DESCRIPTION

Title of Invention:

COSMETIC SHEET AND METHOD FOR PRODUCING THE SAME

Technical Field

[0001]

The present disclosure relates to a cosmetic sheet and a method for producing the cosmetic sheet.

Background Art

[0002]

It has been proposed that inks containing various colorants are applied to a thin film, and the resulting thin film is attached to the human body to obscure, for example, a blotch, macula, or scar (hereinafter, also referred to as a "discolored region") on the skin (for example, Patent Literature 1). In the technique disclosed in Patent Literature 1, an image of the skin is taken to identify a discolored region. A color similar to the color of the periphery of the discolored region is printed on a thin film, and the thin film is attached to the skin to obscure the discolored region.

Citation List

Patent Literature

[0003]

PTL 1: Japanese Unexamined Patent Application Publication No. 2015-43836

Summary of Invention

[0004]

In the technique disclosed in Patent Literature 1, a coating film having a deep color tone is formed on a thin film to conceal the color of a discolored region. However, a cosmetic sheet produced in which manner tends to cause a feeling of thickness, resulting in a problem that the region to which the cosmetic sheet is attached tends to be conspicuous.

[0005]

In the attachment of a cosmetic sheet, a cosmetic sheet having luster and transparency enhances the appearance of the region to which the sheet is attached and makes the difference from a region to which no cosmetic sheet is attached obscure. In contrast to this, in the technique disclosed in Patent Literature 1 in which a coating film of a predetermined color is merely formed, it is

difficult to provide a cosmetic sheet having luster and transparency.

[0006]

An aspect of the present disclosure provides a cosmetic sheet that exhibits luster and transparency and has good appearance when attached and provides a method for producing the cosmetic sheet.

[0007]

A cosmetic sheet according to an aspect of the present disclosure is a cosmetic sheet to be attached to a skin, the cosmetic sheet including a thin film, one surface of which is to be attached to a skin, a complementary color layer used for obscuring a discolored portion of the skin, the complementary color layer being disposed on the thin film and containing a colorant complementary to a color of the discolored portion; a light-scattering layer disposed on the complementary color layer and containing a reflective material, a coloring layer disposed on the light-scattering layer and containing a colorant, and a glossy layer disposed on the coloring layer and containing a gloss agent.

[0008]

According to an aspect of the present disclosure, there is provided a cosmetic sheet that exhibits luster and transparency and has good appearance when attached.

Brief Description of Drawings

[0009]

[Fig. 1A] Fig. 1A is a view illustrating the reflection of light when no cosmetic sheet is attached.

[Fig. 1B] Fig. 1B is a view illustrating the reflection of light when a cosmetic sheet is attached.

[Fig. 2] Fig. 2 is a schematic sectional view illustrating a cosmetic sheet according to an embodiment of the present disclosure.

Description of Embodiments

[0010]

1. Cosmetic sheet

A cosmetic sheet according to the present disclosure is a sheet to be attached to the skin for the purpose of coloration and beautification of the skin. The cosmetic sheet may be a sheet for use by a particular individual (a sheet

amounts of colorants contained in the layers may be the same or different. For example, a coloring layer of any color may be stacked on a coloring layer of skin color

[0041]

The color and brightness of the coloring layer 523 can be adjusted by, for example, a combination of colorants contained in the coloring layer 523. The color and brightness of the coloring layer are easily adjusted in desired ranges by, for example, further combining colorants of blue or black with colorants of white, red, and yellow.

[0042]

Examples of the colorant contained in the coloring layer 523 include inorganic red pigments such as iron titanate, iron oxide, and iron hydroxide; inorganic brownish pigments such as γ-iron oxide; inorganic yellowish pigments, such as yellow iron oxide and ocher; inorganic black pigments such as black iron oxide and carbon black; inorganic violet pigments such as manganese violet and cobalt violet; inorganic green pigments such as chromium hydroxide, chromium oxide, cobalt oxide, and cobalt titanate; inorganic bluish pigments such as Prussian blue (ferric ferrocyanide), ultramarine (ultramarine blue), lapis lazuli blue, mountain blue, aluminum-cobalt oxide, aluminum-zinc-cobalt oxide, silicon-cobalt oxide, silicon-zinc-cobalt oxide, cobalt pigments, smalt, cobalt blue, cobalt stannate, cobalt chromium blue, cobalt-aluminum-silicon oxide, and manganese blue; organic blue pigments and blue dyes such as indigo, phthalocyanine, indanthrene blue, and sulfonated products thereof; lakes produced from various tar-based dyes; lakes produced from various natural dyes; and composite synthetic resin powders produced by combining these powders.

