(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 769 697 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
**04.04.2007 Bulletin 2007/14**

(21) Application number: **05765148.1**

(22) Date of filing: **27.06.2005**

(51) Int Cl.:
***A45D 24/22*** *(2006.01)* ***A45D 19/02*** *(2006.01)*
***A45D 34/00*** *(2006.01)* ***B65D 83/00*** *(2006.01)*

(86) International application number:
**PCT/JP2005/011729**

(87) International publication number:
**WO 2006/006378 (19.01.2006 Gazette 2006/03)**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**

(30) Priority: **08.07.2004 JP 2004202063**

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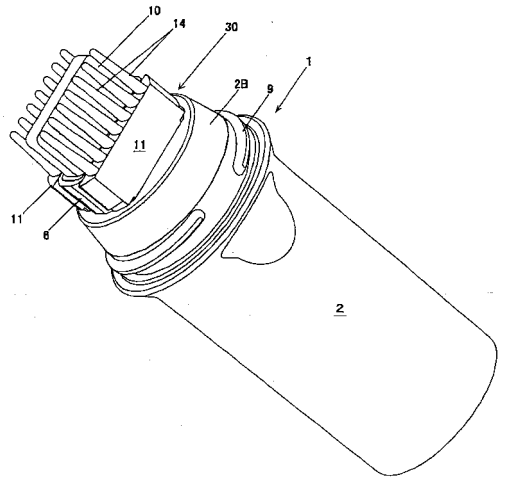
(54) **APPLICATOR FOR HAIR AND COSMETIC CONTAINER WITH THE APPLICATOR**

(57) A hair care applicator of the present invention is one that can, while combing hair by a comber made up of comb members and a porous application body arranged along the comb members, apply an application liquid in a container being attached to the hair by means of the porous application body. The porous application body of the hair care applicator has a porosity (Vd) falling within a range of 70 to 85 %. With this arrangement, the hair care applicator and the applicator-equipped cosmetic container can deliver a suitable supply of application liquid without liquid leakage of the application liquid and, in addition, can assure sufficient application performance, preventing the application liquid or the like from being directly applied to the scalp. Here the porosity is defined as Vd = {1-(w/ρsh)} x 100, where w is the mass of the porous application body, s is the cross-section of the porous application body, ρ is the mean density of the porous application body and h is the length of the porous application body.

*FIG. 1*




EP 1 769 697 A1

## Description

[Technical Field]

**[0001]** The present invention relates to a hair-care applicator (applicator for hair) and a cosmetic container with the applicator, and relates to a hair-care applicator which is attached to a container body to apply an applicator liquid (hair dye, hair liquid, hair tonic etc.) stored in the container while combing hair (including hairs of humans and others such aspetanimals, etc.) as well as to a cosmetic container equipped with that applicator.

[Background Art]

**[0002]** Conventionally there have been known cosmetic containers equipped with a hair applicator which leads a hair dye or the like stored in a container to the spaces between comb teeth of a comber attached to the container to dye hair while combing hair with the comber.
As an example, a configuration has been proposed which is composed of a medical fluid storage container serving as a handle and a comber joined to the container, wherein the comber is composed of a hollow shaft and a plurality of hollow comb teeth joined to the shaft, and the comb teeth are projectively formed so that non-ejecting comb teeth and ejecting comb teeth are arranged alternately (see patent document 1). The non-ejecting comb teeth and ejecting comb teeth each are formed in an approximately triangular plate-like configuration so that the width becomes narrower as it goes toward its top, and the ejecting comb teeth are each formed with an ejection through hole from which medical fluid is ejected. The distance from the tip of the ejecting comb tooth to the ejection hole is specified to fall within a range of 5 to 60 % of the length from the tip of the ejection comb tooth to the proximal end (shaft) while the interval between ejecting comb teeth is specified to fall within a range of 4 to 8 mm. This specification makes optimal the amount of medical fluid held between comb teeth and makes application of medical fluid over hair easy and uniform.

**[0003]** As another configuration a comb-equipped application container has been proposed which is a container having a hollow handle portion attached to a container body and serving as a fluid guiding passage and a comber having a large number of hollow comb teeth arranged longitudinally, wherein each tooth has a fluid ejection path connected to the guiding passage of the handle portion and extended along the tooth length and ejection holes that are connected to the front end of the ejection path and penetrate through the comb tooth from the front to rear(see patent document 2, for example). The ejection holes are arranged so that their positions are shifted between adjacent comb teeth with respect to the tooth length direction. With this configuration, it is possible to apply the fluid over hair from the vicinity of hair roots to hair tips without unevenness, thus facilitating fluid application work.

**[0004]** There is another proposal of a comb-equipped cap to be attached to a brim of a container body, in which a row of main comb teeth is provided, the main comb teeth being formed with ejection holes that open on the side faces thereof and are connected to the container interior. Further, the comb-equipped cap also has sub comb teeth (without holes) which are arranged on both sides along the main comb-teeth with their tips as high as or higher than those of the main comb teeth (see patent document 3, for example).
With this configuration, the user is able to perform combing while keeping the comber or comb body approximately perpendicular to the scalp. It is also possible to prevent color unevenness due to change of the angle of the comb body when combing hair, especially prevent color unevenness at the areas close to hair roots.

