Jan. 31, 1933. G. LIPSHITZ 1,895,854

DISPENSING DEVICE

Filed Jan. 6, 1931

Fig. 7.

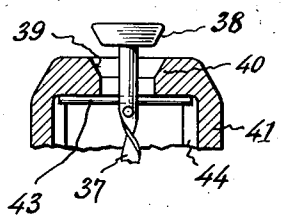


Fig. 1.

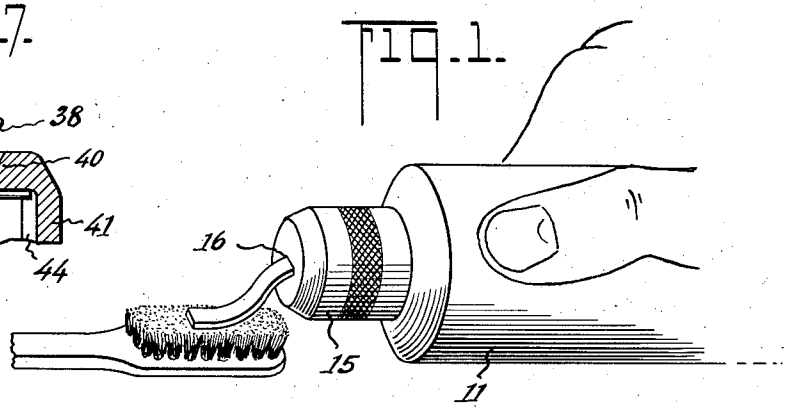


Fig. 2.

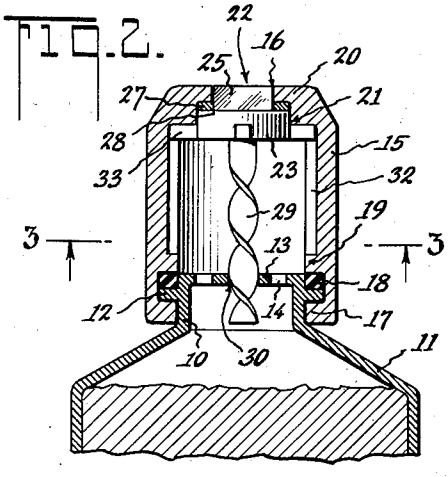


Fig. 4

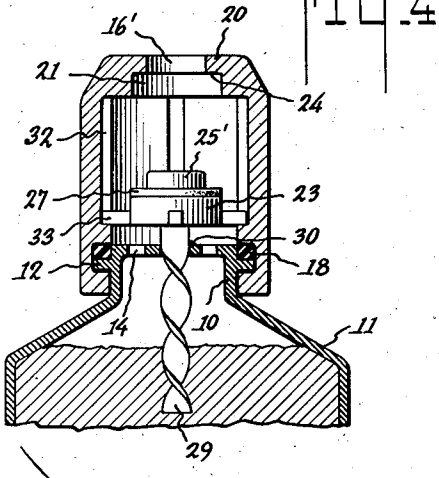


Fig. 3.

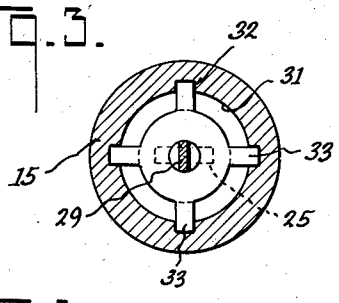


Fig. 6.

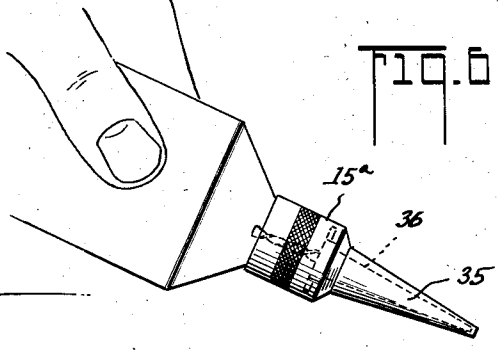
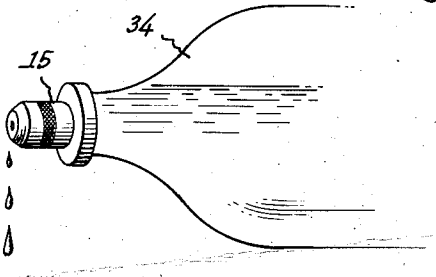


Fig. 5.



