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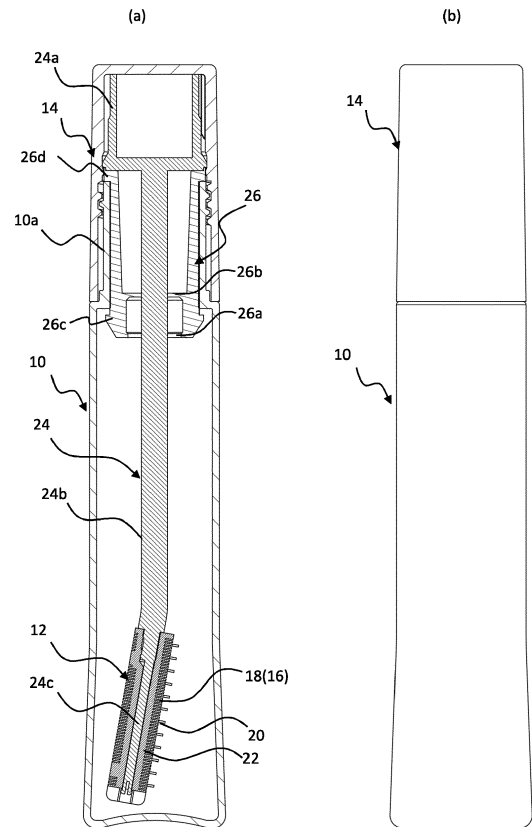
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HAIR DYE CONTAINER

(57) In order to prevent an application fluid from staining the skin surface when the application fluid is applied, a hair dye container includes a container storing a hair dyeing fluid and a grip, integrated with an application body, and being be attachable to and detachable from the container. The application body includes a fin section having multiple fins arranged at intervals, multiple combs having an outer diameter of at least 1 mm larger than the outer diameter of the fins, and an axial core having the fin section provided around the core to retain the dyeing fluid by capillary action between the fins, some or several fins being interposed between the combs.

【FIG. 1】



Description

[Technical Field of the Invention]

5 **[0001]** The present invention relates to a hair dye container for applying a hair dye to hair.

[Background Art]

10 **[0002]** Conventional hair dye containers have been used to apply liquid such as mascara solution for make-up around the eyes, for example (see Patent Document 1 and Patent Document 2).

[0003] The hair dye containers of the Patent Documents 1 and 2 are constructed to apply a liquid to the hair in the target area with the retained liquid in a stack of fins of an applying part.

[0004] There are some hair dye containers that use an applying part with a plurality of teeth projecting radially from a core material (see Patent Document 3), and some that have comb teeth arranged at predetermined intervals in an applying part so that the virtual line of the outer diameter portions are formed in a wavy shape (see Patent Document 4).

15 **[0005]** In addition, hair dye containers may be used for dyeing of hair as well as eyelashes.

[Prior Art Documents]

20 [Patent Documents]

[0006]

25 [Patent Document 1] Japanese Patent Application Laid-open No. 2017-71406

 [Patent Document 2] Japanese Patent Application Laid-open No. 2017-23261

 [Patent Document 3]: Japanese Patent Application Disclosure No. 2013-529534

 [Patent Document 4] Japanese Patent Application Laid-open No. 2007-175256

[Summary OF The Invention]

30 [Problems to be Solved by the Invention]

[0007] However, since the hair dye containers of Patents 1 and 2 have no comb structure, the fins directly contact the skin and may stain the skin with the application fluid. In addition, the hair dye containers of Patent Documents 3 and 4 are designed to hold the application fluid between the comb teeth, and if the comb teeth are widely spaced or the viscosity of the application fluid is low, the application fluid may flow out and adhere to and stain places, for example, the skin, other than the target part such as the hair.

35 **[0008]** In view of the above situation, it is therefore an object of the present invention to provide a hair dye container that can prevent an application fluid from adhering to places other than the target area at the time of application.

40 [Means for Solving the Problems]

[0009] The present invention resides in a hair dye container, comprising: a container storing a hair dyeing fluid; an application body; and a grip integrated with the application body and configured to be attachable to and detachable from the container, wherein: the application body comprises a fin section having a plurality of fins arranged at intervals, a plurality of combs having an outer diameter of at least 1 mm larger than the outer diameter of the fins, and an axial core having the fin section provided there around to retain the dyeing fluid by capillary action between the fins; and a plurality of the fins are interposed between the combs.

50 [Effect of the Invention]

[0010] According to the hair dye container of the present invention, the application body is constructed of a fin section having multiple fins arranged at intervals, multiple combs having an outer diameter of 1 mm or larger than the outer diameter of the fins, an axial core having the fin section provided around it to retain the dyeing fluid by capillary action between the fins, and multiple fins are interposed between the combs. Accordingly, when the user holds the grip and dyes the hair, this configuration allows the user to comb the hair with the multiple combs by moving the application body against the hair and can prevent the fin section from reaching places such as the skin surface other than the hair by means of the combs. Thus, the present invention can achieve excellent effect such as preventing the application fluid

from sticking to places other than the target area during application.

[Brief Description of the Drawings]

[0011]

FIG. 1 is an overall view showing a hair dye container in accordance with an embodiment of the present invention, (a) a longitudinal sectional view and (b) a side view;

FIG. 2 is an illustrative diagram showing the hair dye container of FIG. 1, in which an application body is attached to the tip of a shaft and assembled forming an angle with the shaft extended from a grip, (a) an overall view from the rear side of the application body, (b) a longitudinal section taken along the B-B line of (a), (c) a perspective view from the tip side, (d) a rear view of (a), (e) a side view rotated 90° from (a), (f) a view from the front side, (g) an opposite side view rotated 180° from (a), and (h) a perspective view from the opposite side;

Fig. 3 is an illustrative diagram showing parts of the application body in the hair dye container of Fig. 1, (a) an overall view from a side of the application body, (b) a longitudinal section taken along a B-B line in (a), (c) a view from the shaft attachment side, which is behind the application body, (d) a sectional view taken along a D-D line in (e), (e) a side view rotated 90 degrees from (a), (f) a sectional view taken along a line F-F in (e), (g) a sectional view taken along line G-G in (e), (h) a view from the front side, (i) a view from the opposite side, (j) a perspective view from the rear side, and (k) a perspective view from the front side;

FIG. 4 is an illustrative diagram showing parts of the shaft in the hair dye container of FIG. 1, (a) an overall view from a side of the shaft, (b) a longitudinal section taken along the B-B line of (a), (c) an enlarged perspective view of a tip part, (d) a view from the rear side, (e) a side view, (f) a view from the front side, (g) a sectional view taken along a G-G line in (e), (h) an overall view from the opposite side, and (i) a perspective view from the front side;

FIG. 5 is an illustrative diagram showing parts of a cap in the hair dye container of FIG. 1, (a) a longitudinal section, (b) a rear view, (c) a side view, (d) a front side view, and (e) a perspective view from the front side;

FIG. 6 is an illustrative diagram showing parts of a container body (bottle) in the hair dye container of FIG. 1, (a) a longitudinal section, (b) a side view, and (c) a perspective view from the side where the application body is inserted;

FIG. 7 is an illustrative diagram showing parts of a scraper member in the hair dye container of FIG. 1, (a) a longitudinal section taken along an A-A line in (d), (b) a rear side view (from the application body insertion side), (c) a side view, (d) a front side view, (e) a perspective view from rear side, and (f) a side view 90° rotated from (c), and (g) a perspective view from the front side;

FIG. 8 is a table showing observation results of skin stains when using a variety of application bodies different in structure and surface tension and dyeing fluids different in fluid viscosity for fluid examples 1 to 5 and 7;

FIG. 9 is a table showing observation results of skin stains when using a variety of application bodies different in structure and surface tension and dyeing fluids different in fluid viscosity for fluid examples 6 to 8;

FIG. 10(a) is a table showing the ratio of fluid consumption depending on the slit spacing in the application body and the viscosity of fluid examples, FIG. 10(b) is an illustrative diagram showing dimensions of parts of the application body; and

FIG. 11 is an illustrative chart showing the ratio of fluid consumption depending on the application body and the fluid viscosity of the fluid examples.

