (hereinafter, "**Element 2**")

[Formula 1] $\Delta X \leq 2$ nm

where ΔX represents an absolute value of plane direction phase contrast (R_{in}) measured with the formula "$(n_x-n_y) \times d$" when a sheet-like adhesive of 10 mm × 20 mm prepared with the adhesive composition is stretched to 500 μm or 600 μm in a longitudinal direction at 23 °C, n_x represents a refractive index of the sheet-like adhesive from a plane direction to a horizontal axis, n_y represents a refractive index of the sheet-like adhesive from the plane direction to the longitudinal direction, and d represents a thickness of the sheet-like adhesive

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1) Hereinafter, the "Subject Invention" or "Claim ○" refers to what has been corrected. Only where it is required to specifically classify and indicate the Subject Invention or its individual claims prior to the correction, they shall be referred to as the "Subject Invention before Correction" or "Claim ○ before Correction."

2) 1 brewster = $10^{-12}m^2/\mathrm{N} = 10^{-12}\mathrm{Pa}^{-1}$

(hereinafter, “Claim 1”; the same shall apply to the remaining claims).

【Claim 2】 The protective film for polarizing plates according to claim 1, wherein a weight average molecular weight of the base resin is 500,000–2,000,000.

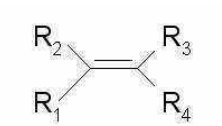
【Claim 3】 The protective film for polarizing plates according to claim 1, wherein ΔX in Formula 1 is 1.5 nm or less and the base resin is a polymer of a monomer mixture containing 80 to 99.8 parts by weight of a (meth)acrylic acid ester monomer and 0.01 to 10 parts by weight of a crosslinkable monomer.

【Claim 4】 The protective film for polarizing plates according to claim 3, wherein one or more (meth)acrylic acid ester monomers are selected from the group consisting of methyl (meth)acrylate, ethyl (meth)acrylate, *n*-propyl (meth)acrylate, isopropyl (meth)acrylate, *n*-butyl (meth)acrylate, *t*-butyl (meth)acrylate, *sec*-butyl (meth)acrylate, pentyl (meth)acrylate, 2-ethylhexyl (meth)acrylate, 2-ethylbutyl (meth)acrylate, *n*-octyl (meth)acrylate, isooctyl (meth)acrylate, isononyl (meth)acrylate, lauryl (meth)acrylate, isobornyl (meth)acrylate, and tetradecyl (meth)acrylate.

【Claim 5】 The protective film for polarizing plates according to claim 3, wherein one or more crosslinkable monomers are selected from the group consisting of a hydroxyl group-containing monomer, a carboxyl group-containing monomer, and a nitrogen-containing monomer.

【Claim 6】 The protective film for polarizing plates according to claim 3, wherein the monomer mixture additionally contains a monomer represented with Formula 1 shown below

[Formula 1]

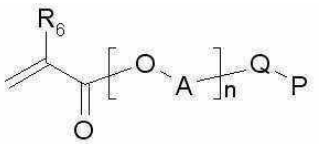


where each of R_1 through R_3 independently represents hydrogen or alkyl; R_4

represents COR_5 or phenyl, acetyloxy substituted or unsubstituted with cyano, or phenyl; and R_5 represents amino or glycidyloxy substituted or unsubstituted with alkyl or alkoxyalkyl.

【Claim 7】 The protective film for polarizing plates according to claim 3, wherein the monomer mixture additionally contains a compound represented with Formula 2 shown below

[Formula 2]

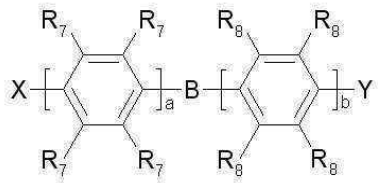


where R_6 represents hydrogen or alkyl; A represents alkylene; n represents an integer of 0 through 3; Q represents a single bond, -O-, -S- or alkylene; and P represents an aromatic ring.

【Claim 8】 The protective film for polarizing plates according to claim 1, wherein the adhesive composition additionally contains a compound with a positive photoelastic coefficient.

【Claim 9】 The protective film for polarizing plates according to claim 1, wherein the compound with the positive photoelastic coefficient is represented with Formula 3 shown below

[Formula 3]

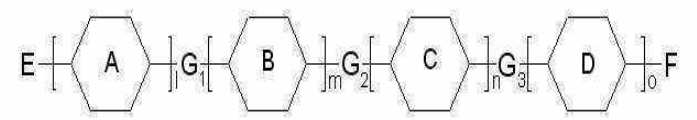


where B represents a single bond, -CH=N-, -N=N-, -N=N(O)-, -COO-, $-CH_2O-$, $-C(R_7)_2-CO-$, $-COO-CH_2-$, -CH=CH-, -C≡C-, -S-, $-SO_2-$, $-\varphi(R_7)-$, $-CH=N-\varphi(R_7)-N=CH-$, $-CH=CH-\varphi(R_7)-N=CH-$, $-CH=CH-\varphi(R_7)-CH=CH-$, $-CH=CH-\varphi(R_7)-\varphi(R_8)-CH=CH-$, $-CH=N-\varphi(R_7)-(R_8)-N=CH-$, $-CH=N-\varphi(R_7)-\varphi(R_8)-CH=CH-$, $-N=N-\varphi$

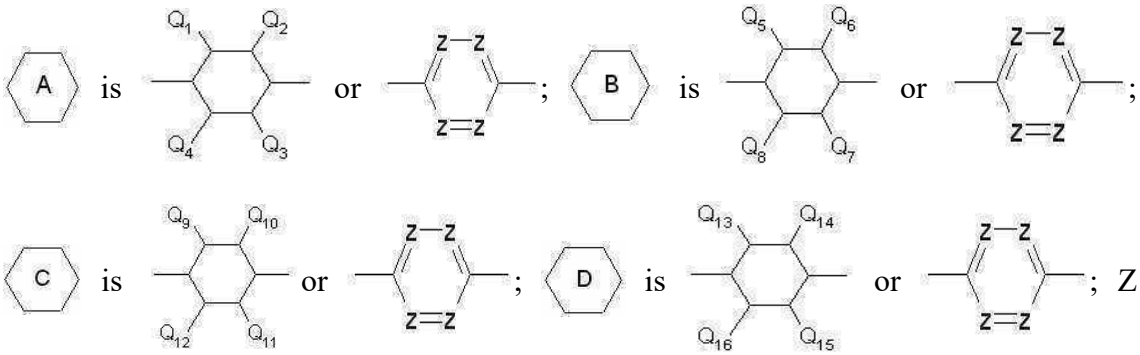
(R_7)-N=CH-, -C(=O)-O-φ(R_7)-C(CH_3)$_2$-, a naphthalene core, or an anthracene core; each of X, Y, R_7, and R_8 independently represent hydrogen, halogen, cyano, amino, hydroxy, alkyl, alkoxy, aryl, dialkylamine, and cumyl;, a represents an integer of 0 through 3; b represents an integer of 1 through 3 when a is 0 and an integer of 0 through 3 when a is an integer of 1 through 3;and φ represents an aromatic core.

【Claim 10】 The protective film for polarizing plates according to claim 8, wherein the compound with the positive photoelastic coefficient is represented with Formula 4 shown below

[Formula 4]



where



is C-W or N; Q_1 through Q_{16} and W are independently hydrogen, halogen, cyano, perfluoroalkyl, perfluoroalkyloxy, -R_9, -OR_9, -NHR_9, -$N(R_9)_2$, -C(=O)R_9, -SR_9, -SOR_9, -SO_2R_9, -C(=O)NR_9, -NR_9C(=O)R_9, -C(=O)OR_9, -OC(=O)R_9, or –OC(=O)OR_9; R_9 is hydrogen, alkyl, alkenyl, alkynyl, or -$(R_{10}O)_qR_{11}$; R_{10} is alkylene; R_{11} is alkyl; q is an integer of 1 through 5; l, m, n, and o are each independently an integer of 0 through 2; l+m+n+o is an integer of 2 or more; E and F are each independently hydrogen, halogen, cyano, -R_9, -OR_9, -NHR_9, -$N(R_9)_2$, -NCO, -NCS, -C(=O)R_9, or –$Si(R_9)_3$; G_1, G_2, and G_3 are each

independently a single bond, -O-, -R_{10}O-, -NR_{10}-, -S-, -SO-, -SO_2-, alkylene, alkenylene, alkynylene, or –U-T-V-; U and T are each independently a single bond, -S-, -NR_{10}-, -$O(CH_2)_p$-, carbonyl, or –O-; V is a single bond, -O-, carbonyl, -NR_{10}-, -S-, -$(CH_2)_p$-, -$O(CH_2)_p$-, or -$(CH_2)_pO$-; and p is an integer of 0 through 5.

【Claim 11】 The protective film for polarizing plates according to claim 1, wherein the adhesive composition additionally contains 0.1 to 10 parts by weight of a crosslinking agent based on 100 parts by weight of the base resin, and ΔX in Formula 1 is 1.0 nm or less.

【Claim 12】 The protective film for polarizing plates according to claim 11, wherein one or more crosslinking agents are selected from the group consisting of an isocyanate compound, an epoxy compound, an aziridine compound, and a metal chelate compound.

【Claim 13】 The protective film for polarizing plates according to claim 1, wherein the adhesive composition additionally contains 0.01 to 10 parts by weight of a silane coupling agent based on 100 parts by weight of the base resin.

【Claims 14, 15】 Deleted.

【Claim 16】 The protective film for polarizing plates according to claim 1, wherein the base film is a polycarbonate-based film, a saturated cycloolefin-based film, an olefin-type thermoplastic resin film which has an imide group substituted or unsubstituted in a side chain, a thermoplastic resin film which has substituted or unsubstituted phenyl group and nitrile group in a side chain, or an acrylic film.

【Claim 17】 The protective film for polarizing plates according to claim 1, wherein the base film includes a graft copolymer containing acrylic resin and conjugated diene rubber.

【Claim 18】 A polarizing plate that includes a polarizing film or a polarizing element and the protective film for polarizing plates according to claim 1 formed on one or both sides of the polarizing film or polarizing element, and wherein ΔX in Formula 1 is 1.5 nm or less on an adhesive layer in the protective film.

【Claim 19】 The polarizing plate according to claim 18, additionally comprising one or more are selected from the group consisting of a protective layer, a reflective layer, an antiglare layer, a retardation plate, a wide viewing angle compensation film, and a brightness enhancement film.

【Claim 20】 A liquid crystal display device comprising a liquid crystal panel in which the polarizing plate of claim 18 is bonded to one side or both sides of a liquid crystal cell.

4) Summary of invention

A Technical Field and Background Art (Paragraphs [0001]–[0009])

The present invention relates to an adhesive composition, a protective film for polarizin g plates, a polarizing plate, and a liquid crystal display (LCD).

To manufacture the LCD, liquid crystal cells including liquid crystals and transparent substrates having electrode layers formed thereon and polarizing plates are required, and suitable adhesives have to be used for binding them. The polarizing plate includes an iodine compound or a dichroic polarizing material aligned in a certain direction, and has a multi-layer structure in which protective films are formed on both faces.

