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(71) Applicant: **PPK (Shanghai) Packaging Co., Ltd.
Shanghai 201101 (CN)**

(72) Inventor: **Zhou, Helin
Shanghai 201101 (CN)**

(74) Representative: **Loo, Chi Ching et al
Albright IP Limited
County House
Bayshill Road
Cheltenham, Gloucestershire GL50 3BA (GB)**

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(54) **REFILL DEVICE**

(57) The present invention discloses a refill device, comprising a case body (31), wherein the case body (31) has an opening end (311), a first case body (312) and a case bottom (32); the case bottom (32) is integrally formed with the first case body (312); the case bottom (32) of the case body (31) is provided with a first cutting line (34) for enclosing a portion to form a bottom bracket (35); and the bottom bracket (35) is separable from the case bottom (32) along the first cutting line (34) under the action of an external force. The case bottom (32) of the present invention is integrally formed with the first case body (312), and the first cutting line (34) is provided on the case bottom (32) to form a separable bottom bracket (35), which is used in cooperation with the packaging device in the embodiment of the present invention, so that the packaging device can be reused. Integrally forming the case bottom (32) and the first case body (312) reduces the number of accessories, reduces the production cost of the product and improves the production efficiency, while reducing the logistics cost and the production cost of the filling line.

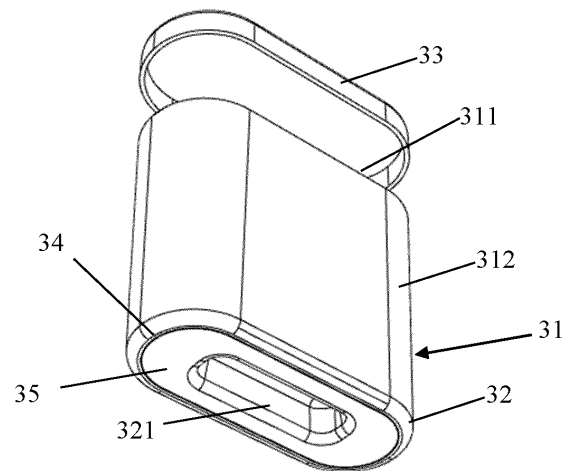


Fig. 2

Description

Technical Field

[0001] The present invention relates to the technical field of household chemicals, and in particular to a refill device for pasty or solid household chemicals.

Background Art

[0002] Deodorant cream, lipstick and other pasty or solid household chemicals are easy to carry and can be used anytime and anywhere. When they are wiped on the hands, ears, mouth and other parts of the human body, it gives off fresh and pleasant fragrance, beautifying people's life and image.

[0003] In order to carry the pasty household chemicals conveniently, there are usually packaging devices such as box packaging, canned packaging or tube packaging, etc. After the use of the household chemicals paste, the packaging materials are usually discarded completely and cannot be reused. When new pasty household chemicals are taken for use, it needs new packaging materials, resulting in extreme waste. In addition, the packaging materials are usually not degradable; and a large amount of discarded packaging materials seriously pollute the environment. Therefore, there is a need to provide a replaceable pasty household chemical of which the packaging device can be reused after the household chemical paste is used up. Accordingly, there is a need to provide a refill device for use with the packaging device. Chinese patent CN213036319 U provides a refill device for a replaceable pasty cosmetic, including a case body and a case bottom which are separately arranged. Both the case body and the case bottom need to be made by separate molds, with relatively high production cost. The finished case body and case bottom are required to be assembled, which brings troublesome operations. It is therefore necessary to design an integrated refill device that reduces production costs, improves production efficiency, and also reduces transportation costs as well as labor costs.

Summary of the Invention

[0004] The technical problem to be solved by the present invention is to provide a refill device, with a case body integrally, so as to reduce the number of accessories, reduce the production cost, improve the production efficiency and also ensure the use effect.

[0005] In order to solve the above technical problem, the present invention provides a refill device, comprising a case body, wherein the case body has an opening end, a first case body and a case bottom; the case bottom and the first case body are integrally formed; the case bottom of the case body is provided with a first cutting line for enclosing a portion to form a bottom bracket; and the bottom bracket is separable from the case bottom along

the first cutting line under the action of an external force.

[0006] Further, the first cutting line has the same shape as the outer contour line of the case bottom; and the bottom bracket is located at the center of the case bottom.

[0007] Further, the first cutting line is cut from the bottom of the case bottom toward the opening end; and the depth of the first cutting line is 8/10-9/10 of the thickness of the case bottom at its location.

[0008] Further, the distance between the first cutting line and the case bottom edge is between 2 mm and 5 mm; and a groove is formed in the middle of the bottom bracket recessed in the direction of the opening end, with the depth of the groove being 6 mm-8 mm.

[0009] Further, the device comprises a case cap which is snap-fitted to the opening end of the case body and is separable from the case body; the case cap is an embedded case cap or an outer cover-type case cap; or, the opening end of the case body is covered with a sealing film closing for the opening end; and the sealing film can be separated from the case body under the action of an external force.

[0010] Further, the opening end of the case body is provided with a flanging formed integrally with the first case body; and the edge of the sealing film is covered on the surface of the flanging. Further, the case body is separated from the flanging by a second cutting line along which the flanging is separable from the first case body under the action of an external force.

[0011] Further, the edge of the sealing film extends towards the outside of the case body to form a ripped portion, with the width of the flanging being 3-5 mm.

[0012] Further, the case body is made of a paper material to which a water-repellent agent and an oil-repellent agent are added; or a coating layer to which a water-repellent agent and an oil-repellent agent are added is provided in the case body.

[0013] Further, the water-repellent agent is 1-3% by weight of the case body and the oil-repellent agent is 3-5% by weight of the case body.

