

## DESCRIPTION

## REFILLING METHOD

## Technical Field

[0001]

The present invention relates to a refilling method for refilling a liquid material such as a skin lotion or emulsion into a main container from a refill container.

## Background Art

[0002]

With regard to a main container to store a liquid material such as a skin lotion or emulsion therein, a content is refilled into the main container from a refill container in order to allow for the repeated use of the main container in terms of promoting resource saving and price reduction.

[0003]

A pouch or a thin blow-molded bottle is typically used as a refill container. At the time of refilling, the refill container is held in such a manner that a discharge port of the refill container is positioned above a mouth of the main container. Then, by gradually increasing the tilt of the refill container, the content thereof is transferred into the main container.

[0004]

In a case where the refill container is a pouch,

however, the refill container itself is not firm enough and the outer shape thereof therefore changes along with the discharge of its content. Thus, in order to make sure that no content discharged from the pouch goes off the mouth of the main container, due caution is required for the holding of the pouch and it is troublesome. Moreover, there is a problem that the discharge port may be carelessly closed due to the overlapping of films forming the pouch. Although the holding of a container at the time of refilling is easier with a bottle than with the pouch, air displacement is not made smoothly in the bottle. As a result, the content of the bottle may be discharged as if it were pulsing, thereby causing a problem such as unwanted bubbling of the content.

[0005]

There has been suggested to provide an air displacement path at a discharge port of a refill container as a method for stabilizing the discharge of a content from the refill container (Patent Literature 1).

[0006]

On the other hand, as an opening portion to form a discharge port on an inner cover sealing a mouth of a container body having stored a liquid therein, there has been known an opening portion such that a cut-off groove is ditched on the inner cover in a shape of the discharge port, a pull ring is provided to a removing portion

surrounded by the cut-off groove via a support rod, the cut-off groove is cut by the pulling-up of the pull ring, and the removing portion is removed together with the pull ring so as to open the discharge port (Patent Literature 2). It is conceivable to provide such an opening portion to a refill container.

[0007]

According to the conventional opening portion with the pull ring, however, the pulling-up direction of the pull ring is difficult to be fixed to one direction. Depending on the pulling-up direction, the cut-off groove may fail to be cut and a joint region between the pull ring and the support rod or a joint region between the support rod and the removing portion may be broken. As a result, the discharge port cannot be opened.

#### Citation List

##### Patent Literature

[0008]

[Patent Literature 1] JP 2005-88929 A

[Patent Literature 2] JP 2008-207855 A

##### Summary of the Invention

##### Problems to be solved by the Invention

[0009]

An object of the present invention is to stabilize the discharge state of a liquid material and to significantly simplify a refilling operation when the

liquid material is refilled into a main container from a refill container.

[0010]

Moreover, an object of the present invention is, when an opening portion provided to a refill container or the like includes a pulled portion such as a pull ring, to ensure that a discharge port is reliably opened by an opening operation by means of the pulled portion and the discharge port formed by the opening operation can smoothly conduct air displacement at the time of discharge.

Means for Solving the Problems

[0011]

The inventor of the present invention has found that it is possible to prevent or suppress the pulsing discharge of a liquid material from a refill container if an angled discharge port such that an opening surface of a discharge nozzle is inclined with respect to a central axis of the discharge nozzle is used as a discharge port of the refill container when the liquid material is refilled into a main container from the refill container. The inventor has also found that a refilling operation can be significantly simplified by making it possible for the refill container to stand by itself with the discharge nozzle of the refill container being inserted into a mouth of the main container.

[0012]

In other words, the present invention provides a refilling method of discharging a liquid material stored in a refill container into a self-standing main container body of a main container through a discharge nozzle of the refill container, the main container including: the self-standing main container body for storing a liquid material therein, the main container body having an upwardly-directed mouth; and a cap unit for closing the mouth in such a manner that the mouth can be opened and closed at will. The method includes: using as the refill container a self-standing refill container in which the discharge nozzle is provided at a top portion of a refill container body and an opening surface of the discharge nozzle defines an angled discharge port inclined with respect to a central axis of the discharge nozzle; and inserting the discharge nozzle of the refill container into the mouth of the main container body, and causing the main container body and the refill container body to stand by themselves with the refill container body being inverted onto the main container body.

[0013]

Moreover, as a refill container used in the above-described refilling method, the present invention provides a refill container wherein a discharge nozzle forming projection obtained by closing a tip portion of a tubular body by an easy-opening portion is provided at the top

portion of the self-standing refill container body, and the easy-opening portion includes:  
an annular tearing portion formed on the tubular body in such a manner that the angled discharge port is opened at the tip portion of the closed tubular body; and a point-of-effort portion connected to a surface on which the annular tearing portion is formed or a portion closer to the tip portion than the annular tearing portion.

In particular, there are provided an embodiment such that a ring-shaped finger hooked portion is provided as the point-of-effort portion and the ring-shaped finger hooked portion is provided on the side of a side surface of the tubular body, an embodiment such that a knob portion rising on an edge face on the tip portion side of the tubular body (hereinafter, referred to as "tubular body tip portion side edge face") surrounded by the annular tearing portion and formed by a plate-like member is provided as the point-of-effort portion, and an embodiment such that an opening tab extending from the tubular body tip portion side edge face surrounded by the annular tearing portion is provided as the point-of-effort portion.

[0014]

Further, the inventor of the present invention has found that, when an opening portion of a refill container is an easy-opening portion such that an annular tearing

portion by means of a cut-off groove or the like is provided at an edge face of a discharge nozzle at which an angled discharge port is to be formed by opening, a removing portion surrounded by the annular tearing portion and a pulled portion are connected with each other by a connecting portion, and the pulled portion is placed on the side of a side surface of the discharge nozzle, if a thickness or a diameter of a removing portion side end of the connecting portion is set to be greater than or equal to that of a pulled portion side end, the annular tearing portion can be easily cut and the removing portion can be removed by pulling up the pulled portion above the removing portion and pulling it along a surface on which the removing portion is formed in such a manner that the removing portion is squeezed by the removing portion side end of the connecting portion and a shear stress is thereby concentrated on an edge of the removing portion in the vicinity of the squeezed portion.

[0015]

In other words, the present invention provides an easy-opening portion to form an angled discharge port whose opening surface is inclined with respect to a central axis of a discharge nozzle upon removal of a tip portion of the discharge nozzle being closed, the easy-opening portion including at the tip portion of the closed discharge nozzle: an annular tearing portion for opening

the angled discharge nozzle; a removing portion surrounded by the annular tearing portion; a connecting portion rising from an end of the removing portion; and a pulled portion extending from the connecting portion to the side of a side surface of the discharge nozzle. In this easy-opening portion, a thickness between a pulled portion side surface and an opposite surface thereof in a removing portion side end of the connecting portion is greater than or equal to a thickness between a pulled portion side surface and an opposite surface thereof in a pulled portion side end of the connecting portion.

[0016]

Moreover, as a first main container to be used in the above-described refilling method, the present invention provides a main container including: a self-standing main container body for storing a liquid material therein, the main container body having an upwardly-directed mouth; and a cap unit to close the mouth in such a manner that the mouth can be opened and closed at will, the cap unit including an inner cap to be detachably screwed with the mouth of the main container body and having a small opening for liquid discharge, and an outer cap to be screwed with the mouth of the main container body at the outside of the inner cap with the inner cap covering the mouth of the main container body.