**[0005]** However, these hair application cosmetic containers entail the occurrence of excessive liquid leakage from the injection opening to the comb body or holes. Further, uniform liquid supply from the communication passage or handle passage cannot be done, causing unevenness in hair dying. To deal with this, there has been a proposal of a hair applicator in which an application liquid is absorbed in a reservoir support that is provided in a container and application pen cores presenting capillarity arranged in rows are used as a comber (see patent documents 4 and 5, for example). Since the comb teeth of the comber have no ejection holes and openings as descried above, no channeling at the paths between teeth will occur. Accordingly, this structure with pen type application cores allows the fluid to be uniformly supplied to every comb tooth or every application core, hence no unevenness or other defect will occur in hair dying.

**[0006]** However, with the above conventional hair applicator, application liquid cannot be supplied well to hair or excessive liquid leakage (forward leakage) may occur depending on the application liquid. In some cases the application liquid from the container cannot be sufficiently supplied to the tips of the application pen cores, and in other cases, the application liquid from application pen cores may directly touch the scalp etc. Accordingly, there has been a risk of the scalp being hurt when used for a hair dye. Further, when the comber has a conventional configuration, it is impossible to secure sufficient application performance to hair. Further, shed hairs etc. adhere to the comb member, and it is impossible to easily remove shed hairs etc., from the comb member or perform other maintenance. As a result there have been inconvenient cases where the applicator still having application liquid left in the container is discarded.

[Patent Document 1] Japanese Patent Application Laid-open 2003-019023
[Patent Document 2] Japanese Patent Application Laid-open 2002-159325
[Patent Document 3] Japanese Patent Application Laid-open 2002-191427
[Patent Document 4] Japanese Utility Model Application Laid-open Hei-4-60116

[Patent Document 5] Japanese Utility Model Application Laid-open Hei-4-60117

[Disclosure of the Invention]

[Problems to be Solved by the Invention]

**[0007]** In view of the above circumstances it is therefore an object of the present invention to provide a hair applicator which appropriately delivers an application liquid without liquid leakage of the application liquid, and provide a hair applicator which, in addition to the aforementioned feature, can assure sufficient application performance, preventing the application liquid or the like from being directly applied to the scalp as well as to provide an applicator-equipped cosmetic container having the same hair applicator.

[Means for Solving the Problems]

**[0008]** The present inventors hereof have found that in the comber structure of a hair applicator, use of a porous application body is more excellent than direct provision of feed openings or ejection openings for comb teeth themselves. They also have found that when such a porous application body is used, a comb member (a normal comb) arranged along with it is supplementally needed. They have further found that in order to prevent liquid leakage (forward leakage) of the application liquid and supply the application liquid to the comber appropriately, the used porous application body should have a porosity (Vd) ranging from 70 to 85%, particularly preferably from 68 to 85 %, and have completed the present invention.

**[0009]** Further, the present inventors hereof have found that when the aforementioned comb member is provided supplementally, the tips of comb teeth of the comb member are adapted to stick further out from the top end of the porous application body by the range of 0.2 to 3.0 mm, whereby it is possible to avoid the application liquid from the application body being directly applied to and dirtying the scalp and apply the hairline from, essentially, the hair roots so as to make the unpainted place along the hairline unrecognizable. They have also found that it is possible to apply the application liquid uniformly over substantially all parts of the hair without dirtying the comb member with the liquid, by arranging the comb member and porous application body closely so that they are kept out of contact from each other with a spacing of 5.0 mm or lower, and are particularly with a spacing falling within the range of 3.5 to 1.0 mm, and have completed the present invention.

That is, the comb applicator of the present invention and applicator-equipped cosmetic container are characterized by the following configurations and means described in (1) to (8).

**[0010]**

(1). A hair care applicator which, while combing hair by a comber made up of a porous application body and a comb member arranged parallel to the porous application body, is able to apply an application liquid in a container being attached to the hair by means of the porous application body, wherein the porosity (Vd) of the porous application body falls within a range of 70 to 85 %.

Here the porosity is defined as $Vd = \{1-(w/psh)\} \times 100$, where w is the mass of the porous application body, s is the cross-section of the porous application body, ρ is the mean density of the porous application body and h is the length of the porous application body.

**[0011]**

(2). The hair care applicator written in the above (1), wherein the distal ends of comb teeth of the comb member stick further out by a distance ranging from 0.2 to 3.0 mm from the top end of the porous application body.

(3). The hair applicator written in the above (1), wherein the porous application body and the comb tooth of the comb member are kept out of contact with each other and arranged close to each other with a spacing of 5.0 mm or lower.

(4). The hair care applicator written in the above (2), wherein the porous application body and the comb tooth of the comb member are kept out of contact with each other and arranged close to each other with a spacing of 5.0 mm or lower.

(5) . The hair care applicator written in the above (1), wherein the comb tooth of the comb member is formed of resin or metal while the porous application body is formed of one or more selected from a sliver pen core, felt-like material or continuous-foamed sponge-like material.

(6). The hair care applicator written in the above (1), wherein the porous application body is formed of a plurality of pen type porous application elements arranged in a comb-like pattern.

**[0012]**

(7). An applicator-equipped cosmetic container comprising: a container body for an application liquid; and a hair care applicator attached to the container body, the hair care applicator which, while combing hair by a comber made up of a porous application body and a comb member arranged parallel to the porous application body, is able to apply an application liquid in a container being attached to the hair by means of the porous application body, wherein the porosity (Vd) of the porous application body falls within a range of 70 to 85 %.