[0014] Further, the water-repellent agent is an aqueous dispersion of an alkyl ketene dimer and the oil-repellent agent is a fluoroalkyl acrylate copolymer.

[0015] Further, at least one through hole is provided on the bottom of the case bottom for pouring a liquid household chemical into the refill device.

[0016] Further, the inner wall of the first case body is provided with a vertical rib and the angle between the first case body and the case bottom is 90°.

[0017] Further, the inner wall of the first case body has at least one section of inner wall surface having an included angle of less than 90° with the case bottom, so that the dimension of the opening end of the first case body is smaller than the dimension of the case bottom.

[0018] Further, the case body is configured for holding a pasty or solid household chemical.

[0019] The invention has the following beneficial effects compared with the prior art. According to the refill device provided by the present invention, the case bot-

tom and the first case body are integrally formed, and a first cutting line is provided on the case bottom to form a separable bottom bracket for cooperating with an external packaging device. As long as the lifting mechanism and the second case body are provided in the packaging device, the old refill device can be discarded. At the same time, a new refill device containing the household chemical is loaded into the second case body of the packaging device, so that the packaging device can be reused. The lifting platform is moved against the bottom bracket of the refill device by rotating the base of the lifting mechanism so as to achieve the ejection and retraction of the paste of the household chemical, facilitating the use of the pasty or solid household chemical. The case bottom and the first case body of the refill device are integrally formed to reduce the number of accessories, with only one mold needed for forming, which reduces the production cost. The case bottom and the first case body do not need to be additionally assembled, which improves the production efficiency and reduces the labor cost. At the same time, there is no need for separate boxed transportation, which reduces logistics costs. The refill device is made of degradable materials, especially paper materials, which can be recycled and degraded and are more environmentally friendly. The paste or solid household chemicals can be prevented from being separated from the case body in use by providing the vertical rib on the inner side of the case body or setting the included angle between the first case body and the case bottom to be less than 90°.

Brief Description of the Drawings

[0020]

Fig. 1 is a schematic view showing an exploded structure of a refill device according to an embodiment of the present invention;
 Fig. 2 is a schematic view showing an exploded structure of a refill device according to an embodiment of the present invention from another angle;
 Fig. 3 is a schematic view showing an exploded structure of a refill device according to another embodiment of the present invention;
 Fig. 4 is a schematic view of the structure of a case cap of a refill device according to a further embodiment of the present invention;
 Fig. 5 is a schematic view showing an exploded structure of a refill device according to another embodiment of the present invention;
 Fig. 6 is a schematic view showing an exploded structure of a refill device according to a further embodiment of the present invention;
 Fig. 7 is a schematic view of the packaging of the refill device of Fig. 6;
 Fig. 8 is a schematic view of the structure of a refill device according to another embodiment of the present invention;

Fig. 9 is a schematic view showing an exploded structure of a refill device according to a further embodiment of the present invention;

Fig. 10 is a schematic view showing an exploded structure of a refill device according to a further embodiment of the present invention;

Fig. 11 is a disassembled schematic view of a pasty household cosmetic packaging device for a pasty household chemical containing a refill device according to an embodiment of the present invention.

[0021] In the drawings,

1, packaging device; 2, second case body; 3, refill device; 4, lifting mechanism; 23, first end; 24, second end; 31, case body; 32, case bottom; 33, case cap; 34, first cutting line; 35, bottom bracket; 36, sealing film; 37, second cutting line; 38, flanging; 39, vertical rib; 41, lifting platform; 43, fixed sleeve; 45, base; 212, flange; 221, clamping hole; 311, opening end; 312, first case body; 321, groove; 322, through hole; 361, ripped portion; 412, boss; 431, button; 433, open end.

Detailed Description of the Invention

[0022] The present invention is further described below with reference to the accompanying drawings and embodiments.

[0023] With reference to Figs. 1 and 2, the present embodiment provides a refill device. The refill device 3 can be used in cooperation with a packaging device. The refill device 3 includes a case body 31 having an opening end 311, a first case body 312 and a case bottom 32. The case bottom 32 and the first case body 312 are integrally formed. The case bottom 32 of the case body 31 is provided with a first cutting line 34 for enclosing a portion to form a bottom bracket 35. The bottom bracket 35 is separable from the base 32 along the first cutting line 34 under the action of an external force. The case body 31 is configured for holding a pasty or solid household chemical. Further, the first cutting line 34 has the same shape as the outer contour line of the case bottom 32. The bottom bracket 35 is located at the center of the case bottom 32.

[0024] In the present embodiment, the first cutting line 34 is cut from the bottom of the case bottom toward the opening end 311. The depth of the first cutting line 34 is preferably 4/5-9/10 of the thickness of the case bottom 32 at its location. The distance between the first cutting line 34 and the edge of the case bottom is preferably between 2 mm and 5 mm.

[0025] In an embodiment, as shown in Figs. 1 and 2, the cross-sectional shape of the case body 31 is rectangular in the middle and semicircular at both ends. In other embodiments, the case body 31 may also be cylindrical, as shown in Fig. 3. The specific shape of the case body 31 may be set as required, and this embodiment is not particularly limited.

[0026] Specifically, the replacing device 3 further includes a case cap 33 which is snap-fitted on the opening

end 311 of the case body 31 and is provided separately from the case body 31. The case cap protects the household chemical which has not been used in the refill device 3 from being contaminated. The case cap 33 may be an outer cover-type case cap as shown in Fig. 2 or an embedded case cap. The cover 33 should be detachably connected to the case body 31, since the case cap 33 will be removed for use from the refill device 3 in combination with the external packaging device during use. The removed case cap 33 may be discarded or may be snap-fitted onto the first end 23 of the case body 2 of the packaging device and then snap-fitted onto the cap of the packaging device to provide dual protection for the household chemical in the refill device 3. Further, as shown in Fig. 4, the outer cover-type case cap 33 is designed in an arched configuration so that the filled paste protrudes from the case body 31 and can be immediately used without additional action by the consumer after installing the refill device.

