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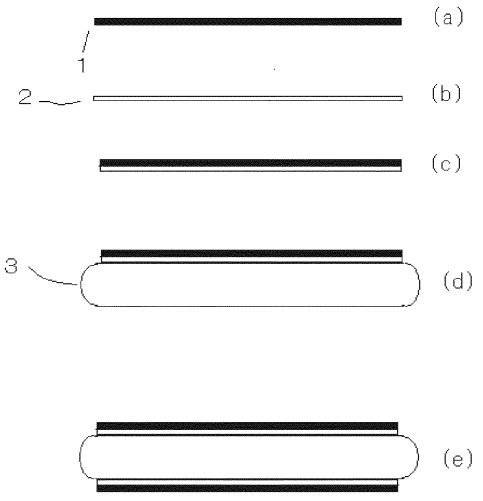
(54) MAKEUP APPLICATOR

(57) When using a makeup applicator, a cosmetic material has been excessively absorbed into the makeup applicator, sound due to void has occurred during the use of the makeup applicator, or wrinkles have occurred by the use thereof. In order to solve this, provided is a makeup applicator wherein one surface of a slice sheet (1) obtained by slicing an open-cell foam sponge forms a coating surface, and a coating layer (2) is provided so as to adhere to a recessed section, in accordance with the shape of the inner surface thereof, in which two types of recessed sections: a recessed section formed by that the surface of the other surface of the slice sheet (1) is roughened by a slice blade, and a recessed section formed by that the original pores of the open-cell foam sponge are cut are combined and formed, and wherein the surface one the side on which the coating layer (2) of the slice sheet (1) is formed ins bonded to a base material (3).

FIG. 1



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Description

Technical Field

[0001] The present invention relates to a makeup applicator constituted by providing a film in a manner adhering along the shapes of recessed sections on one side of a sliced open-cell foam body, and bonding a base material to the film surface. More specifically, the present invention relates to a makeup applicator wherein the film adhered along the shapes of many recessed sections on the sliced surface is formed by means of thermal transfer.

Prior Art

[0002] Makeup applicators are such that, if a large amount of cosmetic material is taken on the applicator, the applicator slips and cannot apply cosmetic material uniformly. If the amount of cosmetic material on the applicator is small, on the other hand, the skin receives more resistance when the cosmetic material is applied, which is not desirable in terms of how the user feels.

Accordingly, development efforts have been made to improve the amount of cosmetic material impregnated into the makeup sponge by adjusting the foam structure, foam density and thickness of the sponge, so that an appropriate amount of cosmetic material can be applied according to the type of makeup.

Specifically, the impregnated amount of cosmetic material has been adjusted by tuning the impregnated amount within an appropriate range by improving the size and density of pores during foaming of NBR latex or NR latex or wet foaming of urethane, or by adjusting the thickness of the sliced open-cell foam body.

[0003] The former means, i.e., tuning of the impregnated amount within an appropriate range by improving the size and density of pores, is already possible in the hands of those skilled in the art in a desirable manner, but there are still several areas that need to be improved regarding the latter method, or adjusting the thickness of the sliced open-cell foam body. To be specific, although the latter method is drawing keen interest in the industry because the foam structure of the sponge and its physical properties can be utilized to improve the touch and skin coating property of the sponge, and the impregnated amount of cosmetic material can be adjusted in a desired manner, the problem of cosmetic material permeating to the surface on the opposite side to dirty the fingers, etc., has not been addressed.

As solutions to this problem, means (a) to (c) below are known that include forming a non-permeating layer by providing a film.

[0004] (a) Makeup puff applicator constituted by an elastic sheet having a porous layer such as a thin wet-foamed urethane layer on which a wet-foamed skin layer is provided via a hot-melt resin film. To be specific, this makeup puff is made by using a porous layer formed according to the solution application method by using a wet-foamed urethane sheet of 0.4 to 0. 8 mm in thickness on a woven fabric (nylon tricot half), or by using a porous layer formed according to the wet method by applying polyurethane resin on a release paper, where hot-melt resin is thermally fused on an elastic sheet using a thermo-fusion film of 30 to 70 μm in thickness.

(Refer to Patent Literature 1.)

[0005] (b) Makeup sponge puff made by providing a net-like pattern of 1 mm in width and 3 mm in pitch on one side of an open-cell foam sponge by means of thermal compression to partially seal the foams in order to adjust the impregnated amount of cosmetic material without using film. (Refer to Patent Literature 2.)

[0006] (c) Makeup puff made by bonding an applicator sponge with a base sponge via a non-permeating layer, and then providing a film by the aforementioned bonding and further providing an irregular pattern on the applicator sponge by means of thermal compression to adjust the impregnated amount of cosmetic material. (Refer to Patent Literature 3.) In an example of this makeup puff, a NBR sponge of 8 mm in thickness is used as the base sponge and its skin layer is used as the non-permeating layer, and an open-cell foam urethane sponge sheet constituting the applicator sponge is provided on top, after which an irregular pattern is made on the applicator sponge using a metal die by means of thermal compression to compress the thickness to 0.5 mm.