[Embodiment for Carrying Out the Invention]

[0012] Embodiments of the present invention will be described below with reference to the accompanying drawings.

[0013] FIG. 1 shows an overall view of a hair dye container according to an embodiment. FIG. 2 shows a state in which an application body is attached to the tip of a shaft and assembled forming an angle with the shaft extended from a grip. FIGS. 3 to 7 show parts diagrams of different components.

[0014] As shown in FIGS. 1 and 2, a hair dye container includes a container 10 storing a hair dyeing fluid and a grip 14 integrated with an application body 12, which is configured to be attachable to and detachable from the container to the container 10. The application body 12 is formed of a fin section 18 having a plurality of fins 16 arranged at intervals, a plurality of combs 20 having an outer diameter of at least 1 mm larger than the outer diameter of the fins 16, and an axial core 22 having the fin section 18 formed there around to retain the hair dyeing fluid by capillary action between the fins 16, a plurality of the fins 16 being interposed between the combs 20.

[0015] The application body 12 is provided and attached at the tip 24c of an axial shaft 24 extending integrally from the grip 14, forming an angle with the shaft 24.

[0016] A scraper member 26 is fitted in the mouth of the container 10 so as to scrap off excess hair dyeing fluid more than needed for the application body 12.

[0017] In use of the hair dye container, as shown in FIG. 2, the grip 14 integrated with the application body 12 is pulled

from the container 10 (see FIG. 1), and the hair dyeing fluid is applied by rubbing the application body 12 to the hairline and places where the user wants to dye.

[Application Body 12]

[0018] In the application body 12, the fin section 18 has a plurality of square-shaped fins 16 having approximately the same outer diameter with each other in axial view, arranged at intervals. The combs 20 each have an outer diameter of a least 1 mm larger than the outer diameter of the fins 16 and two projections on one side of the fin section 18, and are arranged so that multiple fins, for example, three fins 16 are interposed between adjacent combs 20 in the fin section 18. The central part of the fin section is the axial core 22, which is formed in an almost cylindrical shape with a hollow 22a therein. Arranged around the axial core 22 are the fins 16, which hold the hair dyeing fluid by capillary force there between.

[0019] The hollow 22a of the axial core 22 is penetrated to be open from the front to rear of the axial core 22. The rear end of the hollow 22a is formed with a fitting rib 22b, which catches the front end of the shaft 24 when the shaft is fitted into the hollow 22a.

[0020] The combs 20 are each configured to have a pair of horn-like protrusions on one side of the fin section 18 of a roughly rectangular shape in axial view, and provide the function of combing the hair when the aforementioned side of the fin section 18 is rubbed against a target place.

[0021] Three (one example of multiple) fins 16 are interposed between the combs 20. The spacing between the combs 20 is at least 1.2 mm.

[0022] A plurality of spaced walls 22c are formed in the front end of the application body 12, protruding forward from the axial core 22. The spacings of the multiple walls 22c provide the function of combing and tidying up the hair with their fine parts.

[Shaft 24]

[0023] A bowl-shaped portion 24a that is inserted into the grip 14 (see FIGS. 1 and 2) is provided in the rear end of the shaft 24 so that the shaft can be joined to the grip 14. The bowl-shaped portion 24a has flanges or other projections and indentations for fitting the grip 14 on the outer periphery thereof. The bowl-shaped portion 24a is formed with a rod-shaped shaft body 24b extending forward. The tip 24c having a small diameter is extended bending at an angle of approximately 0 to 45° with respect to the axial direction of the shaft body 24b.

[0024] As shown in FIG. 4, a base 24c1 of the tip 24c has a small diameter than the shaft body 24b, forming a stepped part.

[0025] The stepped part of the base 24c1 is formed in an irregular semi-circular shape as shown in FIG. 4(g) so as to prevent the application body 12 from rotating relative to the tip 24c when the application body 12 (see FIGS. 2 and 3) is mounted. The base 24c1 is formed with a plurality of ribs 24c2, as shown in FIG. 4(c), which produce pressure from inside when fitted into the hollow 22a (see FIG. 3) of the axial core 22 of the application body 12. The tip 24c is forked at the distal end, each branch having a flange 24d projected on the outer circumference. The flanges 24d function to prevent the application body 12 from falling off when the tip 24c is inserted in the hollow 22a of the axial core 22.

[Grip 14]

[0026] The grip 14 has a cap-shaped configuration, as shown in FIG. 5, and has a concave and convex portion 14a on the deep side in the interior so as to fit and hold the bowl-shaped portion 24a of the shaft 24. The grip 14 also has a female thread 14b formed in the middle part of the interior so as to screw fit on the mouth of the container.

[Container 10]

[0027] As shown in FIG. 6, the container 10 has a cylindrical configuration in which a mouth part 10a through which the application body 12 is made narrower and formed with a male thread on the outer peripheral side thereof. The container 10 stores a hair dyeing fluid in the product state shown in FIG. 1. In this case, the container 10 is configured so that the lower portion thereof is filled with the hair dyeing fluid and the hair dyeing fluid is supplied to the application body 12 as it is immersed.

[Scraper Member 26]

[0028] As shown in FIG. 1, the scraper member 26 is fitted inside the mouth part 10a of the container 10, and has a scraping wall 26a openable thanks to elastic deformation, located inside the container 10 and formed at the distal end

thereof, and a passage wall 26b for the application body 12 located slightly behind the scraping wall.

[0029] In detail, as shown in FIG. 7, the scraping wall 26a has star-shaped slits 26a1 formed radiating from the center, and the passage wall 26b has a circular passage hole 26b1 that is slightly larger than the application body 12 (see FIG. 1). The scraper member 26 has a large-diametric portion 26c formed around the distal end thereof to prevent itself from coming off and also has a flange 26d formed around the rear end thereof.

[0030] As shown in FIG. 1, when the scraper member 26 is fitted in the container 10, the large-diametric portion 26c opposes the lower step of the mouth part 10a to prevent the scraper member from coming off while the flange 26d is engaged with the mouth part 10a to prevent the scraper member from dropping into the container 10, whereby the scraper member 26 is positioned.

[0031] Here, in use of the hair dye container of the embodiment, it is preferable that the hair dyeing fluid should have a viscosity of 2 to 130 mPa·s in view of facilitating application to the hair of head. If the viscosity of the hair dye is less than 2 mPa·s, the hair dye applied to the hairline, in particular, will reach the skin through the hair and stain the scalp, whereas if the viscosity exceeds 130 mPa·s, it is difficult to spread the hair dye thinly and evenly on the hair, which is undesirable. In addition, the surface tension is preferably set to be 22 to 55 mN/m from the viewpoint of not staining the surrounding area and the scalp when applying to the hair of the head. If the surface tension of the hair dye is less than 22 mN/m, the hair dye especially applied to the hairline will reach the skin through the hair and stain the scalp, whereas if the surface tension exceeds 55 mN/m, it is difficult to retain the hair dye in the applying part and the fluid is likely to splash and stain the surroundings during use, which is undesirable.

[0032] Table 1 shows Examples 1 to 8 of hair dyeing fluids suitable for dying hair.

[Table 1]

	Ex. 1	Ex.2	Ex. 3	Ex. 4	Ex. 5	Ex. 6	Ex. 7	Ex.8
Black No. 401	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Purple No. 401	0.3	0.3	0.3	0.3	0.3			
Orange No. 205	0.5	0.5	0.5	0.5	0.5	0.1	0.1	
Red No. 227	0.1	0.1	0.1	0.1	0.1			
Carbon Black								0.6
Polyquaternium 10		0.1	0.3	0.3	0.4			
Polyquaternium 55	1.0	1.0	1.0	2.0	2.0			
(EthylMethacrylate Betaine/Acrylate) Copolymer						3.0	3.0	
(Acrylate/ Ethylhexyl Acrylate) Copolymer								0.4
Behenes 30								0.2
1,3 Butylene Glycol								0.6
Benzyl Alcohol	10.0	10.0	10.0	10.0	10.0			
Lactic Acid	2.7	2.7	2.7	2.7	2.7			
Ethanol	33.3	33.3	33.7	33.7	33.3	96.6	45.0	
Preservative	Small Amount	Small Amount	Small Amount	Small Amount	Small Amount	Small Amount	Small Amount	Small Amount
Water (Purified Water)	Residue	Residue	Residue	Residue	Residue			Residue
Total (%)	100	100	100	100	100	100	100	100
Viscosity (mPa·s)	10	30	80	130	160	2	2	3
Surface Tension (mN/m)	33	33	33	33	33	22	35	55

[0033] FIGS. 8 to 9 show the results of sensitivity tests of hair dyeing fluids of examples 1 to 8 ("fluid examples 1 to 8"), as to the presence or absence of fluid suction between the combs, and skin stains, depending on the slit spacing, the fin thickness, the spacing between combs, and the fluid viscosity and surface tension of the fluid examples 1 to 8.