Here the porosity is defined as $Vd = \{1-(w/\rho sh)\} \times 100$, where w is the mass of the porous application

body, s is the cross-section of the porous application body, ρ is the mean density of the porous application body and h is the length of the porous application body.

(8). The applicator-equipped cosmetic container written in the above (7), wherein a reservoir support of the application liquid is accommodated inside the container and the reservoir support comprises padding.

[Effect of the Invention]

**[0013]** According to the thus constructed configuration or means of the present invention, when the porous application body (including comb-shaped, bar-shaped and other plate-like porous application bodies), examples of application bodies including sliver pen cores, felt-like materials, continuous-foamed sponge-like materials, etc., is adapted to have a porosity (Vd) ranging from 70 to 85%, it is possible to prevent liquid leakage (forward leakage) of the application liquid and provide a suitable supply of the application liquid to the comber. Since the tips of the comb member stick further out by 0.2 to 3.0 mm from the top end of the porous application body of the comber, it is possible to secure sufficient application performance as well as to avoid dirtying the scalp because the application liquid from the application body will not be directly applied to the scalp. Further, provision of the porous application body and comb teeth of the comb member arranged closely in parallel and kept out of contact with each other with a spacing of 5 mm or shorter, enables uniform application to essentially all parts of hair without dirtying the comb member with the application liquid.

[Brief Description of the Drawings]

**[0014]**

[FIG. 1] FIG. 1 is a perspective view showing an applicator-equipped cosmetic container having a hair applicator according to the present invention with its cap removed.

[FIG. 2] FIGS. 2 (a) and2 (b) are front partial sectional view and side sectional view of an applicator-equipped cosmetic container according to the present invention.

[FIG. 3] FIG. 3 is an exploded perspective view showing an applicator-equipped cosmetic container according to the present invention.

[FIG. 4] FIGS. 4(a) and 4(b) are front view and side view of a comb member used for a hair applicator according to the present invention.

[FIG. 5] FIG. 5 is a perspective view showing another embodiment of an applicator-equipped cosmetic container according to the present invention.

[Description of Reference numerals]

**[0015]**

| | |
|---|---|
| 1 | applicator-equipped cosmetic container |
| 2 | container body |
| 4 | reservoir support |
| 5A, 5B | lid member |
| 10 | porous application member |
| 11 | comb member |
| 12 | binding member |
| 14 | comb teeth |
| 15 | cap |

[Best Mode for Carrying out the Invention]

**[0016]** Referring next to the drawings a hair care applicator of the present invention and a cosmetic container equipped with the applicator will be described in detail based on the best mode for carrying out the present invention. However, the hair care applicator of the present invention and the applicator-equipped cosmetic container should not be limited to the following embodiment.

**[0017]** As shown in FIGS. 1 to 3 an applicator-equipped cosmetic container 1 of the present embodiment, is specifically composed of a comber 30 can a container body 2. Comber 30 as the hair care applicator is composed of comb members 11 and a plate-shaped porous application body 10 arranged with the comb members 11, and is constructed such that an application fluid in a container body 2 can be applied over hair by way of application body 10 as hair is combed with comber 30.

**[0018]** As shown in FIGS. 1 to 3, in cosmetic container 1 resin container body 2 is formed in a cylindrical shape. A rear end 2A of container body 2 is made open so that a reservoir support member 4 shown in FIG. 3 can be inserted and stored into container body 2. Support member 4 supports an application fluid or cosmetic substance. The inner wall at rear end 2A is formed with a thread while a lid member 5B is also formed with a thread so that the two are screw fitted to each other to seal off the opening. Lid member 5B is fixed pressing the rear end 4B of support member 4. Further, in lid member 5B, a lid member 5A for design purposes is attached to lid member 5B.

As the aforementioned reservoir support member 4, the material should not be particularly limited as long as it can support the applicator liquid. For example, padding etc., can be considered.

**[0019]** At the top end 2B of container body 2, a rectangular cylindrical attachment hole 6, socket holes 7 and a threaded portion 9 are formed, the attachment hole 6 being formed at the approximate center. Plate-shaped porous application body 10 is inserted into attachment hole 6 while comb members 11 made of resin are attached to socket holes 7 arranged on both sides. Threaded portion 9 is screw fitted to a threaded portion of an aftermentioned cap. Porous application body 10 is

mounted into attachment hole 6 by means of a rectangular support member 12, so that porous application body 10 is arranged in an upright position along the axial direction of container body 2. The proximal end 10A of porous application body 10 is inserted into part of the top end 4B of the aforementioned support member 4 and coupled when it is mounted.

Here, the exterior wall surface of rectangular support member 12 is put in fluid-tight contact with the cylindrical interior wall surface of attachment hole 6, and support member 12 may be fitted either removably to, or totally fixed to, attachment hole 6.

**[0020]** The aforementioned porous application body 10 has a porosity (Vd) ranging from 70 to 85%, particularly preferably from 68 to 85 %. Here, the porosity is defined as $Vd = \{1-(w/\rho sh)\} \times 100$, where w is the mass of the porous application body, s is the cross-section of the porous application body, ρ is the mean density of the porous application body and h is the length of the porous application body). Use of a porous application body 10 having a porosity falling within the above range makes it possible to prevent liquid leakage (forward leakage) of the application liquid and provide a suitable supply of the application liquid to comber 30. If the porosity of the application body is lower than the above range, it becomes difficult to provide a suitable supply of the application liquid from the container. On the contrary, it exceeds the above range, it becomes difficult to prevent forward leakage.