Prior Art Literatures

Patent Literatures

[0007] Patent Literature 1: Japanese Utility Model Laid-open No. Sho 55-095611

Patent Literature 2: Japanese Patent Laid-open No. Hei 09-164017
Patent Literature 3: Japanese Patent Laid-open No. 2005-118433

Summary of the Invention

Problems to Be Solved by the Invention

[0008] The porous surface of the makeup puff described in (a) above has a skin layer on it and therefore the foam density is different between the surface and interior. Since the surface layer is a fine layer, cosmetic material supplied onto the surface of the makeup puff exists primarily on the surface layer, and it is not impregnated into the interior in a large quantity. As a result, it cannot be concluded that this porous layer contributes particularly to impregnation and application of cosmetic material. Also, this makeup puff uses a film made of general-purpose hot-melt resin, instead of a slice sheet, so a film adhering to the shapes of recessed sections cannot be obtained.
Furthermore, it cannot be said that the hot-melt resin is covering the porous surface on the elastic sheet side along the shapes of inner surfaces of recessed sections.
In addition, such makeup puff does not allow cosmetic material to be impregnated into the porous layer and consequently the entire amount of cosmetic material is supplied to the skin immediately after the start of application, which makes it difficult to supply cosmetic material gradually to the skin by adjusting the application force, etc., according to a specific intent of the user or to apply a uniform amount of cosmetic material.
The makeup sponge puff described in (b) above feels hard because the foams are sealed by thermal compression of the sponge in a net-like pattern. Furthermore, there is no non-permeating layer on the back side, etc., so cosmetic material permeating from the front side may ooze out from the side faces or back side, and this problem reduces the practicability of this technology compared to technologies involving formation of film.
The makeup puff described in (c) above is made by forming a non-permeating layer and then providing a porous layer of irregular pattern via the non-permeating layer by means of bonding a porous sheet, etc. However, the non-permeating layer is primarily a skin layer on the makeup puff and does not cover the surface of recessed sections present in the porous application layer provided on top of the skin layer in a manner contacting the skin layer and, because the aforementioned voids between the surface film of the porous application layer and sponge do not disappear after the thermal compression of the irregular pattern, cosmetic material impregnated into the puff will reach the skin layer during use and fill the recessed sections.

[0009] As mentioned above, methods are known to provide a makeup applicator **characterized in that** permeation of cosmetic material is stopped by providing some kind of film on the open-cell sponge and consequently the impregnated amount of cosmetic material is adjusted, as described in Patent Literatures 1 and 3 above. If the open-cell sponge is made into a slice sheet, however, its surface will have recessed sections formed via combination of many recessed sections which are formed by the catching of the slice blade by the open-cell foam body when the open-cell foam body is sliced and which are larger than the pores in the foam body, and recessed sections which are derived from the cross-section of pores in the open-cell sponge and which are of the same size as the cells in the foam body, and if a film is simply bonded over the surface, voids will be created by these combined recessed sections between the surface of the slice sheet and the film. These voids are larger than the pores in the sponge.
Since these voids absorb an excessive amount of cosmetic material when the puff is used, cosmetic material will still remain in these combined recessed sections even after the end of application with cosmetic material squeezed out of the puff. Also, one's face has various surface shapes including relatively flat areas like the cheeks and forehead and relatively raised areas like the chin and nose, and therefore when the same amount of force is applied to the puff by the hand, greater pressures will be applied to the raised areas when contacted by the puff, meaning that more cosmetic material will be applied to these raised areas.
As explained above, with conventional makeup applicators, it is difficult to apply cosmetic material uniformly and a lot of cosmetic material may be applied to certain areas of the body.
Furthermore, if a lot of cosmetic material still remains in the puff, washing requires more time and effort when the puff is washed after use. Also when the puff is not washed and impregnated material dries up, the puff will become hard due to dried cosmetic material when more cosmetic material remains in the puff, and usability will drop thereafter.
In addition, dried cosmetic material can generate sound when the puff is used and may also lead to other problems such as causing lines to form in the puff.
The present invention aims to provide a makeup applicator that solves the aforementioned problems associated with formation of a film, where the film is formed in such a way as to permit the impregnated amount of cosmetic material to be adjusted in a desired manner.

Means for Solving the Problems

[0010] Means for solving the aforementioned problems is as follows:

A makeup applicator, constituted by: a slice sheet made by slicing an open-cell foam sponge, one side of which

forms an application surface, where a film layer is provided on the other side of the slice sheet in a manner adhering along the shapes of recessed sections made via combination of two types of recessed sections including recessed sections formed by roughening of the surface by a slice blade and recessed sections formed by cutting of the original foams in the open-cell foam sponge; and a base material bonded to the side of the slice sheet on which the film layer is formed [Claim 1]; wherein the film layer may be formed by means of thermal transfer [Claim 2]; wherein the slice sheet layer may have a thickness of 0.2 to 2.0 mm [Claim 3]; wherein the film layer by means of thermal transfer may be made of a polyester urethane resin of 45 to 60 MPa in tensile failure stress and 500 to 700% in tensile failure strain, having a thickness of 2 to 50 μm, and adhering along the shapes of recessed sections formed via combination of the two types of recessed sections [Claim 4]; wherein the film may contain an antibacterial agent [Claim 5]; and wherein the side of the slice sheet on which the film is formed is bonded to the base material and an applicator part constituted by the sliced surface on the opposite side of the one on which the film is formed is provided on one side or both sides, or the side of the slice sheet on which the film is formed is bonded to the base material, the base material is bonded to one part of a support implement in a manner enveloping it, and an applicator part constituted by the slice sheet surface is provided over the entire surface in one part of the support implement [Claims 6 to 8].

Effects of the Invention

[0011] The surface of the slice sheet appears flat to the naked eye, but as shown in Fig. 5, it has many waving recessed sections. These shapes of recessed sections generate when the foam sponge is sliced using a slice blade and, although the diameters and depths of these recessed sections vary depending on the shape and specification of the slice blade and slicing conditions, they are significantly larger than those of recessed sections made by cutting of original pores in the slice sheet.

In addition to these recessed sections, there are also small recessed sections formed by cutting of pores originally present in the open-cell foam body, and the surface of the slice sheet conforming to the present invention has recessed sections formed via combination of these two types of recessed sections.

On the side of the open-cell foam body where a film is provided on the slice layer, the film is formed in a manner adhering along the shapes of inner surfaces of these recessed sections made by slicing.

As a result, cosmetic material, etc., is impregnated into the slice sheet through its application surface when the makeup applicator is used, and this cosmetic material, etc., impregnated into the open-cell foams travels further into the slice sheet. When this occurs, impregnated cosmetic material, etc., permeates into the open-cell portions, but since the film formed over the applicable recessed sections cuts off the passage of cosmetic material, etc., connecting the open-cells continuing from the front surface of the slice sheet and these recessed sections, permeated cosmetic material, etc., does not reach and fill the recessed sections, which prevents excessive impregnation of cosmetic material, etc.