[0034] The presence or absence of fluid suction between the combs of the application body was observed when the combs were oriented sideways, downward, and upward, respectively, and skin stains were observed. The result was considered to be "No Good" if there was a stain on the skin and to be "Good" if there was no stain on the skin. FIG. 10(b) shows the thickness t of the fin 16, the slit spacing δ , and the slit spacing W (between combs 20) in the application body 12.

[Test results mainly dependent on the fluid viscosity of the hair dyeing fluid]

[0035] FIG. 8 shows the test results when using fluid examples 7, 1 to 5 having different fluid viscosities. The test results in FIG. 8 are shown for the hair dye containers of Comparative Examples I, III, IV, V and VII (abbreviated as "CEX. I" and the like in FIG. 8) and for the hair dye containers of Examples II, V, VI and VIII (abbreviated as "Ex. II" and the like in FIG. 8).

[Comparative Example I]

[0036] In the hair dye container according to Comparative Example I, the slit spacing was 0.5 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 0.5 (mm).

[0037] In Comparative Example I, use of the fluid examples 7, 1 to 5 presented stains on the skin surface, hence Comparative Example I was "No Good".

[0038] In Comparative Example I, because the spacing between the combs was narrow, hence the capillary force was strong, the fluid was sucked up between the combs and the skin surface was stained when the fluid examples 7, 1 to 3 were used. However, with the combs oriented upward, the fluid was pulled down from the combs due to gravity, hence did not stain the skin surface. When each fin had a comb and the combs were oriented downward, the fluid moved to the combs due to gravity. The low-viscosity fluid moved easily and the fluid was pulled down between the combs, making stains worse.

[0039] Moreover, in Comparative Example I, because the comb spacing was narrow, hence the capillary force was strong, the fluid was sucked up between the combs when the fluid examples 4 to 5 were used. Even when the combs were oriented upward, the fluid did not run off due to high viscosity under the effect of gravity, so that the skin surface was stained.

[Example II]

[0040] In a hair dye container of Example II, the slit spacing was 0.5 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 1.3 (mm).

[0041] In the hair dye container of Example II, all the fluid examples 7 and 1 to 5 did not cause any stain on the skin surface, so Example II was "Good".

[0042] In this case, because the comb spacing was wide, hence the capillary force was weak, the fluid was not sucked up between the combs and did not stain the skin. Since the slit spacing was narrower than the comb spacing so that there was a difference in capillary force, the fluid was held between the slits without yielding to gravity even when the combs were oriented downward.

[Comparative Example III]

[0043] In a hair dye container of Comparative Example III, the slit spacing was 0.2 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 0.2 (mm).

[0044] In Comparative Example III, use of the fluid examples 7 and 1 to 5 caused stains on the skin surface for all cases so Comparative Example III was "No Good".

[0045] In this case, the comb spacing was narrow, hence the capillary force was strong, so that the fluid was sucked up between the combs and the skin surface was stained.

[0046] Regardless of the orientation of the combs, the fluid was sucked up and resulted in staining the skin surface.

[Comparative Example IV]

[0047] In a hair dye container of Comparative Example IV, the slit spacing was 0.2 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 0.7 (mm).

[0048] Comparative Example IV had stains on the skin surface, hence was "No Good".

[0049] In Comparative Example IV, because the comb spacing was narrow, hence the capillary force was strong, the fluid was sucked up between the combs and the skin surface was stained when the fluid examples 7, 1 to 3 were used. However, with the combs oriented upward, the fluid was pulled down from the combs due to gravity, hence did not stain the skin surface.

[0050] In Comparative Example IV, because the comb spacing was narrow, hence the capillary force was strong, the fluid was sucked up between the combs, causing stains on the skin surface when the fluid examples 4 to 5 were used. Even when the combs were oriented upward, the fluid did not run off due to high viscosity under the effect of gravity, so that the skin surface was stained.

[Example V]

[0051] In a hair dye container for Example V, the slit spacing was 0.2 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 1.2 (mm).

[0052] In the hair dye container of Example V, all the fluid examples 7 and 1 to 5 did not cause any stain on the skin surface, so Example V was "Good".

[0053] In this case, because the comb spacing was wide, hence the capillary force was weak, the fluid was not sucked up between the combs and did not stain the skin surface. Since the slit spacing was narrower than the comb spacing hence stronger capillary force acted, the fluid was held between the slits without yielding to gravity even when the combs were oriented downward.

[Example VI]

[0054] In a hair dye container of Example VI, the slit spacing was 0.2 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 1.7 (mm).

[0055] In the hair dye container of Example VI, all the fluid examples 7 and 1 to 5 did not cause any stain on the skin surface, so Example VI was "Good".

[0056] In this case, because the comb spacing was wide, hence the capillary force was weak, the fluid was not sucked up between the combs and did not stain the skin surface. Since the slit spacing was narrower than the comb spacing hence stronger capillary force acted, the fluid was held between the slits without yielding to gravity even when the combs were oriented downward.

[Comparative Example VII]

[0057] In a hair dye container of Comparative Example VII, the slit spacing was 0.7 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 0.7 (mm).

[0058] In the Comparative Example VII, use of the fluid examples 7, 1 to 5 presented stains on the skin surface, so Comparative Example VII was "No Good".

[0059] In this case, when each fin had a comb and the combs were oriented downward, the fluid moved to the combs due to gravity. In particular, when the slit spacing was wide, hence the capillary force was weak, the fluid ran between the combs and stained the skin surface.

[Example VIII]

[0060] In a hair dye container of Example VIII, the slit spacing was 0.5 (mm), the fin thickness was 0.5 (mm), and the comb spacing was 1.5 (mm).

[0061] In the hair dye container of Example VIII, all the fluid examples 7 and 1 to 5 did not cause any stain on the skin surface, so Example VIII was "Good".

[0062] In this case, because the comb spacing was wide, hence the fluid was not sucked up between the comb. Since the slit spacing was narrower than the comb spacing so that there was a difference in capillary force, the fluid was held between the slits without yielding to gravity even when the combs were oriented downward.

[Test results mainly dependent on the surface tension of the hair dying fluid]

[0063] FIG. 9 shows the test results when using fluid examples 6, 7 and 8 having different surface tension. The test results in FIG. 9 are shown for the hair dye containers of Comparative Examples a, c, d and g (abbreviated as "CEX. a" and the like in FIG. 9) and for the hair dye containers of examples b, e, f and h (abbreviated as "Ex. b" and the like in FIG. 9).

[Comparative Example a]

[0064] In a hair dye container of Comparative Example a, when the slit spacing was 0.5 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 0.5 (mm), stains on the skin surface were found, so Comparative Example a was "No Good".

[0065] In Comparative Example a, when each fin had a comb and the combs were oriented downward, the fluid of the fluid examples 6 and 7 moved to the combs due to gravity. In particular, since the fluid was low in surface tension presenting a weak capillary force, the fluid ran between the combs, staining the skin surface. As the surface tension of the fluid increases, the fluid was liable to be sucked between the combs, staining the skin surface even when the comb was oriented sideways.

[0066] In Comparative Example a, when the fluid example 8 was used, the surface tension was high, hence capillary force was strong, so the fluid was sucked up between the combs, staining the skin surface.