[0017]

Further, as a second main container, there is provided a main container including: a self-standing main container body for storing a liquid material therein, the main container body having an upwardly-directed mouth; and a cap unit for closing the mouth in such a manner that the mouth can be opened and closed at will, the cap unit including an annular member attached to the mouth of the main container body, an inner cap connected to the annular member with a hinge, covering the mouth of the main container body in such a manner that the mouth can be opened and closed at will, and having a small opening for liquid discharge, and an outer cap to be screwed with the mouth of the main container body at the outside of the inner cap with the inner cap covering the mouth of the main container body.

#### Advantageous Effects of the Invention

[0018]

According to the refilling method of the present invention, a liquid material is refilled into the main container body from the refill container body through the angled discharge port inclined with respect to the central axis of the discharge nozzle. As a result, it is possible to suppress the pulsing discharge of the liquid material at the time of refilling, thereby achieving a stable smooth discharge state. Thus, it becomes possible to suppress the bubbling of the liquid material.

[0019]

Moreover, according to the present invention, the discharge nozzle of the refill container is inserted into the mouth of the main container body, and the refill container body and the main container body are made to stand by themselves with the refill container body being inverted. As a result, after the self-standing state is achieved, a refilling operation can be completed without holding the refill container. Thus, the refilling operation can be significantly simplified.

[0020]

Moreover, according to the refill container of the present invention, the easy-opening portion can be easily opened, and the angled discharge port inclined with respect to the central axis of the discharge nozzle is formed by the opening. Thus, this is useful as a refill container used to carry out the refilling method of the present invention.

[0021]

In particular, when the easy-opening portion is provided in the refill container in such a manner that the connecting portion connecting between the removing portion and the pulled portion has a specified thickness or diameter, the easy-cut portion is cut more reliably and the removing portion is thereby removed by pulling up the pulled portion above the removing portion and then pulling

it. As a result, the angled discharge port can be formed at the tip of the discharge nozzle.

[0022]

Moreover, according to the main container of the present invention, the inner cap having the small opening for liquid discharge can be easily attached to and detached from the mouth of the main container. As a result, the mouth can be opened wide at the time of refilling by quickly removing the inner cap from the mouth of the main container, and the main container can be subjected to the refilling method of the present invention. After the completion of the refilling, the inner cap can be quickly put back on the mouth, and the main container can be then used as a discharge container.

#### Brief Description of the Drawings

[0023]

FIG. 1A shows perspective views of a main container 10 and a refill container 40A according to one embodiment used in a refilling method of the present invention.

FIG. 1B shows perspective views showing an open state of the main container 10 and an opened state of a discharge nozzle of the refill container 40A of FIG. 1A, respectively.

FIG. 1C is an explanatory diagram illustrating a refilling method, at the start thereof, using the main container 10 and the refill container 40A of FIG. 1A.

FIG. 1D shows a perspective view and a partial cross-sectional view showing a self-standing state of the main container 10 and the refill container 40A of FIG. 1A in the refilling method using them.

FIG. 2 shows explanatory diagrams of a cap unit 20A of the main container shown in FIG. 1A.

FIG. 3 shows explanatory diagrams of a cap unit 20B of a main container according to another embodiment of the present invention.

FIG. 4A shows a perspective view (a) and a cross-sectional view (b) in the vicinity of a discharge nozzle forming projection of the refill container 40A shown in FIG. 1A.

FIG. 4B is an explanatory diagram for an opening method of the discharge nozzle forming projection of the refill container 40A shown in FIG. 1A.

FIG. 5 is a perspective view in the vicinity of a discharge nozzle forming projection of a refill container 40B according to another embodiment of the present invention.

FIG. 6 shows a perspective view (a) and a partial cross-sectional view (b) in the vicinity of a discharge nozzle forming projection of a refill container 40C according to yet another embodiment of the present invention.

FIG. 7 shows a perspective view (a) and a side view

(b) in the vicinity of a discharge nozzle forming projection of a refill container 40D according to yet another embodiment of the present invention.

FIG. 8 shows a perspective view (a) and side views (b) and (c) in the vicinity of a discharge nozzle forming projection of a refill container 40E according to yet another embodiment of the present invention.

FIG. 9A is a perspective view of a refill container 40F having an easy-opening portion 45E according to one embodiment.

FIG. 9B is a cross-sectional view in the vicinity of a discharge nozzle of the refill container 40F in FIG. 9A.

FIG. 10 is an explanatory diagram for an opening operation of the easy-opening portion 45E.

FIG. 11A is an explanatory diagram for an action of the easy-opening portion 45E at the time of an opening operation.

FIG. 11B is an explanatory diagram for an action of the easy-opening portion 45E at the time of the opening operation.

FIG. 11C is an explanatory diagram for an action of the easy-opening portion 45E at the time of the opening operation.

FIG. 12 is a perspective view of a discharge nozzle having an easy-opening portion 45F.

FIG. 13 is a perspective view of a discharge nozzle

having an easy-opening portion 45G.

FIG. 14 is a perspective view of a discharge nozzle having an easy-opening portion 45H.

FIG. 15 is a cross-sectional view of a discharge nozzle having an easy-opening portion 45I.

FIG. 16A is an explanatory diagram for an action of the easy-opening portion 45I at the time of an opening operation.

FIG. 16B is an explanatory diagram for an action of the easy-opening portion 45I at the time of the opening operation.

FIG. 17 is a cross-sectional view of a discharge nozzle having an easy-opening portion 45J.

FIG. 18A shows a perspective view (a) and a side view (b) of a refill container 40G having an easy-opening portion 45K.

FIG. 18B is an explanatory diagram for a method of opening a discharge nozzle forming projection of the refill container 40G shown in FIG. 18A.

FIG. 19A shows a perspective view (a) and a side view (b) of a refill container 40H having an easy-opening portion 45L.

FIG. 19B is an explanatory diagram for a method of opening a discharge nozzle forming projection of the refill container 40H shown in FIG. 19A.

FIG. 20A is a perspective view of a refill container

40I having an easy-opening portion 45M.

FIG. 20B is an explanatory diagram for a method of opening a discharge nozzle forming projection of the refill container 40I shown in FIG. 20A.

FIG. 21 is a perspective view of the easy-opening portion 45E covered by a protective cover 31a.

FIG. 22 is a perspective view of the easy-opening portion 45E covered by a protective cover 31b.

#### Description of Embodiments

[0024]

The present invention will now be described in detail below with reference to the drawings. Note that the same reference numerals denote identical or equivalent components.

[0025]

FIG. 1A shows perspective views of a main container 10 and a refill container 40A according to one embodiment used in a refilling method of the present invention. The main container 10 includes a main container body 11 for containing a liquid material A therein, and a cap unit 20A.

[0026]

The main container body 11 has a tubular shape having a bottom and can stand by itself. The main container body 11 has an upwardly-directed mouth 12. As shown in FIG. 1B (a), a peripheral wall of the mouth 12 is formed to have two steps in such a manner that the

external diameter thereof is reduced toward an upper end thereof. A thread is formed on each of a peripheral wall upper portion 13 having a smaller diameter and a peripheral wall lower portion 14 having a larger diameter.

[0027]

The cap unit 20A is provided for closing the mouth 12 of the main container body 11 in such a manner that it can be opened and closed at will. More specifically, the cap unit 20A is composed of an inner cap 21A and an outer cap 30 as shown in FIG. 2(a). The inner cap 21A has an approximately disc shape. The inner cap 21A includes a small opening 22 for liquid discharge at the central portion thereof, and an annular wall 23 at the periphery thereof. As shown in FIG. 2(b), the inner side of the annular wall 23 of the inner cap 21A and the peripheral wall upper portion 13 of the mouth 12 of the main container body 11 are detachably screwed together. As shown in FIG. 2(c), with the inner cap 21A being screwed with the peripheral wall upper portion 13 of the mouth 12 of the main container body 11, the outer cap 30 is screwed with the peripheral wall lower portion 14 of the mouth 12 at the outside of the inner cap 21A.