[0027] In this embodiment, the case body 31 and the case cap 33 are both made of degradable materials. Further, the case body 31 and the case cap 33 are both made of paper materials from a paper pulp die-casting process, which are environmentally friendly and degradable, and also can be recycled. In a specific embodiment, the paper of the case body 31 is added with a water-repellent agent and an oil-repellent agent. In another embodiment, a coating layer to which a water-repellent agent and an oil-repellent agent are added is provided in the inner wall of the case body 31. Further, the water-repellent agent is 1-3% by weight of the case body 31 and the oil-repellent agent is 3-5% by weight of the case body 31. Preferably, the water-repellent agent is an aqueous dispersion of an alkyl ketene dimer and the oil-repellent agent is a fluoroalkyl acrylate copolymer. The function of being waterproof and oil-proof can prevent household chemicals in the case body from leaking or grease from penetrating into the paper case, so as to avoid liquid leakage and yellowing of the paper case. Referring to Figs. 5 and 6 together, the opening end 311 of the case body 31 is covered with a sealing film 36 for closing the opening end 311, and the sealing film 36 can be separated from the case body under the action of an external force. When the refill device 3 is used, the sealing film 36 is removed to be used in combination with the external packaging device. The sealing film 36 replaces the case cap 33 to protect the household chemical which has not been used in the refill device 3 from being contaminated, so that the manufacturing process of the case cap is omitted to save materials and improve efficiency. In a particular embodiment, the opening end 311 of the case body 31 can also be provided with a flanging 38 which is integrally formed with the first case body 312. The flanging 38 may be formed by extending to the outside of the case body 31, as shown in Fig. 6, or extending to the inside of the case body 31. The present invention does not limit this. The outer contour line of the flanging 38 may have the same shape as the opening end 311 of the case

body 31. The edge of the sealing film 36 coated on the surface of the flanging 38. Preferably, the width of the flanging 38 is 3-5 mm. The flanging 38 has a certain width to ensure an area covered by the sealing film 36 and to ensure the firmness of the covering. The edge of the sealing film 36 extends to the outside of the case body 31 to form a ripped portion 361 for facilitating the removal of the sealing film 36 by the application of force. The sealing film 36 is an aluminum film and the material is environmentally friendly.

[0028] Referring to Figs. 6 and 7 together, an annular second cutting line 37 is provided at the junction of the case body 31 and the flanging 38. The flanging 38 can be separated from the first case body 312 along the second cutting line 37 under the action of an external force. When the sealing film 36 is removed, the flanging 38 may be separated from the case body 31 along with the sealing film 36, which is more convenient to use.

[0029] Referring also to Fig. 8, the center of the bottom bracket 35 is recessed toward the opening end 311 to form a groove 321 having a shape and size matched with the shape and size of a boss 412 on the lifting platform of the packaging device. The depth of the groove 321 is preferably 6 mm-8 mm, more preferably 6.5 mm-7.5 mm. The groove 321 increases the contact area between the household chemical paste and the case bottom 32 to prevent the household chemical paste from falling out of the case body 31. Further, the case bottom 32 is provided with at least one through hole 322 through which liquid household chemicals can be filled into the refill device 3. The household chemicals formed by being poured into the refill device 3 via the through hole 322 are more aesthetically pleasing. Preferably, the number of the through holes 322 is two and are symmetrically located outside the groove 321. In other embodiments, the filling may also be performed from the opening end 311.

[0030] Referring to Fig. 9, further, in order to prevent the paste or solid household chemical from falling off during use, the inner wall of the first case body 312 is provided with a vertical rib 39, which increases the contact surface between the paste or solid household chemical installed in the case body 31 and the inner side of the case body 31 to increase the friction force and prevent the paste or solid household chemical from being separated from the case body 31, with a guiding function. In this embodiment, the angle between the first case body 312 and the case bottom 32 may be 90°, i.e. the first case body 312 and the case bottom 32 are vertically disposed. The opening end 311 and the case bottom 32 of the first case body 312 have the same size.

[0031] With reference to Fig. 10, in other embodiments, the inner wall of the first case body 312 has at least one section of inner wall surface having an included angle of less than 90° with the case bottom, preferably 85°-89°, so that the size of the opening end 311 of the first case body 312 is less than the size of the case bottom 32, forming a structure with a small opening and a large bottom. In this embodiment, the bottom bracket 35 can

be a planar structure, and it is not necessary to provide a groove to increase the contact area of the paste or solid household chemical so as to prevent falling off. The bottom bracket 35 is not provided with a through hole 32, and the paste or solid household chemical can be put into the case body 31 after the case body 31 is formed. The size of the paste or solid household chemical is closely matched with the size of the opening end 311. Due to the smaller size of the opening end 311, the pressure of the opening end 311 on the paste or solid household chemical is greater, thereby increasing the friction between the opening end 311 and the paste or solid household chemical, so that the paste or solid household chemical can be prevented from being detached from the case body 31 during use.