[0043]

The binder contained in the coloring layer 523 may be the same as the binder contained in the light-scattering layer 522 described above. The amount of binder contained in the coloring layer 523 is preferably 0.5 to 10 parts by mass, more preferably 1.5 to 5.7 parts by mass when the amount of the colorant is set to 10 parts by mass. When the amount of binder relative to the amount of colorant is in the above range, the colorant has high fixability. When the amount of binder is in the above range, the amount of colorant becomes relatively easily sufficient, and the coloring layer 523 of a desired color can be provided.

The cosmetic sheet 50 may include a layer other than the thin film 520, the light-scattering layer 522, the coloring layer 523, the glossy layer 524, and the complementary color layer 521 within a range that does not impair the objects and advantages of the present disclosure. For example, a hygroscopic layer that contains a moisture absorbent to control the humidity on the surface of the cosmetic sheet 50 and to enhance the comfort may be disposed between the coloring layer 523 and the glossy layer 524. Examples of the moisture absorbent include spherical silica, porous acrylic particles, and nylon 6 (polyamide 6).

[0064]

A description has been made of an embodiment in which the thin film 520, the light-scattering layer 522, the coloring layer 523, and the glossy layer 524 are laminated in this order or an embodiment in which the thin film 520, the complementary color layer 521, the light-scattering layer 522, the coloring layer 523, and the glossy layer 524 are laminated in this order. Alternatively, for example, the glossy layer 524 may be disposed on a structure in which light-scattering layers 522 and coloring layers 523 are repeatedly laminated. Alternatively, the coloring layer 523 and the glossy layer 524 may be disposed on a structure in which complementary color layers 521 and light-scattering layers 522 are repeatedly laminated. In any configuration, the glossy layer 524 described above is preferably disposed as the outermost surface layer. With this configuration, luster and transparency can be imparted to a portion to which the cosmetic sheet 50 is attached.

[0065]

7. Method for Producing Cosmetic Sheet

A method for producing the cosmetic sheet described above will be described below. The cosmetic sheet can be produced by performing, for example, a step of applying a light-scattering layer ink containing a reflective material to a surface of a thin film (the thin film described above), the surface being opposite to a surface to be attached to a skin, to form a light-scattering layer; a step of applying a coloring layer ink containing a colorant onto the light-scattering layer to form a coloring layer; and a step of applying a glossy layer ink containing a gloss agent to form a glossy layer. In the case where a complementary color layer is formed, before the formation of the light-scattering

combined to form desired layers. In some types of the cosmetic sheet, a white ink can be used as the light-scattering layer ink and the glossy layer ink.

[0071]

Herein, in the production of a cosmetic sheet, the method for applying the light-scattering layer ink, the coloring layer ink, the glossy layer ink, and the complementary color layer ink (hereinafter, also collectively referred to as a cosmetic ink) is not particularly limited, and a publicly known method may be employed. Examples of the method for applying the complementary color layer ink, the light-scattering layer ink, and the coloring layer ink include an ink jet printing method, a screen printing method, offset printing, and gravure printing. Of these, the ink jet method is preferred from the viewpoint of, for example, facilitating on-demand printing and achieving multilayer printing in which the cosmetic ink is applied a plurality of times.

[0072]

For example, an ink jet apparatus used when the cosmetic ink is applied by the ink jet method is not particularly limited. Any apparatus using a publicly known piezoelectric system, thermal system, or electrostatic system can be used. Of these, an ink jet apparatus using a piezoelectric element system is preferred from the viewpoint that heating, which is necessary for a thermal ink jet system, is not necessary.