In the multi-layer structure, a triacetyl cellulose (TAC) film has been most widely used as the protective film. However, due to poor heat resistance and moisture resistance, the TAC film, when being used for a long period of time in a high-temperature and/or high-humidity condition, would undergo polarization degree degradation, be peeled from a polarizing element, or experience optical characteristic deterioration. The TAC film has dimensional stability degraded by ambient environmental change, a relatively large photoelastic coefficient, and large phase retardation change, thus significantly degrading image quality in the case of long-time use.

Another feature to be considered in designing an LCD is low light leakage. That is,

functional films such as a phase retardation plate, a compensation plate for wide viewing angle, or a brightness enhancing film may be additionally attached to the polarizing plate. Such functional films forming the multi-layer polarizing plate are made of materials having different molecular structures and compositions, and so have different physical properties. In particular, under high-temperature and/or high-humidity conditions, the dimensional stability is insufficient depending on variation in the shrinkage or expansion behavior of materials having a unidirectional molecular alignment. As a result, if the polarizing plate is fixed with adhesives, then stress is concentrated under a high-temperature or high-temperature and high-humidity condition, leading to birefringence and thus light leakage.

As a representative method for solving these problems, there may be a method of optimizing designing of adhesives for fixing the polarizing plate. For example, the adhesive may be designed to be soft such that it can be easily deformed by external stress, thereby giving a stress relaxing property, or the adhesive may be designed to be very hard such that the shrinkage of the polarizing plate caused by the external environment may be suppressed.

However, it is difficult to realize an adhesive satisfying physical properties such as endurance reliability, cuttability, re-peeling property, and workability at the same time, merely with techniques known so far, and most of the techniques presume the use of a TAC protective film, leading to a fundamental limitation in that the performance of a finally manufactured LCD is degraded.

B Problem to Be Solved and Solution to Problem (Paragraphs [0010]–[0017])

The present invention has been made to consider the foregoing problems, and an object thereof is to provide an adhesive composition showing excellent endurance reliability even in a severe environment, having superior physical properties such as cuttability, re-peelability, and workability, and being capable of efficiently suppressing light leakage even when being applied to a film having a low photoelastic coefficient.

The present invention provides, as means for achieving the foregoing object, an adhesive composition which satisfies a condition of Formula 1 given below:

[Formula 1]

$\Delta X \leq 2$ nm

Where ΔX represents an absolute value of a phase contrast (R_{in}) in a surface

direction, measured with an equation of "(nx-ny)×d" when a sheet-like adhesive prepared with an adhesive composition is elongated by 500 μm in a vertical axis direction of a sheet surface at a temperature of 23 °C.

The present invention provides, as another means for achieving the foregoing object, a base film and a protective film for polarizing plates including an adhesive layer containing the adhesive composition according to the present invention, formed on one side or both sides of the base film.

C Effect of Invention (Paragraph [0018])

In the present invention, an adhesive showing, even in severe environments such as high-temperature and/or high-humidity conditions, etc., excellent endurance reliability and having superior physical properties, such as cuttability, re-peelability, and workability, can be provided. In particular, it is possible to provide an adhesive composition which can efficiently prevent the light leakage that may occur in an LCD, even when being applied to a protective film having a low photoelastic coefficient.

B. Prior Arts

1) Prior Art 1 (Plaintiff's Exhibits 5 and 14)

This relates to the "pressure-sensitive adhesive for low polarity film" published in Japanese Laid-open Patent Publication No. 2005-53976 disclosed on March 3, 2005, and its main contents are as follows:

A Technical Field and Existing Arts

The present invention relates to a low-polarity film pressure-sensitive adhesive, and more specifically, a pressure-sensitive adhesive having good adhesion to low-polarity films, such as a viewing angle widening film, a phase contrast film, etc. used in a liquid crystal display. (Paragraph [0001])

In liquid crystal displays, polarizing plates and phase contrast plates are laminated, and in recent years, there has been an increasing demand for larger or higher-performance displays. Thus, the functions of laminated films have been advanced. However, many of these films have low polarity. Thus, if the conventional pressure-sensitive adhesives are used, then the adhesion to film surfaces would be deteriorated and the durability would be damaged. (Paragrap

hs [0002], [0003])

B Problem to Be Solved and Solution to Problem

Accordingly, an object of the present invention is to provide a pressure-sen sitive adhesive having excellent performance such as adhesion, etc. even for a low-polarity film having a photoelastic function. (Paragraph [0006])

As a result of intensive studies in the above situation, the present inventors completed the present invention by adding, to pressure-sensitive adhesives, a crosslinking agent and a high-molecular weight polymer with a weight average molecular weight of 1,000,000 to 2,000,000 with an alicyclic monomer or aro matic-containing monomer as a copolymer component.

That is, the present invention is to provide a pressure-sensitive adhesive for a low-polarity film containing the following components (A) and (B): Component (A) is a high-molecular weight polymer whose weight average molecular weig ht is in the range of 1,000,000 to 2,000,000 and which is obtained by copoly merizing (a1), (a2), and (a3). Component (a1) is (meth)acrylic acid alkyl ester of 30–90 mass %. Component (a2) is an alicyclic monomer or aromatic ring-c ontaining monomer of 9–50 mass %. Component (a3) is a functional group-co ntaining monomer 0.5–10 mass %; and Component (B) is a crosslinking agen t. (Paragraphs [0008], [0009])

C Effect of Invention

Even where the pressure-sensitive adhesive of the present invention is use d for a low-polarity film, it has excellent adhesion and reworkability. Therefore, by using this pressure-sensitive adhesive, it is possible to impart moderate ad hesion to low-polarity films having optical functions such as viewing angle wid ening films, phase contrast plate films, polarizing plates, etc. (Paragraphs [005 4], [0055])

2) Prior Art 2 (Plaintiff's Exhibits 6 and 15)

This relates to the "pressure-sensitive adhesive for low-polarity film, acrylat e-based pressure-sensitive adhesive, and polarizing plate and liquid crystal display device using the same" published in Japanese Laid-open Patent Publication No. 2 008-144125 disclosed on June 26, 2008, and its main contents are as follows:

A Technical Field and Background Art (Paragraphs [0001]–[0006])

The present invention relates to a pressure-sensitive adhesive composition for a polarizing plate protective film. More specifically, the present invention relates to an acrylate-based pressure-sensitive adhesive which can maintain optical properties of polarizing plates, etc. and a polarizing plate and liquid crystal display device manufactured with the acrylate-based pressure sensitive adhesive.

Recently, liquid crystal display devices (hereinafter, “LCDs”) are widely used in small products, such as conventional calculators, watches, etc., to large products, such as automotive instruments, PC monitors, TVs, etc. Since the LCDs are often in use for a long time at all times, the polarizing plate is required to have long-term durability so that the image quality of the LCD would not be deteriorated even after the long-term use.

If a polarizing plate used in a liquid crystal cell with a Twisted Nematic (TN)-type display mode is processed under high-temperature and high-humidity conditions, the internal stress generated in the polarizing plate distorts an absorption axis at a peripheral edge of the polarizing plate and the optical transmittance changes, and light leakage would occur.

In order to solve such problem, as for the light leakage by the TN-type liquid crystal mode, means for appropriately softening pressure-sensitive adhesive and imparting stress relaxation properties have been reported (see Japanese Laid-open Patent Publication No. 9-137143). However, acrylate-based pressure-sensitive adhesives that have a stress relaxing function are generally so flexible that they are fatal to the liquid crystal display function, such as by bubble formation or peeling due to stress that occurs during prolonged use or high temperature and humidity. In addition, when a highly flexible pressure-sensitive adhesive layer is used, the adhesive would be easily stretched when the polarizing plate adhesive product is cut precisely, and thus the product would be contaminated.

In order to solve these problems, a technique for improving the light leakage by manufacturing a polarizing plate using an acrylate-based pressure-sensitive adhesive for polarizing plates with a positive photoelastic coefficient is disclosed (see Japanese Laid-open Patent Publication No. 2004-516359).

The method of imparting stress relaxation to the pressure-sensitive adhesive disclosed in Japanese Laid-open Patent Publication No. 9-137143 could suppress the light leakage to some extent if the LCD is small. However, such method would not be able to suppress the light leakage sufficiently in devices with large LCDs, such as large LCD TVs, etc. Furthermore, the component having a positive photoelastic coefficient as illustrated in Japanese Laid-open Patent Publication No. 2004-516359 generally has low solubility. Further, where large amounts of such components are added to have a desired value of the photoelastic coefficient for the pressure-sensitive adhesive, it would cause a problem in the durability particularly for large LCD TVs by elusion of materials. On the other hand, if the amounts of the components having a positive photoelastic coefficient are reduced, the light leakage may not be reduced sufficiently.

B Problem to Be Solved and Solution to Problem

An object of the present invention is to provide a pressure-sensitive adhesive capable of improving light leakage at the periphery of the screen due to changes in temperature and humidity and continuous lighting of the liquid crystal display device, and peeling of the polarizing plate, and a polarizing plate and a liquid crystal display device using the same. (Paragraph [0007])

As a result of intensive studies to solve the problems mentioned above, the present inventors obtained a copolymer by conventional copolymerization of a monomer having positive intrinsic birefringence with an acrylate monomer having negative intrinsic birefringence. By using the base polymer of the pressure-sensitive adhesive, it was found that the retardation generated due to the distortion of the pressure-sensitive adhesive can be controlled with time, and peeling of the polarizing plate can be suppressed. (Paragraph [0008])

Means for solving the problems mentioned above are as follows: (Paragraph [0009])

(1) An acrylate-based pressure-sensitive adhesive containing a copolymer formed from a composition comprising at least one monomer with positive intrinsic birefringence, at least one acrylate monomer with negative intrinsic birefringence, and at least one monomer with a crosslinking site.

(11) A liquid crystal display device characterized in that transmission axes of

the two polarizing plates are perpendicular to each other, and at least one of t he polarizing plates is the polarizing plate according to (10).

(12) The liquid crystal display device according to (11), wherein the polarizin g plates are bonded so that the transmission axes of the polarizing plates are in a direction of 45 degrees with respect to the side of a display screen and +250 to+800 ($\times 10^{-12} Pa^{-1}$) is an in-plane photoelastic coefficient of the pres sure-sensitive adhesive layer formed with the acrylate-based pressure-sensitive adhesive according to one of (1) through (9).

(14) The liquid crystal display device according to (11), wherein the polarizin g plates are bonded so that the transmission axes of the polarizing plates are in a direction of 0 or 90 degrees with respect to the side of a display screen and –400 to+250 ($\times 10^{-12} Pa^{-1}$) is an in-plane photoelastic coefficient of the p ressure-sensitive adhesive layer formed with the acrylate-based pressure-sensiti ve adhesive according to one of (1) through (9).