[0032] With reference to Fig. 11, the refill device 3 provided in the present embodiment can be used in combination with the packaging device 1 outside the refill device 3 to install the pasty or solid household chemical in the refill device 3. The case body 31 is loaded into the second case body 2. The opening end 311 of the case body 31 is clamped at the first end 23 of the second case body 2. The edge of the case bottom 32 abuts against the end surface of the open end 433 of the fixed sleeve 43, so that the case body 31 is fixed and not moved in the case body 2. The top surface of the lifting platform 41 of the lifting mechanism 4 abuts against the bottom bracket 35 of the refill device 3. When the base 45 is rotated to move the lifting platform 41 towards the first end 2, the bottom bracket 35 is pushed to separate from the case bottom 32, and the household chemical paste and the bottom bracket 35 are driven to move relative to the first case body 312, so that the pasty or solid household chemical is exposed from the first end 23 of the second case body 2 for use by a consumer, or is withdrawn into the case body 31 for storage after use. Further, the first end 23 of the second case body 2 extends inwards to form a flange 212 which enables the opening size of the first end 23 to be smaller than the opening size of the opening end 311 of the case body 31, so that the opening end 311 of the case body 31 is clamped in the second case body 2. When the lifting platform 41 moves, only the household chemical paste is driven to move, while the first case body 312 is fixed. Furthermore, the top surface of the lifting platform 41 is convexly provided with a boss 412. Accordingly, the bottom bracket 35 is provided with a groove 321 matched with the boss 412, so that the boss 412 abuts in the groove 321, preventing the household chemical paste in the case body 31 from shaking or tilting, so that the household chemical paste can move smoothly.

[0033] The pasty household chemicals described in the present invention include but are not limited to deodorant cream, lipsticks, pasty lip gloss, eye shadows or pressed powder. The refill device provided in the present invention can be used as long as it is a pasty or solid household chemical.

[0034] The specific shape of the packaging device is not particularly limited in the present embodiment, and

may be a case shape, a bottle shape, a can shape, etc. depending on the type of pasty or solid household chemicals or the desired design shape, such as a tubular shape for lipsticks, a case shape shown in Fig. 1 or a cylindrical shape shown in Fig. 3 for deodorant cream, and a cylindrical shape for pressed powder, etc. The packaging device can be reused so long as the structure of the packaging device provided is used to detachably connect the second case body 2 with the lifting mechanism 4 for ease of replacement, and the lifting mechanism 4 moves with the household chemical paste in the refill device 3.

[0035] In summary, according to the refill device provided by the present invention, the case bottom 32 and the first case body 312 are integrally formed. A first cutting line 34 is provided on the case bottom 32 to form a separable bottom bracket 35 for cooperating with the packaging device, provided that a detachably connected lifting mechanism 4 and the second case body 2 are provided in the packaging device. After the lifting mechanism 4 is disassembled, the old refill device 3 can be discarded. At the same time, a new refill device 3 containing pasty or solid household chemicals is loaded into the second case body 2, so that the packaging device can be reused. The lifting platform 41 is moved against the bottom bracket 35 of the refill device 3 by rotating the base 45 of the lifting mechanism 4 so as to achieve the ejection and retraction of the household chemicals, facilitating the use of the pasty or solid household chemicals. The case bottom 32 and the first case body 312 are integrally formed to reduce the number of accessories, with only one mold required, which reduces the production cost. There is no need to additionally assemble the first case body 312 and the case bottom 32, with the production efficiency greatly improved and the labor cost reduced. At the same time, no separate packing is needed, which reduces the transportation cost. The refill device 3 is made of a degradable material which is especially made by the paper pulp die-casting process, recyclable and more environmentally friendly. The paste or solid household chemical can be prevented from being separated from the case body 31 during use by providing the vertical rib 39 on the inner side of the case body 31 or setting the included angle between the first case body 312 and the case bottom 32 to be less than 90.

[0036] Although the present invention has been disclosed in terms of preferred embodiments, it is not intended to limit the present invention. Any person skilled in the art may make some modifications and improvements without departing from the spirit and scope of the present invention. Therefore, the scope of the present invention is defined by the claims.

ORIGINAL PARENT CLAIMS FORMING PART OF THE DESCRIPTION AS PREFERRED EMBODIMENTS OF THE INVENTION ONLY

[0037]

1. A refill device, characterized by comprising a case body, wherein the case body has an opening end, a first case body and a case bottom; the case bottom and the first case body are integrally formed; the case bottom of the case body is provided with a first cutting line for enclosing a portion to form a bottom bracket; and the bottom bracket is separable from the case bottom along the first cutting line under the action of an external force.

2. The refill device according to claim 1, characterized in that the first cutting line has the same shape as the outer contour line of the case bottom; and the bottom bracket is located at the center of the case bottom.

3. The refill device according to claim 1, characterized in that the first cutting line is cut from the bottom of the case bottom toward the opening end; and the depth of the first cutting line is 8/10-9/10 of the thickness of the case bottom at its location.

4. The refill device according to claim 2, characterized in that the distance between the first cutting line and the case bottom edge is between 2 mm and 5 mm; and a groove is formed in the middle of the bottom bracket recessed in the direction of the opening end, with the depth of the groove being 6 mm-8 mm.

5. The refill device according to claim 1, characterized by further comprising a case cap which is snap-fitted to the opening end of the case body and is separable from the case body; the case cap is an embedded case cap or an outer cover-type case cap; or, the opening end of the case body is covered with a sealing film closing for the opening end; and the sealing film can be separated from the case body under the action of an external force.

6. The refill device according to claim 5, characterized in that the opening end of the case body is provided with a flanging formed integrally with the first case body; and the edge of the sealing film is covered on the surface of the flanging.

7. The refill device according to claim 6 characterized in that the case body is separated from the flanging by a second cutting line along which the flanging is separable from the first case body under the action of an external force.

8. The refill device according to claim 7, characterized in that the edge of the sealing film extends towards the outside of the case body to form a ripped portion, with the width of the flanging being 3-5 mm.