[0028]

Typically, an inner cap having a small opening for liquid discharge, which is to be attached to a container body having stored a liquid material therein, is drive-

fitted into a mouth of the container body. Thus, the attachment or detachment of the inner cap cannot be easily performed, and it is therefore difficult to remove the inner cap and refill the container body with a liquid material. According to the main container 10, however, the inner cap 21A is detachably attached to the mouth 12 of the main container body 11 by means of screwing. Thus, when the main container 10 is used as a container for discharging a liquid material, the inner cap 21A can be screwed with the mouth 12 of the main container body 11, thereby allowing an appropriate quantity of the liquid material A to be discharged from the small opening 22 for liquid discharge. When filling the main container body 11 with the liquid material A, on the other hand, the inner cap 21A can be removed from the mouth 12, thereby facilitating the filling of the liquid material A from the mouth 12. Therefore, the main container 10 is suitable for use in the refilling of the liquid material A.

[0029]

As shown in FIG. 1A(b), the refill container 40A, on the other hand, includes: a refill container body 41 having a tubular shape with a bottom; and a discharge nozzle forming projection 42 projecting from the top portion of the refill container body 41 in a direction outwardly from a central axis L1 direction of the refill container body 41. The refill container body 41 is formed

by a thin blow molded bottle, and is a self-standing container capable of maintaining a certain shape regardless of the presence or absence of its content.

[0030]

The discharge nozzle forming projection 42 rises from a cap 43 integrally molded with the discharge nozzle forming projection 42, and is undetachably fixed to a mouth of the refill container body 41 by the cap 43.

[0031]

The discharge nozzle forming projection 42 is formed by closing a tip portion of a tubular body 44 with an easy-opening portion 45A. A central axis L2 of the tubular body 44 coincides with the central axis L1 of the refill container body 41. Moreover, as shown in FIG. 1D, the external diameter of a base portion 44a of the tubular body 44 is slightly smaller than the opening diameter of the mouth 12 of the main container body 11 so as to have such a size that the tubular body 44 can be inserted into the mouth 12 of the main container body 11 with substantially no staggering. Moreover, the external diameter of the cap 43 is slightly larger than the opening diameter of the mouth 12 of the main container body 11. As a result, when the tubular body 44 is inserted into the mouth 12 of the main container body 11, the mouth 12 can support the cap 43 with a horizontal plane 44b of a stepped portion provided between the cap 43 and the base

portion 44a, i.e., can support the refill container body 41 being inverted onto the main container body 11.

[0032]

As shown in FIG. 4A, the easy-opening portion 45A includes: an annular tearing portion 46 formed in the tubular body 44 so that an angled discharge port is opened at the tip portion of the tubular body 44; and a point-of-effort portion connected with a tubular body side surface on a side closer to the tip portion of the tubular body 44 than the annular tearing portion 46. The point-of-effort portion is a portion at which a force is applied by a finger when opening the easy-opening portion 45A, and is formed as a ring-shaped finger hooked portion 47 in the present embodiment. Here, a degree of inclination of an opening surface of the angled discharge port with respect to the tubular body 44 is preferably set so that an angle  $\theta$  (FIG. 4A(b)) formed by a central portion of a plane surrounded by the annular tearing portion 46 and the central axis L2 of the tubular body 44 falls within a range of 30° to 60°.

[0033]

According to a more specific embodiment for forming the annular tearing portion 46, an annular groove is formed on the tubular body 44, and such a groove portion makes the tubular body 44 thin, for example. Accordingly, as shown in FIG. 4B, if the finger hooked portion 47 is

pulled up in a direction indicated by an arrow using an upper end of the annular tearing portion 46 as a fulcrum, the annular tearing portion 46 is torn and the easy-opening portion 45A can be therefore removed easily. As the annular tearing portion 46, a thin portion may be formed along a line to be torn by thinning the wall thickness of the tubular body 44 from the front and back sides thereof, or half-cutting or the like may be formed. Moreover, as long as the easy-opening portion 45A can be removed, the thin portion, the half-cutting, or the like to form the annular tearing portion 46 can be formed either as a continuous line or intermittently.

[0034]

When the easy-opening portion 45A is removed, the discharge nozzle forming projection 42 becomes an obliquely-cut discharge nozzle 48 such that the opening surface at the tip portion is inclined with respect to the central axis L2 of the discharge nozzle.

[0035]

Note that the cap 43 including the discharge nozzle forming projection 42 can be molded separately from the refill container body 41. Moreover, the filling of the liquid material A into the refill container 40A at the time of manufacture is performed before the cap 43 is attached and fixed to the mouth of the refill container body 41.

[0036]

According to the refilling method of the present invention, the outer cap 30 and the inner cap 21A are first removed from the main container body 11 of the above-described main container 10 so as to open the mouth 12 as shown in FIG. 1B. On the other hand, a finger is hooked around the finger hooked portion 47 of the refill container 40A and then pulled up so as to remove the easy-opening portion 45A, thereby obtaining the refill container 40A having the discharge nozzle 48. Then, the discharge nozzle 48 of the refill container 40A is inserted into the mouth 12 of the main container body 11 as shown in FIG. 1C, and the main container body 11 and the refill container body 41 are made to stand by themselves as shown in FIG. 1D with the refill container body 41 being inverted onto the main container body 11 for refilling the liquid material A.

[0037]

Then, the central axis L2 of the tubular body 44 coincides with the central axis L1 of the refill container body 41, and the refill container body 41 stands vertically on the main container body 11. Moreover, since the external diameter of the base portion 44a of the tubular body is formed to have a size such as to prevent the tubular body 44 from staggering in the mouth 12 of the main container body 11 and the horizontal plane 44b of the

stepped portion of the tubular body 44 is supported by an upper end edge of the mouth 12 of the container body 11, the self-standing state of the refill container body 41 can be maintained without holding the refill container body 41. Thus, it is possible to considerably reduce the trouble of holding the refill container 40A in fear of spilling the liquid material during the refilling thereof.

[0038]

Moreover, the discharge nozzle 48 has an appropriate opening diameter and is provided with an angled discharge port 50 formed at the tip portion thereof. As a result, the pulsing movement of the liquid material A can be suppressed, and the liquid material A can be therefore smoothly discharged into the main container body 11 from the refill container body 41. Accordingly, it is also possible to prevent the unwanted bubbling of the liquid material A. In a case where the viscosity of the liquid material A is in the range of 500 mPa·s to 10000 mPa·s, for example, the effect of suppressing the pulsing movement of the liquid material A becomes prominent especially when the inner diameter of the discharge nozzle 48 is in the range of 12 mm to 20 mm and the angle  $\theta$  of the opening surface of the angled discharge port 50 is in the range of 40° to 50°.

[0039]

The refilling method of the present invention can be

applied to various main containers having upwardly-directed mouths. For example, the refilling method of the present invention can be suitably applied also to a main container having a cap unit 20B shown in FIG. 3 in place of the cap unit 20A shown in FIG. 2.