As a result, the user can apply cosmetic material, etc., to the skin, etc., by a small amount at a time as supplied onto the makeup applicator, which makes it possible to apply an intended amount of cosmetic material, etc., uniformly, to any area, without causing the makeup applicator to slip. Furthermore, cosmetic material, etc., does not remain in the recessed sections after use, which makes washing easy and prevents the makeup applicator from hardening due to drying of remaining cosmetic material, etc., when the makeup applicator is not washed. The above feature also prevents generation of sound during use due to cosmetic material, etc., remaining in the recessed sections, or formation of lines in the slice sheet due to these recessed sections, and consequently improves the feeling of use.

Brief Description of the Drawings

[0012]

[Fig. 1] Drawing of a puff manufacturing process wherein a film layer is provided on a slice sheet layer and the resulting layer structure is attached on top of a base material

[Fig. 2] Drawing of a makeup tip according to a makeup applicator conforming to the present invention

[Fig. 3] Makeup applicator having a gripping part

[Fig. 4] Makeup applicator having a gripping part

[Fig. 5] Photographs showing the surface of the film and section views of the slice sheet and film layers obtained in Example 1

[Fig. 6] Photograph showing a section view of the slice sheet and film layers obtained in Comparative Example 1

Description of the Symbols

[0013] 1: Slice sheet layer

2: Film layer
3: Base material
4: Support implement
5: Core
6: Gripping part

Mode for Carrying Out the Invention

(Slice sheet layer)

[0014] For the material sponge of the slice sheet layer conforming to the present invention, a sponge made from NBR or NR latex by the Dunlop method, sponge made from polyurethane by the wet foaming method, sponge made by forming open-cell foams from closed-cell polyurethane foams, or any other known sponge can be used. Properties of the sponge itself, such as foaming scale factor, can be adjusted in a desired manner and the amount of cosmetic material, etc., impregnated into the slice sheet layer can be adjusted by adjusting the foaming scale factor.
Such sponge is sliced using a slice blade to obtain a slice sheet layer whose thickness is 0.2 to 2.0 mm, or more preferably 0.2 to 1.0 mm, having a sliced surface on both sides. The purpose of slicing the sponge is to remove the fine layer on the sponge surface, or namely the skin layer, and also to adjust the amount of cosmetic material, etc., impregnated into the makeup applicator during use by adjusting its thickness. It is difficult to reduce the thickness of the slice sheet layer to less than 0.2 mm, and a thickness of 2.0 mm or more is not desirable because it does not help the adjustment of impregnated amount. Also, it is difficult to impregnate and retain a sufficient amount of cosmetic material, etc., unless the foams are open-cell type.
The surface of the slice sheet is very irregular due to catching of the slice blade by the walls of pores when the pores in the open-cell sponge are cut with the slice blade as mentioned above, and these irregularities are greater than the irregularities caused by the original foams in the sponge.

(Thermal transfer sheet)

[0015] The thermal transfer sheet is a member used to provide, on one side of the slice sheet layer mentioned above, a thermal transfer layer which is a film layer whose primary purpose is to prevent permeation of cosmetics material, etc. This thermal transfer sheet has a base film constituted by heat-resistant resin film such as PET and is made by sequentially forming a release layer and a thermally transferred resin layer on one side of the base film.
The thickness of the heat-resistant resin film should desirably be 20 to 30 μm because the film must be flexible, while the release layer is provided to separate the base film and thermal transfer layer during thermal transfer so that the thermal transfer layer can be removed from the base film.
The release layer facilitates removal of the thermal transfer layer because when it melts under heating, the adhesive force with the base material layer and thermal transfer layer is reduced.
This release layer may be a release layer that liquefies during thermal transfer to provide flexibility and cushion property, such as a layer made of a polymer with a low melting point and that remains solid at normal temperature, wherein, as the release layer liquefies due to the heat during thermal transfer, the flexibility and cushion property needed to cause the film to adhere to the irregular surface of the slice sheet can be achieved. This effect allows a thicker film layer to be formed over the irregularities, especially recessed sections, and as a result the depth of recessed sections can be reduced. Low-density polyethylene resins whose melting point is between 60 to 100°C can be used as release agents capable of achieving the above effect, where examples include UBE (registered trademark) Polyethylene UM8928 with a melting point of 69°C and UBE (registered trademark) Polyethylene UM8420 with a melting point of 94°C (products of Ube-Maruzen Polyethylene). A desired thickness of the release layer is 25 to 40 μm.
Also note that, if a film adhering to the irregular shapes of recessed sections present on the surface of the slice sheet is not formed due to the thermal transfer layer and open-cells are connected to these recessed sections, problems associated with these recessed sections will occur, such as excessive application of cosmetic material, etc., as a result of an excessive amount of cosmetic material, etc., being impregnated and filled into the space formed by the recessed sections due to these open-cells in the slice sheet that are connected to the recessed sections, as well as cosmetic material, etc., remaining in the recessed sections after use of the makeup applicator. However, the present invention eliminates these problems by forming a film that adheres to the irregular shapes of recessed sections so as not to allow the open-cell foams to be connected to the recessed sections and thereby preventing an excessive amount of cosmetic material, etc., from being filled into the recessed sections.

(Film layer)

[0016] As mentioned above, the film layer functions by adhering to the shapes of recessed sections present on the surface of the slice sheet, and therefore the film layer present over these recessed sections is thick, while the film layer present over projected sections is relatively thin. The thickness of the film layer is 2 to 50 μm, or preferably 2 to 20 μm, but these thickness ranges represent an average thickness and are identical to the thickness of the film layer as formed on the base film via the release layer before thermal transfer.