GEORGE LIPSHITZ
INVENTOR

BY Victor J. Evans

ATTORNEY

WITNESS:
H. J. Mank

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UNITED STATES PATENT OFFICE

GEORGE LIPSHITZ, OF NEW YORK, N. Y.

DISPENSING DEVICE

Application filed January 6, 1931. Serial No. 507,025.

This invention relates to dispensers, and more particularly to the cap or closure portion provided at the neck of a collapsible tube, bottle, can, jar, and other containers of semi-solid, viscous, liquid, fluid, gaseous or other materials.

The primary object of the invention is to construct a closure cap for a container which will form a permanent part of the container, to seal the same against escape of the contents of the container when the device is not in use, the body portion of the cap being movable to uncover an orifice in the cap, whereby the contents may be extruded or dispensed at will.

Another object of the invention is to provide a dispensing device with a permanently attached cap which includes a traveling valve or closure member adapted to be moved toward and away from the dispensing orifice by rotation of the cap, yet with the cap revolving non-spirally.

Still another object is to simplify and improve the construction of dispensing devices generally and to provide an article of this character which will consist of but few parts, will be positive in its action, and which can be economically manufactured.

Other objects and advantages of the invention will be hereinafter specifically pointed out, or will become apparent, as the specification proceeds.

With the above indicated objects in view, the invention resides in certain novel constructions and combinations and arrangement of parts, clearly described in the following specification and fully illustrated in the accompanying drawing, which latter shows embodiments of the invention as at present preferred.

In the drawing:

Fig. 1 is a prespective view showing the present device applied to a collapsible tube adapted to dispense tooth paste in ribbon form;

Fig. 2 is a vertical sectional view through the dispensing end of a collapsible tube showing the parts in position to seal the dispensing orifice;

Fig. 3 is a transverse sectional view through the cap, taken on the line 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a view similar to Fig. 2, but showing the parts in position with the dispensing orifice open, and with a round outlet orifice;

Fig. 5 is a view similar to Fig. 1, showing the invention applied to a liquid container or bottle;

Fig. 6 is a perspective view illustrating a modification of the dispensing orifice and the closure therefor; and

Fig. 7 is a detail sectional view illustrating an alternative construction for the dispenser orifice closure.

Referring to Figs. 1 to 4 of the drawing the dispensing device is here shown applied to the neck 10 of a collapsible tube 11. The neck portion 10 is preferably formed with an annular flange 12 surrounding the outer side of the neck slightly below the top portion 13. This top portion 13 is preferably provided with a series of holes or apertures 14 through which the contents of the tube or container 11 may be discharged.

Means are provided to prevent dispensing of the container contents, and said means in this instance include a cylindrical hollow cap 15 which surrounds the neck portion 10 and includes valve or closure means operatively connected to the cap and adapted to be moved toward and away from the dispensing orifice 16 by rotation of the cap, in one direction or another, with respect to the container. The hollow cap 15 is provided with an inwardly extending flange portion 17 which is adapted to abut against the underside of the neck flange 12. To insure a tight fit between the cap and the neck a suitable resilient washer 18 is preferably provided above the flange 12, this washer 18 being in turn arranged to engage a second internal flange portion 19 provided on the inner wall of the cap 15 above the flange portion 17.

The top 20 of the cap 15 is provided with a recess 21 which communicates with the smaller diameter rectangular orifice 16 (Fig. 2). A closure member 22 is provided to seal the dispensing orifice 16, this closure member 22 in this instance including a body portion 23 adapted to seat against the annu-

lar shoulder 24 at the end of the recess 21, and an elongated or rectangular neck portion 25 adapted to enter the orifice 16, a suitable resilient washer 27 being preferably provided at the outer rim 28 of the body portion 23, to insure a tight closure and prevent escape of any of the contents of the container, particularly when the contents may consist of other than solid or semi-solid material. The discharge orifice may be circular in cross section as seen at 16′ in Fig. 4, in which case the closure neck portion will be cylindrical as seen at 25′ in Fig. 4.