[0040]

As shown in FIG. 3(a), the cap unit 20B is composed of: an annular member 24 to be attached to the mouth 12 of the main container body 11 by means of fitting; a disc-shaped inner cap 21B having the small opening 22 for liquid discharge at the central portion thereof; and the outer cap 30. The annular member 24 and the inner cap 21B are connected with each other by a hinge 25. Therefore, the inner cap 21B can cover the mouth 12 of the main container body 11 in such a manner that the mouth 12 can be opened and closed at will. As shown in FIG. 3(c), with the inner cap 21B covering the mouth 12 of the main container body 11, the outer cap 30 is screwed with the mouth 12 of the main container body 11 at the outside of the inner cap 21B. Thus, according to the main container having the cap unit 20B, when it is used as a container for discharging the liquid material A, the hinge 25 is closed so that the inner cap 21B covers the mouth 12 of the main container body 11 as shown in FIG. 3(b), thereby allowing an appropriate quantity of the liquid material A to be discharged from the small opening 22 for liquid

discharge. When the main container body 11 is filled with the liquid material A, on the other hand, the hinge 25 is opened so that the mouth 12 of the main container body 11 is widely opened, thereby facilitating the filling of the liquid material A from the mouth 12. Therefore, the main container having the cap unit 20B is also suitable for use in the refilling of the content.

[0041]

Note that the cap unit 20B may be formed by the integral molding of the annular member 24, the inner cap 21B, and the hinge 25 connecting therebetween, or may be formed by connecting the annular member 24 and the inner cap 21B, which have been separately molded, with the hinge 25.

[0042]

The refilling method of the present invention can be performed by using various self-standing refill containers each having the discharge nozzle with the angled discharge port formed at the tip portion thereof at the top portion of the refill container body, and can use various refill containers each provided with the easy-opening portion where such a discharge nozzle is formed.

[0043]

For example, instead of the refill container 40A shown in FIG. 4A having the cylindrical base portion 44a of the tubular body 44, a refill container 40B shown in

FIG. 5 has the base portion 44a of the tubular body 44 having a square tubular shape with corners at side edge portions thereof being rounded. As a result, even when the refilling of the liquid material A is performed while the refill container 40A is inverted onto the main container body 11 as shown in FIG. 1D and the mouth 12 of the main container body 11 is therefore covered by the refill container 40A, the outer periphery of the base portion 44a of the tubular body 44 is in contact with the inner wall of the mouth 12 of the main container body 11 only at the side edge portions thereof, not over the entire periphery thereof. It is therefore possible to remove air smoothly. Moreover, by making the side edge portions of the base portion 44a of the tubular body 44 abut against or closely-positioned to the inner wall of the mouth 12 of the main container body 11, the refill container 40A can be fixed to some extent on the main container body 11. Note that a similar effect can be obtained also when a cross-sectional shape of the base portion 44a of the tubular body 44 is an ellipse or a polygon with more corners.

[0044]

In the refill container 40A shown in FIG. 4A, the refill container body 41, the discharge nozzle forming projection 42, and the cap 43 may be integrally formed. In such a case, an opening may be separately provided to a

bottom of the refill container body 41, a liquid material may be filled into the refill container body from the opening on the bottom, and the opening on the bottom may be sealed after the filling by means of heat seal or the like.

[0045]

In a refill container of the present invention, as in an easy-opening portion 45B of a refill container 40C shown in FIG. 6(a), the annular tearing portion 46 may be formed on the tubular body 44 so that an angled discharge port is opened at the tip portion of the tubular body 44, and the ring-shaped finger hooked portion 47 may be provided as the point-of-effort portion so as to rise on a tubular body tip portion side edge face 49 surrounded by the annular tearing portion 46. According to the refill container 40C, the annular tearing portion 46 is torn by pulling up the finger hooked portion 47 upwardly as shown by an arrow in FIG. 6(b), and the easy-opening portion 45B is thereby removed as shown by a broken line.

[0046]

As in a refill container 40D shown in FIG. 7, an upper end of the tubular body tip portion side edge face 49 and the finger hooked portion 47 may be connected with each other so that the ring-shaped finger hooked portion 47 serving as the point-of-effort portion in an easy-opening portion 45C is generally horizontally supported on

the tubular body tip portion side edge face 49 surrounded by the annular tearing portion 46. According to the refill container 40D, the annular tearing portion 46 is torn by pulling the finger hooked portion 47 in an obliquely downward direction as shown by an arrow in FIG. 7(b), and the easy-opening portion 45C is thereby removed as shown by a broken line.

[0047]

As in a refill container 40E shown in FIG. 8, a ring face of the ring-shaped finger hooked portion 47 serving as the point-of-effort portion in an easy-opening portion 45D may be provided on a side surface side of the tubular body 44 so as to be parallel to a rising direction of the tubular body 44, and an upper end of a removing portion 51 surrounded by the annular tearing portion 46 on the tubular body tip portion side edge face 49 and an upper end of the finger hooked portion 47 may be connected to each other via a strip-shaped connecting portion 52.

[0048]

By forming the finger hooked portion 47 not at a position directly above the removing portion 51 but at a position extended to the side surface side of the tubular body 44 as described above, an intensive shear stress can be applied to the annular tearing portion 46 in the vicinity of the connecting portion 52 between the finger hooked portion 47 and the removing portion 51 by means of

an opening operation to be described later, thereby facilitating the tearing of the annular tearing portion 46.

[0049]

In this case, a lower end of the ring-shaped finger hooked portion 47 and an upper surface of the cap 43 are preferably connected with each other with a stick-shaped joint portion 54a, for example, so that they can be easily separated off with hand. Accordingly, it becomes possible to eliminate a case such that the finger hooked portion 47 is bent and hooked into a surrounding object during the transportation thereof and it thereby causes accidental opening thereof. Note that the position where the finger hooked portion 47 is jointed is not limited to the upper surface of the cap 43. For example, as shown in FIG. 8(c), a joint portion 54b may be provided to the base portion 44a of the tubular body.

[0050]

As a method of using the refill container 40E, as shown in FIG. 8(b) or 8(c), the joint portion 54a between the finger hooked portion 47 and the upper surface of the cap 43 or the joint portion 54b is first torn, the finger hooked portion 47 is pulled up as shown by a broken line (an arrow a) in such a manner that the finger hooked portion 47 is inverted around the strip-shaped connecting portion 52, and the finger hooked portion 47 is further pulled down toward a side opposite to the position at

which the finger hooked portion 47 is initially provided (an arrow b). As a result, the annular tearing portion 46 is torn, and the easy-opening portion 45D is thereby removed as shown by a two-dot chain line. By lifting up the ring portion in an inverted manner as described above, a force due to leverage is applied on the way on the upper end of the annular tearing portion 46, thereby causing a crack. Since tearing outspreads from the crack, opening is facilitated.

[0051]

FIG. 9A is a perspective view of a refill container 40F including an easy-opening portion (hereinafter, referred to also as an opening structure) 45E having a more preferred structure than the above-described easy-opening portion 45D. FIG. 9B is a cross-sectional view taken along line X-X in the vicinity of the discharge nozzle 48 in FIG. 9A.

[0052]

Also in the opening structure 45E, the tip portion of the discharge nozzle 48 is closed by the edge face 49 inclined with respect to the central axis L2 of the discharge nozzle 48. Provided to the edge face 49 are the annular tearing portion 46 formed along the outer shape of the edge face 49, the removing portion 51 surrounded by the annular tearing portion 46, the short strip-shaped connecting portion 52 extended so as to rise from the

upper end of the removing portion 51, and the finger hooked portion 47 extended from the connecting portion 52 to a side surface side of the discharge nozzle 48. The finger hooked portion 47 is provided with a finger hooked ring 47a. The connecting portion 52 does not rise extending over the removing portion 51 and the outer side thereof, but a joint surface between the connecting portion 52 and the removing portion 51 is positioned only at an inner side of the annular tearing portion 46.