Then, as a result of the film layer formed in a manner adhering to the shapes of recessed sections, the passage connecting these recessed sections and slice sheet is blocked and the recessed sections become no longer connected to the pores. When the makeup applicator is used, cosmetic material, etc., which has been impregnated into the surface layer formed from the slice sheet does not reach these recessed sections and therefore does not remain in the recessed sections, which makes it possible to accurately apply cosmetic material, etc., according to the impregnated amount as determined by the thickness of the slice sheet and also according to the intended amount to be applied. At the same time, excessive absorption of cosmetic material in the makeup applicator, generation of sound when the makeup applicator is used, and forming of lines in the application surface of the makeup applicator, can be prevented.

The constituent of this film formed on the release layer as a thermal transfer layer should be such that it adheres to the irregularities and prevents permeation. A desirable resin film constituent offering flexibility is polyester urethane resin whose tensile failure strength is in a range of 45 to 60 MPa and tensile failure strain is in a range of 500 to 700%. More preferably the tensile failure strength should be in a range of 48 to 53 MPa, while the tensile failure strain should be in a range of 550 to 650%. If the tensile failure strength and tensile failure strain are lower than the aforementioned ranges, the film breaks easily, and if the tensile failure strength and tensile failure strain are greater than the aforementioned ranges, on the other hand, poor adhesion prevents the film from fully adhering to and covering the recessed sections on the slice sheet; either way, connection of these recessed sections and open-cells cannot be prevented. To form a thermal transfer layer of 2 to 50 μm in thickness constituted by this polyester urethane, the applicable resin is dissolved in a solvent and applied to the surface of the release layer on the base sheet.

Also note that, once used, the makeup applicator has resident bacteria, etc., on it that has attached to the makeup applicator from the skin during use. For example, if water-soluble cosmetic material, etc., is attached to the makeup applicator, growth of resident bacteria, etc., contained in the attached cosmetic material, etc., causes the makeup applicator to generate a foul smell. Also when the makeup applicator contains moisture following washing after use, water bacteria, etc., present in this moisture content may grow and also generate a foul smell. However, impregnating an antibacterial agent in the film layer and allowing the antibacterial agent to gradually diffuse in the makeup applicator has the effect of preventing growth of resident bacteria, water bacteria, etc., or killing these bacteria, thereby preventing generation of a foul smell.

For the antibacterial agent that can be used for this purpose, silver zeolite, silver-containing glass or other silver antibacterial agent, or any antibacterial agent that can be used with cosmetic materials, or any other known antibacterial agent can be selected and used as desired. Among others, silver antibacterial agents are preferred for their antibacterial property and chemical stability and also for their safety to the human body such as not irritating the skin.

As explained above, an antibacterial agent must be blended into the film layer to prevent generation of a foul smell. Assume that an antibacterial agent is incorporated into the sponge layer. If the sponge is a vulcanized foam body, the antibacterial agent reacts with the sulfur compound and loses its antibacterial property. Also note that an attempt to incorporate an antibacterial agent when using a method of obtaining a foam body by a wet method, would result in elution of the antibacterial agent containing silver, for example, together with the soluble grains eluted for foaming foams in liquid, and consequently no antibacterial agent will remain in the sponge layer and no antibacterial property will be achieved.

It should be noted that the film layer can contain known additives for resins such as fragrance agents, coloring agents, fillers that are selected as necessary. By using coloring agents, the makeup applicator can have different colors on different surfaces of the makeup applicator, or patterns, etc., can be added on the surface of the makeup applicator.

(Thermal transfer method)

[0017] Under the present invention, the thermal transfer method can be used to form a film on one side of the slice sheet, where this thermal transfer method may be based on either continuous transfer or static transfer.

Whichever method is used, it is necessary that the film layer be softened via heating to a level at which it can cover the shapes of recessed sections on the surface of the slice sheet, and if the film layer is a release layer that functions when heated, it is necessary that the release layer be heated to a temperature at which its intended function can be achieved, and to meet the aforementioned needs, it is necessary to adjust the heating temperature and heating time of the thermal transfer sheet, machine operating speed, and other conditions.

Under the continuous transfer method, the aforementioned thermal transfer sheet, which may have a web-like shape,

for example, can be placed on top of a web-like slice sheet and the layered sheets can be calendared continuously by means of thermal compression under the conditions of 15 mm/sec in speed and 180°C in roller surface temperature, to transfer a film in a manner adhering to the irregularities and covering the shapes of recessed sections.
Under the static transfer method, on the other hand, the slice sheet and thermal transfer sheet can be placed one atop the other and pressed by means of thermal compression at 150°C for 4 to 5 seconds, to transfer a film in a manner adhering to the irregularities and covering the shapes of recessed sections.

(Makeup applicator)

[0018] The makeup applicator proposed by the present invention works in such a way that it is shaped into a puff, tip, etc., and cosmetic material is impregnated into it through the application surface and then applied to the target area of the body using the puff, tip, etc. Of course, the makeup applicator need not be a puff or tip, but it can be in any other form as long as it has the structure proposed by the present invention. Also, the applicable puff, tip or any other makeup applicator can have any known size, shape, gripping structure, etc.
Moreover, the makeup applicator is constituted by a slice sheet having a film layer provided on one side, and a base material whose surface is bonded to the film layer. To be specific, the slice sheet is oriented in such a way that the film layer faces the base material that has been adjusted to an appropriate size for use as a puff, tip, etc., and placed on the base material so that the slice sheet is on the surface of the base material. The base material and slice sheet may be bonded using known adhesives such as olefin adhesive, rubber adhesive, acrylic adhesive, or they may be bonded or adhered by other means. It is also necessary to select an adhesive that does not affect the adhesive force during lamination in the event that any part of the release agent layer remains on the film layer when the film layer is thermally transferred.
The constituent of the film provided on the release layer as a thermal transfer layer should be such that the film adheres to the irregularities of the slice sheet and prevents permeation. As mentioned above, a desirable resin film constituent offering flexibility is polyester urethane resin whose tensile failure strength is in a range of 45 to 60 MPa and tensile failure strain is in a range of 500 to 700%. If the tensile failure strength and tensile failure strain are lower than the aforementioned ranges, the film breaks easily, and if the tensile failure strength and tensile failure strain are greater than the aforementioned ranges, on the other hand, poor adhesion prevents the film from fully covering the recessed sections on the slice sheet. To form a thermal transfer layer of 2 to 50 μm in thickness constituted by this polyester urethane, the applicable resin is dissolved in a solvent and applied.
The makeup applicator may be (1) a foundation applicator made by bonding the film side of the slice sheet to the base material so that the other sliced side is used as the applicator part, or (2) a makeup tip made by bonding the film side of the slice sheet to both sides of the base material and bonding the base material to one end of a support implement in a manner enveloping it, so that the sliced side is used as the applicator part.
It can also be a brush-like applicator having a gripping part made of hard material such as resin, metal, wood, where the base material on which the application surface has been formed is affixed onto this gripping part.
For this base material, as in the above-mentioned covering layer, any known antibacterial agent, fragrance agent, coloring agent, filler, etc., can be used.