9. The refill device according to claim 1, characterized in that the case body is made of a paper material to which a water-repellent agent and an oil-repellent agent are added; or a coating layer to which a water-repellent agent and an oil-repellent agent are added is provided in the case body.

10. The refill device according to claim 9 characterized in that the water-repellent agent is 1-3% by weight of the case body and the oil-repellent agent

is 3-5% by weight of the case body.

11. The refill device according to claim 9 characterized in that the water-repellent agent is an aqueous dispersion of an alkyl ketene dimer and the oil-repellent agent is a fluoroalkyl acrylate copolymer.

12. The refill device according to claim 1, characterized in that at least one through hole is provided on the bottom of the case bottom for pouring a liquid household chemical into the refill device.

13. The refill device according to any one of claims 1-12, characterized in that the inner wall of the first case body is provided with a vertical rib and the angle between the first case body and the case bottom is 90°.

14. The refill device according to any one of claims 1-12, characterized in that the inner wall of the first case body has at least one section of inner wall surface having an included angle of less than 90° with the case bottom, so that the dimension of the opening end of the first case body is smaller than the dimension of the case bottom.

15. The refill device according to claim 1, characterized in that the case body is configured for holding a pasty or solid household chemical.

Claims

1. A refill device, comprises a case (31), wherein the case (31) is made of a paper material; the case (31) has an opening end (311), a first case body (312) and a case bottom (32); the case (31) is configured for holding a pasty or solid household chemical; the refill device (3) is used in combination with a packaging device (1), the packaging device (1) comprises a second case body (2) and a lifting mechanism (4), the first case body (312) can be loaded into the second case body (2), the lifting mechanism (4) comprises a lifting platform (41) and a base (45); **characterized in that** the case bottom (32) and the first case body (312) are integrally formed; the case bottom (32) of the case (31) is provided with a first cutting line (34) for enclosing a portion to form a bottom bracket (35); the top surface of the lifting platform (41) can abut against the bottom bracket (35) of the refill device (3), the lifting platform (41) is moved against the bottom bracket (35) of the refill device (3) and the bottom bracket (35) is pushed to separate from the case bottom (32) along the first cutting line by rotating the base of the lifting mechanism, so as to achieve the ejection and retraction of the paste of the household chemical, facilitating the use of the pasty or solid household chemical.
2. The refill device according to claim 1, **characterized in that** the first cutting line (34) has the same shape as the outer contour line of the case bottom (32); and the bottom bracket (35) is located at the center of the

case bottom (32).

surface having an included angle of less than 90° with the case bottom (32), so that the dimension of the opening end (311) of the first case body (312) is smaller than the dimension of the case bottom (32).

3. The refill device according to claim 1, **characterized in that** the first cutting line (34) is cut from the bottom of the case bottom (32) toward the opening end (311); and the depth of the first cutting line (34) is 8/10-9/10 of the thickness of the case bottom (32) at its location. 5
4. The refill device according to claim 2, **characterized in that** the distance between the first cutting line (34) and the case bottom (32) edge is between 2 mm and 5 mm; and a groove (321) is formed in the middle of the bottom bracket (35) recessed in the direction of the opening end (311), with the depth of the groove (321) being 6 mm-8 mm. 10 15
5. The refill device according to claim 1, **characterized by** further comprising a case cap (33) which is snap-fitted to the opening end (311) of the case (31) and is separable from the case (31); the case cap (33) is an embedded case cap or an outer cover-type case cap; or, the opening end (311) of the case (31) is covered with a sealing film closing for the opening end (311); and the sealing film can be separated from the case (31) under the action of an external force. 20 25
6. The refill device according to claim 1, **characterized in that** the case (31) is made of a paper material to which a water-repellent agent and an oil-repellent agent are added; or a coating layer to which a water-repellent agent and an oil-repellent agent are added is provided in the case. 30
7. The refill device according to claim 6 **characterized in that** the water-repellent agent is 1-3% by weight of the case and the oil-repellent agent is 3-5% by weight of the case. 35
8. The refill device according to claim 6 **characterized in that** the water-repellent agent is an aqueous dispersion of an alkyl ketene dimer and the oil-repellent agent is a fluoroalkyl acrylate copolymer. 40
9. The refill device according to claim 1, **characterized in that** at least one through hole is provided on the bottom of the case bottom (32) for pouring a liquid household chemical into the refill device (3). 45
10. The refill device according to any one of claims 1-9, **characterized in that** the inner wall of the first case body (312) is provided with a vertical rib and the angle between the first case body (312) and the case bottom (32) is 90°. 50 55
11. The refill device according to any one of claims 1-9, **characterized in that** the inner wall of the first case body (312) has at least one section of inner wall