[0053]

With the object of suppressing the pulsing movement of a discharge liquid, an inclination of the edge face 49 is set, as shown in FIG. 9B, so that an angle  $\theta$  formed by the central portion of the edge face 49 and the central axis L2 of the discharge nozzle 48 is in the range of  $30^\circ$  to  $60^\circ$ . Thus, if an inner diameter S1 of the discharge nozzle 48 is set to 15 mm, for example, a distance S2 between the upper end and the lower end of the annular tearing portion 46 is set to about 13.5 mm.

[0054]

On an outer surface of the removing portion 51, a direction to which the finger hooked portion 47 is pulled when opening this opening structure is indicated by a thick portion 53 forming an arrow shape in relief. Such an arrow-shaped thick portion 53 is appropriately provided in view of: reinforcing the joint area between the

connecting portion 52 and the removing portion 51; successfully transmitting a pulled force of the connecting portion 52, which is caused by the pulling during the opening operation, to the removing portion 51 so that the removing portion 51 can be turned up in a laterally uniform manner and the removing portion 51 can be thereby easily removed; and presenting a plain explanation of the opening operation to a user. As a specific example for the thickness and size of the thick portion 53, if a wall thickness S3 of the discharge nozzle 48 is set to 1.3 mm and a thickness S4 of a portion of the removing portion 51 excluding the thick portion 53 is set to 0.8 mm in the above-described opening structure in which the inner diameter S1 of the discharge nozzle 48 is about 15 mm, for example, a thickness S5 of the thick portion 53 is set to about 1.6 mm and a length S6 of the thick portion 53 in the horizontal direction is set to about 7 mm. Note that the shape of the thick portion 53 is not limited to the arrow shape illustrated in the figure. It may be any shape as long as it can transmit the pulling force during the opening operation to the removing portion 51 in such a manner that the removing portion 51 is turned up in a laterally uniform manner.

[0055]

The finger hooked portion 47 serving as a pulled portion is vertically suspended along the side surface of

the discharge nozzle 48. With the finger hooked portion 47 being vertically suspended as described above, a specific example of a length S7 from an upper end to a lower end of the finger hooked portion 47 is 20 mm, for example.

[0056]

In the present embodiment, one protrusion 55 protruding toward the central portion side of the removing portion 51 is provided to a removing portion side end 52a of the short strip-shaped connecting portion 52 connecting between the removing portion 51 and the finger hooked portion 47. As a result, a thickness D1 between a finger hooked portion side surface 52a1 and an opposite surface 52a2 thereof in the removing portion side end 52a of the connecting portion becomes greater than a thickness D2 between a pulled portion side surface 52b1 and an opposite surface 52b2 thereof in a finger hooked portion 47 side end 52b of the connecting portion. Also, an area of a cross-section Sa of the removing portion side end 52a of the connecting portion 52 becomes greater than an area of a cross-section Sb of the pulled portion side end 52b. The thickness D1 between the pulled portion side surface 52a1 and the opposite surface 52a2 thereof in the removing portion side end 52a of the connecting portion 52 herein refers to a maximum value of the distance between these surfaces 52a1 and 52a2. The thickness D1 is equivalent

not to a thickness D1' of a portion where no protrusion 55 is formed but to a maximum thickness in the protrusion 55. Similarly, the thickness D2 between the finger hooked portion side surface 52b1 and the opposite surface 52b2 thereof in the finger hooked portion 47 side end 52b of the connecting portion 52 refers to a maximum value of the distance between these surfaces 52b1 and 52b2. Even if grooves or the like are formed on these surfaces 52b1 and 52b2, the thickness D2 is not influenced by such grooves. As specific examples of the thicknesses D1 and D2, D1 is preferably in the range of 1.5 to 7 mm, more preferably in the range of 3.5 to 5 mm, and D2 is preferably in the range of 1.5 to 5 mm, more preferably in the range of 3 to 4 mm in the above-described opening structure in which the inner diameter S1 of the discharge nozzle 48 is about 15 mm, for example. The cross-sectional area of the connecting portion 52 herein refers to an area of a plane perpendicular to the extending direction of the connecting portion 52 in that portion. More specifically, the above-described area of the cross-section Sa of the removing portion side end 52a refers to an area of the cross-section Sa perpendicular to the extending direction of the removing portion side end 52a, and the area of the cross-section Sb of the pulled portion side end 52b refers to an area of the cross-section Sb perpendicular to the extending direction of the pulled portion side end 52b.

(FIG. 9B). Although the thickness and cross-sectional area of the connecting portion 52 are varied during the opening operation, the thickness and the cross-sectional area as used herein refer to the thickness and the cross-sectional area in the absence of an applied external stress. Various methods irrespective of a contact type or a non-contact type can be used for measuring the thickness and the cross-sectional area. For example, a measure such as a vernier caliper, a laser displacement meter, or the like can be used.

[0057]

According to the opening structure 45E, the angled discharge port 50 is opened by the following opening operation. The angled discharge port 50 is opened by: first separating off the ring-shaped finger hooked portion 47 of the opening structure 45E from the top surface of the cap 43; hooking a finger around the finger hooked ring 47a of the finger hooked portion 47 to pull it up as shown in FIG. 10 (an arrow a); bending the finger hooked portion 47 in an inverted manner so as to pull it up above the removing portion 51 (an arrow b); further pulling the finger in an approximately horizontal direction or in an obliquely downward direction along the removing portion 51 (an arrow c) so as to move the finger hooked portion 47 away from the initial position thereof on the side of the connecting portion 52; and thereby cleaving the annular

tearing portion 46 and removing the removing portion 51.

[0058]

According to this opening operation, as shown in FIG. 11A, the finger hooked portion 47 is separated off from the cap 43, and the separated one end is lifted up in a direction shown by the arrow a. When a ring surface of the finger hooked ring 47a of the finger hooked portion 47 comes to be positioned approximately horizontally, the connecting portion 52 starts to bend at a portion immediately above the protrusion 55 where the thickness of the connecting portion 52 is small.

[0059]

The one end of the finger hooked portion 47 is further lifted up, and the finger hooked portion 47 is inverted as shown in FIG. 11B. As the ring surface of the finger hooked ring 47a is moved closer to the removing portion 51 as shown by the arrow b, the protrusion 55 is squeezed by the bent connecting portion 52 as shown by an arrow p. As shown in FIG. 11C, if the finger hooked portion 47 is further pulled along the edge face 49 of the discharge nozzle 48 in an approximately horizontal direction or in an obliquely downward direction (the arrow c) along the removing portion 51 so as to move the finger hooked portion 47 away from the initial position of the connecting portion 52, an intensive shear stress is applied on an annular tearing portion 46a in the vicinity

of the removing portion side end 52a of the connecting portion 52 due to leverage using as a fulcrum an edge portion of the removing portion side end 52a of the connecting portion 52, which is closer to the center of the removing portion, more specifically, a removing portion center side base portion 55a of the protrusion 55. As a result, the annular tearing portion 46a is easily torn. After the annular tearing portion 46a is torn, the remaining annular tearing portion 46 can be easily torn off. Thus, according to the opening structure 45E, the removing portion 51 can be easily removed and the angled discharge port 50 can be thereby opened by the tearing-off of the annular tearing portion 46. Moreover, according to this opening operation, since the bending direction of the connecting portion 52 is stabilized in one direction, it is possible to regulate the pulling direction of the finger hooked portion 47 and to prevent the twisting of the strip-shaped connecting portion 52. Thus, it is possible to prevent the cutting-off of the finger hooked portion 47 during the opening operation. In addition, since the finger hooked portion 47 is provided at the tip portion of the discharge nozzle 48 projecting from the top surface of the cap 43, there is no way that the peripheral wall around the pull ring interferes with the operation of pulling the finger hooked portion 47 as in the conventional opening structure described in Patent

Literature 1.