C Effect of Invention

By forming the pressure-sensitive adhesive layer with the pressure-sensitive adhesive of the present invention, a pressure-sensitive adhesive layer with a d esired photoelastic coefficient can be obtained, and the polarizing plate with th e pressure-sensitive adhesive layer can prevent light leakage and longitudinally suppress the peeling of polarizing plates. (Paragraph [0010])

D Best Mode

An acrylate-based pressure-sensitive adhesive of the present invention contai ns a copolymer formed from a composition comprising at least one monomer with positive intrinsic birefringence,[3)] at least one acrylate monomer with negati ve intrinsic birefringence, and at least one monomer with a crosslinking site. T he monomer used in the acrylate-based copolymer that is the base polymer of the conventional acrylate-based adhesive has a negative intrinsic birefringence, and the acrylate-based copolymer has a negative photoelastic coefficient. There by, when an adhesive layer becomes distorted, the retardation will occur, and t hus the light leakage, etc. will occur. The present invention controls the retarda tion generated by the distortion of the pressure-sensitive adhesive layer and pr events the light leakage by copolymerizing a monomer with positive intrinsic bir

efringence and a monomer used in the base polymer other than the acrylate-based monomer. By copolymerizing, it is possible to prevent the peeling of the polarizing plate that occurs when a compound with positive intrinsic birefringence is added as disclosed in Japanese Laid-open Patent Publication No. 2004-516359. (Paragraph [0011])

It is possible to set a photoelastic coefficient of the pressure-sensitive adhesive layer to a desired value by adjusting the type, ratio, and amount of a monomer with positive intrinsic birefringence used when synthesizing the copolymer and acrylate-based monomer with negative intrinsic birefringence. For example, it is possible to increase the value of the photoelastic coefficient by increasing a monomer element with positive intrinsic birefringence constituting the copolymer or decreasing an acrylate-based monomer with negative intrinsic birefringence constituting the copolymer. On the contrary, it is possible to decrease the value of the photoelastic coefficient by decreasing a monomer element with positive intrinsic birefringence constituting the copolymer or increasing an acrylate-based monomer with negative intrinsic birefringence constituting the copolymer. (Paragraph [0012])

The photoelastic coefficient is defined by birefringence (Δn) generated when stress (σ) is applied, and can be represented as follows: Photoelastic coefficient (C) = Δn / σ. (Paragraph [0014])

(Measurement of photoelastic coefficient) A photoelastic coefficient was measured at a wavelength of 630 nm by applying a tensile force of 0 – 10 N to both ends of samples of pressure-sensitive adhesives with thickness of 0.5 μm and 2 cm with an ellipsometer M-220 manufactured by JASCO Corporation at a temperature of 25 °C and humidity of 60%. Where the load area changes due to the deformation of samples, the area is corrected and an accurate stress is calculated. (Paragraph [0090])

The polarizing plate of the present invention has protective films on both sides. Any protective film that is usually used for a polarizing plate could be used as a protective film of polarizing plates. In the present invention, it is recommended to use a cellulose acrylate film or a cycloolefin polymer. The protective films on both sides may be the same or different ... In the polarizing plate of th

e present invention, a pressure-sensitive adhesive layer is provided on at least one surface (one side of the polarizer) of the protective film or the surface of t he protective film via another functional layer. In this case, it is recommended to adjust a photoelastic coefficient of the pressure-sensitive adhesive depending on the photoelastic coefficient of the polarizing plate protective film. In particula r, when an absorption axis of the polarizing plate is 45 degrees with respect t o the side of the screen, the retardation generated in the polarizing plate prote ctive film shall be offset in order to reduce the light leakage. Thus, it is neces sary to adjust the photoelastic coefficient of the pressure-sensitive adhesive de pending on the photoelastic coefficient of the polarizing plate protective film. (P aragraph [0050])

It is possible for norbornene polymer hydride to use, as a cycloolefin polyme r, what is sold under a proprietary name of Arton G or Arton F of JSR Co., Lt d., or Zeon Japan, Zeonor ZF14, ZF16, Zeonex 250 or Zeonex 280 of Zeon J apan Co., Ltd. (Paragraph [0059])

The liquid crystal display device of the present invention has two polarizing plates whose the transmission axes are orthogonal to each other and at least one of which is the polarizing plate of the present invention. Also, it is desirabl e that both of the two polarizing plates are the polarizing plate of the present i nvention. In the liquid crystal display of the present invention, it is possible to sufficiently reduce the light leakage even in large display devices of 15 inches or more by setting an in-plane photoelastic coefficient to -400 to $+800$ ($\times 10^{-12}$ Pa^{-1}) with acrylate-based pressure-sensitive adhesive compositions of the prese nt invention. In the liquid crystal display device of the present invention, the po larizing plate is bonded so that its transmission axis is in the direction of 45 d egrees with respect to the side of the display screen (see FIG. 1(a)). It is desi rable to set an in-plane photoelastic coefficient of the adhesive layer formed wi th the pressure-sensitive adhesive of the present invention to $+250$ to $+800$($\times 1$ $0^{-12}Pa^{-1}$), more desirably to $+300$ to $+600$($\times 10^{-12}Pa^{-1}$). As a display mode of t he liquid crystal cell in the liquid crystal display device, a TN mode can be pr eferably exemplified. In addition, if the photoelastic coefficient of the pressure-s ensitive adhesive layer could be set within the above range, the same effect o

f suppressing light leakage could be obtained even if the pressure-sensitive ad hesive layer is not formed using the acrylate-based pressure-sensitive adhesive composition of the present invention. (Paragraph [0081])

3) Prior Art 3 (Plaintiff's Exhibit 7)

This relates to the "acrylic resin films and method of producing the same" published in Korean Laid-open Patent Publication No. 2007-6928 disclosed on Ja nuary 11, 2007, and its main contents are as follows:

A Technical Field and Background Art (pp. 4, 5)

The present invention relates to a novel and industrially useful acrylic resin film excellent in transparency, weather resistance, heat resistance, and toughn ess.

Acrylic resin films are excellent in transparency, surface gloss, and light resi stance. Thus, they are used for the surfaces and skins of, for example, liquid crystal display sheets and films, optical materials such as light guide plates, e tc., interior and exterior materials of motor vehicles, exterior materials of auto matic vending machines, electric appliances, interior and exterior materials of building materials, etc., and also for the surface protection of polycarbonate, polyvinyl chloride, etc.

In recent years, these resin films have begun to also be used in severe en vironmental conditions requiring weather resistance and heat resistance as in outdoors and interiors of motor vehicles owing to the widespread use of, for example, car navigation systems, handheld cameras, etc. For use under such s evere environmental conditions, sheets and films with polymethyl methacrylat e resin as the substrate have problems in that they are liable to be deforme d due to low heat resistance and that they are liable to be cracked during p rocessing due to low toughness, though they are excellent in transparency an d weather resistance.

3) The "intrinsic birefringence" means the intrinsic birefringence depending on molecular structure and is generated by the anisotropy of polarizability in the molecule. Also, the degree of macroscopic birefringence is governed by the intrinsic birefringence and molecular orientation ([0013] in Plaintiff's Exhibit No. 6).

Even though a variety of attempts have been made to solve these problem s, they failed to satisfy desired properties to a certain extent.

B Problem to Be Solved and Solution to Problem

An object of the present invention is to provide a novel and industrially us eful acrylic resin film excellent in transparency, weather resistance, heat resista nce, and toughness, since an acrylic resin film with such properties has not b een available. Another object of the present invention is to provide an acrylic resin film which has a hard coating layer formed at least on one surface of t he film, and further has a reflection preventive film formed at least on one s urface of the film, and also to provide an optical filter comprising the film. (p. 5)

The inventors of the present invention studied intensively to solve the prob lems stated above, and as a result, found that an acrylic resin film made of a material obtained by mixing specific acrylic elastic particles with an acrylic r esin containing glutaric acid anhydride units, which has total light transmittan ce, a haze value, and a heat shrinkage rate in at least either the longitudinal direction or the transverse direction respectively kept in specific ranges and a lso has the folding endurance value (times) kept at 20 or more, can be an a crylic resin film having transparency, weather resistance, heat resistance, and high toughness not achieved by the conventional findings, and excellent proc essing properties. (p. 5)

C Effect of Invention

The present invention can provide a novel and industrially useful acrylic res in film having excellent transparency, weather resistance, and heat resistance and having high toughness. Especially particularly, this invention can realize a n acrylic resin film remarkably improved, for example, to have a total light tr ansmittance of 91% or more, a haze value of 1.5% or less, a thermal deform ation temperature of 110°C or higher and an elongation at breakage of 10% or more. The acrylic resin film of the present invention can be preferably use d as an industrial material such as an optical filter requiring processing at hi gh temperature. Furthermore, the film obtained like this is good also in surfa ce hardness, thickness uniformity, and surface adhesiveness and can be well

used also for various other applications than the optical filter. (p. 7)

4) Prior Art 4 (Defendant's Exhibits 4 and 9)

This relates to the "pressure-sensitive adhesive composition for optical use and pressure-sensitive adhesive sheet" published in Japanese Laid-open Patent Publication No. 2007-169329 disclosed on July 5, 2007, and its main contents are as follows:

A Technical Field and Background Art

The present invention relates to the optical pressure-sensitive adhesive composition used for attaching optical functional films, such as polarizing plate or retardation plate, etc. to optical components, such as a liquid crystal cell in a liquid crystal display device, etc. (Paragraph [0001])

Since the polarizing plate is formed by stretching, dimensional changes with time are likely to occur. If the internal stress generated by the dimensional change cannot be absorbed and relaxed, the distribution of residual stress acting on the polarizing plate becomes non-uniform, and as a result, color unevenness and white spotting occur on the surface of the liquid crystal element. (Paragraph [0003])

On the other hand, birefringence of the pressure-sensitive adhesive layer can be considered as another factor that causes uneven color and white spots. Where the dimensional change of the polarizing plate occurs over time, the pressure-sensitive adhesive layer may be distorted, and the birefringence occurs as the polymers included in the pressure-sensitive adhesive layer is partly oriented. Thus, the colors become uneven and the white spotting occurs. (Paragraph [0004])

B Problem to Be Solved and Solution to Problem

The purpose of the present invention is not only to relieve distortion of the optical substrate, particularly due to expansion and contraction of the polarizing plate, by shifting the pressure-sensitive adhesive, but also to provide an optical pressure-sensitive adhesive composition that does not cause uneven color and white spots in a liquid crystal element by making birefringence clos

e to zero. (Paragraph [0009])

As a result of intensive studies to solve the problems of the prior art, the present inventors could copolymerize the adhesive resin of the pressure-sensi tive adhesive composition with an acrylic acid alkyl acrylate ester monomer a nd a specific aromatic ring. By co-polymerizing with a certain monomer at a certain ratio and adjusting the viscosity coefficient of the pressure-sensitive a dhesive composition containing the pressure-sensitive adhesive resin, it is pos sible to follow the dimensional change of the polarizing plate. The inventors have found that a pressure-sensitive adhesive composition can be obtained t hat does not cause peculiar color unevenness and white spots when used for an optical substrate such as a plate. (Paragraph [0015])