The present invention is explained based on the drawings.

[0019] A manufacturing process for a makeup applicator conforming to the present invention is shown in Fig. 1 (a) through (e).

(a) indicates a slice sheet layer 1 obtained by slicing an open-cell foam sponge, while (c) has a film layer 2 provided on it by means of thermal transfer.
(d) is a puff, etc., made by bonding the film layer of the laminate in (c) to the surface of a base material 3 so that one side can be used as the application surface, while (e) has the laminate in (c) constituted by the slice sheet layer 1 and film layer 2 also bonded to the other side of the base material as necessary.

Fig. 2 shows a tip made by bonding (c) above to the surface of a conical base material 3 supported by a support implement 4.
In addition, Figs. 3 and 4 both show a brush-like puff made by connecting a flat sheet-like core 5 to a gripping part 6 made of hard material and then providing a base material layer 3 on both the front side and back side of this core 5, while forming a slice sheet layer 1 on the surface of the base material via a film 2. To use this puff, the gripping part 6 is held with fingers and cosmetic material is impregnated into the slice sheet layer 1, meaning that cosmetic material does not attach to and dirty the fingers during use.
[0020] The makeup applicator proposed by the present invention may be used as (1) a foundation applicator made

by bonding the film side of the slice sheet to the base material so that the other sliced side is used as the applicator part, (2) a makeup applicator made by bonding the film side of the slice sheet to both sides of the base material so that the applicator part is provided on both sides, or (3) a makeup tip made by bonding the film side of the slice sheet to the base material and bonding the base material to a support implement in a manner enveloping it, so that the applicator part is formed on both sides of the support implement. The base material may be NBR, NR, polyurethane sponge, porous material such as nonwoven fabric, or nonporous material such as rubber, flexible resin molding, or any other material that deforms flexibly along the skin surface to allow the slice sheet layer on the surface to be pressed against the skin surface. This is explained specifically using examples, but it should be noted that the present invention is not at all limited to the examples.

Also note that in connection with the present invention, tensile failure strengths were measured based on JIS K7161, while tensile failure strains were also measured based on JIS K7161.

Example 1

(Thermal transfer sheet)

[0021] As a flexible cushioning release layer, a film made of UBE (registered trademark) Polyethylene UM8928, which is a LDPE with a melting point of 69°C (product of Ube-Maruzen Polyethylene), was dry-laminated on one side of a PET film of 25 μm in thickness to provide a 30-μm release layer. Also, Vylon (registered trademark) UR-2300 of 50 MPa in tensile failure stress and 600% in tensile failure strain (product of Toyobo) was dissolved in methyl ethyl ketone and made into a 30% solution, and this solution was coated on top of the release layer and dried to form a polyester urethane resin film of 15 μm in thickness to obtain a thermal transfer sheet.

Under Comparative Example 1, a film of 15 μm in thickness was formed by using Kuramiron (registered trademark) U8175 of 42 MPa in tensile failure stress and 355% in tensile failure strain (product of Kuraray), instead of the aforementioned Vylon (registered trademark) UR-2300.

(Formation of film by transfer)

[0022] To provide a slice sheet of open-cell foam sponge, a polyurethane wet-foamed sponge was sliced to 0.7 mm. The aforementioned thermal transfer sheet was then placed on this slice sheet and pressed for 4 seconds at 150°C to form an adhered film of 15 μm in thickness.

The obtained slice sheet having a film was bonded to a porous base material to create each of the following makeup applicators:

(1) A makeup applicator where the film side of the slice sheet was bonded to NBR sponge of 7 mm in thickness as a porous base material.

(2) A makeup applicator where the film side of the slice sheet was bonded to both sides of NBR sponge of 7 mm in thickness as a porous base material.

(3) A makeup tip where the film side of the slice sheet was bonded to NBR sponge of 1 mm in thickness as a porous base material, while the porous base material was bonded to one end of the support implement of the makeup tip over a length of 11 mm, and the surface of the slice sheet was used as the applicator part.

(Evaluation)

[0023] Table 1 shows the results of measuring the remaining amount of liquid foundation on the application surfaces of (1) and (2) above under the measuring conditions specified below.