[0060]

In the present invention, with regard to the shape of the connecting portion 52, the removing portion side end 52a of the strip-shaped connecting portion 52 may be formed thicker and to have a larger diameter as a whole than the finger hooked portion side end 52b of the connecting portion 52 as shown in an easy-opening portion 45F of FIG. 12 instead of providing the protrusion 55 as a portion of the strip-shaped connecting portion 52, which is closer to the removing portion 51, as described above.

[0061]

Furthermore, as shown in an easy-opening portion 45G of FIG. 13, a cross section of the connecting portion 52 may be formed to have a circular or elliptical shape, and the removing portion side end 52a of the connecting portion 52 may be set to have a gradually larger diameter than the pulled portion side end 52b of the connecting portion 52.

[0062]

As shown in an easy-opening portion 45H of FIG. 14, the protrusion 55 provided one in the easy-opening portion 45E shown in FIG. 9A may be provided two or more so as to be placed side by side. Note that if the connecting portion 52 is provided with the protrusion 55 in which the thickness D1 of the removing portion side end 52a of the

connecting portion is set to be larger than the thickness D2 of the finger hooked portion side end 52b of the connecting portion, the cross-sectional area of the removing portion side end 52a of the connecting portion 52 does not always need to be greater than the cross-sectional area of the finger hooked portion side end 52b of the connecting portion 52.

[0063]

Also with these easy-opening portions (opening structures) 45F, 45G, and 45H, by pulling the finger hooked portion 47 as shown in FIGS. 11A to 11C described above, an intensive shear stress is applied on the annular tearing portion 46a in the vicinity of the removing portion side end 52a of the connecting portion 52 due to leverage using as a fulcrum the base portion on the removing portion center side of the removing portion side end 52a of the connecting portion 52. As a result, the annular tearing portion 46a can be easily torn. In terms of preventing easy twisting of the connecting portion 52 during the opening operation, it is more preferable that the cross section of the connecting portion 52 have a rectangular shape as shown in FIG. 9A or FIG. 12 and the connecting portion 52 therefore have a strip shape as compared to a case where the cross section of the connecting portion 52 has a circular or elliptical shape shown in FIG. 13. By making a width W (FIG. 9A) of the

removing portion side end 52a of the connecting portion sufficiently large, the connecting portion 52 is less likely to twist, thereby stabilizing the pulling-up direction of the finger hooked portion 47. Note that the size of the width W is preferably equal to or greater than the thickness thereof.

[0064]

Moreover, with regard to the shape of the connecting portion 52, the cross-sectional area of the connecting portion 52 may be set substantially constant over a region extending from the removing portion side end 52a of the connecting portion 52 to the finger hooked portion side end 52b thereof as in an easy-opening portion 45I shown in FIG. 15. In this case, in an opening operation of pulling up the finger hooked portion 47 over the removing portion 51 as shown in FIG. 16A (an arrow a) and pulling the finger hooked portion 47 along the edge face 49 of the discharge nozzle so as to move the finger hooked portion 47 away from the initial position of the connecting portion 52 as shown in FIG. 16B (an arrow b), a thickness and a rigidity of the connecting portion 52 are preferably determined in such a manner that the boundary between the connecting portion 52 and the removing portion 51 is bent but the connecting portion 52 itself does not bend. Also with the easy-opening portion 45I, an intensive shear stress is easily exerted on the annular tearing portion

46a in the vicinity of the removing portion side end 52a of the connecting portion 52, and the annular tearing portion 46a can be therefore torn easily.

[0065]

An easy-opening portion of the present invention may have an opening structure in which the connecting portion 52 between the removing portion 51 and the finger hooked portion 47 is provided at a lower end inside the removing portion 51 as in an easy-opening portion 45J shown in FIG. 17. In this case, the finger hooked portion 47 is inverted over the removing portion 51 and pulled in an obliquely upward direction.

[0066]

Various embodiments for the easy-opening portion of the present invention are further possible. For example, as in a refill container 40G shown in FIG. 18A, an easy-opening portion 45K may be provided with the annular tearing portion 46 so that a tip portion of the tubular body 44 is obliquely cut and may be provided with an opening tab 60 extending from the tubular body tip portion side edge face 49 surrounded by the annular tearing portion 46 as the point-of-effort portion. According to the refill container 40G, by pulling up the opening tab 60 as shown in FIG. 18B, a force can be applied so that the easy-opening portion 45K can be rotated with the lowest point of the annular tearing portion 46 opposing the

opening tab 60 being used as a fulcrum. As a result, the easy-opening portion 45K can be removed easily.

[0067]

Further, as in a refill container 40H shown in FIG. 19A, an easy-opening portion 45L may be provided with the annular tearing portion 46 on the tubular body 44 so that an angled discharge port is opened at a tip portion of the tubular body 44 and may be provided with a half-disc-shaped knob portion 61 standing on the tubular body tip portion side edge face 49 surrounded by the annular tearing portion 46 and formed by a curved plate-like member as the point-of-effort portion. As shown in FIG. 19A(b), a cross-section of the knob portion 61 along the tubular body tip portion side edge face 49 is curved in the form of an inverted S-shape. Thus, when removing the easy-opening portion 45L, fingers are placed on the curved portion of the knob portion 61 and the knob portion 61 is twisted with a central axis L3 of the tubular body tip portion side edge face 49 being used as a center of the twisting as shown in FIG. 19B. As a result, the easy-opening portion 45L can be easily removed.

[0068]

A refill container 40I shown in FIG. 20A is different from the refill container 40H of FIG. 19A in that the knob portion 61 is formed by a waved plate-like member. As shown in FIG. 20B, the knob portion 61 can be

twisted to remove an easy-opening portion 45M also in the refill container 40I.

[0069]

Note that the above-described modified embodiments of the main container and the refill container of the present invention can be variously combined.

[0070]

For example, the easy-opening portion of the present invention is not limited to being formed on the discharge nozzle projecting from the cap. It may be formed on a discharge nozzle directly projecting from the top surface of a refill container body. In this case, an opening may be provided to a bottom of the refill container body, content liquid may be filled into the refill container body from the opening on the bottom, and the opening on the bottom may be sealed after the filling by means of heat seal or the like.

[0071]

Moreover, each of the above-described easy-opening portions may be provided with a protective cover detachably covering that portion. As shown in FIG. 21, in a case where the discharge nozzle 48 rises from the cap 43, a protective cover 31a may cover not the cap 43 but the discharge nozzle 48. Alternatively, as in a protective cover 31b shown in FIG. 22, it may cover both of the discharge nozzle 48 and the cap 43.

[0072]

A refill container used for carrying out the refilling method of the present invention does not always need to be the refill container whose easy-opening portion is integrally molded with the discharge nozzle. For example, a tip portion of a discharge nozzle at which an angled discharge port is formed may be sealed by the welding of a film, and the film may be peeled off when used. Furthermore, it may include, aside from a cap covering a mouth of a refill container body during the distribution thereof, a cap with a discharge nozzle whose tip portion is obliquely cut as a refilling-dedicated cap to be attached to the mouth of the refill container body at the time of refilling.

Industrial Applicability

[0073]

The refilling method of the present invention is useful as a method of refilling a liquid material such as a skin lotion or emulsion into a main container from a refill container.

Reference Signs List

The present invention further discloses the following embodiments.