The above phenomenon is caused by a pressure-sensitive adhesive resin ob tained by copolymerizing an acrylic acid alkyl ester monomer and a copolym erizable monomer having a specific aromatic ring at a certain ratio, and the orientation birefringence is close to zero in the pressure-sensitive adhesive la yer. For this reason, it is considered that even if a deviation occurs due to e xpansion and contraction of the polarizing plate, it was achieved by not caus ing birefringence. (Paragraph [0016])

Therefore, according to the present invention, the polarizing plate has a sui table adhesive force, good adhesion to the optical functional film, and furthe r contains a copolymerizable monomer with an aromatic ring as a constituent component. Provided is a pressure-sensitive adhesive composition that can pr event the occurrence of uneven color and white spots due to expansion and contraction. (Paragraph [0017])

The monomer (b) to be copolymerized with the monomer (a) is a monome r having an aromatic ring, which reduces the orientation birefringence of the pressure-sensitive adhesive composition of the present invention, thereby pola rizing the polarizing plate. Even if the dimensional change occurs, the pressur e-sensitive adhesive composition of the present invention is provided with a f unction that does not cause uneven color/ whitening phenomenon and does not cause foaming or peeling due to the dimensional change. (Paragraph [00 20])

C. IPTAB Decision, etc. (Plaintiff's Exhibits 3 and 4)

1) On October 31, 2013, the defendant filed, against the plaintiff, who is a p atentee, a petition with the Intellectual Property Trial and Appeal Board (hereinaf ter the "IPTAB") for invalidation of the registration of the Subject Invention prio r to correction to the effect that "the patented invention prior to correction could easily be invented from Prior Arts 1 through 3 by a person having ordinary skill in the art to which the patented invention pertains (hereinafter a "skilled perso n") and thus lacks an inventive step. Thus, the registration of the patented invent ion prior to correction should be invalidated."

2) Meanwhile, on May 19, 2014, when the plaintiff's petition progressed as IPT AB Decision 2013Dang2894, the plaintiff filed a petition for correction limiting som e claims of the patented invention prior to correction. Accordingly, the IPTAB heard the petition for trial along with the petition for correction.

3) On May 14, 2015, the IPTAB admitted the plaintiff's petition for correction on the ground that "since the Petition for Correction at Issue satisfies all requiremen ts for correction in the proceedings for invalidation of patents, it shall be upheld. H owever, an inventive step of claims 1 through 5, 7 through 14, 16, and 18 through 20 prior to correction is denied by Prior Art 2. Further, an inventive step of claim 6 is denied by Prior Arts 1 and 2. Also, an inventive step of claim 17 is denied b y Prior Arts 2 and 3." Also, the IPTAB rendered its decision (Plaintiff's Exhibit 3) granting the defendant's petition for trial.

4) Then, on July 3, 2015, the plaintiff filed a complaint with this court to seek revocation of the IPTAB Decision and, on March 7, 2016, filed a petition for corre ction with the IPTAB to correct the claims of the patented invention prior to correc tion as provided in A. 3). The IPTAB heard the petition as 2016Jeong28 and, on N ovember 30, 2018, rendered the IPTAB Correction Decision to admit the petition fo r a trial of correction, and the IPTAB Correction Decision then became final and c

onclusive.

【Factual basis】 Undisputed facts, statements in Plaintiff's Exhibits 1 through 7, 14, and 15 and Defendant's Exhibits 4 and 9, and the purport of the overall arg ument

2. Summary of Parties' Arguments and Questions Presented

A. Plaintiff

Since it may not be deemed that what is to be protected by the Subject Inv ention is unclear, the Subject Invention does not violate Article 42(4)(ii) of the old Patent Act (before amendments were made to Act No. 10716 on May 24, 2 011; hereinafter, the "old Patent Act"). Also, it may be deemed that an inventive step of the Subject Invention is denied by the Prior Arts. However, the IPTAB decision was inconsistent with the above analysis and determined that the Subject Invention is invalid. Thus, the IPTAB decision should not be upheld.

B. Defendant

The registration of the Subject Invention should be revoked on the following grounds and thus, the IPTAB decision consistent with the following analysis sho uld be upheld.

1) Violation of Article 42(4)(ii) of the old Patent Act

Claim 1 defines [Formula 1] as $\Delta X \leq 2$ nm and ΔX as an absolute valu e of plane direction phase contrast (R_{in}) measured with the formula "$(n_x-n_y) \times d$" when the sheet-like adhesive of 10 mm × 20 mm prepared with the adhesive co mposition is stretched to 500 μm or 600 μm in a longitudinal direction at 23 ° C. On the other hand, Claim 1 does not limit the thickness (d) of the sheet-like adhesive, and thus, the scope of birefringence (n_x-n_y) of the sheet-like adhesive t hat satisfies $\Delta X \leq 2$ nm is not limited. Therefore, since it may be construed tha t almost all adhesive compositions could achieve the purpose of Claim 1, irrespe ctive of the birefringence rate (n_x-n_y) of the adhesive, it is unclear what would b

e protected. Thus, Claim 1 violates Article 42(4)(ii) of the old Patent Act.

2) Lack of inventive step

Since a skilled person could easily invent Claim 1 by combing Prior Arts 2 and 3 or Prior Arts 2 and 4, an inventive step of Claim 1is denied, and the r emaining claims also lack an inventive step by Prior Arts 1 through 4.

C. Questions Presented

Ultimately, the present questions are (1) whether the Subject Invention violat es Article 42(4)(ii) of the old Patent Act and thus shall be invalidated, and (2) whether an inventive step of the Subject Invention is denied by the Prior Arts.

3. Whether in Violation of Article 42(4)(ii) of old Patent Act

A. Relevant Laws

Article 42(4)(ii) of the old Patent Act stipulates that the invention shall be clearly and concisely described in the claims. Since the scope of protection of a patented invention shall be determined by matters stated in the claims, the claims shall contain only clear descriptions, and terms that represent the composition of an invention unclearly shall not be allowed (see Supreme Court Decision, 2003H u2072, dated November 24, 2006; Supreme Court Decision, 2012Hu1613, dated J uly 24, 2014). Whether an invention is clearly described in the claims shall be d etermined on a case-by-case basis, not based on the terms used in the claims, b ut depending on whether a skilled person could clearly understand the invention from what is stated in the claims in light of the description of the invention, sta tements in the drawings, and common technical knowledge at the time of the ap plication (see Supreme Court Decision, 2014Hu1563, dated April 7, 2017).

B. Analysis

In light of the statements in Plaintiff's Exhibit 2 and the purport of the overall argument made by witness D the following can be admitted: A thickness appropriate for a pressure-sensitive adhesive composition used in a polarizing

plate protective film is about 20 - 30 μm; and the detailed description of the Subject Invention discloses an embodiment (see [0027] of Plaintiff's Exhibit 2) to prepare a pressure-sensitive adhesive layer with an even thickness of 25 μm.

Thus, even if it is deemed that Claim 1 does not expressly limit a thickness (d) of the sheet-like adhesive, it seems that a skilled person could easily understand the scope of thickness appropriate for the pressure-sensitive adhesive compositions applied to the polarizing plate protective film in light of the statements in the specification and common technical knowledge at the time of the application.

Therefore, it seems that a skilled person could clearly understand, based on common technical knowledge, that the technical meaning of ΔX is defined as an absolute value of plane direction phase contrast (R_{in}) measured with the formula "$(n_x-n_y) \times d$" when the sheet-like adhesive of 10 mm × 20 mm prepared with the adhesive composition is stretched to 500 μm or 600 μm in a longitudinal direction at 23 °C, and the meaning of [Formula 1] defined as $\Delta X \leq 2$ nm. Thus, the defendant's argument that the Subject Invention is in violation of Article 42(4)(ii) of the old Patent Act is without merit.

4. Inventive Step

A. Inventive Step of Claim 1

1) Comparison of elements with Prior Art 2

	Claim 1	Prior Art 2
1	A base film whose absolute value of a photoelastic coefficient is 3 brewster or less	- It is recommended to use a cellulose acrylate film or a cycloolefin polymer as a polarizing plate protective film. [0050] - It is possible for a norbornene polymer hydride to use, as a cycloolefin polymer, what is sold under a proprietary name o f 'Arton G' or 'Arton F' of JSR Co., Ltd.,

		or 'Zeonor ZF14,' Zeonor ZF16,' 'Zeonex 250' or 'Zeonex 280' of Zeon Japan Co., Ltd. [0058]-[0059]
2	An adhesive layer that is formed on one or both sides of the base film is a cured product of an adhesive composition which contains acrylic resin, silicone resin, rubber resin, or EVA resin as a base resin and meets the conditions of Formula 1 shown below: [Formula 1] $\Delta X \leq 2$ nm where ΔX represents an absolute value of plane direction phase contrast (Rin) measured with formula "$(n_x-n_y) \times d$", when the sheet-like adhesive of 10 mm × 20 mm prepared with the adhesive composition is stretched to 500 μm or 600 μm in a longitudinal direction at 23 °C, n_x represents a refractive index of the sheet-like adhesive from the plane direction to the horizontal axis, n_y represents a refractive index of the sheet-like adhesive from the plane direction to the longitudinal direction, and d represents a thickness of the sheet-like adhesive.	- In the polarizing plate of the present invention, a pressure-sensitive adhesive layer is provided on at least one surface (one side of the polarizer) of the protective film or the surface of the protective film via another functional layer. [0050] - In the liquid crystal display of the present invention, it is possible to sufficiently reduce the light leakage even in large display devices of 15 inches or more by setting an in-plane photoelastic coefficient to -400 to $+800$ ($\times 10^{-12} Pa^{-1}$) with acrylate-based pressure-sensitive adhesive compositions of the present invention. [0081]-[0082]

2) Analysis of commonalities and differences

a) Element 1

Element 1 of Claim 1 and its corresponding element in Prior Art 2 are identical in that they are a base film of a polarizing plate protective film (polarizing plate protective coat)[4].

However, Element 1 limits an absolute value of the photoelastic coefficient of the base film to less than 3 brewster, whereas the corresponding element in Prior Art 2 does not limit an absolute value of the photoelastic coefficient (hereinafter "Difference 1").

b) Element 2

Element 2 of Claim 1 and its corresponding element in Prior Art 2 are identical in that they are polarizing plate protective films (acrylate-based pressure-sensitive adhesive compositions) which are formed on one side or both sides of the base film (polarizing plate protective film) and include a pressure-sensitive adhesive layer that is a cured product of a pressure-sensitive adhesive layer (acrylate-based pressure-sensitive adhesive composition) containing acrylic resin, silicone resin, rubber resin, or EVA resin as a base resin.

However, while the pressure-sensitive adhesive composition satisfies the condition of [Formula 1] defined as $\Delta X \leq 2$ nm in Element 2, the pressure-sensitive adhesive composition in Prior Art 2 is within a range of -400 to $+800(\times 10^{-12}Pa^{-1})$ (hereinafter, "Difference 2").