[Example b]

[0067] In a hair dye container of Example b, the slit spacing was 0.5 (mm), the fin thickness was 0.5 (mm), and the comb spacing was 1.3 (mm).

[0068] In the hair dye container of Example b, all the fluid examples 6, 7, and 8 did not cause any stain on the skin surface, and were "Good".

[0069] In this case, the capillary force was weak because the combs spacing was wide, so the fluid did not get sucked up between the combs and cause any stains on the skin surface. Even when the combs were oriented downward, the fluid did not run onto the combs due to the difference of the combs in capillary force from the slits.

[Comparative Example c]

[0070] In a hair dye container of Comparative Example c, the slit spacing was 0.2 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 0.2 (mm).

[0071] In the hair dye container of Comparative Example c, all of the fluid examples 6, 7, and 8 had stains on the skin surface and were "No Good".

[0072] In this case, because the comb spacing was narrow so a strong capillary force acted there between, the fluid was sucked up between the combs, causing stains on the skin surface.

[Comparative Example d]

[0073] In a hair dye container of Comparative Example d, the slit spacing was 0.2 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 0.7 (mm).

[0074] In the hair dye container of Comparative Example d, the fluid examples 6, 7 and 8 all had stains on the skin surface and were "No Good".

[0075] In the hair dye container of Comparative Example d, because the comb spacing was narrow so a strong capillary force acted there between, the fluid was sucked up between the combs, causing stains on the skin surface. With the combs oriented upward, the fluid could not be supported by the low surface tension and was pulled down between the slits, hence did not cause stains on the skin surface. On the other hand, with the fluid with a high surface tension, the fluid did not run and the skin surface was stained.

[Example e]

[0076] In a hair dye container for Example e, the slit spacing was 0.2 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 1.2 (mm).

[0077] In the hair dye container of Example e, all the fluid examples 6, 7, and 8 did not cause any stain on the skin surface, and were "Good".

[0078] In this case, the capillary force was weak because the combs spacing was wide, so the fluid did not get sucked up between the combs. Even when the combs were oriented downward, the fluid did not run onto the combs due to the difference of the combs in capillary force from the slits.

[Example f]

[0079] In a hair dye container for Example f, the slit spacing was 0.2 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 1.7 (mm).

[0080] In the hair dye container of Example f, all the fluid examples 6, 7, and 8 did not cause any stain on the skin surface, and were "Good".

[0081] In this case, the capillary force was weak because the combs spacing was wide, so the fluid did not get sucked up between the combs. Even when the combs were oriented downward, the fluid did not run onto the combs due to the difference of the combs in capillary force from the slits.

[Comparative Example g]

[0082] In a hair dye container for Comparative Example g, the slit spacing was 0.7 (mm), the fin thickness was 0.3 (mm), and the comb spacing was 0.7 (mm).

[0083] In the hair dye container of Comparative Example g, the fluid examples 6, 7 and 8 all had stains on the skin surface and were "No Good".

[0084] In this case, when each fin had a comb and the combs were oriented downward, the fluid moved to the combs due to gravity. In particular, because the slit spacing was wide, hence the capillary force was weak, the fluid ran between the combs and stained the skin surface.

[Example h]

[0085] In a hair dye container for example h, the slit spacing was 0.5 (mm), the fin thickness was 0.5 (mm), and the comb spacing was 1.5 (mm).

[0086] In the hair dye container of Example e, all the fluid examples 6, 7, and 8 did not cause any stain on the skin surface, and were "Good".

[0087] In this case, the capillary force was weak because the combs spacing was wide, so the fluid did not get sucked up between the combs. Even when the combs were oriented downward, the fluid did not run onto the combs due to the difference of the combs in capillary force from the slits.

[0088] From the results of the above Comparative Examples and Examples, it is understood that the hair dyeing fluid is suitable when having a viscosity in the range of 2 to 130 mPa·s or a surface tension of 22 to 55 mN/m.

[0089] FIG. 10(a) shows the consumption ratios (%) of different hair dyeing fluids in hair dye containers having a slit spacings of 0.2, 0.5, and 0.7 (mm), respectively, when the fluid viscosity was varied from 2 to 160 (mPa·s). FIG. 11 shows plots of the fluid consumption ratios for different slit spacings of 0.2, 0.5 and 0.7, with respect to the fluid viscosity.

[0090] It is understood that when the fluid viscosity is around 150 (mPa·s), the fluid consumption ratio decreases regardless of slit spacing.

[0091] The embodiment is a mere example and is not limited to use with hair dyeing fluids.

[Industrial Availability]

[0092] The hair dye container of the present invention can be used for hair dyeing.

[Description of Reference Numerals]

[0093]

- 10 container
- 10a mouth part
- 12 application body
- 14 grip
- 14a concave and convex portion
- 14b female thread
- 16 fin
- 18 fin section
- 20 comb
- 22 axial core
- 22a hollow
- 22b rib
- 22c wall
- 24 shaft
- 24a bowl-shaped portion
- 24b shaft body

	24c	tip
	24d	flange
	24c1	tip base
	24c2	tip rib
5	26	scraper member
	26a	scraping wall
	26a1	slits in the scraping wall
	26b	passage wall
	26b1	passage hole in the passage wall
10	26c	large-diametric portion of the scraper member
	26d	flange of the scraper member