<1>. A refilling method of discharging a liquid material stored in a refill container into a self-standing main container body of a main container through a discharge nozzle of the refill container, the main container including: the self-standing main container body to store a liquid material therein, the main container body having an upwardly-directed mouth; and a cap unit to close the mouth in such a manner that the mouth can be opened and closed at will,

the method comprising:

using as the refill container a self-standing refill container in which the discharge nozzle is provided at a top portion of a refill container body and an opening surface of the discharge nozzle defines an angled discharge port inclined with respect to a central axis of the discharge nozzle; and

inserting the discharge nozzle of the refill container into the mouth of the main container body, and causing the main container body and the refill container body to stand by themselves with the refill container body being inverted onto the main container body.

[0000]

<2>. The refilling method according to <1>, wherein:  
the refill container before opened includes a

discharge nozzle forming projection obtained by closing a tip portion of a tubular body by an easy-opening portion at the top portion of the self-standing refill container body;

the easy-opening portion includes an annular tearing portion formed on the tubular body in such a manner that the angled discharge port is opened at the tip portion of the closed tubular body, and a point-of-effort portion connected to a surface on which the annular tearing portion is formed or a portion closer to the tip portion than the annular tearing portion; and

a refill container obtained by removing the easy-opening portion from the refill container before opened is used as the refill container having the angled discharge port.

<3>. The refilling method according to <2>, wherein a ring-shaped finger hooked portion is provided on a side of a side surface of the tubular body as the point-of-effort portion in the refill container before opened.

<4>. The refilling method according to <3>, wherein the ring-shaped finger hooked portion of the refill container before opened is a pulled portion connected to a removing portion surrounded by the annular tearing portion on a tubular body tip portion side edge face with a

connecting portion.

<5>. The refilling method according to <3>, wherein the tubular body of the refill container before opened rises from a cap of the refill container body, and a lower end of the ring-shaped finger hooked portion is connected to the cap in such a manner that the lower end can be separated off therefrom.

<6>. The refilling method according to <3>, wherein the tubular body of the refill container before opened rises from a cap of the refill container body, and the ring-shaped finger hooked portion is connected to a side surface of the tubular body in such a manner that the ring-shaped finger hooked portion can be separated off therefrom.

<7>. The refilling method according to <2>, wherein a knob portion rising on a tubular body tip portion side edge face surrounded by the annular tearing portion and formed by a plate-like member is provided to the refill container before opened as the point-of-effort portion.

<8>. The refilling method according to <7>, wherein a cross-section of the plate-like member has an S-shape in the knob portion of the refill container before opened.

<9>. The refilling method according to any of <3> to <6>, comprising pulling up the ring-shaped finger hooked portion from the side surface of the tubular body in an inverted manner and pulling the finger hooked portion toward a side opposite to a position at which the finger hooked portion is initially provided so as to remove the easy-opening portion from the refill container before opened.

<10>. A refill container used in the refilling method of <1>, wherein:

a discharge nozzle forming projection obtained by closing a tip portion of a tubular body by an easy-opening portion is provided at the top portion of the self-standing refill container body; and

the easy-opening portion includes

an annular tearing portion formed on the tubular body in such a manner that the angled discharge port is opened at the tip portion of the closed tubular body; and

a point-of-effort portion connected to a surface on which the annular tearing portion is formed or a portion closer to the tip portion than the annular tearing portion.

<11>. The refill container according to <10>,  
wherein a ring-shaped finger hooked portion is provided on  
a side of a side surface of the tubular body as the point-  
of-effort portion.

<12>. The refill container according to <11>,  
wherein the ring-shaped finger hooked portion is a pulled  
portion connected to a removing portion surrounded by the  
annular tearing portion on a tubular body tip portion side  
edge face with a connecting portion.

<13>. The refill container according to <11>,  
wherein the tubular body rises from a cap of the refill  
container body, and a lower end of the ring-shaped finger  
hooked portion is connected to the cap in such a manner  
that the lower end can be separated off therefrom.

<14>. The refill container according to <11>,  
wherein the tubular body rises from a cap of the refill  
container body, and the ring-shaped finger hooked portion  
is connected to a side surface of the tubular body in such  
a manner that the ring-shaped finger hooked portion can be  
separated off therefrom.

<15>. The refill container according to <10>,  
wherein as the point-of-effort portion a knob portion

rises on a tubular body tip portion side edge face surrounded by the annular tearing portion and formed by a plate-like member.

<16>. The refill container according to <15>, wherein a cross-section of the plate-like member has an S-shape in the knob portion.

<17>. The refill container according to <10>, comprising an opening tab extending from a tubular body tip portion side edge face surrounded by the annular tearing portion as the point-of-effort portion.

<18>. The refill container according to any of <10> to <17>, wherein an inclination of the opening surface of the angled discharge port with respect to a central axis of the tubular body is in a range of 30° to 60°.

<19>. The refill container according to any of <10> to <18>, wherein the central axis of the tubular body coincides with a central axis of the refill container body.

<20>. An easy-opening portion for forming an angled discharge port whose opening surface is inclined with respect to a central axis of a discharge nozzle upon removal of a tip portion of the discharge nozzle being

closed,

the easy-opening portion comprising at the tip portion of the closed discharge nozzle: an annular tearing portion for opening the angled discharge nozzle; a removing portion surrounded by the annular tearing portion; a connecting portion rising from an end of the removing portion; and a pulled portion extending from the connecting portion to a side of a side surface of the discharge nozzle, wherein

a thickness between a pulled portion side surface and an opposite surface thereof in a removing portion side end of the connecting portion is greater than or equal to a thickness between a pulled portion side surface and an opposite surface thereof in a pulled portion side end of the connecting portion.

<21>. The easy-opening portion according to <20>, wherein the thickness between the pulled portion side surface and the opposite surface thereof in the removing portion side end of the connecting portion is greater than the thickness between the pulled portion side surface and the opposite surface thereof in the pulled portion side end of the connecting portion.

<22>. The easy-opening portion according to <20> or <21>, wherein an area of a cross-section of the removing

portion side end of the connecting portion is greater than an area of a cross-section of the pulled portion side end of the connecting portion.

<23>. The easy-opening portion according to any of <20> to <22>, wherein the cross-section of the connecting portion has a rectangular shape.

<24>. The easy-opening portion according to any of <20> to <23>, wherein a protrusion protruding toward a center side of the removing portion is provided at the removing portion side end of the connecting portion.

<25>. The easy-opening portion according to <20>, wherein the thickness between the pulled portion side surface and the opposite surface thereof in the connecting portion is approximately constant over a region extending from the removing portion side end of the connecting portion to the pulled portion side end thereof.

<26>. The easy-opening portion according to any of <20> to <25>, wherein the connecting portion rises from an upper end or a lower end of the removing portion.

<27>. The easy-opening portion according to any of <20> to <26>, wherein the pulled portion is vertically

suspended along the discharge nozzle, and a lower end thereof is connected to the side surface of the discharge nozzle or a base surface from which the discharge nozzle rises in such a manner that the lower end can be separated off therefrom.

<28>. The easy-opening portion according to any of <20> to <27>, wherein the closed discharge nozzle is formed on a cap to be attached to a mouth of a container body so as to protrude from the cap.

<29>. The easy-opening portion according to any of <20> to <28>, wherein a thick portion connected to the connecting portion is provided to the removing portion.

<30>. The easy-opening portion according to <29>, wherein the thick portion of the removing portion has a design indicating an opening direction.

<31>. A main container to be used in the refilling method according to any of <1> to <9>, comprising:

a self-standing main container body for storing a liquid material therein, the main container body having an upwardly-directed mouth; and

a cap unit to close the mouth in such a manner that the mouth can be opened and closed at will,

the cap unit including

an inner cap to be detachably screwed with the mouth of the main container body and having a small opening for liquid discharge, and

an outer cap to be screwed with the mouth of the main container body at the outside of the inner cap with the inner cap covering the mouth of the main container body.