3) Analysis of differences

a) Difference 1

A skilled person could easily overcome Difference 1 by combining Prior Arts 2 and 3 for the following reasons:

(1) Prior Art 3 discloses an acryl resin film that could be used as a polarizing plate protective film (see 2nd paragraph on p. 16 of Plaintiff's Exhibit 7) and suggests $-2\times10^{-12}Pa^{-1}$ or $2\times10^{-12}Pa^{-1}$ as a range of a numeric value of the photoelastic coefficient desirable for the acryl resin film (see 4th paragraph on p. 16 of Plaintiff's Exhibit 7). If the range of the numeric value of the photoelastic coefficient of the film is converted into brewster, its absolute value

4) The parentheses indicates an element of Prior Art 2 which corresponds to an element in Claim 1; hereinafter, the same shall apply when comparing the Subject Invention and the Prior Arts.

would be 2 brewster or less, and thus it falls within the range of the numeric value of the photoelastic coefficient of the base film in Element 1.

(2) Also, as to the technical meaning that limits the range of the numeric value of the photoelastic coefficient of the acryl resin film, Prior Art 3 discloses that "It is preferred that the coefficient of photoelasticity is $-2\times10^{-12}Pa^{-1}$ to $2\times10^{-12}Pa^{-1}$, since the change of retardation is small even in the case where the acrylic resin film is stressed by such causes as the thermal expansion of another member stuck to the acrylic resin film, and the residual stress, when the acrylic resin film is used for a liquid crystal television with a large screen. It is preferred that the coefficient of photoelasticity is smaller since the change of retardation caused by stress is small, and a more preferred range is $-1\times10^{-12}Pa^{-1}$ to $1\times10^{-12}Pa^{-1}$" (see 4th paragraph on p. 16 of Plaintiff's Exhibit 7). This is the same as the problem to be solved (see [0005]) by controlling the photoelastic coefficient of the base film within a range of a numeric value in Claim 1.

(3) On the other hand, as to the materials applicable to the polarizing plate protective film, Prior Art 2 discloses that "all protective films ordinarily used as a protective film in a polarizing plate can be used as a protective film" (see [0050]). The smaller the photoelastic coefficient of a protective film is, the smaller the change in phase contrast. Thus, a skilled person, who knows that it is desirable to apply a protective film with a small photoelastic coefficient to a polarizing plate and a liquid crystal display device, would be sufficiently motivated to apply, to Prior Art 2, an acryl resin film whose absolute value of the photoelastic coefficient disclosed in Prior Art 3 is 2 brewster or less.

b) Difference 2

It would be reasonable to deem that a skilled person would be able to easily overcome Difference 2 with Prior Art 2 for the following reasons:

(1) Standard of judgment on inventive step of parameter invention

The term “parameter invention” refers to an invention whose elements are specified with characteristic values (parameters) newly created in terms of physics, chemistry, and biology and correlation among plural variables.

An inventive step of a parameter invention which contains statements to specify an article with properties, characteristics, etc. shall be judged with a focus on the understanding of the technical meaning of the parameters. Where a parameter invention indicates the same properties or characteristics of articles disclosed by prior arts merely in a different way, or simply confirms the original properties or characteristics inherent in the disclosed articles, the parameter invention shall be deemed as being substantively identical or similar with different expressions in relation to its prior art. Thus, the novelty and inventive step of such parameter invention are denied.

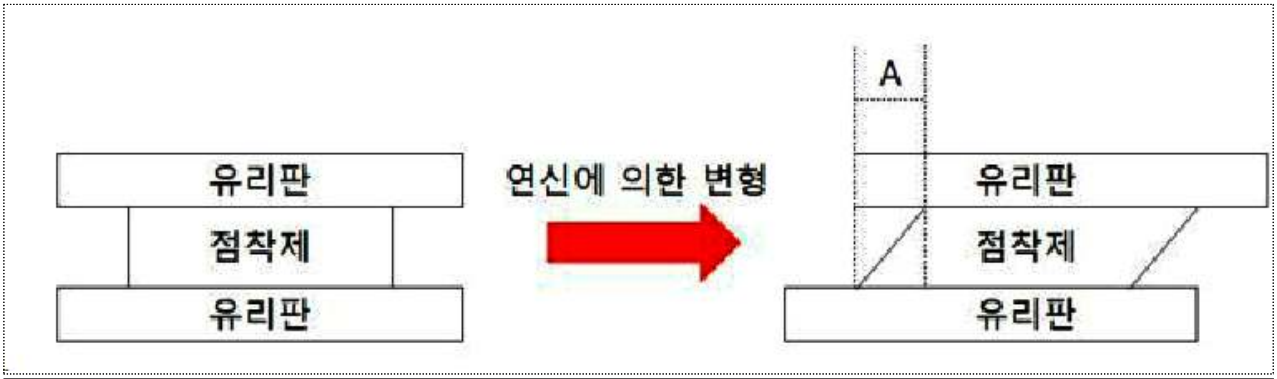
On the other hand, where a parameter invention is meaningful as technical means to solve problems differently from disclosed inventions and thus has unique effects, such as a different effect, etc., an inventive step of the parameter invention would not be denied. To this end, the specification shall disclose in detail the parameters which are meaningful as technical means to solve different problems from those of inventions already disclosed and the causal relationship between the parameters and their unique effects, such as a different effect, etc., or a skilled person could infer the meaning as technical means and the causal relationship from disclosures in the specification.

On the other hand, even where the technical meaning could not be recognized for the adoption of a parameter, most parameter inventions usually limit, as a numerical value, the newly adopted parameters. Even in these cases, it may be deemed that the parameter invention also correspond to a numerical limitation invention. Thus, in determining an inventive step thereof, the laws

related to numerical limitation inventions may also be applied. That is, where a patented invention limits, with numerical values, the scope of elements in inventions disclosed prior to the filing of the application of a patented invention and the problems and effects of the patented invention are not different from those of disclosed inventions, and the only difference among them is whether a scope of elements is limited in terms of its numeric value, the difference is only to limit a numeric value that a skilled person could select through ordinary and repeated experimentation, and thus its inventive step is denied, provided there is no significant effect within the limited numeric range. If there are different and significant effects within the limited numeric range, it shall be deemed that an inventive step thereof is not denied.

(2) Analysis of technical meaning of adoption of ΔX

(a) First, Element 2 represents ΔX as an absolute value of plane direction phase contrast (R_{in}) measured with the formula "(n_x-n_y) × d" when the sheet-like adhesive of 10 mm × 20 mm prepared with the adhesive composition is stretched to 500 μm or 600 μm in a longitudinal direction at 23 °C, and ΔX corresponds to a new parameter not disclosed in Prior Art 2. ΔX is the absolute value of the plane direction phase contrast (R_{in}) of the pressure-sensitive adhesive composition measured in specific stretch conditions as illustrated in the figure shown below. Under such stretch conditions, the orientation birefringence and the photoelastic birefringence are all revealed. Claim 1 solves technical problems, such as changes in optical characteristics, prevention of light leakage, etc., depending on the changes in the surrounding environment by adopting ΔX, which is a parameter, and controlling the same within a specific range of absolute values of phase contrast generated when the pressure-sensitive adhesive composition is distorted to a certain extent (see [0024]-[0035]).



유리판	Glass plate	점착제	Pressure-sensitive adhesive
연신에 의한 변형	Distortion by stretching		

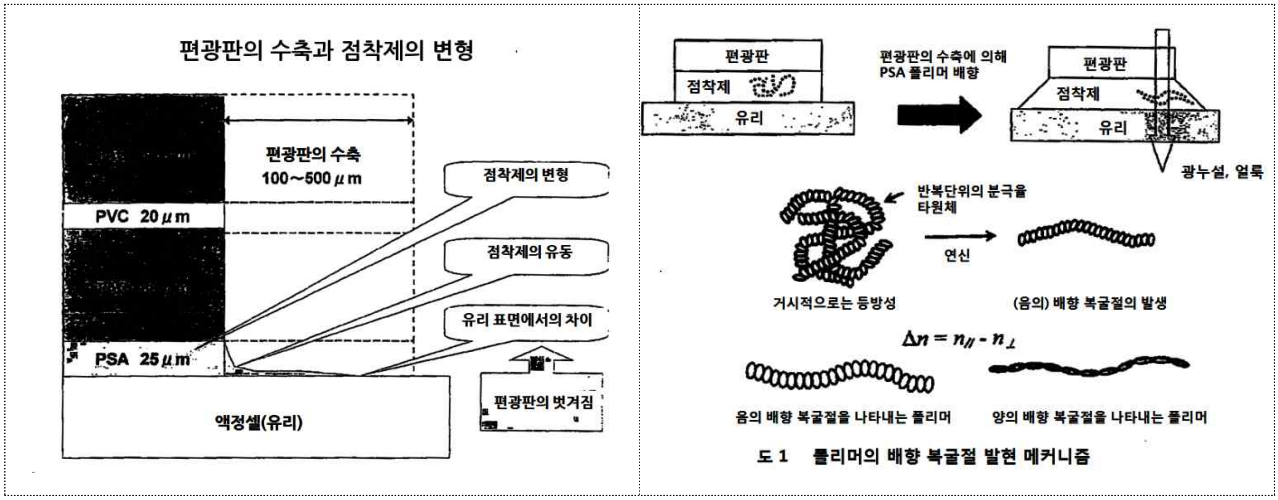
(b) On the other hand, Prior Art 2 solves a technical problem to suppress light leakage by limiting an absolute value of the in-plane photoelastic coefficient (C) of the pressure-sensitive adhesive composition within a certain range ([0050], [0081], [0082]). The photoelastic coefficient (C) of Prior Art 2 is defined as $C=\Delta n / \sigma$ (birefringence (Δn) generated when a certain stress (σ) is applied) [0014]. The photoelastic coefficient (C) of Prior Art 2 is measured by applying a tensile force in a range of 0 - 10 N from both ends to pressure-sensitive adhesive samples of 2 cm × 2 cm and thickness of 0.5 μm with an ellipsometer M-220 manufactured by JASCO Corporation at a temperature of 25 °C and humidity of 60% [0090]. In light of the fact that the measurement is rendered at a temperature higher than the glass transition temperature of the pressure-sensitive adhesive composition, it seems that the photoelastic birefringence and orientation birefringence are both revealed in the pressure-sensitive adhesive composition, provided that a tensile force within a range of 0 - 10 N is applied from both ends of the pressure-sensitive adhesive composition sample (Witness D testified that even if he/she conducted an experiment with a focus on the measurement of photoelastic birefringence, the orientation birefringence could be included in the birefringence which occurs substantially because the photoelastic coefficient was measured at a temperature of 25 ℃, which is higher than the glass transition temperature. The witness E also testified to the same effect). Ultimately, the fact that an absolute value of

the photoelastic coefficient in Prior Art 2 is small could be construed as indicating that the sum of photoelastic birefringence and orientation birefringence generated by stress applied to the pressure-sensitive adhesive composition is also small.