Claims

- 15
1. A hair dye container, comprising:
- a container storing a hair dyeing fluid;
 an application body; and
 20 a grip integrated with the application body and configured to be attachable to and detachable from the container, wherein:
- the application body comprises a fin section having a plurality of fins arranged at intervals, a plurality of combs having an outer diameter of at least 1 mm larger than the outer diameter of the fins, and an axial core having the
 25 fin section provided there around to retain the dyeing fluid by capillary action between the fins; and a plurality of the fins are interposed between the combs.
2. The hair dye container according to claim 1, wherein the spacing between the combs is 1.2 mm or greater.
- 30 3. The hair dye container according to claim 1 or 2, wherein the hair dyeing fluid has a viscosity of 2 to 130 mPa•s or a surface tension in the range of 22 to 55 mN/m.
4. The hair dye container according to one of claims 1 to 3, wherein the application body is provided and attached at the tip of a shaft extending from the grip, forming an angle with the shaft.
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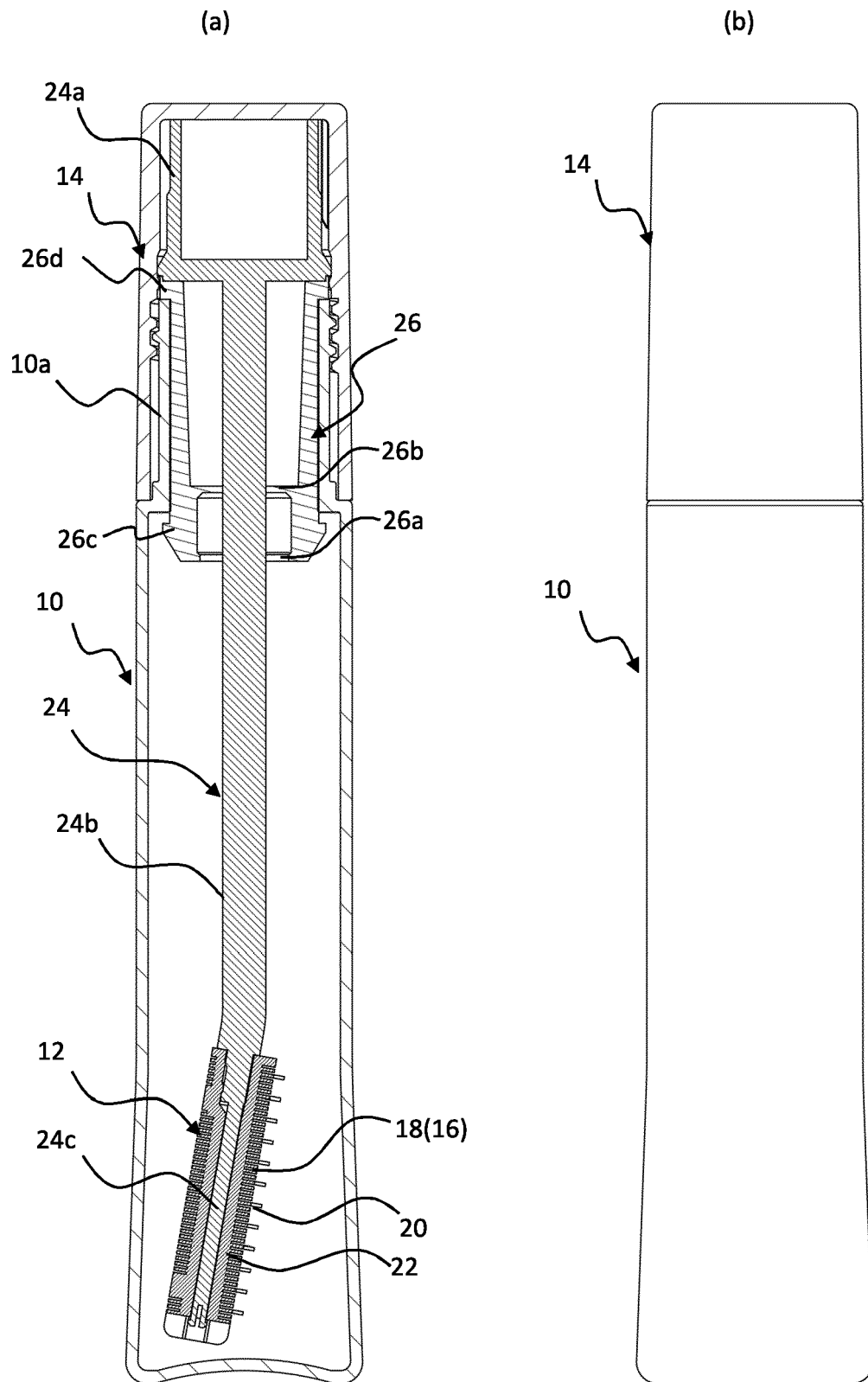
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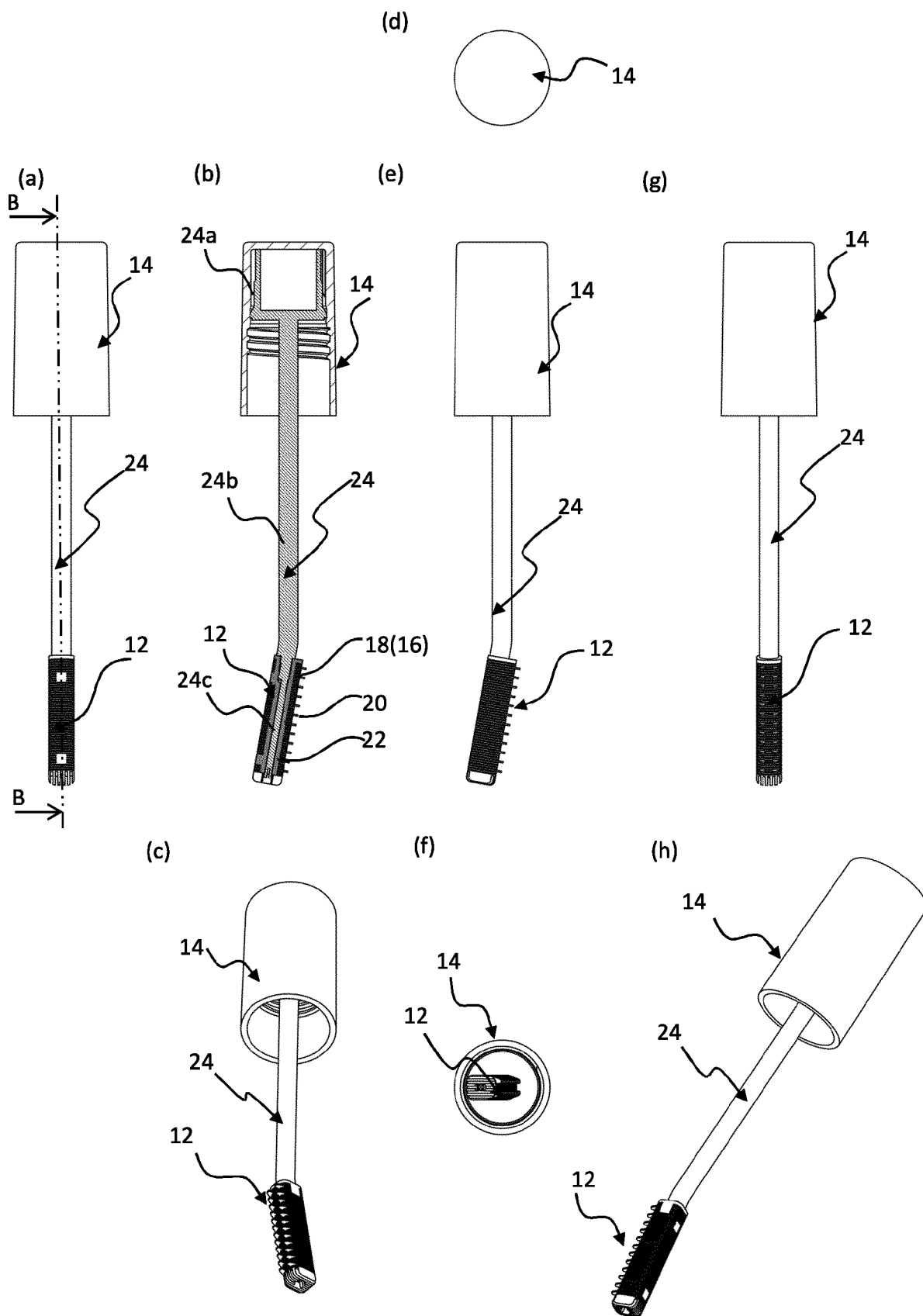
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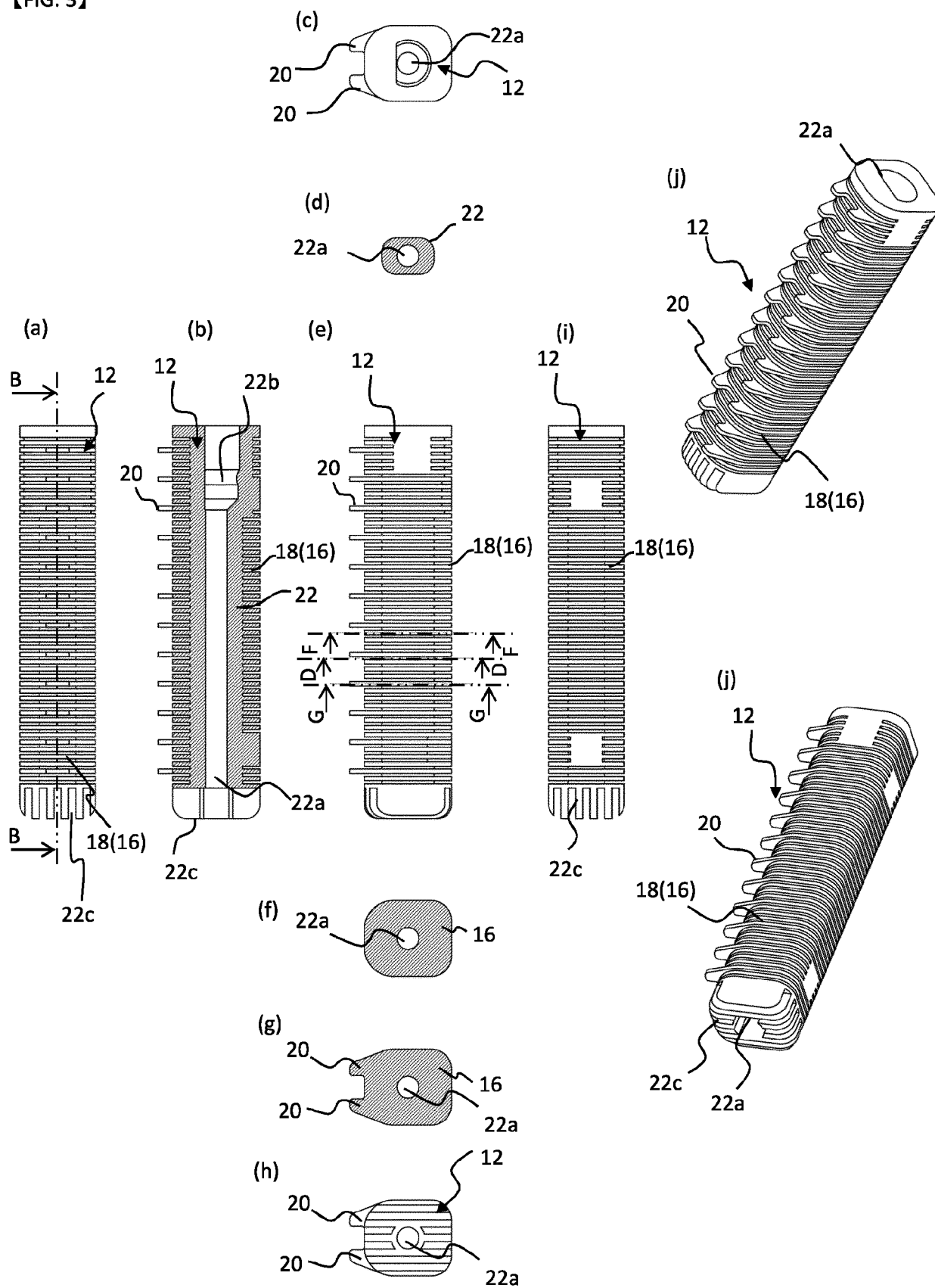
【FIG. 1】