[Table 1]

	Impregnated amount of cosmetic material
Example 1	0.012 ml/cm^2
Comparative Example 1	0.058 ml/cm^2

While Example 1 and Comparative Example 1 both provide an applicator sliced to the same thickness and having a film, the remaining amount was greater under the Comparative Example because the shapes of recessed sections on the surface of the slice sheet on which the film is formed were not covered fully and therefore the impregnated cosmetic material reached the recessed sections formed via combination of large recessed sections that resulted from slicing of

the other side of the slice sheet as well as recessed sections made when the pores contained in the slice sheet were cut. Under the Example, liquid foundation could be used effectively because the shapes of recessed sections were fully covered, and the remaining amount of cosmetic material in the applicator after use could be kept low. The remaining amount could not be reduced to the level of 0.012 ml/cm^2 using the conventional film forming technology and a lot of cosmetic material, or specifically 0.058 ml/cm^2 as shown under Comparative Example 1, remained.
Measurement conditions for remaining amount of cosmetic material:

0.8 g of liquid foundation was taken on the application surface of the applicator sample having a circular shape of 30 mm in diameter and a known weight, after which the applicator sample was held with a hand and liquid foundation was applied to the inner side of the arm. After liquid foundation had been applied, the weight of the applicator was measured and the amount of liquid foundation remaining on the applicator was obtained from comparing the weights of the applicator before and after the application.

Fig. 5 shows a section view of the film formed under Example 1 in a manner adhering to the irregularities.

(a) is a photograph showing the surface of the film layer formed on one side of the slice sheet, where irregularities resulting from slicing remain on the surface and can be confirmed. The bonding condition of this film layer and slice sheet is shown in (b) through (d). From these figures, it can be confirmed that recessed sections on the surface of the slice sheet, shown in whitish color, and the black film layer are adhered to each other. The surface of the film layer also has irregularities, as shown in (a), reflecting the surface irregularities of the slice sheet itself.

Fig. 6 shows the bonding condition of the slice sheet surface and film layer obtained under Comparative Example 1, where voids are present in the recessed sections of the slice sheet below the black film layer. This is why the surface of the film layer is flat and free from any irregularities reflecting the surface irregularities of the slice sheet layer.

(Evaluation of ease of application to skin)

[0024] When usability was evaluated in terms of application, the applicator obtained under the Example did not absorb cosmetic material excessively and kept the amount of cosmetic material remaining in it to only 0.012 ml/cm^2. Because less cosmetic material remained, cosmetic material could be applied uniformly even when the applied force and application area were changed, and it was also easy to remove the remaining cosmetic material by washing the applicator after use, and even when the applicator was dried without washing after use, the applicator did not harden much because there was less cosmetic material to become dry, and consequently the applicator maintained good usability during subsequent uses. Furthermore, the applicator remained free from sound or lines after use and thus solved the problems associated with applicators with film.
On the other hand, the applicator obtained under the Comparative Example had a large amount of cosmetic material amounting to 0.058 ml/cm^2 remaining in it. Also, it generated sound due to voids during use and formed lines originating from voids, and problems associated with applicators with film remained.

Claims

1. A makeup applicator, constituted by: a slice sheet made by slicing an open-cell sponge, one side of which slice sheet forms an application surface, where a film layer is provided on the other side of the slice sheet by adhering along the shapes of inner surfaces of recessed sections made via combination of two types of recessed sections which are recessed sections formed by roughening the surface by a slice blade and recessed sections formed by cutting the original pores in the open-cell sponge; and a base material bonded to the side of the slice sheet on which the film layer is formed.

2. A makeup applicator according to Claim 1, wherein the slice sheet layer has a thickness of 0.2 to 2.0 mm.

3. A makeup applicator according to Claim 1 or 2, **characterized in that** the film layer is formed by means of thermal transfer.

4. A makeup applicator according to Claim 3, **characterized in that** the film layer by means of thermal transfer is made of a polyester urethane resin of 45 to 60 MPa in tensile failure stress and 500 to 700% in tensile failure strain, having a thickness of 2 to 50 μm, and adhering along the shapes of recessed sections formed via combination of the two types of recessed sections.

5. A makeup applicator according to any one of Claims 1 to 4, **characterized in that** the film contains an antibacterial agent.

6. A makeup applicator according to any one of Claims 1 to 5, **characterized in that** the side of the slice sheet on which the film is formed is bonded to the base material and an applicator part constituted by the sliced surface on the opposite side of the one on which the film is formed is provided on one side.

7. A makeup applicator according to any one of Claims 1 to 5, **characterized in that** the two sides of the slice sheet on which the film is formed are bonded to both sides of the base material and an applicator part constituted by the sliced surface is provided on both sides.

8. A makeup applicator according to any one of Claims 1 to 5, **characterized in that** the side of the slice sheet on which the film is formed is bonded to the base material, the base material is bonded to one part of a support implement in a manner enveloping it, and an applicator part constituted by the slice sheet surface is provided over the entire surface in one part of the support implement.