[0073]

The cosmetic ink may be applied only once or twice or more in each step of forming each layer. When the cosmetic ink is applied multiple times in each step, the cosmetic ink may be dried each time of application or may be dried after the cosmetic ink is applied multiple times.

[0074]

The glossy layer ink may contain particles having a relatively large particle size. Accordingly, the method for applying the glossy layer ink is appropriately selected according to, for example, the particle size of particles contained in the glossy layer ink and an application pattern of the glossy layer ink. Examples of the method for applying the glossy layer ink include not only an ink jet printing method, a screen printing method, offset printing, and gravure printing but also spray printing, letterpress printing, flexographic printing, xerography, transfer, thermal transfer, silkscreen printing, and reverse roll coating using a gravure plate.

[0075]

The light-scattering layer ink, the coloring layer ink, the glossy layer ink, and the complementary color layer ink may be applied from separated apparatuses or the same apparatus. For example, in the case where the light-scattering layer ink, the coloring layer ink, and the complementary color layer ink are applied by an ink jet printing method, and the glossy layer ink is applied by a spray printing method, each cosmetic ink may be applied by using an apparatus that includes an ink tank for containing each cosmetic ink, an ink jet nozzle connected to the ink tank, and a spray nozzle connected to the ink tank. The application of the cosmetic ink with the ink jet nozzle and the application of the cosmetic ink with the spray nozzle may be performed in a state where the thin film is fixed at a predetermined position. Alternatively, the cosmetic ink may be sequentially applied from the ink jet nozzle and the spray nozzle while the thin film is moved in a certain direction. An example of such an apparatus includes a transport unit for transporting a thin film, an ink jet printing unit for applying a cosmetic ink to the thin film transported by the transport unit, and a spray printing unit for further applying a glossy layer ink onto a coating film (such as a complementary color layer, a light-scattering layer, or a coloring layer) formed by the ink jet printing unit, the spray printing unit being disposed on the downstream side of the ink jet printing unit in a direction in which the thin film is transported. The apparatus may include, for example, a heating unit for drying coating films formed by the ink jet printing unit and the spray printing unit.

[0076]

The method for drying the cosmetic ink may be any method that can remove the solvent (for example, a higher alcohol and purified water described below) in the cosmetic ink. For example, the cosmetic ink may be dried by a method including drying at atmospheric pressure and at room temperature or a method including drying by heating to a predetermined temperature and/or by reducing the pressure. In the case of heating, heating to a temperature of, for example, 25°C to 50°C is preferred. In the above range, the cosmetic ink can be efficiently dried without degrading the thin film and the solid component in the cosmetic ink. In the case of reducing the pressure, the pressure is preferably reduced by -0.1 to 0 MPa. Under the reduced pressure in the above range, the cosmetic ink can be efficiently dried. The drying time is appropriately selected according to, for example, the

(phytosteryl/isosteryl/cetyl/stearyl/behenyl) dimer dilinoleate; sucrose pentahydroxystearate; and di(octyldodecyl/phytosteryl/behenyl) lauroyl glutamate.
[0097]

The modified cornstarches may be compounds produced by modifying cornstarch with any compound within a range that does not impair the objects and advantages of the present disclosure. Examples thereof include hydroxypropyl-modified starches produced by causing 3-(dodecenyl)dihydro 2,5-furandione to react with cornstarch.
[0098]

Among the compounds mentioned above, from the viewpoint of improving drying properties of the cosmetic ink, an acrylates copolymer, an acrylates (ethylhexyl acrylate) copolymer, a polyurethane-14-AMP-acrylates copolymer, alkyl acrylate copolymer ammonium, bis(behenyl/isostearyl/phytosteryl) dimer dilinoleyl dimer dilinoleate-glyceryl tri-hydrogenated rosinate, xanthan gum crosspolymer-hydroxyethylcellulose, Tremella Fuciformis polysaccharide, a modified cornstarch, and dextrin isostearate are preferred, and an acrylates copolymer, an acrylates (ethylhexyl acrylate) copolymer, a polyurethane-14-AMP-acrylates copolymer, alkyl acrylate copolymer ammonium, bis(behenyl/isostearyl/phytosteryl) dimer dilinoleyl dimer dilinoleate-glyceryl tri-hydrogenated rosinate, xanthan gum crosspolymer-hydroxyethylcellulose, and Tremella Fuciformis polysaccharide are more preferred.
[0099]