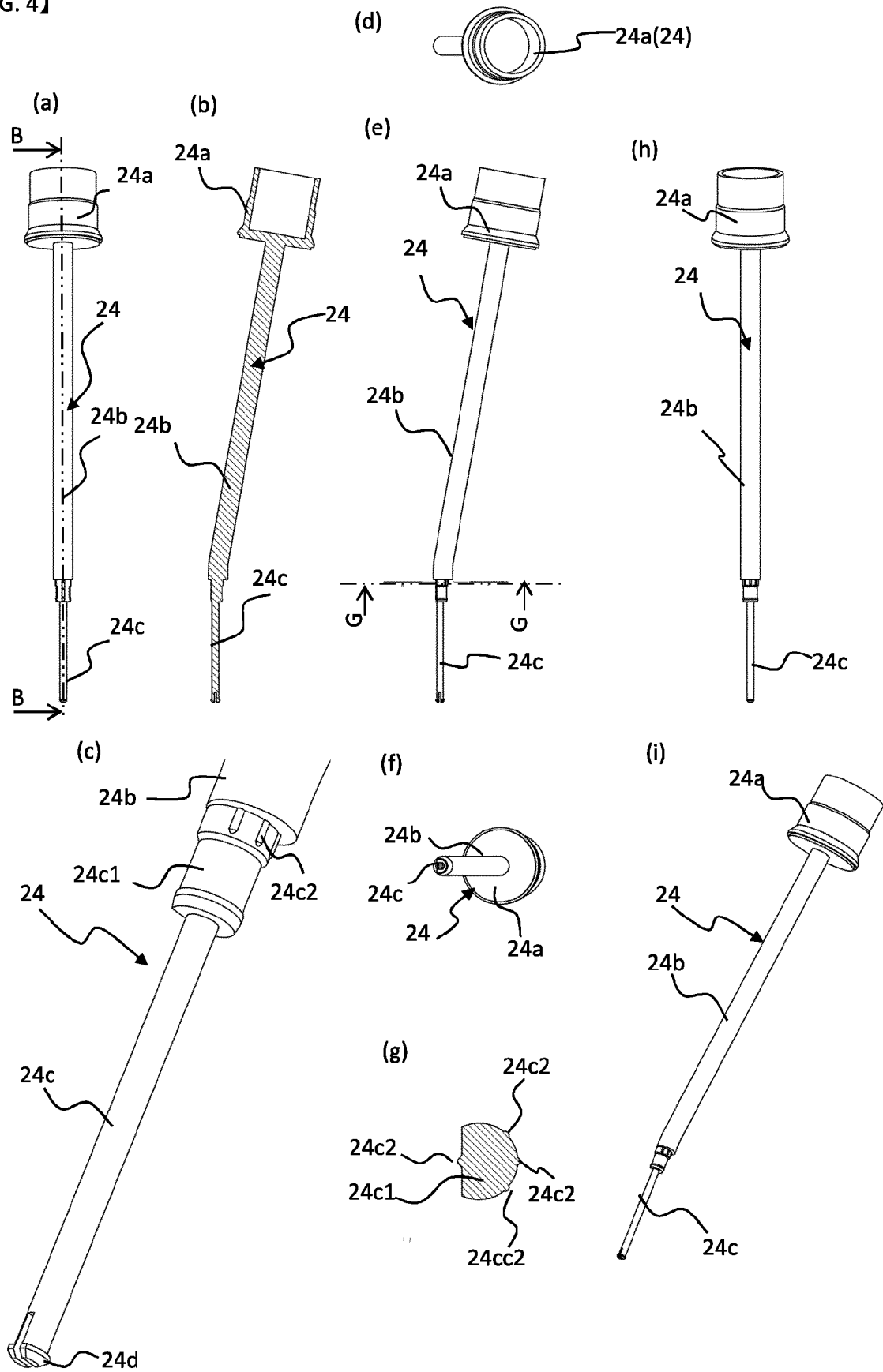
【FIG. 2】



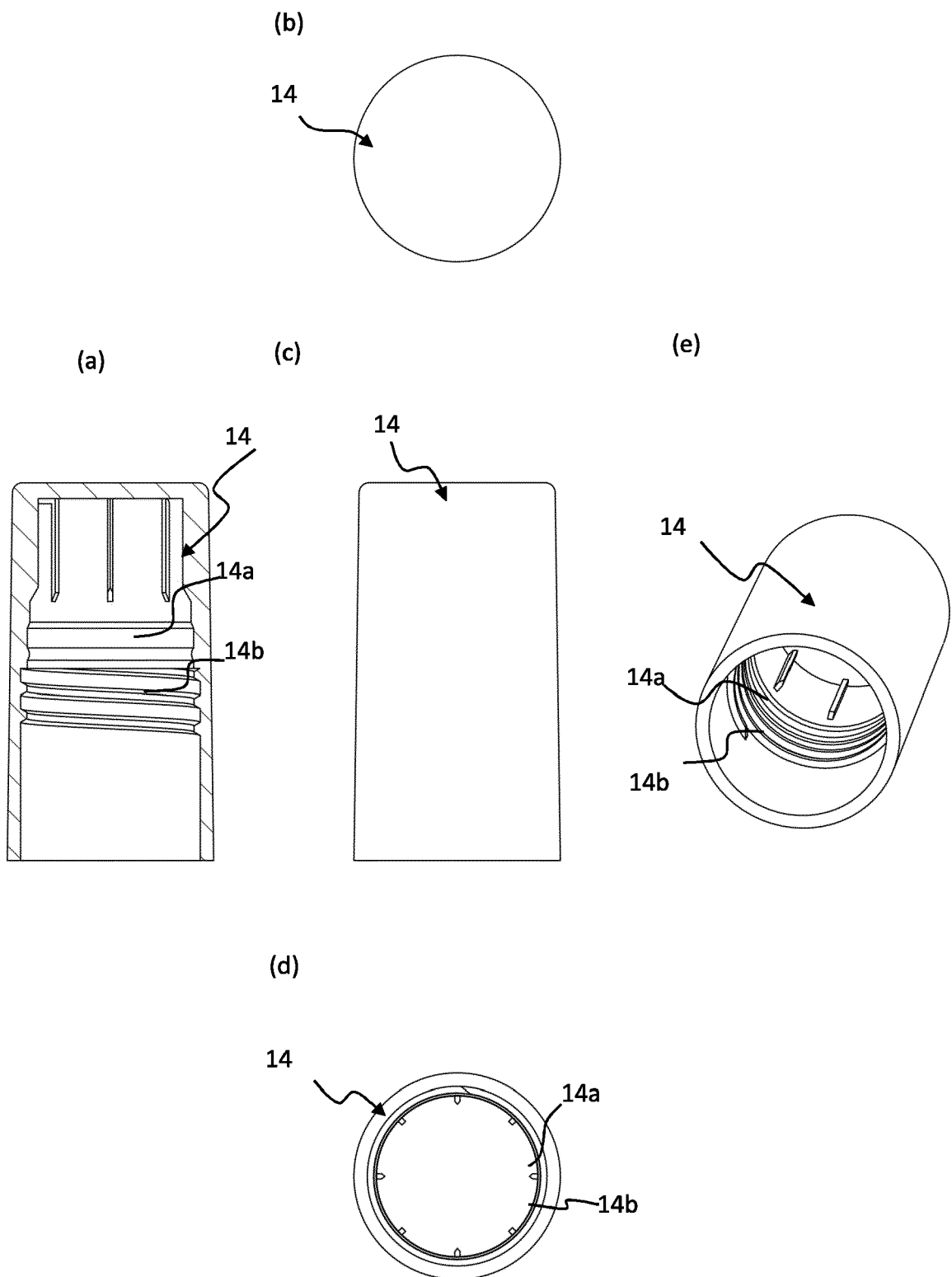
【FIG. 3】



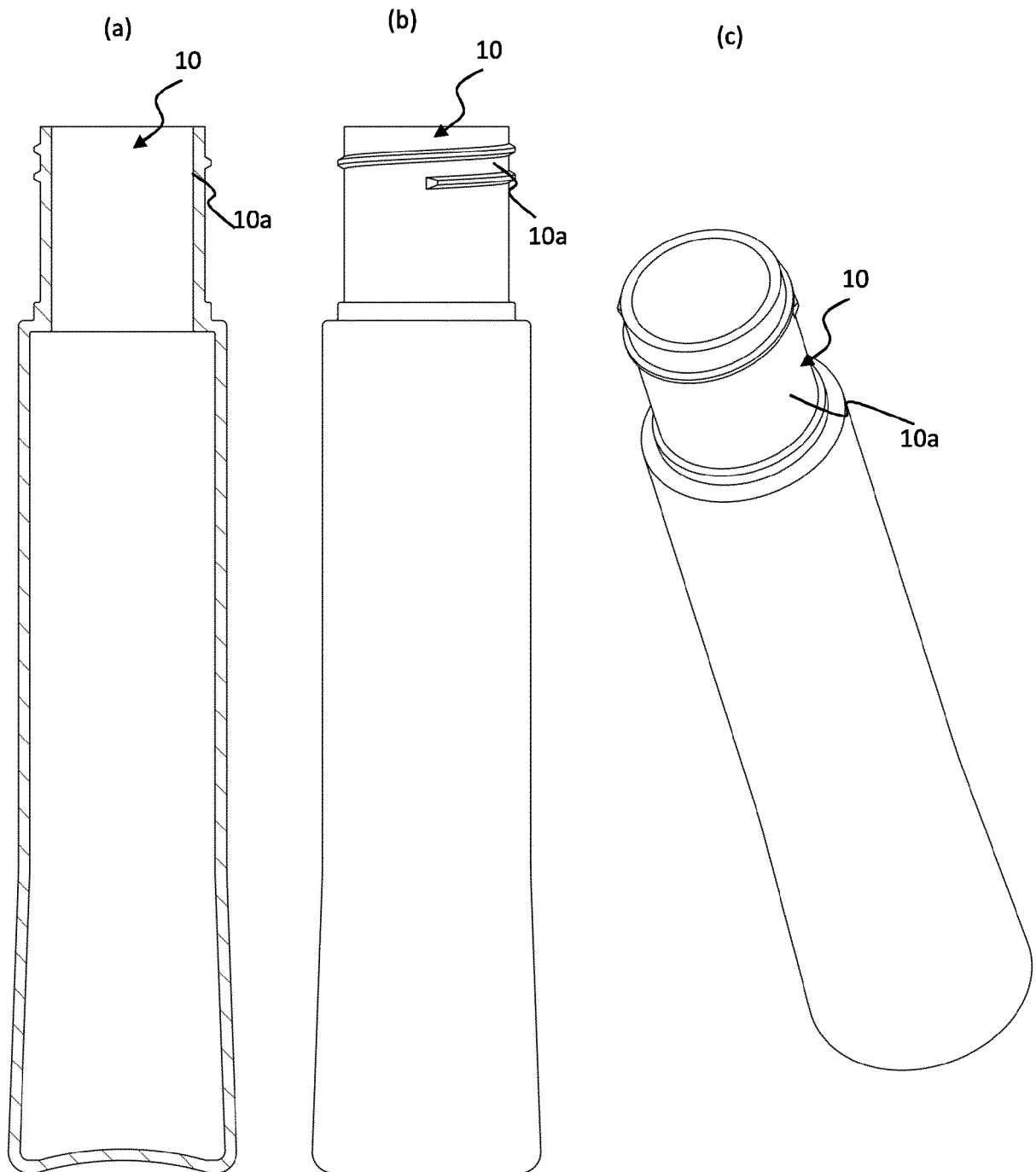
【FIG. 4】



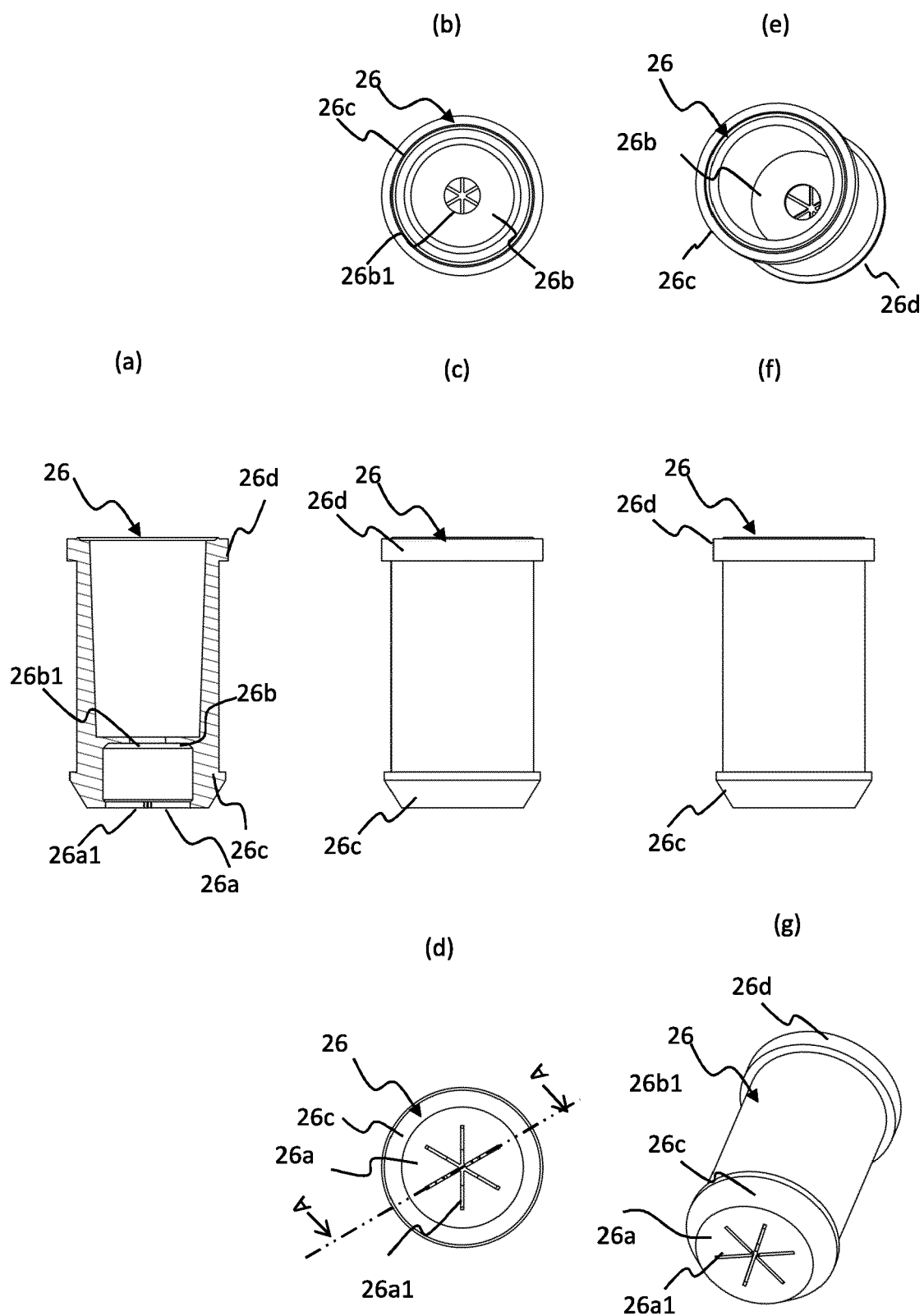
【FIG. 5】



【Fig. 6】



【FIG. 7】



【FIG. 8】

Ex. or CEx.	Slit Spacing [mm]	Fin Thickness [mm]	Comb Spacing [mm]	Fluid Example	Fluid Viscosity [mPas]	Surface Tension [mN/m]	Suction between Combs			Stains on Skin Surface
							Combs Sideways	Combs Downward	Combs Upward	
CEx. I	0.5	0.3	0.5	7	2	35	Found	Found	None	No Good
				1	10	33				
				2	30					
				3	80					
				4	130					
				5	160					
Ex. II			1.3	7	2	35	None	None	None	Good
				1	10	33				
				2	30					
				3	80					
				4	130					
				5	160					
CEx. III	0.2	0.3	0.2	7	2	35	Found	Found	Found	No Good
				1	10	33				
				2	30					
				3	80					
				4	130					
				5	160					
CEx. IV			0.7	7	2	35	Found	Found	None	No Good
				1	10	33				
				2	30					
				3	80					
				4	130					