(c) An amount of the photoelastic birefringence and orientation birefringence would differ depending on the force applied to the pressure-sensitive adhesive composition and the direction and degree of deformation thereof. Thus, it seems that it would not be easy to convert ΔX in Element 2 from the photoelastic coefficient in Prior Art 2, unless there is information on the shape and degree of deformation in the pressure-sensitive adhesive composition that occurs when a tensile force is applied to measure the photoelastic coefficient in Prior Art 2 (see the testimony of witness D). However, if an absolute value of the photoelastic coefficient in Prior Art 2 is small, an amount of comprehensive birefringence, which changes depending on a force applied to the pressure-sensitive adhesive composition, would also be relatively small. Accordingly, it may be deemed that the birefringence that occurs in the pressure-sensitive adhesive composition and which is measured with a certain amount of force under specific stretch conditions would also be relatively small. Ultimately, it could be estimated that an absolute value of ΔX defined as a product of thickness and birefringence that occurs under specific stretch conditions would also be relatively small (Witness E testified that if a photoelastic coefficient measured by applying a tensile stress to the pressure-sensitive adhesive is 0, a photoelastic coefficient measured by applying a shear stress to the pressure-sensitive adhesive would also be 0. Thus, the pressure-sensitive adhesives with a photoelastic coefficient of 0 disclosed in Prior Art 2 (pressure-sensitive adhesives 3, 5, and 9 in Table 2) would have a photoelastic coefficient of 0 even where a shear stress is applied as when

measuring ΔX. Therefore, ΔX would be 0, and if the photoelastic coefficient in Prior Art 2 is small, ΔX in the Subject Invention would also be small.).

(d) On the other hand, the following technical ideas were widely known to skilled persons prior to the filing of the application of the patented invention: if a polarizing plate shrinks, a pressure-sensitive adhesive would be deformed (If the polarizing plate shrinks by 100-500 μm as illustrated in the figure shown below, the pressure-sensitive adhesive would be stretched in a direction of shrinkage by a length of shrinkage. Witness D testified that it was known that if the pressure-sensitive adhesive is between the polarizing plate and the glass and the temperature rises, the polarizing plate would shrink and an end of the polarizing plate would be deformed by 500-600 μm.); accordingly, the orientation birefringence would occur in the pressure-sensitive adhesive (the orientation birefringence is realized by the mechanism illustrated in the figure shown below); and the light leakage would be improved with the optical control which suppresses the birefringence of the pressure-sensitive adhesive generated by the deformation (witness E testified that it is fundamental that when developing a pressure-sensitive adhesive, the smaller the birefringence occurs according to environmental changes, the more the light leakage is suppressed). Also, it is a common technical problem in this industry that it is required, as a detailed optical control method, to adopt zero/zero birefringence polymers which suppress the orientation birefringence and the photoelastic birefringence (pp. 6, 13, and 14 of Defendant's Exhibit 5).



편광판의 수축과 점착제의 변형	Shrinkage of polarizing plate and deformation of pressure-sensitive adhesive	편광판의 수축	Shrinkage of polarizing plate
점착제의 변형	Deformation of pressure-sensitive adhesive	점착제의 유동	Flow of pressure-sensitive adhesive
유리 표면에서의 차이	Difference on glass surface	액정셀(유격)	Liquid crystal cell (clearance)
편광판의 벗겨짐	Peeling of polarizing plate	편광판	Polarizing plate
점착제	Pressure-sensitive adhesive	편광판의 수축에 의해 PSA 폴리머 배향	PSA polymer orientation caused by shrinkage of polarizing plate
유리	Glass	광누설, 얼룩	Light leakage, stain
거시적으로는 등방성	Macroscopic isotropy	반복단위의 분극율 타원체	Polarizing rate ellipsoid in unit of repetition
연신	Stretch	(음의) 배향 복굴절의 발생	Occurrence of (negative) orientation birefringence
음의 배향 복굴절을 나타내는 폴리머	Polymer representing negative orientation birefringence	양의 배향 복굴절을 나타내는 폴리머	Polymer representing positive orientation birefringence
도 1 폴리머의 배향 복굴	FIG. 1 Orientation		

절 발현 매커니즘	Birefringence Realization Mechanism of Polymer		

(e) ΔX means plane direction phase contrast caused by birefringence that occurs in a state in which a pressure-sensitive adhesive composition is stretched when a polarizing plate is shrunk by 500 - 600 μm at room temperature. To control an absolute value of ΔX within a certain range is to control the orientation birefringence and the photoelastic birefringence as close to zero as possible, and also to control plane direction phase contrast so that the light would not be leaked even in a state in which the pressure-sensitive adhesive is stretched. This is only to represent, in a formula, the general technical problem in this technical field (Witness D testified that in relation to the technical meaning of ΔX, it is possible to measure the birefringence in light of the deformation that could occur when applying the pressure-sensitive adhesive to the polarizing plate protective film and use the same. However, it would be meaningful to limit a numeric value of birefringence to 2 nm.). That is, ΔX is a parameter which provides only information of plane direction phase contrast when the pressure-sensitive adhesive composition is stretched. Preventing light leakage by controlling ΔX is identical to controling the light leakage by controlling the photoelastic coefficient in Prior Art 2.

(f) Thus, it seems that ΔX in Element 2 merely indicates, in a different manner of representation, the properties or characteristics (photoelastic coefficient, unique birefringence, photoelastic birefringence, orientation birefringence, etc.) of the pressure-sensitive adhesive disclosed in Prior Art 2 and Defendant’s Exhibit 5 or confirms the original properties or characteristics inherent in publicly known articles. Also, there is no circumstance to deem that ΔX is meaningful as technical means to solve problems different from those solved by the invention disclosed by Prior Art 2 and thus has unique effects,

such as a different effect, etc. Thus, it is difficult to recognize that Claim 1 is technically meaningful by its adoption of ΔX.

(3) Where it is recognized that there is an effect different or substantial in a range where $\triangle\Delta X \leq 2$ nm

(a) Where a difference is recognized with different effect

In the case of a pressure-sensitive adhesive layer in which a photoelastic coefficient of the pressure-sensitive adhesive in Prior Art 2 is -400 to $+250$ ($\times 10^{-12}Pa^{-1}$), the light leakage would not occur, even if the pressure-sensitive adhesive layer is peeled off (see [Table 3], [0098]). This is an effect identical to the fact that where the pressure-sensitive adhesive of Claim 1 is in a range of $\Delta X \leq 2$ nm, its reliability and durability would be excellent and the light leakage would not occur (see [Table 3], [0261]). Thus, it may not be deemed that a different effect would occur in a range where $\Delta X \leq 2$ nm.

(b) Where a difference is recognized with a substantial effect

The uniformity of light penetration (light leakage) in Claim 1 was evaluated at room temperature after leaving, for 500 hours at a temperature of 60 ℃ or for 500 hours at a temperature of 50 ℃ and a relative humidity of 90%, a polarizing plate obtained by adhesion processing of the polarizing plate to which an acryl-based protective film with a photoelastic coefficient of 1.35 brewster on one side of a pressure-sensitive adhesive layer prepared in an embodiment or a comparative example is applied after attaching the pressure-sensitive adhesive plate to a glass substrate so that an optical absorption axis is crossed on both sides. The results of evaluation are as stated in [Table 3] shown below ([0230], [0250]-[0262]):

표 3	Table 3	실시예	Embodiment
비교예	Comparative example	위상차	Phase contrast
변형	Deformation	내구신뢰성	Durability reliability
광투과 균일성(빛샘)	Light transmission		

	uniformity (light leakage)		

[표 3]

		실시예						비교예			
		1	2	3	4	5	6	1	2	3	4
위상차 (nm)	500㎛ 변형	-0.2	-0.45	0.21	0.32	0.45	-0.12	-3.76	2.78	2.57	3.21
	600㎛ 변형	-1.05	-1.2	0.23	0.33	1.2	-0.89	-5.66	4.54	4.21	5.2
내구신뢰성		○	○	○	○	○	○	○	○	○	△
광투과 균일성(빛샘)		○	○	○	○	○	○	×	×	×	×

Evaluation criteria

○: Difficult to determine heterogeneity of light penetration with naked eye

△: Some heterogeneity of light penetration

×: Large amount of heterogeneity of light penetration

Since a range of the numerical value of ΔX is obtained from experiments only on an “acryl-based protective film with a photoelastic coefficient of 1.35 brewster,” it is questionable whether the light leakage would be prevented in a range where $\Delta X \leq 2$ nm equally for other films whose photoelastic coefficient is 3 brewster or less. Rather, in light of the statements in [0050] of Prior Art 2 that “since the retardation generated from a polarizing plate protective film shall be offset to reduce the light leakage, it is required to change a photoelastic coefficient of pressure-sensitive adhesive according to a photoelastic coefficient of the polarizing plate protective film,” the photoelastic coefficient of pressure-sensitive adhesive shall change according to the photoelastic coefficient of the protective film. Thus, it seems that a range of numerical values of ΔX in the pressure-sensitive adhesive shall change to prevent the light leakage in an optimal manner in each protective film. Thus, it is difficult to deem, due to technical characteristics stated above, that there would be a change in substantial effects at a threshold in a range of numerical value where $\Delta X \leq 2$ nm.

Also, the specification of the Subject Invention only discloses an embodiment with $0.12 \leq \Delta X \leq 0.45$ and a comparative example with $2.57 \leq \Delta X \leq 3.76$. Thus, it could be inferred that where a protective film with photoelastic coefficient of 1.35 brewster is used, the light leakage would be prevented better with $\Delta X \leq 0.45$ than with $\Delta X \geq 2.57$. For example, it could not be concluded that light leakage would be prevented substantially better in the full range with $0.46 \leq \Delta X \leq 2$ than with $\Delta X = 2.1$.

(c) Thus, it may not be deemed that the numeric limitation of ΔX in Element 2 would generate different or substantial effects around the limited numeric range. Rather, it shall be deemed that the numeric limitation ΔX in Element 2 is merely a simple numeric limitation that a skilled person could select in an appropriate manner through normal and repeated experimentation.

4) Discussion of plaintiff's arguments on this point

a) The plaintiff argues that an inventive step of Claim 1 is admitted on the following grounds: Claim 1 is directed to a protective film (Element 2) in which a pressure-sensitive adhesive composition of $\Delta X \leq 2$ nm and a base film with an absolute value of the photoelastic coefficient of 3 brewster or less (Element 1) are combined; and Claim 1 has unpredictable substantial effects, such as prevention of deterioration of picture quality, suppression of light leakage, etc. due to organic combination of its elements.

However, the following correspond to common sense in the optical field: where an absolute value of the photoelastic coefficient of the base film is low and where the birefringence of the pressure-sensitive adhesive composition is low, light leakage would be prevented; and where two different layers are combined, the phase contrast of the layers is the sum of the phase contrast of each layer (Defendant's Exhibit 8). In light of the relative skill of those in the art at the time of the application, where a pressure-sensitive adhesive

composition with low birefringence is combined with a protective film with a low absolute value of a photoelastic coefficient, a skilled person would easily predict that the overall phase contrast would be low, and thus that light leakage would be efficiently prevented. Thus, the plaintiff's arguments above are without merit.

b) Also, the plaintiff argues that the prevention of light leakage is different in the Subject Invention and Prior Art 2 in that the Subject Invention prevents the light from being leaked by a base film of a protective film, while Prior Art 2 prevents the light from being leaked by the distortion of an absorption axis in a polarizer.