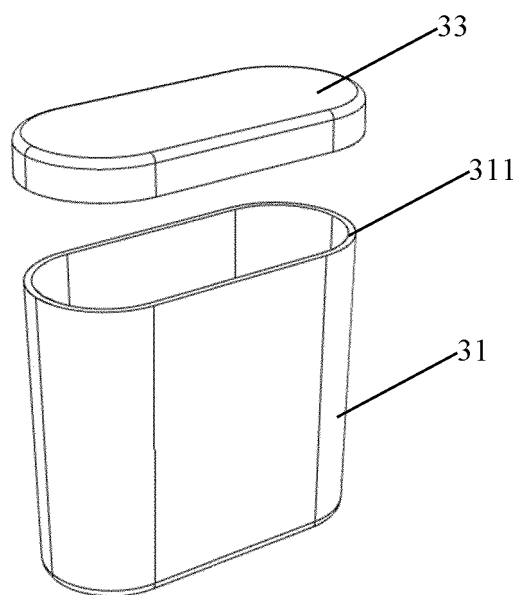


Fig. 1

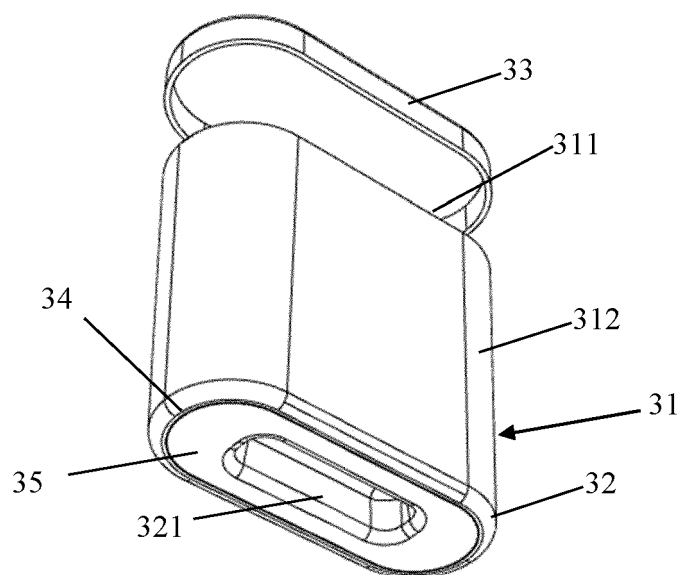


Fig. 2

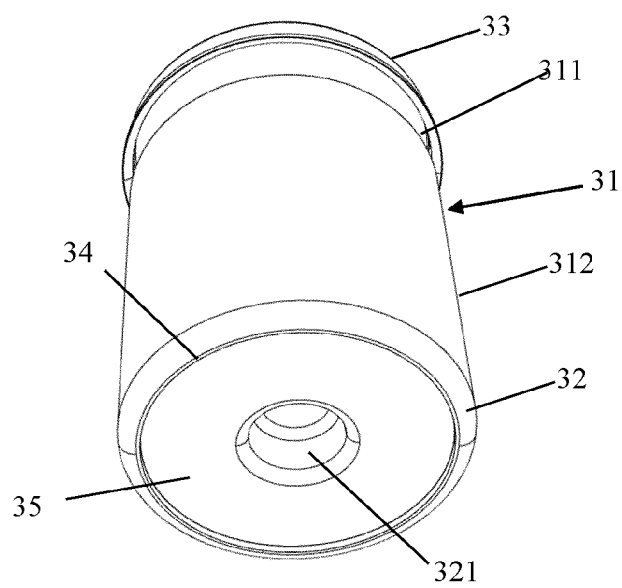


Fig. 3



Fig. 4

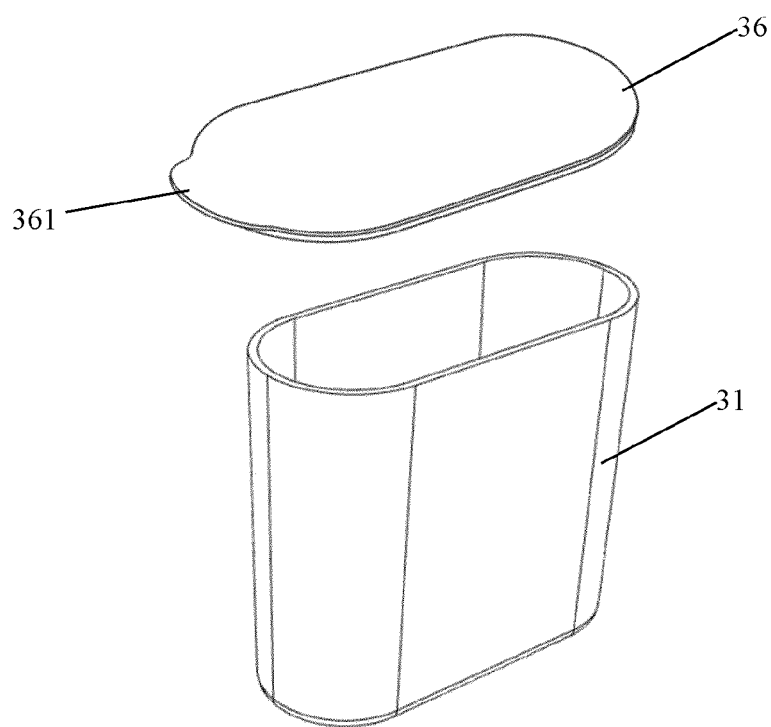