As a porous application body material usable within the aforementioned range, sliver pen cores, felt-like materials, continuous-foamed sponge-like materials, etc., are preferable.

**[0021]** Comb member 11 is formed of a molded member of resin as shown in FIG. 4, and is constructed of a base 13 and a plurality of comb teeth 14 arranged on the top end face of base 13 at regular intervals. Base 13 is formed to be an engaging portion to be detachably engaged into the aforementioned socket hole 7. The distal part of comb tooth 14 is made round. When base 13 and socket hole 7 are engaged with each other, comb members 11 are set in parallel with porous application body 10 mounted in attachment hole 6. In this attached state of comb members 11, the distal ends 14B of comb teeth 14 stick further out from top end 10B of porous application body 10. The amount of projection (L) as shown in FIG. 2, falls within the range of 0.2 to 3.0 mm, and more particularly preferably falls within the range of 0.5 to 2.0 mm. Upon usage, this amount of projection (L) makes it possible to apply the application liquid to most of the hairs only from their roots without delivering the application liquid to the scalp and others. When the amount of projection is lower than the above range, there is a risk that porous application body 10 directly comes into contact with the scalp. When it exceeds the above range, it is difficult to supply sufficient application to the hair roots.

**[0022]** Also, as shown in FIG. 2 porous application body 10 and comb teeth 14 are preferably arranged closely along side each other so that they are kept out of contact from each other with a spacing S of 5.0 mm or lower, and are particularly preferably arranged apart from each other a distance falling within the range of 0.5 to 3.5 mm. In the present invention, it is not absolutely required that the distance between porous application body 10 and comb teeth 14 should be kept within a fixed distance or smaller, but specifying the distance within the above range makes it possible to prevent the liquid from dirtying the comber as well as to improve the performance of application to hair.

Accordingly, comber 30 as the hair care applicator according to the present invention is constituted of top end 2A of container body 2, porous application body 10, rectangular support member 12 and comb members 11 of base 13 and comb teeth 14.

**[0023]** The aforementioned comber 30 is covered with the aforementioned cap 15. Cap 15 is composed of an inner cap 16, a middle cap 17 and an outer cap 18. Inner cap 16 is formed with an opening portion 22 that abuts the top face of top end 2B of container body 2. Further, in the top end part of inner cap 16 guide hollows 21 with guide projections for separating comb teeth 14 and porous application body 10 and for holding the distal ends of these are formed. A coil spring 23 is arranged inside middle cap 17.

**[0024]** In the thus constructed applicator-equipped cosmetic container 1, since porous application body 10 is used in the structure of comber 30, this structure presents more excellent application performance than that where ejection holes of the application liquid are formed in the comb teeth themselves. Further, specifying for porous application body 10 its porosity within the predetermined range makes it possible to sufficiently prevent liquid leakage (forward leakage) of the application liquid and provide a suitable and uniform supply of the application liquid to comber 30.

Moreover, rows of comb teeth 14 of comb members 11 are arranged close to the thus formed porous application body 10, and the distal ends of the comb teeth of the comb members are projected with the predetermined amount, whereby it is possible to prevent the application liquid from the application body from being directly delivered to the scalp. Accordingly, there is no risk of dirtying the scalp. Further, specifying the closeness within the predetermined range makes it possible to prevent the application liquid from dirtying comb members 11 as well as to assure a good combing condition and a sufficient application performance.

**[0025]** In the above embodiment, top end 2B of container body 2 is formed as part of comber 30 integrally with container body 2 so that the hair care applicator according to the present invention is provided as comber 30 of applicator-equipped cosmetic container 1. However, the present invention should not be limited to this. The top end part of container body 2 may be formed as a detachable lid member so that the hair care applicator may be provided as a separate part from the cosmetic

container.

Though in the above embodiment, support member 12 of porous applicationbody 10 and combmembers 11 maybe detachable from container body 2, they may be configured so as to be fixed to container body 2. In this case, it is preferred that at least one of porous body 10 and comb members 11 is adapted to be detachable. Such a detachable configuration markedly facilitates removal of entangled hairs such as shed hairs sticking to porous application body 10, and eliminates hindrance to handling performance.

Though in the above embodiment it is specified that comb members 11 are made of resin, other materials than this can be used. For example, metal, natural resin, other natural comb material etc. may be used. However, from an exact sizing viewpoint, resin and metal, which are material having precision formability, are preferable.

In the above embodiment, lid member 5B is removable from reservoir support 4, however lid member 5B may be totally fixed thereto, if required, so as not to be detachable.

**[0026]** In the above embodiment, the application liquid is a hair dye but should not be limited thereto. Examples may include a hair liquid, a hair tonic, a hair shining agent for pets and other animals, and others. Also, these application liquids should meet the relationship as to liquid retention force with the aforementioned porous application body.

**[0027]** FIG. 5 shows another mode of an applicator-equipped cosmetic container according to the present invention. Here, for the components of an applicator-equipped cosmetic container 40 shown in FIG. 5, identical or similar to those of the cosmetic container shown in FIG. 1, are allotted with the same reference numerals and their detailed description is omitted.