However, it is difficult to deem that the prevention of light leakage has different causes in the Subject Invention and Prior Art 2 in light of the following facts: the specification of the Subject Invention includes no disclosure that the light is leaked by a base film of a protective film or that the base film of the protective film would prevent the light leakage; instead, the specification of the Subject Invention states that the light would be leaked where a polarizing plate is fixed to a pressure-sensitive adhesive ([0007]); and the light leakage is measured with a polarizing plate in an embodiment ([0255], [0256]). Thus, the plaintiff's arguments above are without merit.

c) Furthermore, the plaintiff argues that the Subject Invention can prevent light leakage and relieve color shift at the same time by combining a protective film with a low photoelastic coefficient and a pressure-sensitive layer that meets specific conditions, while Prior Art 2 cannot prevent light leakage and relieve color shift at the same time, because Prior Art 2 does not consider the pressure-sensitive adhesive layer.

However, there is no ground in the specification of the Subject Invention to view the improvement of picture quality by the Subject Invention as the

relaxation of color shift, because the specification of the Subject Invention discloses the improvement of picture quality but does not mention the relaxation of color shift. Thus, the plaintiff's arguments above are without merit.

5) Summary of comparison: claim 1 lacks inventive step

As examined above, since a skilled person could easily derive Claim 1 by combining Prior Arts 2 and 3, the difficulty of composition is not admitted. Also, a skilled person could easily predict an effect of the combination, and thus the significance of the effect of the combination is not admitted, either. Ultimately, an inventive step of Claim 1 is denied by the combination of Prior Arts 2 and 3.

B. Inventive Step of Claim 2

Claim 2 relates to a "protective film for polarizing plates according to claim 1, wherein a weight average molecular weight of the base resin is 500,000 - 2,000,000."

However, since Prior Art 2 states that "an average molecular weight of an acrylate-based polymer is, even if not specifically limited, preferably about 300,000 to 2,500,000" [0030], a skilled person could easily derive the additionally limiting composition in Claim 2 therefrom.

Thus, as in Claim 1, an inventive step of Claim 2 is denied by combining Prior Arts 2 and 3.

C. Inventive Step of Claim 3

Claim 3 relates to a "protective film for polarizing plates according to claim 1, wherein ΔX in Formula 1 is 1.5 nm or less and the base resin is a polymer of monomer mixture containing 80 to 99.8 parts by weight of (meth)acrylic acid ester monomer and 0.01 to 10 parts by weight of a crosslinkable monomer."

In this regard, Prior Art 2 states that "in the pressure-sensitive adhesive of the present invention, it is particularly preferable that 0.5 - 20 parts by weight

of an isocyanate-based crosslinking agent is contained with respect to 100 parts by weight of the base polymer (solid content)" [0038]. Thus, a skilled person could easily derive from the disclosures of Prior Art 2 the composition of base resin among the additionally limiting compositions in Claim 3. The composition to limit ΔX to 1.5 nm or less is a mere numeric limitation that a skilled person could easily select based on the technical ideas to prevent light leakage and improve durability by minimizing, as close to zero as possible, or suppressing, to a certain scope, the change of birefringence in the pressure-sensitive adhesive caused by stress.

Thus, as in Claim 1, an inventive step of Claim 3 is denied by combining Prior Arts 2 and 3.

D. Inventive Step of Claim 4

Claim 4 relates to a “protective film for polarizing plates according to claim 3, wherein one or more (meth)acrylic acid ester monomers are selected from the group consisting of methyl (meth)acrylate, ethyl (meth)acrylate, *n*-propyl (meth)acrylate, isopropyl (meth)acrylate, *n*-butyl (meth)acrylate, *t*-butyl (meth)acrylate, *sec*-butyl (meth)acrylate, pentyl (meth)acrylate, 2-ethylhexyl (meth)acrylate, 2-ethylbutyl (meth)acrylate, *n*-octyl (meth)acrylate, isooctyl (meth)acrylate, isononyl (meth)acrylate, lauryl (meth)acrylate, isobornyl (meth)acrylate, and tetradecyl (meth)acrylate.”

However, Prior Art 2 states that “the acrylate polymer is based on an acrylate polymer having a monomer unit of (meth)acrylic acid alkyl ester as a main skeleton” [0020]. Thus, the PHOSITA could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 4.

Therefore, as in Claim 3, an inventive step of Claim 4 is denied by combining Prior Arts 2 and 3.

E. Inventive Step of Claim 5

Claim 5 relates to a “protective film for polarizing plates according to claim 3, wherein one or more crosslinkable monomers are selected from the group consisting of a hydroxyl group-containing monomer, a carboxyl group-containing monomer, and a nitrogen-containing monomer.”

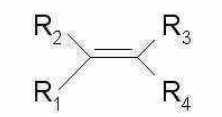
In this regard, since Prior Art 2 discloses a monomer containing hydroxyl and a monomer containing carboxyl as a monomer with crosslinking site [0028], a skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 5.

Thus, as in Claim 3, an inventive step of Claim 5 is denied by combining Prior Arts 2 and 3.

F. Inventive Step of Claim 6

Claim 6 relates to a “protective film for polarizing plates according to claim 3, wherein the monomer mixture additionally contains a monomer represented with Formula 1 shown below”

[Formula 1]



(where each of R_1 through R_3 independently represents hydrogen or alkyl; R_4 represents COR_5 or phenyl, acetyloxy substituted or unsubstituted with cyano, or phenyl; and R_5 represents amino or glycidyloxy substituted or unsubstituted with alkyl or alkoxyalkyl).

The specification of the Subject Invention discloses, in [0047], as concrete examples of the monomer in Formula 1, nitrogen-containing monomers, such as (meth)acrylonitrile, (meth)acrylamide, *N*-methyl (meth)acrylamide, or *N*-butoxy methyl (meth)acrylamide, etc.; styrene monomers, such as styrene or methyl styrene, etc.; epoxy group-containing monomers, such as glycidyl (meth)acrylate, etc.; or carbonic acid vinyl ester, etc. such as vinyl acetate. However, Prior Art

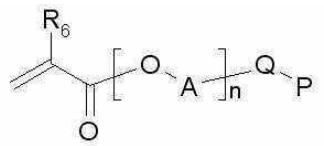
1 discloses styrene, methylstyrene, etc., as examples of aromatic ring-containing monomers ([0016]) and (meth)acrylamide, etc. as examples of functional group-containing monomers ([0018]), and a skilled person could easily derive from the above disclosure of Prior Art 1 an additionally limiting composition of Claim 6.

Thus, an inventive step of Claim 6 is denied by combining Prior Arts 1 through 3.

G. Inventive Step of Claim 7

Claim 7 relates to a "protective film for polarizing plates according to claim 3, wherein the monomer mixture additionally contains a compound represented with Formula 2 shown below"

[Formula 2]



(where R_6 represents hydrogen or alkyl; A represents alkylene; n represents an integer of 0 through 3; Q represents a single bond, -O-, -S-, or alkylene; and P represents an aromatic ring).

In this regard, the specification of the Subject Invention discloses, in [0059], the following as concrete examples of monomers in Formula 2: phenoxy ethyl (meth)acrylate, benzyl (meth)acrylate, 2-phenylthio-1-ethyl (meth)acrylate, 6-(4,6-dibromo-2-isopropyl phenoxy)-1-hexyl (meth)acrylate, 6-(4,6-dibromo-2-*sec*-butyl phenoxy)-1-hexyl (meth)acrylate, 2,6-dibromo-4-nonylphenyl (meth)acrylate, 2,6-dibromo-4-dodecylphenyl (meth)acrylate, 2-(1-naphthyloxy)-1-ethyl (meth)acrylate, 2-(2-naphthyloxy)-1-ethyl (meth)acrylate, 6-(1-naphthyloxy)-1-hexyl (meth)acrylate, 6-(2-naphthyloxy)-1-hexyl (meth)acrylate, 8-(1-naphthyloxy)-1-octyl (meth)acrylate, and 8-(2-naphthyloxy)-1-octyl (meth)acrylate. Also, Prior Art 2 discloses, in [0021],

that benzyl acrylate, phenoxyethylacrylate, etc. may be used as a pressure-sensitive adhesive component. A skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 7.

Thus, as in Claim 3, an inventive step of Claim 7 is denied by combining Prior Arts 2 and 3.

H. Inventive Step of Claim 8

Claim 8 relates to a "protective film for polarizing plates according to claim 1, wherein the adhesive composition additionally contains a compound with a positive photoelastic coefficient."

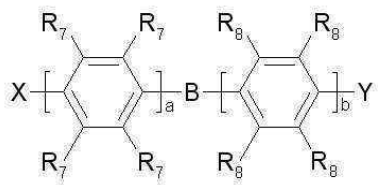
However, claim 1 of Prior Art 2 contains a monomer with positive unique birefringence as a pressure-sensitive adhesive element. A skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 8.

Thus, as in Claim 1, an inventive step of Claim 8 is denied by combining Prior Arts 2 and 3.

I. Inventive Step of Claim 9

Claim 9 relates to a "protective film for polarizing plates according to claim 1, wherein the compound with the positive photoelastic coefficient is represented with Formula 3 shown below"

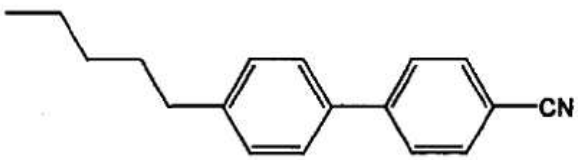
[Formula 3]



(where B represents a single bond, -CH=N-, -N=N-, -N=N(O)-, -COO-, -CH_2O-, -$C(R_7)_2$-CO-, -COO-CH_2-, -CH=CH-, -C≡C-, -S-, -SO_2-, -φ(R_7)-, -CH=N-φ(R_7)-N=CH-, -CH=CH-φ(R_7)-N=CH-, -CH=CH-φ(R_7)-CH=CH-, -CH=CH-φ(R_7)-φ

(R_8)-CH=CH-, -CH=N-φ(R_7)-(R_8)-N=CH-, -CH=N-φ(R_7)-φ(R_8)-CH=CH-, -N=N-φ(R_7)-N=CH-, -C(=O)-O-φ(R_7)-C(CH_3)$_2$-, a naphthalene core, or an anthracene core; each of X, Y, R_7, and R_8 independently represent hydrogen, halogen, cyano, amino, hydroxy, alkyl, alkoxy, aryl, dialkylamine, and cumyl; a represents an integer of 0 through 3; b represents an integer of 1 through 3 when a is 0 and an integer of 0 through 3 when a is an integer of 1 through 3; and φ represents an aromatic core).

However, Prior Art 2 discloses, in [0033], the following compound as an example of a monomer with positive unique birefringence. Further, in Formula 3 above, X is alkyl and B is a direct combination. Also, R7 and R8 are hydrogen. Furthermore, a and b are each 1, and a skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 9.