Fig. 5

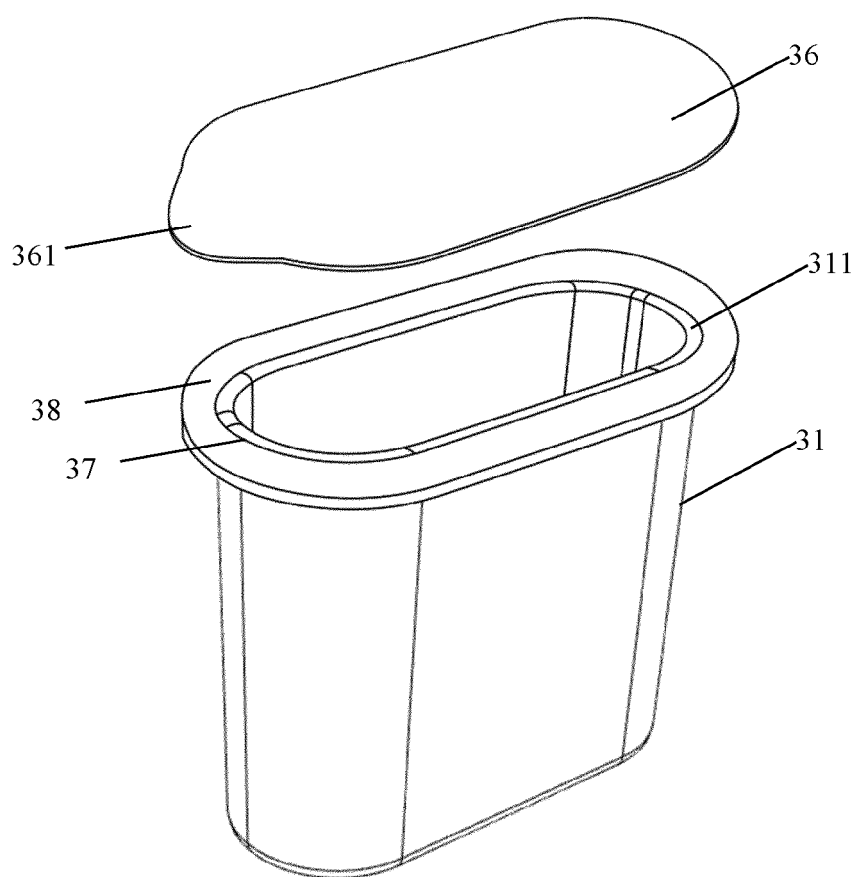


Fig. 6

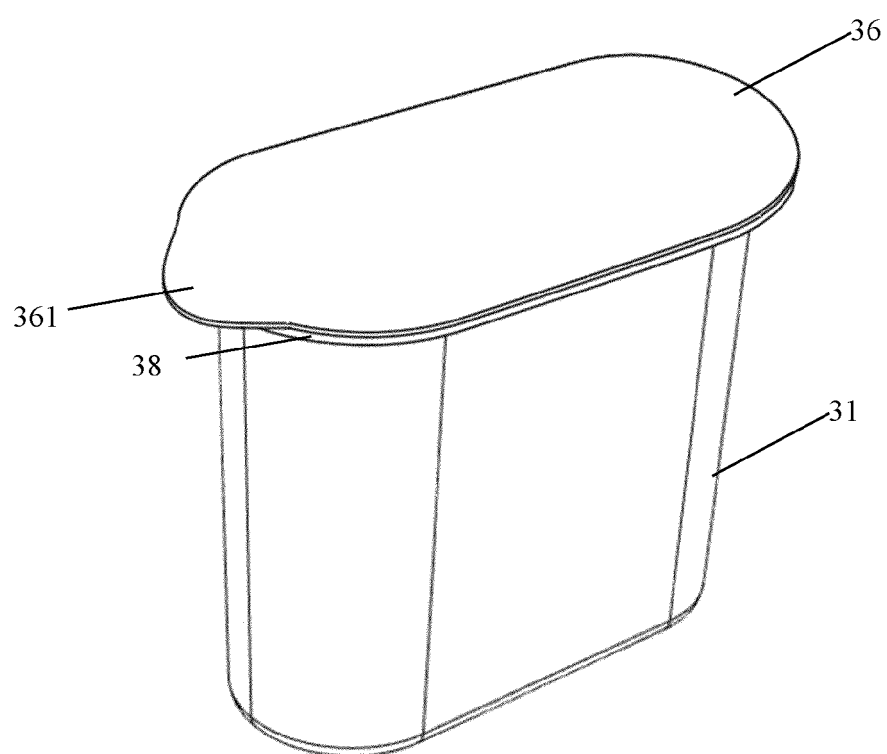


Fig. 7

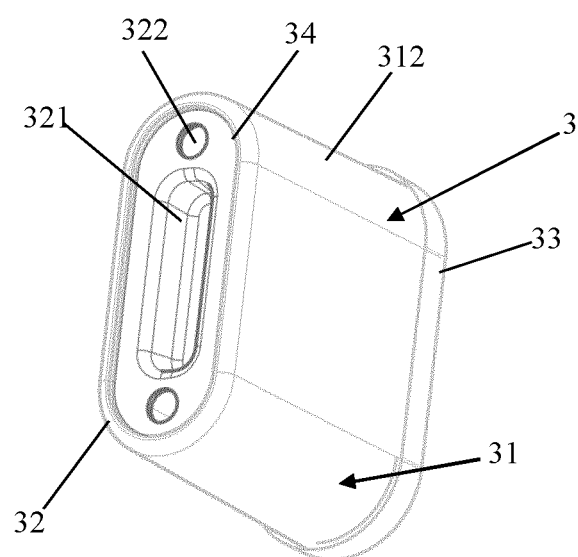


Fig. 8

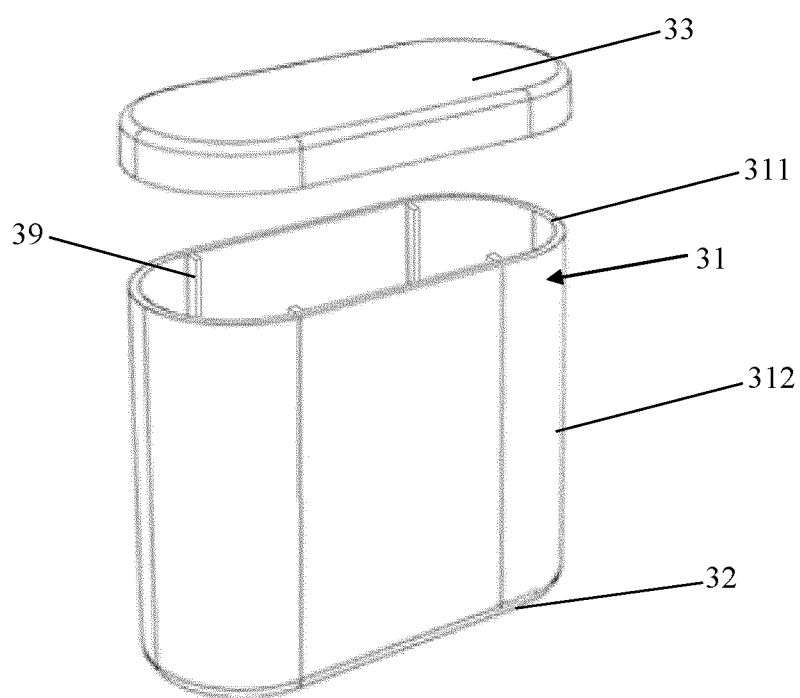