The amount of film-forming agent contained in 100 parts by mass of the cosmetic ink is preferably 20 parts by mass or less, more preferably 0.1 to 10 parts by mass, still more preferably 0.3 to 5 parts by mass. When the amount of film-forming agent is 0.1 parts by mass or more, drying properties of the cosmetic ink is enhanced as described above. On the other hand, an excessively large amount of film-forming agent may excessively increase the viscosity of the cosmetic ink. However, 20 parts by mass or less of the film forming agent can provide the cosmetic ink with a viscosity suitable for printing by various printing methods.
[0100]

In preparation of the cosmetic ink, the film-forming agent is typically dissolved in a solvent to prepare a solution, and the solution is mixed with, for example, a colorant, a reflective material, a gloss agent, a binder, a higher alcohol,

and purified water. The solvent used in this case is also preferably a solvent that does not irritate the skin and is preferably the above higher alcohol and water.
[0101]

The cosmetic ink may further contain, for example, a water-soluble polymer (polymer that does not correspond to the above film-forming agent) for binding the reflective material, the colorant, the gloss agent, and the like to a printing object within a range that does not impair the objects and advantages of the present disclosure.
[0102]

(Dispersant)

The dispersant is a component added in order to uniformly disperse components in the cosmetic ink and to maintain the dispersion state for long time. The type of dispersant is not particularly limited as long as the dispersant can exhibit such a function. In the cosmetic ink, in particular, a colorant, a reflective material, a gloss agent (hereinafter, also collectively referred to as "various particles"), and the like tend to settle with time. In view of this, the dispersant is preferably a material capable of suppressing settling of these.
[0103]

Specifically, the dispersant is preferably a compound that adsorbs around various particles and that is capable of suppressing settling of various particles as a result of electrostatic repulsion or repulsion due to steric hindrance between dispersant particles. The various particles may be dispersed in a dispersion liquid adjusted to be basic in order to enhance dispersibility to purified water or a higher alcohol. The cosmetic ink containing various particles that have been subjected to such a treatment preferably contains anionic dispersant, and particularly preferably contains a dispersant formed of an organic polymer from the viewpoint of easily obtaining repulsive force due to steric hindrance or the like. The organic polymer preferably has 8 or more carbon atoms, more preferably 10 or more carbon atoms.
[0104]

Specific examples of the dispersant formed of an anionic organic polymer include polyoxyethylene stearyl ether phosphates such as steareth-2 phosphate and steareth-3 phosphate; polyoxyethylene lauryl ether phosphates such as oleth-4 phosphate; polyoxyethylene alkyl (12-15) ether phosphates (the values in the parentheses represent the numbers of carbon atoms); and sodium laureth-11

carboxylate. A specific example of the dispersant formed of a nonionic organic polymer is sucrose fatty acid ester.

[0105]

The amount of dispersant is appropriately selected according to the type of the dispersant. The dispersant is preferably contained in an amount of 2% to 50% by mass, more preferably 2% to 10% by mass relative to the cosmetic ink. When the amount of dispersant is in the above range, for example, settling of various particles is suppressed, and phase separation, settling, and the like can be made difficult to occur for a long time.

[0106]

(Various Additives)

The various additives are also preferably compounds having negative skin irritation. Examples of the various additives include pH-adjusting agents, thickeners, ultraviolet absorbers, ultraviolet scattering agents, antiseptic/antifungal agents, deoxidizers, antioxidants, antiseptic agents, antifading agents, antifoaming agents, fragrances, and solvents other than higher alcohols and purified water.