The difference of applicator-equipped cosmetic container 40 of this embodiment from container 1 of FIG. 1 is that the porous application body is made up of a plurality of pen type porous application elements 41, and these porous application elements 41 are arranged in a row by a binding member 42 along the adjoining comb teeth. These pen type porous application elements 41 have a porosity (Vd) falling within the range of 70 to 85 %, similarly to the embodiment shown in FIG. 1. Further, the front ends of comb teeth 14 of comb members 13 are arranged so as to stick further out from the front ends of pen type porous application elements 41, by 0.2 to 3.0 mm while comb teeth 14 and porous application elements 41 are kept out of contact with each other with a spacing of 5.0 mm or lower.

**[0028]** Porous application elements 41 supported by binding member 42 are arranged so as to be apart from each other a distance ranging from 0.4 to 4.0 mm, more preferably, a distance ranging from 0. 6 to 2.0 mm. A distance smaller than the above range causes difficulty in combing with a greater number of shed hairs entangled. On the other hand, a distance greater than the above range makes the contactness between hair and pen type porous application elements 41 per unit mass worse, resulting in insufficient application performance. With the thus constructed applicator-equipped cosmetic container 40, it is possible to provide the same effect as that of cosmetic container 1 shown in FIG. 1, it is also possible to achieve fine application because porous application elements 41 are comb-shaped.

[Industrial Usability]

**[0029]** With the hair-care applicator of the present invention and its applicator-equipped cosmetic container, when an application liquid (hair dye, hair liquid, hair tonic, etc.) stored in a container is applied to hair while coming the hair with the comber provided for the container body, it is possible to provide a suitable supply of the application liquid without causing any liquid leakage of the application liquid as well as to secure sufficient application performance without causing direct contact of the application liquid with the scalp, hence the invention presents high industrial usability while keeping excellent performance.

## Claims

1. A hair care applicator which, while combing hair by a comber made up of a porous application body and a comb member arranged parallel to the porous application body, is able to apply an application liquid in a container being attached to the hair by means of the porous application body, wherein the porosity (Vd) of the porous application body falls within a range of 70 to 85 %
(here the porosity is defined as Vd ={1- (w/ρsh)} x 100, where w is the mass of the porous application body, s is the cross-section of the porous application body, ρ is the mean density of the porous application body and h is the length of the porous application body).

2. The hair care applicator according to Claim 1, wherein the distal ends of comb teeth of the comb member stick further out by a distance ranging from 0.2 to 3 mm from the top end of the porous application body.

3. The hair care applicator according to Claim 1, wherein the porous application body and the comb tooth of the comb member are kept out of contact with each other and arranged close to each other with a spacing of 5.0 mm or lower.

4. The hair care applicator according to Claim 2, wherein the porous application body and the comb tooth of the comb member are kept out of contact with each other and arranged close to each other with a spacing of 5.0 mm or lower.

5. The hair care applicator according to Claim 1, where-

in the comb tooth of the comb member is formed of resin or metal while the porous application body is formed of one or more selected from a sliver pen core, felt-like material or continuous-foamed sponge-like material.

**6.** The hair care applicator according to Claim 1, wherein the porous application body is formed of a plurality of porous application elements arranged in a comb-like pattern.

**7.** An applicator-equipped cosmetic container comprising: a container body for an application liquid; and a hair care applicator attached to the container body, the hair care applicator which, while combing hair by a comber made up of a porous application body and a comb member arranged parallel to the porous application body, is able to apply an application liquid in a container being attached to the hair by means of the porous application body, wherein the porosity (Vd) of the porous application body falls within a range of 70 to 85 % (here the porosity is defined as $Vd = \{1- (w/\rho sh)\} \times 100$, where w is the mass of the porous application body, s is the cross-section of the porous application body, $\rho$ is the mean density of the porous application body and h is the length of the porous application body).

**8.** The applicator-equipped cosmetic container according to Claim 7, wherein a reservoir support of the application liquid is accommodated inside the container and the reservoir support comprises padding.