<32>. A main container to be used in the refilling method according to any of <1> to <9>, comprising:

a self-standing main container body for storing a liquid material therein, the main container body having an upwardly-directed mouth; and

a cap unit for closing the mouth in such a manner that the mouth can be opened and closed at will,

the cap unit including

an annular member attached to the mouth of the main container body,

an inner cap connected to the annular member with a hinge, covering the mouth of the main container body in such a manner that the mouth can be opened and closed at will, and having a small opening for liquid discharge, and

an outer cap to be screwed with the mouth of the main container body at the outside of the inner cap.

with the inner cap covering the mouth of the main container body.

[0074]

- 10 main container
- 11 main container body
- 12 mouth
- 13 peripheral wall upper portion
- 14 peripheral wall lower portion
- 20A, 20B cap unit
- 21A, 21B inner cap
- 22 small opening for liquid discharge
- 23 annular wall
- 24 annular member
- 25 hinge
- 30 outer cap
- 31a, 31b protective cover
- 40A, 40B, 40C, 40D, 40E, 40F, 40G, 40H, 40I refill  
container
- 41 refill container body
- 42 discharge nozzle forming projection
- 43 cap
- 44 tubular body
- 44a base portion of tubular body
- 44b horizontal plane of stepped portion
- 45A, 45B, 45C, 45D, 45E, 45F, 45G, 45H, 45I, 45J,

45K, 45L, 45M      easy-opening portion or opening structure

46      annular tearing portion

46a      annular tearing portion in the vicinity of  
removing portion side end of connecting portion

47      finger hooked portion

47a      finger hooked ring

48      discharge nozzle

49      tubular body tip portion side edge face or edge  
face of discharge nozzle

50      discharge port

51      removing portion

52      connecting portion

52a      removing portion side end of connecting portion

52b      finger hooked portion side end of connecting  
portion

53      thick portion

54a, 54b      joint portion

55      protrusion

60      opening tab

61      knob portion

A      liquid material

L1      central axis of refill container body

L2      central axis of tubular body or discharge  
nozzle

L3      central axis of tubular body tip portion side  
edge face

**CLAIMS**

1. A refill container comprising a discharge nozzle forming projection obtained by closing a tip portion of a tubular body by an easy-opening portion provided at a top portion of the self-standing refill container body, wherein the easy-opening portion includes:

an annular tearing portion formed on the tubular body in such a manner that an angled discharge port is opened at the tip portion of the closed tubular body; and a point-of-effort portion connected to a surface on which the annular tearing portion is formed or a portion closer to the tip portion than the annular tearing portion.

2. The refill container according to claim 1, wherein a ring-shaped finger hooked portion is provided on a side of a side surface of the tubular body as the point-of-effort portion.

3. The refill container according to claim 2, wherein the ring-shaped finger hooked portion is a pulled portion connected to a removing portion surrounded by the annular tearing portion on a tubular body tip portion side edge face with a connecting portion.

4. The refill container according to claim 2, wherein the tubular body rises from a cap of the refill container body, and a lower end of the ring-shaped finger hooked portion is connected to the cap in such a manner that the lower end can be separated off therefrom.

5. The refill container according to claim 2, wherein the tubular body rises from a cap of the refill container body, and the ring-shaped finger hooked portion is connected to a side surface of the tubular body in such a manner that the ring-shaped finger hooked portion can be separated off therefrom.

6. The refill container according to claim 1, wherein as the point-of-effort portion a knob portion rises on a tubular body tip portion side edge face surrounded by the annular tearing- portion and formed by a plate-like member.

7. The refill container according to claim 6, wherein a cross-section of the plate-like member has an S-shape in the knob portion.

8. The refill container according to claim 1, wherein an opening tab extending from a tubular body tip portion side edge face surrounded by an annular tearing portion is provided as a point-of-effort portion.

9. An easy-opening portion for forming an angled discharge port whose opening surface is inclined with respect to a central axis of a discharge nozzle upon removal of a tip portion of the discharge nozzle being

closed, the easy-opening portion comprising at the tip portion of the closed discharge nozzle: an annular tearing portion for opening the angled discharge nozzle; a removing portion surrounded by the annular tearing portion; a connecting portion rising from an end of the removing portion; and a pulled portion extending from the connecting portion to a side of a side surface of the discharge nozzle, wherein, a thickness between a pulled portion side surface and an opposite surface thereof in a removing portion side end of the connecting portion is greater than or equal to a thickness between a pulled portion side surface and an opposite surface thereof in a pulled portion side end of the connecting portion.

10. The easy-opening portion according to claim 9, wherein the thickness between the pulled portion side surface and the opposite surface thereof in the removing portion side end of the connecting portion is greater than the thickness between the pulled portion side surface and the opposite surface thereof in the pulled portion side end of the connecting portion.

11. The easy-opening portion according to claim 9, wherein a protrusion protruding toward a center side of the removing portion is provided at the removing portion side end of the connecting portion.

12. The easy-opening portion according to claim 9, wherein the thickness between the pulled portion side surface and the opposite surface thereof in the connecting portion is approximately constant over a region extending from the removing portion side end of the connecting portion to the pulled portion side end thereof.

13. The easy-opening portion according to any of claims 9 to 12, wherein the connecting portion rises from an upper end or a lower end of the removing portion.

14. The easy-opening portion according to any of claims 9 to 13, wherein the pulled portion is vertically suspended along the discharge nozzle, and a lower end thereof is connected to the side surface of the discharge nozzle or a base surface from which the discharge nozzle rises in such a manner that the lower end can be separated off therefrom.

15. The easy-opening portion according to any of claims 9 to 14, wherein the closed discharge nozzle is formed on a cap to be attached to a mouth of a container body so as to protrude from the cap.

16. The easy-opening portion according to claim 9, wherein a thick portion connected to the connecting portion is provided to the removing portion.

17. The easy-opening portion according to claim 16, wherein the thick portion of the removing portion has a design indicating an opening direction.

18. A combination of a main container and a refill container to be used in a main container refilling method, the refill container comprising:

the refill container as claimed in any one of claims 1 to 8; and

the main container comprising:

a self-standing main container body for storing a liquid material therein, the main container body having an upwardly-directed mouth; and

a cap unit to close the mouth in such a manner that the mouth can be opened and closed at will,

the cap unit including

an inner cap to be detachably screwed with the mouth of the main container body and having a small opening for liquid discharge, and

an outer cap to be screwed with the mouth of the main container body at the outside of the inner cap with the inner cap covering the mouth of the main container body.

19. The combination as claimed in claim 18 wherein the combination further comprises the easy opening portion as claimed in any one of claims 9 to 17.

20. A main container for use with:

a) a refill container as claimed in any one of claims 1 to 8; or

b) a refill container as claimed in any one of claims 1 to 8 incorporating the easy opening portion as claimed in any one of claims 9 to 17;

in a main container refilling method, wherein the main container comprises:

a self-standing main container body for storing a liquid material therein, the main container body having an upwardly-directed mouth; and

a cap unit for closing the mouth in such a manner that the mouth can be opened and closed at will,

the cap unit including

an annular member attached to the mouth of the main container body,

an inner cap connected to the annular member with a hinge, covering the mouth of the main container body in such a manner that the mouth can be opened and closed at will, and having a small opening for liquid discharge, and

an outer cap to be screwed with the mouth of the main container body at the outside of the inner cap with the inner cap covering the mouth of the main container body.