[0107]

Examples of the pH-adjusting agents include acids such as hydrochloric acid, citric acid, acetic acid, phosphoric acid, sulfuric acid, gluconic acid, and succinic acid; carbonates such as potassium carbonate and sodium hydrogencarbonate; hydroxides of an alkali metal such as sodium hydroxide and potassium hydroxide; and buffer solutions containing any of these salts (such as a phosphate buffer solution, a citrate buffer solution, and an acetate buffer solution).

[0108]

·Physical Properties of Cosmetic Ink

Each of the cosmetic inks preferably has a viscosity of 50 mPa·s or less, more preferably 1 to 20 mPa·s, still more preferably 3.5 to 8 mPa·s, at 25°C, as measured with a cone-plate viscometer at a rate of 100 (1/s). The cosmetic ink having a viscosity in the above range can be easily printed by using various printers. In particular, the cosmetic ink having a viscosity in the above range is easily and stably ejected from an ink jet apparatus.

[0109]

The cosmetic ink preferably has a pH in the range of 6 to 10, more

preferably 7.5 to 9.5. When the cosmetic ink has a pH in the above range, for

CLAIMS

[Claim 1]

A cosmetic sheet to be attached to a skin, the cosmetic sheet comprising:

a thin film, one surface of which is to be attached to a skin;

a complementary color layer used for obscuring a discolored portion of the skin, the complementary color layer being disposed on the thin film and containing a colorant complementary to a color of the discolored portion;

a light-scattering layer disposed on the complementary color layer and containing a reflective material;

a coloring layer disposed on the light-scattering layer and containing a colorant; and

a glossy layer disposed on the coloring layer and containing a gloss agent.

[Claim 2]

The cosmetic sheet according to Claim 1,

wherein the glossy layer is disposed so as to cover an entire surface of the coloring layer.

[Claim 3]

The cosmetic sheet according to Claim 1,

wherein the glossy layer is disposed so as to cover only a partial region of the coloring layer.

[Claim 4]

The cosmetic sheet according to any one of Claims 1 to 3,

wherein the glossy layer is disposed as an outermost surface layer.

[Claim 5]

The cosmetic sheet according to any one of Claims 1 to 4,

wherein the glossy layer has a thickness of 10 nm or more and 60 μm or less.

[Claim 6]

A method for producing a cosmetic sheet to be attached to a skin, the method comprising:

a step of forming, on a surface of a thin film, the surface being opposite to a surface to be attached to a skin, a complementary color layer used for obscuring a discolored portion of the skin and containing a colorant complementary to a color of the discolored portion;

a step of applying a light-scattering layer ink containing a reflective material

onto the complementary color layer to form a light-scattering layer;

a step of applying a coloring layer ink containing a colorant onto the light-scattering layer to form a coloring layer; and

a step of applying a glossy layer ink containing a gloss agent onto the coloring layer to form a glossy layer.

[Claim 7]

The method for producing a cosmetic sheet according to Claim 6, wherein

the coloring layer ink and the glossy layer ink each contain a higher alcohol having 3 or more carbon atoms, purified water, and a binder, and

the binder in the coloring layer ink and the binder in the glossy layer ink contain compounds having a common structure.

[Claim 8]

The method for producing a cosmetic sheet according to Claim 6,

wherein the glossy layer ink further contains a film-forming agent.

[Claim 9]

The method for producing a cosmetic sheet according to Claim 8,

wherein an amount of the film-forming agent in the glossy layer ink is 0.1% to 10% by mass.

[Claim 10]

The method for producing a cosmetic sheet according to Claim 6,

wherein the glossy layer ink further contains a dispersant.

[Claim 11]

The method for producing a cosmetic sheet according to Claim 6,

wherein the application of the light-scattering layer ink and the applciation of the coloring layer ink are performed by an ink jet printing method.

[Claim 12]

The method for producing a cosmetic sheet according to Claim 11,

wherein the application of the glossy layer ink is performed by at least one method selected from a spray method, a screen printing method, an offset printing method, a gravure printing method, a letterpress printing method, a flexographic printing method, xerography, transfer, thermal transfer, a silkscreen printing

method, and a reverse roll coating method using a gravure plate.