FIG. 1

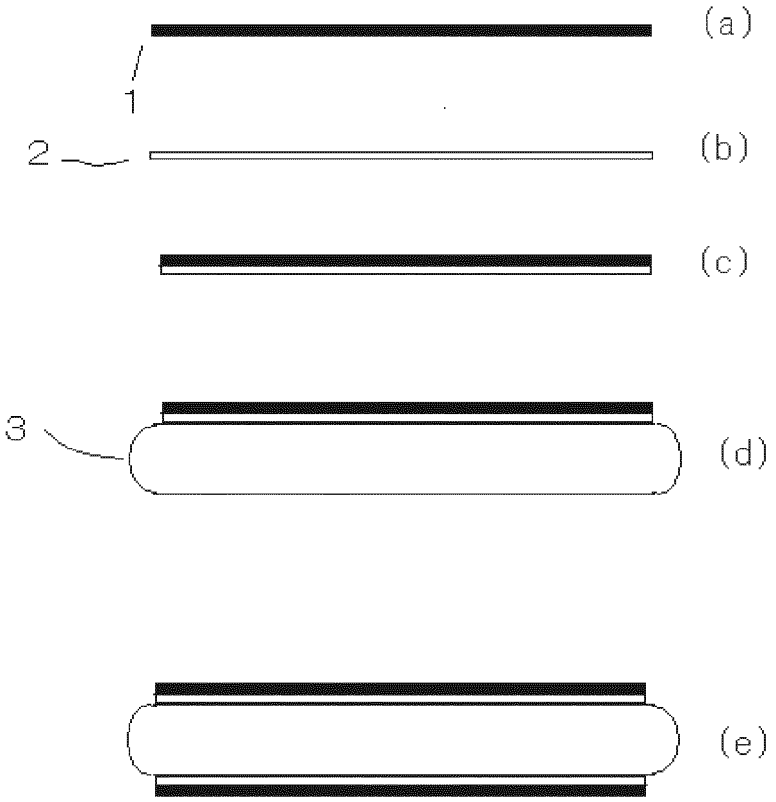


FIG. 2

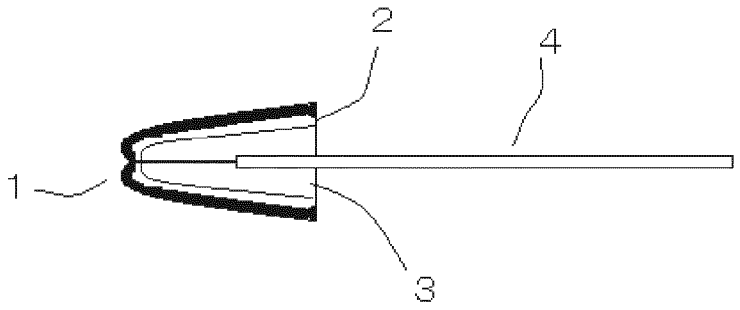


FIG. 3

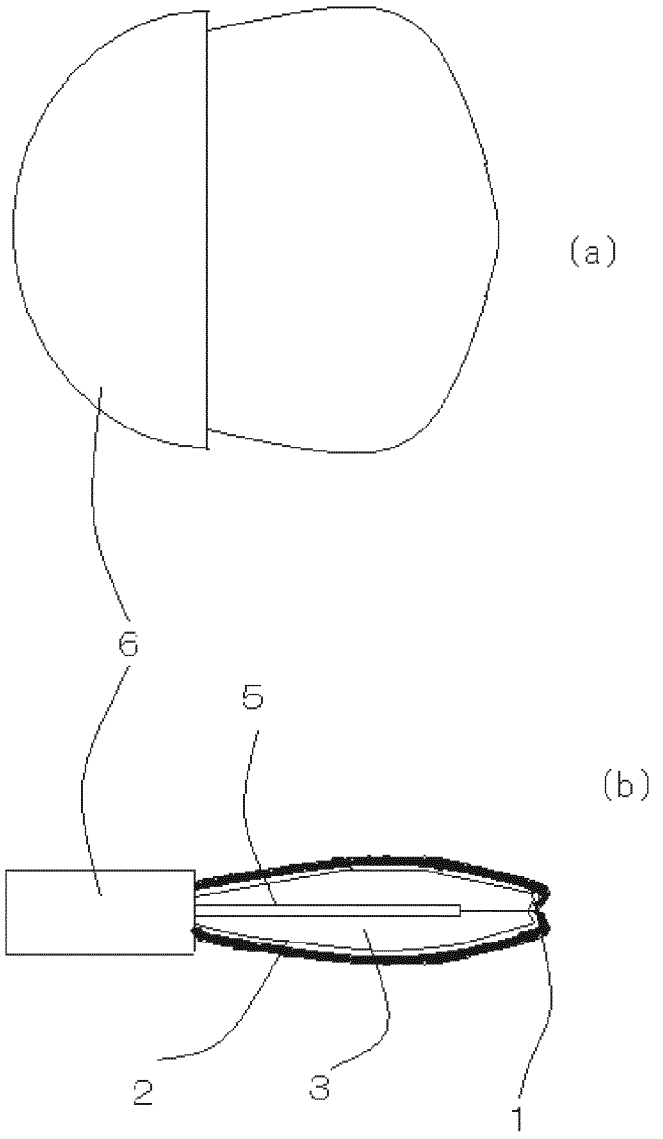


FIG. 4

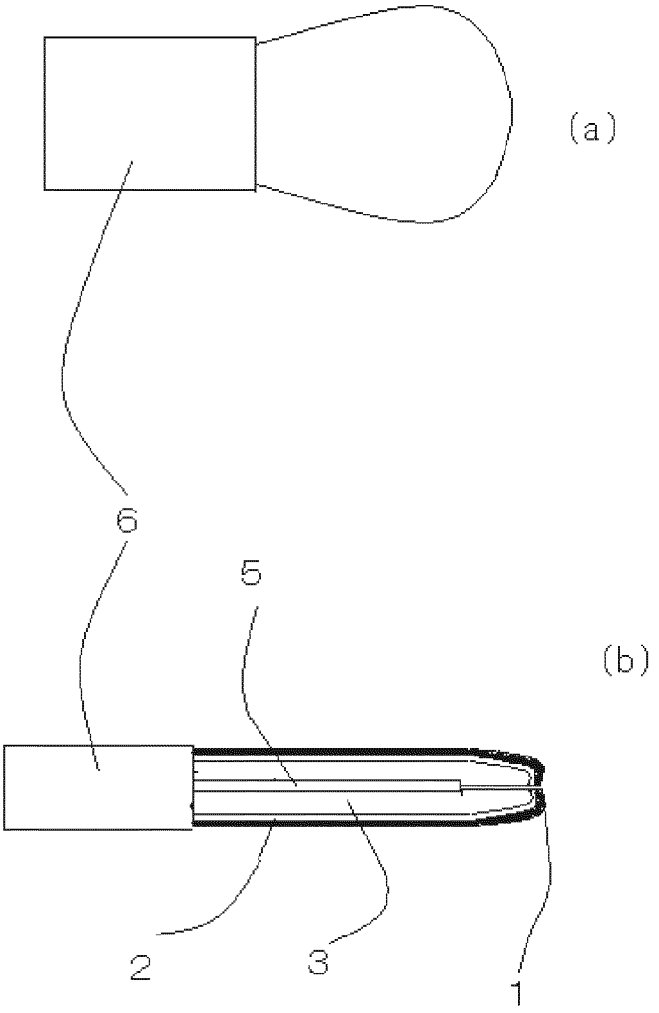
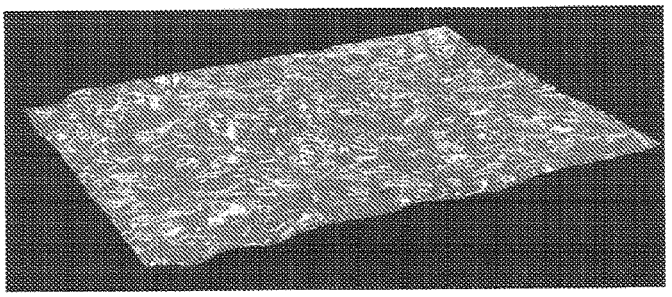
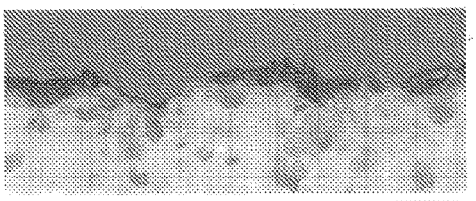