Fig. 9

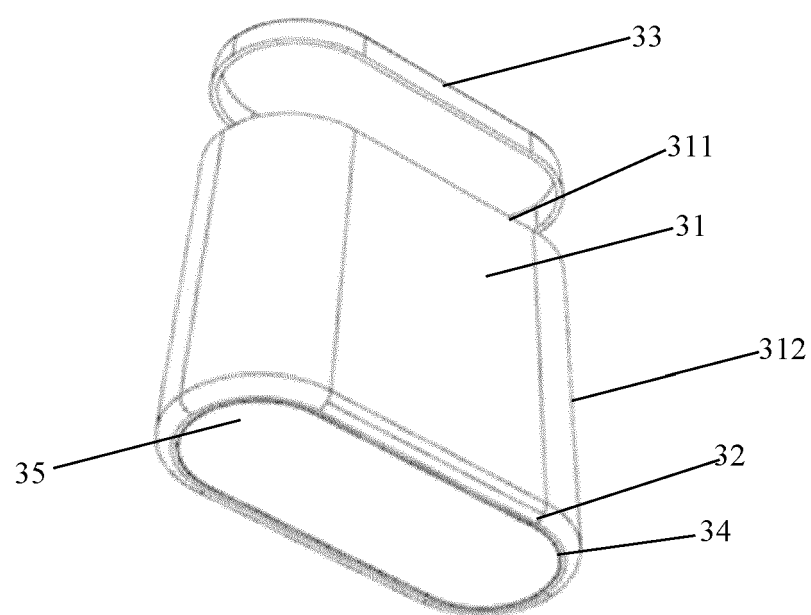


Fig. 10

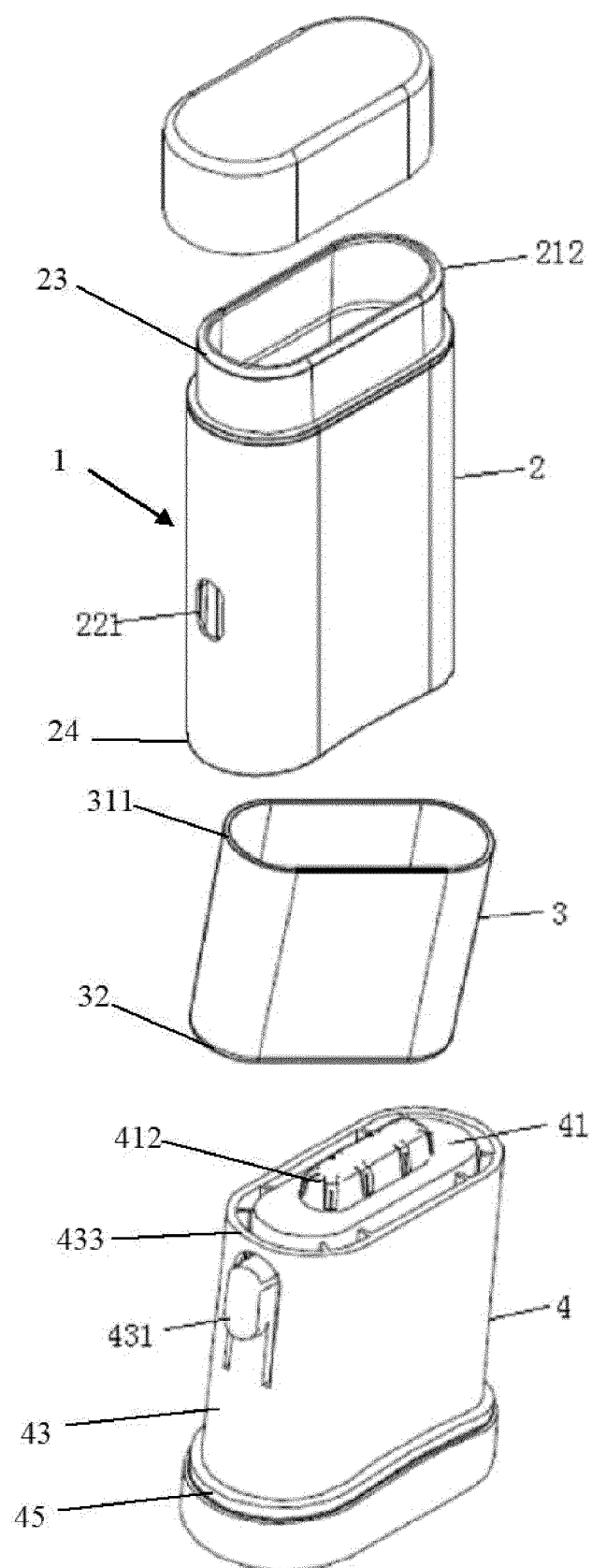


Fig. 11

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 213036319 U [0003]