FIG. 1

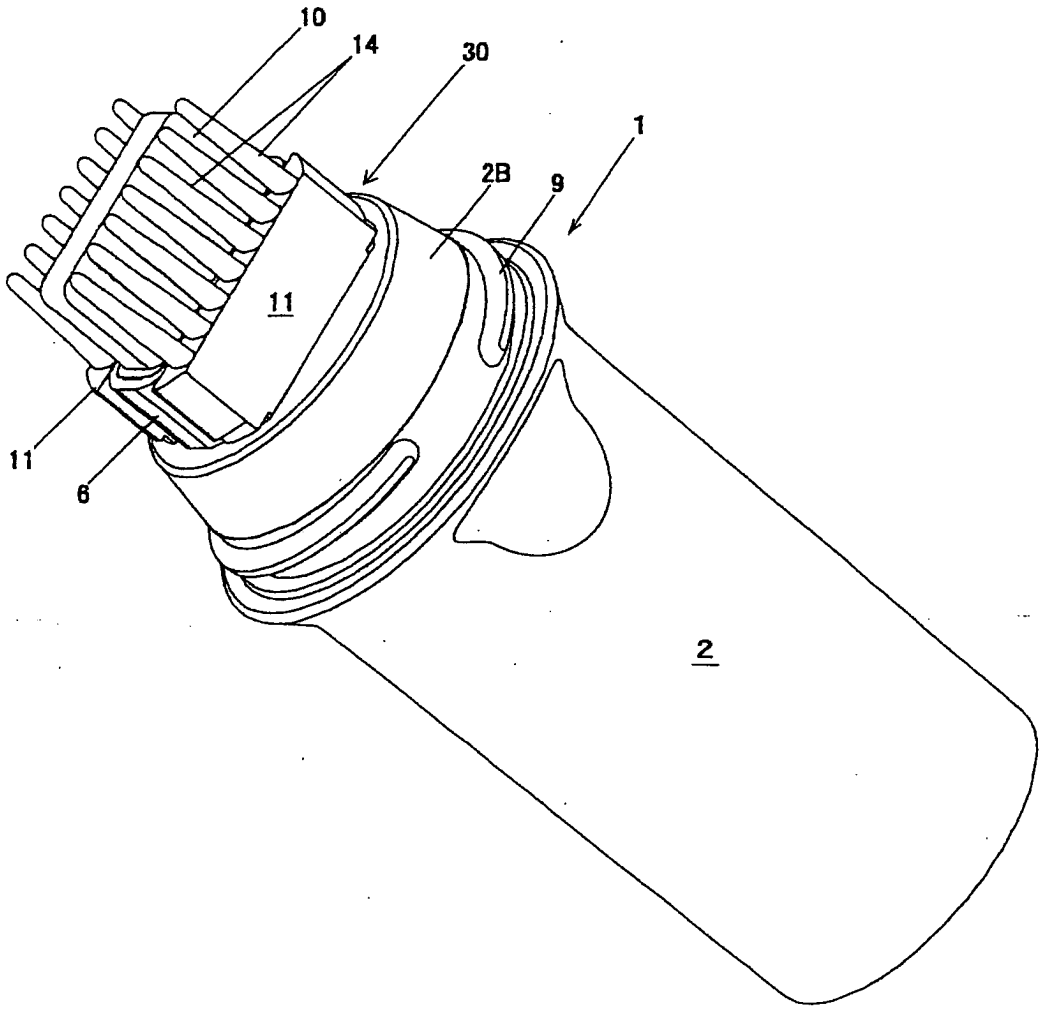


FIG.2

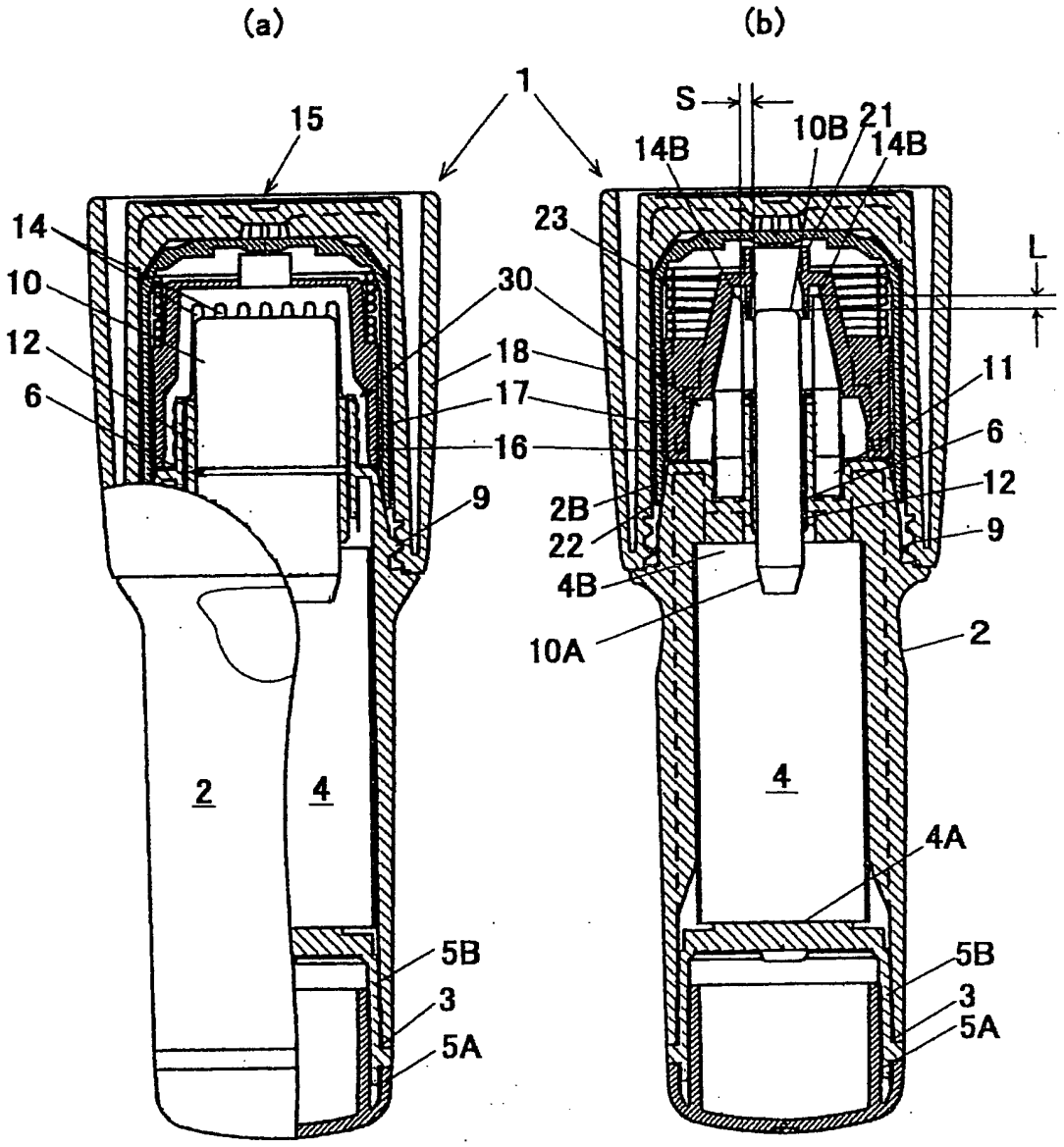

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FIG.3

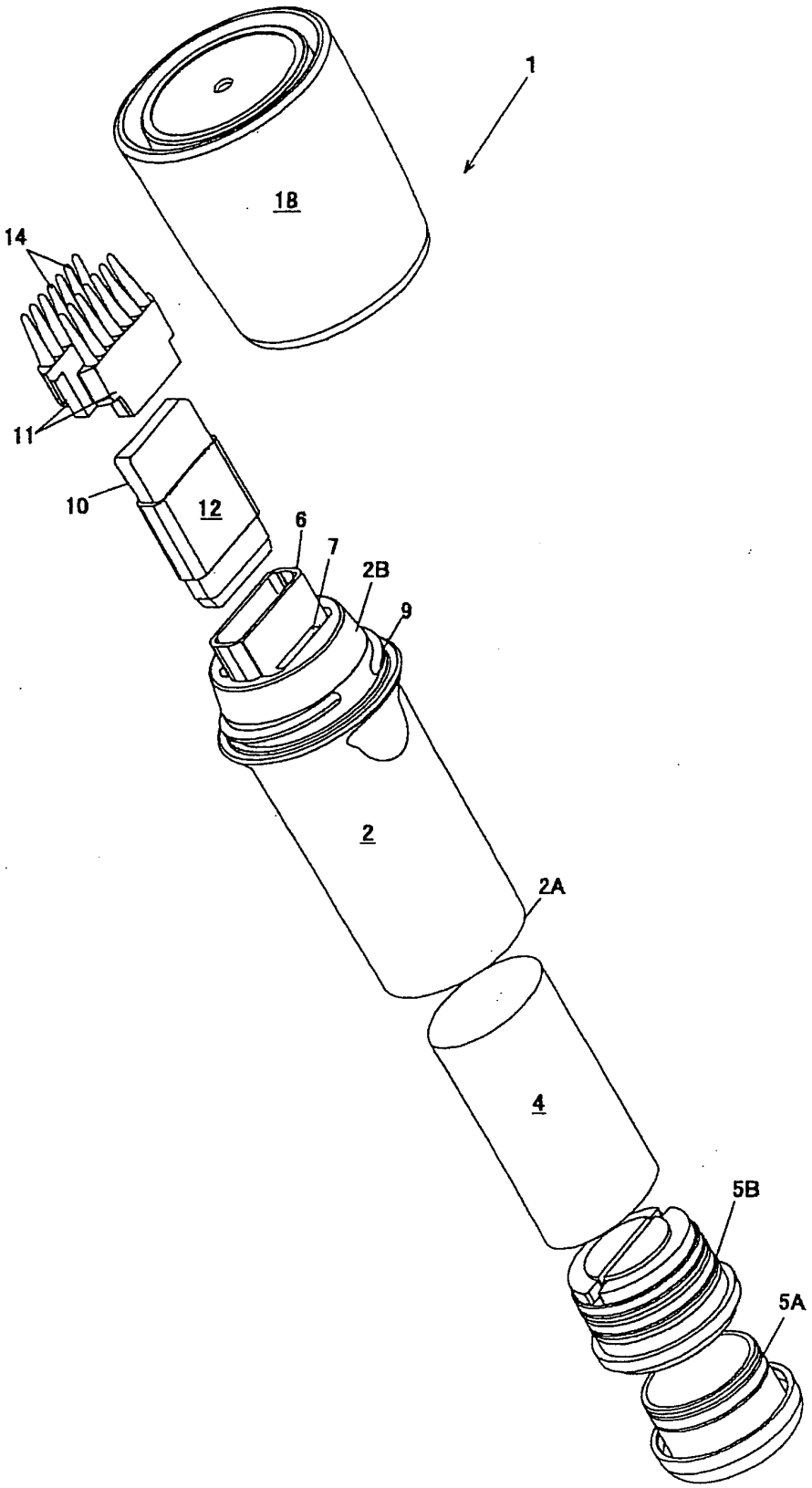


FIG.4

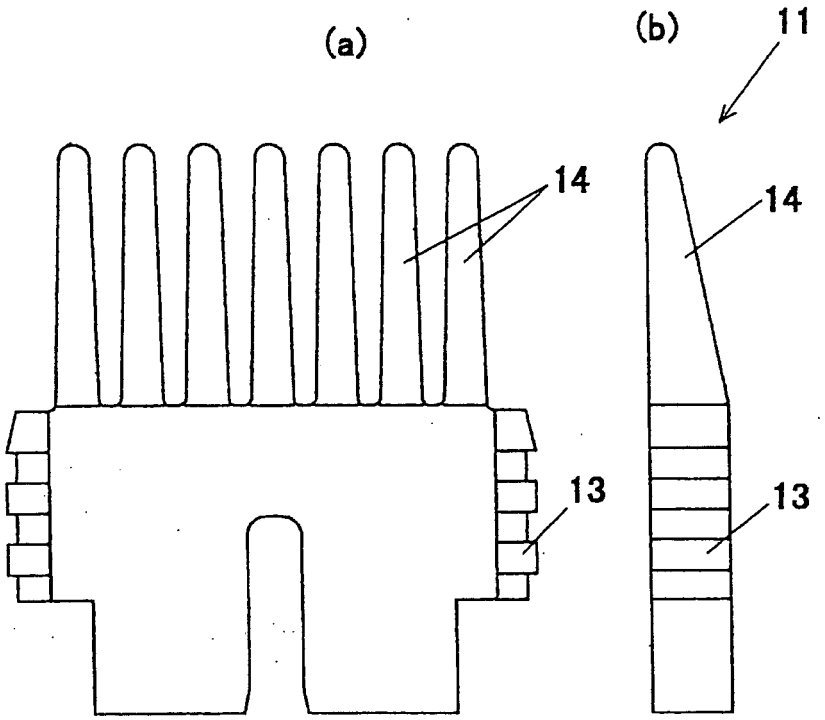
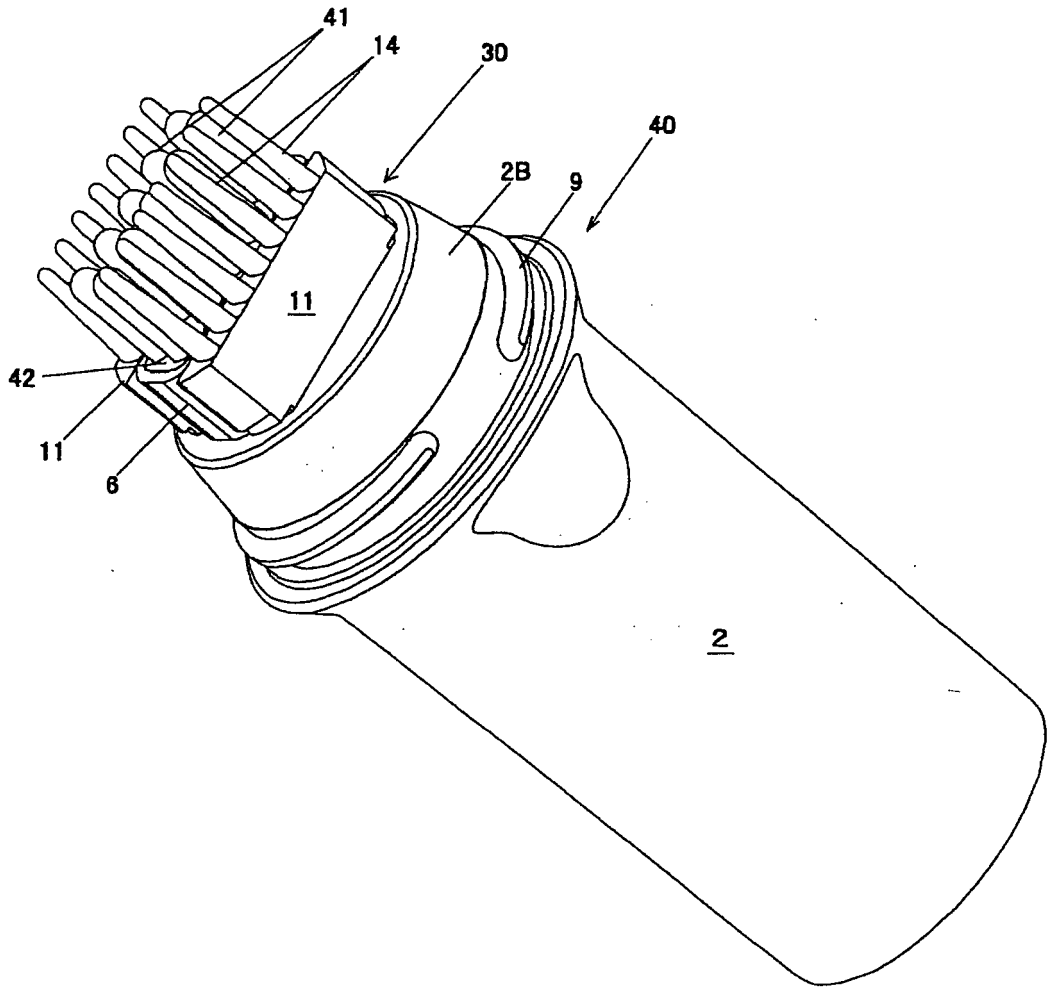


FIG.5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2005/011729

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] A45D24/22, 19/02, 34/00, B65D83/00

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)
Int.Cl[7] A45D24/22, 19/02, 34/00, B65D83/00

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 1996-2005
Kokai Jitsuyo Shinan Koho 1971-2005 Toroku Jitsuyo Shinan Koho 1994-2005

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. |
|---|---|---|
| Y | JP 61-240905 A (Michio OTSUKI), 27 October, 1986 (27.10.86), Full text; all drawings (Family: none) | 1-8 |
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☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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## REFERENCES CITED IN THE DESCRIPTION

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