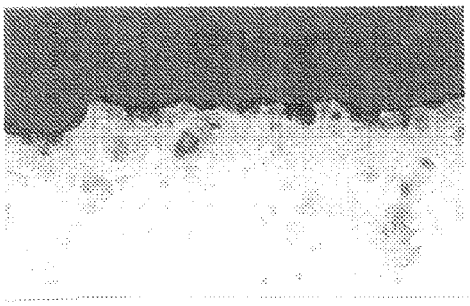
FIG. 5



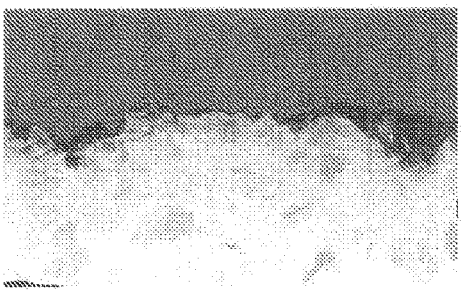
(a)



(b)

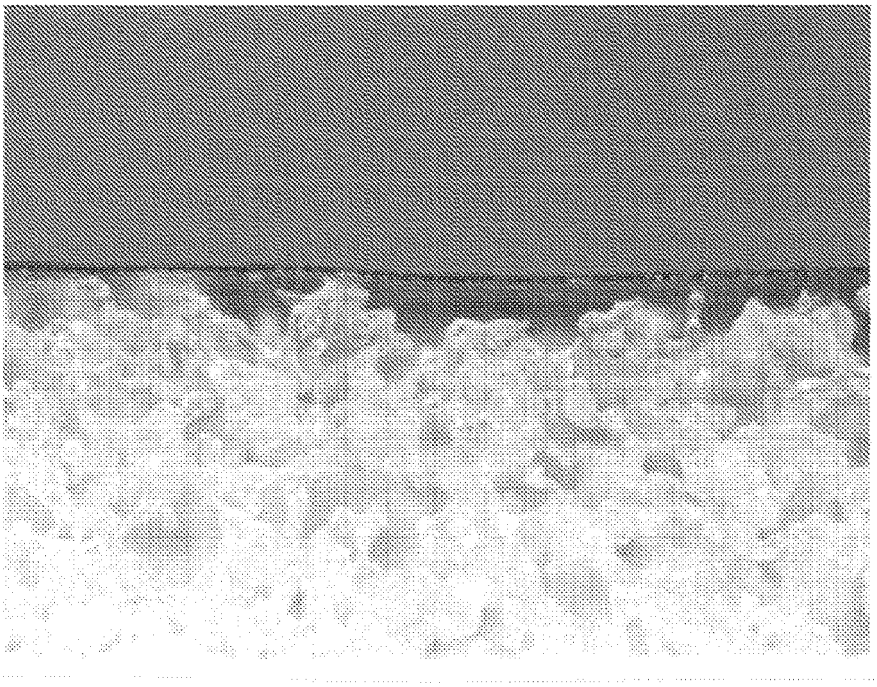


(c)



(d)

FIG. 6



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/062143

A. CLASSIFICATION OF SUBJECT MATTER
A45D34/04(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A45D34/04, 33/34-33/36

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2010
Kokai Jitsuyo Shinan Koho 1971-2010 Toroku Jitsuyo Shinan Koho 1994-2010

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 87214/1973(Laid-open No. 32175/1975) (Kenji NAKAMURA), 08 April 1975 (08.04.1975), drawings & JP 50-32175 U & JP 53-355 Y2	1-8
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 13637/1980(Laid-open No. 114711/1981) (Kabushiki Kaisha Panji), 03 September 1981 (03.09.1981), drawings & JP 56-114711 U & JP 58-11292 Y2	1-8

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
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Date of the actual completion of the international search	Date of mailing of the international search report
04 August, 2010 (04.08.10)	17 August, 2010 (17.08.10)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/062143

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 203064/1985(Laid-open No. 112211/1990) (Seiwa Kogyo Kabushiki Kaisha), 07 September 1990 (07.09.1990), drawings & JP 2-112211 U	1-8
A	JP 2001-128730 A (Kenji NAKAMURA), 15 May 2001 (15.05.2001), paragraph [0021] & JP 3566892 B2	1-8
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 180927/1978(Laid-open No. 95611/1980) (Yoshiaki KONDO), 02 July 1980 (02.07.1980), & JP 55-95611 U & JP 61-27528 Y2	1-8
A	JP 9-164017 A (Nihon Puff Co., Ltd.), 24 June 1997 (24.06.1997), (Family: none)	1-8
A	JP 2005-118433 A (Shiseido Co., Ltd.), 12 May 2005 (12.05.2005), (Family: none)	1-8

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP SHO55095611 B **[0007]**
- JP HEI09164017 B **[0007]**
- JP 2005118433 A **[0007]**