				5	160					
Ex. V			1.2	7	2	35	None	None	None	Good
				1	10	33				
				2	30					
				3	80					
				4	130					
				5	160					
Ex. VI			1.7	7	2	35	None	None	None	Good
				1	10	33				
				2	30					
				3	80					
				4	130					
				5	160					
CEx. VII	0.7	0.3	0.7	7	2	35	None	Found	None	No Good
				1	10	33				
				2	30					
				3	80					
				4	130					
				5	160					
Ex. VIII	0.5	0.5	1.5	7	2	35	None	None	None	Good
				1	10	33				
				2	30					
				3	80					
				4	130					
				5	160					

【FIG. 9】

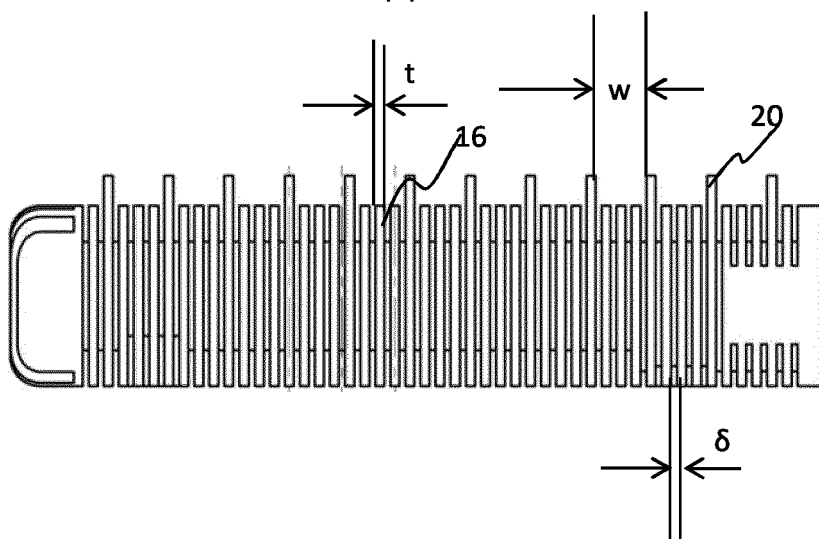
Ex. or CEx.	Slit Spacing [mm]	Fin Thickness [mm]	Comb Spacing [mm]	Fluid Example	Surface Tension [mN/m]	Fluid Viscosity [mPa·s]	Suction between Combs			Stains on Skin Surface
							Combs Sideways	Combs Downward	Combs Upward	
CEx. a	0.5	0.3	0.5	6	22	2	None	Found	None	No Good
				7	35	2	Found	Found	None	
				8	55	3	Found	Found	Found	NoGood
Ex. b			1.3	6	22	2	None	None	None	Good
				7	35	2				
				8	55	3				