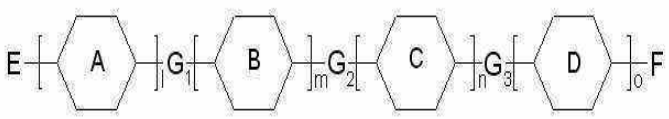


Thus, as in Claim 8, an inventive step of Claim 9 is denied by combining Prior Arts 2 and 3.

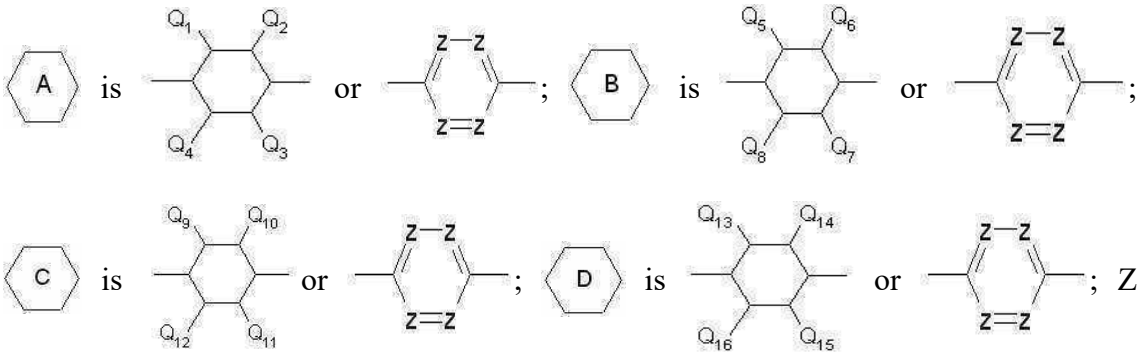
J. Inventive Step of Claim 10

Claim 10 relates to a "protective film for polarizing plates according to claim 8, wherein the compound with the positive photoelastic coefficient is represented with Formula 4 shown below"

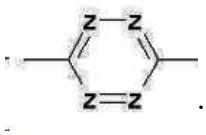
[Formula 4]



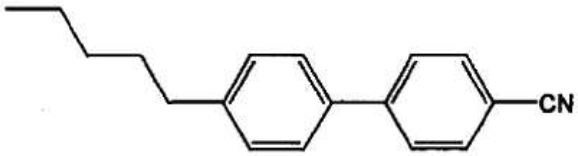
(where



is C-W or N; Q_1 through Q_{16} and W are independently hydrogen, halogen, cyano, perfluoroalkyl, perfluoroalkyloxy, -R_9, -OR_9, -NHR_9, -$N(R_9)_2$, -$C(=O)R_9$, -SR_9, -SOR_9, -SO_2R_9, -$C(=O)NR_9$, -$NR_9C(=O)R_9$, -$C(=O)OR_9$, -$OC(=O)R_9$, or –$OC(=O)OR_9$; R_9 is hydrogen, alkyl, alkenyl, alkynyl, or -$(R_{10}O)_qR_{11}$; R_{10} is alkylene; R_{11} is alkyl; q is an integer of 1 through 5; l, m, n, and o are each independently an integer of 0 through 2; l+m+n+o is an integer of 2 or more; E and F are each independently hydrogen, halogen, cyano, -R_9, -OR_9, -NHR_9, -$N(R_9)_2$, -NCO, -NCS, -$C(=O)R_9$, or –$Si(R_9)_3$; G_1, G_2, and G_3 are each independently a single bond, -O-, -$R_{10}O$-, -NR_{10}-, -S-, -SO-, -SO_2-, alkylene, alkenylene, alkynylene, or –U-T-V-; U and T are each independently a single bond, -S-, -NR_{10}-, -$O(CH_2)_p$-, carbonyl, or –O-; V is A single bond, -O-, carbonyl, -NR_{10}-, -S-, -$(CH_2)_p$-, -$O(CH_2)_p$-, or -$(CH_2)_pO$-; and p is an integer of 0 through 5).

In this regard, Prior Art 2 discloses, in [0033], the following compound as a monomer with positive unique birefringence. Also, in Formula 4, l is 1 and m and n are 0. Furthermore, o is 1 and A and D are 

. z is C-W and W is hydrogen. Also, E is –R_9 and R_9 is alkyl. Furthermore, G1 and G3 are a direct combination and F is cyano, and a skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 10.



Thus, as in Claim 8, an inventive step of Claim 10 is denied by combining Prior Arts 2 and 3.

K. Inventive Step of Claim 11

Claim 11 relates to a "protective film for polarizing plates according to claim 1, wherein the adhesive composition additionally contains 0.1 to 10 parts by weight of a crosslinking agent based on 100 parts by weight of the base resin and ΔX in Formula 1 is 1.0 nm or less."

However, Prior Art 2 states, in [0038], that it would be particularly desirable that 0.5 - 20 parts by weight of an isocyanate-based crosslinking agent are contained with respect to 100 parts by weight of the base polymer (solid content). A skilled person could easily derive from the above disclosure of Prior Art 2 the composition of the base resin and crosslinking agent among additionally limiting compositions of Claim 11. The composition that limits ΔX to 1.0 nm or less is based on the technical idea to seek prevention of light leakage and improve durability by minimizing a change in birefringence of the pressure-sensitive adhesive for stress in Prior Art 2 to as close to 0 as possible or suppressing the same within a certain range. Further, a skilled person could select such numeric limitation appropriately.

Thus, as in Claim 1, an inventive step of Claim 11 is denied by combining Prior Arts 2 and 3.

L. Inventive Step of Claim 12

Claim 12 relates to a "protective film for polarizing plates according to claim 11, wherein one or more crosslinking agents are selected from the group consisting of an isocyanate compound, an epoxy compound, an aziridine

compound, and a metal chelate compound."

However, Prior Art 2 discloses, in [0037], as a crosslinking agent, an epoxy crosslinking agent, an isocyanate crosslinking agent, and a multi-functional metal chelate. A skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 12.

Thus, as in Claim 11, an inventive step of Claim 12 is denied by combining Prior Arts 2 and 3.

M. Inventive Step of Claim 13

Claim 13 relates to a "protective film for polarizing plates according to claim 1, wherein the adhesive composition additionally contains 0.01 to 10 parts by weight of a silane coupling agent based on 100 parts by weight of the base resin."

Since Prior Art 2 states, in [0041], that the silane coupling agent (solid content) is preferably about 0.001 to 10 parts by weight with respect to 100 parts by weight of the base polymer (solid content), a skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 13.

Thus, as in Claim 1, an inventive step of Claim 13 is denied by combining Prior Arts 2 and 3.

N. Inventive Step of Claim 16

Claim 16 relates to a "protective film for polarizing plates according to claim 1, wherein the base film is a polycarbonate-based film, a saturated cycloolefin-based film, an olefin-type thermoplastic resin film which has an imide group substituted or unsubstituted in a side chain, a thermoplastic resin film which has a substituted or unsubstituted phenyl group and nitrile group in a side chain, or an acrylic film."

Since Prior Art 2 discloses, in [0059], a cycloolefin polymer protective film,

a skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 16.

Thus, as in Claim 1, an inventive step of Claim 16 is denied by combining Prior Arts 2 and 3.

O. Inventive Step of Claim 17

Claim 17 relates to a "protective film for polarizing plates according to claim 1, wherein the base film includes a graft copolymer containing acrylic resin and conjugated diene rubber."

However, claim 1 of Prior Art 3 discloses an acryl resin film whose main material is a compound of acryl resin and an acryl elastic body particle. Also, the first and second paragraphs of the bottom of p. 13 disclose diene-based rubber as a rubber polymer used in the rubber-containing graft copolymer usable as acrylic elastic particles, specifically, polybutadiene, styrene-butadiene copolymer, styrene-butadiene block copolymer, acrylonitrile-butadiene copolymer, butyl acrylate-butadiene copolymer, polyisoprene, butadiene-methyl methacrylate copolymer, butyl acrylate-methyl methacrylate copolymer, butadiene-ethyl acrylate copolymer, ethylene-propylene copolymer, ethylene-propylene-diene-based copolymer, ethylene-isoprene copolymer, ethylene-methyl acrylate copolymer, etc. Also, a skilled person could easily derive from the above disclosure of Prior Art 3 an additionally limiting composition of Claim 17.

Thus, as in Claim 1, an inventive step of Claim 17 is denied by combining Prior Arts 2 and 3.

P. Inventive Step of Claim 18

Claim 18 relates to a "polarizing plate that includes a polarizing film or a polarizing element and the protective film for polarizing plates according to claim 1 formed on one or both sides of the polarizing film or polarizing element, and wherein ΔX in Formula 1 is 1.5 nm or less on an adhesive layer

in the protective film."

In this regard, Prior Art 2 states, in [0050], that a pressure-sensitive adhesive layer would be formed on at least one surface of a protective film (one side of a polarizer) in the polarizing plate, and the composition to limit ΔX to 1.5 nm or less is based on the technical idea to seek prevention of light leakage and improve durability by minimizing a change in birefringence of the pressure-sensitive adhesive for stress in Prior Art 2 to as close to 0 as possible or suppressing the same within a certain range. Thus, these are merely limitations on numerical values that a skilled person could select appropriately.

Thus, as in Claim 1, an inventive step of Claim 18 is denied by combining Prior Arts 2 and 3.

Q. Inventive Step of Claim 19

Claim 19 relates to a "polarizing plate according to claim 18, wherein one or more are selected from a group consisting of a protective layer, a reflective layer, an antiglare layer, a retardation plate, a wide viewing angle compensation film, and a brightness enhancement film."

However, Prior Art 2 states, in [0050], that a pressure-sensitive adhesive layer is formed by placing another functional layer on a surface of a protective film on at least one plane of a polarizing plate (one side of a polarizer). Also, the following functional layers are widely used in liquid crystal display devices: protective layer, reflective layer, antiglare layer, retardation plate, wide viewing angle compensation film, and brightness enhancement film. Also, a skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 19.

Thus, as in Claim 18, an inventive step of Claim 19 is denied by combining Prior Arts 2 and 3.

R. Inventive Step of Claim 20

Claim 20 relates to a “liquid crystal display device comprising a liquid crystal panel in which the polarizing plate of claim 18 is bonded to one side or both sides of a liquid crystal cell.”

In this regard, claim 11 of Prior Art 2 discloses a liquid crystal display device comprising two polarizing plates; and a picture display device to cross at a right angle with a penetration axis of the two polarizing plates, wherein at least one polarizing plate is the prescribed polarizing plate. Also, a skilled person could easily derive from the above disclosure of Prior Art 2 an additionally limiting composition of Claim 20.

Thus, as in Claim 18, an inventive step of Claim 20 is denied by combining Prior Arts 2 and 3.

5. Conclusion

Thus, an inventive step of all claims in the Subject Invention is denied, and the registration thereof shall be invalidated. The IPTAB decision is consistent with the above analysis and shall be upheld. The plaintiff’s claim to revoke the IPTAB decision is without merit.

Presiding Judge Jejeong LEE
Judge Kisu KIM
Judge Jiyoung Yi