CEx. c	0.2	0.3	0.2	6	22	2	Found	Found	Found	No Good
				7	35	2				
				8	55	3				
CEx. d			0.7	6	22	2	Found	Found	None	No Good
				7	35	2			Found	
				8	55	3				
Ex. e			1.2	6	22	2	None	None	None	Good
				7	35	2				
				8	55	3				
Ex. f			1.7	6	22	2	None	None	None	Good
				7	35	2				
				8	55	3				
CEx. g	0.7	0.3	0.7	6	22	2	None	Found	None	No Good
				7	35	2				
				8	55	3				
Ex. h	0.5	0.5	1.5	6	22	2	None	None	None	Good
				7	35	2				
				8	55	3				

【FIG. 10】

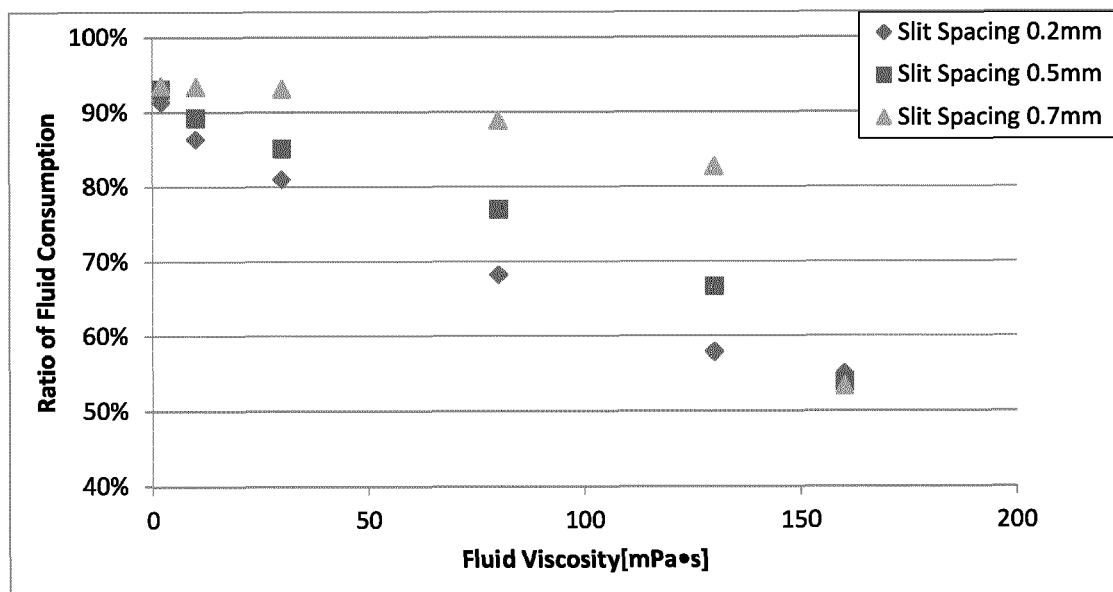
(a)

Slit Spacing [mm]	Fluid Viscosity[mPa·s]					
	2	10	30	80	130	160
0.2	91%	86%	81%	68%	58%	55%
0.5	93%	89%	85%	77%	67%	54%
0.7	94%	93%	93%	89%	83%	53%

(b)



【FIG. 11】





EUROPEAN SEARCH REPORT

Application Number
EP 20 19 9278

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Place of search The Hague		Date of completion of the search 4 February 2021	Examiner Ehksam, Sabine
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