Means are provided, dependent upon rotation of the cap 15 in one direction or another, to move the closure device 22 toward and away from the discharge orifice 16. For this purpose, in this instance, the closure member 22 constitutes a traveler adapted to be moved in a spiral path toward and away from the orifice 16. The lower or body portion 23 of the closure member has rigidly attached thereto a traveling spiral screw member 29. This spiral screw member 29 is substantially oblong in cross section, and extends through an elongated aperture 30 provided in the top portion 13 of the container. To rotate the spiral screw 29, and hence cause the same to travel downward or upward to move the closure member away from or to the discharge orifice 16, I provide means whereby the closure member, and hence the spiral screw 29, will rotate with the cap 15, said means also permitting the closure member to move freely up or down during rotation of the cap 15, thus defining the spiral path of movement of the closure. To this end the inner wall 31 of the cap is provided with a plurality of identical vertical slotted portions 32, and the body portion 23 of the closure member is provided with a plurality of wing members 33 the ends of which extend into the slotted portions 31. In this instance I show four wings adapted to travel in corresponding slots, but any suitable number of wings and slots may be provided.

As will be seen from a comparison of Figs. 2 and 4, rotation of the cap 15 in one direction will also rotate the closure member 22. This will also effect rotation of the spiral screw 29, by reason of its engagement with the walls of the elongated aperture 30. This, referring to Fig. 2, will cause the screw to travel downward during its rotation, to the position shown in Fig. 4. This opens the discharge orifice 16 or 16′ and enables the contents of the container or tube 11 to be discharged through the apertures 14, between the wings 33 and thence out through the recess 21 and orifice 16. When the material in the container consists of a liquid, the liquid may readily be thus poured out; or, as shown in Fig. 1, when the material in the container consists of a semi-solid, such as tooth paste, or the like, the material is extruded by compressing the walls of the container to collapse the tube in the usual manner. When the desired quantity of material has been discharged, the cap 15 is simply screwed in the opposite direction, which causes the closure member 22 to re-assume its closing position as shown in Fig. 2.

It is understood of course that the discharge orifice 16 may be of any desired shape, so that semi-solid contents may be discharged in forms having the cross-sectional shape of a cylinder as seen at 16′ in Fig. 4, a square, a ribbon, a triangle, an octagon, or other forms.

The device is equally applicable to the dispensing of liquids whether in a continuous stream, or in drop form, as indicated in Fig. 5.

In the latter case the bottle or other vessel 34 has its neck portion formed in substantially the same manner as that of the tube shown in Figs. 2 and 4, but the closure member in this instance is preferably in the form of an elongated pin which permit the liquid to be discharged drop by drop.

In Fig. 6 the device is shown as applied to a collapsible tube of medicine or the like having a semi-solid or viscous consistency, for which purpose the cap 15*a* is preferably formed with an elongated spout 35, and the closure member is desirably of conical shape, as shown at 36, to cooperate with the inner wall of the spout 35.

The cap 15, in any of its modifications, may be rotated to the right or to the left to raise or lower the closure member, or vice versa. Also, instead of withdrawing the closure member from the discharge orifice, to open the latter, by causing the same to recede within the cap 15, the device may be constructed so that the closure member may be raised to a position outside of the cap 15, as shown in Fig. 7, wherein the spiral screw 37 is connected to a conical closure member or valve 38 adapted to normally rest in a conical seat 39 provided in the end 40 of the cap 41, the stem 42 of the closure member 38 having a suitable plurality of pins or wings 43 which are guided in grooves 44, the screw 37, wings 43 and slots 44 functioning in all essential respects similar to the screw 29, wings 33 and slots 32 already described.

Considerable particularities of description, as to materials, part details, dimensions, capacities and utilities may have been herein indulged in, but it will be understood that these statements, made with particular reference to the embodiments of the invention illustrated in the drawing, are not in any way to be taken as definitive or limitative of the invention. Inasmuch as many changes could be made in the above constructions, and many apparently widely different embodiments of the invention could be made without departing from the scope thereof,

it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the langauge contained in the following claims is intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

In other words, the scope of protection contemplated is to be taken solely from the appended claims, interpreted as broadly as is consistent with the prior art.

What I claim is:

1. A dispensing device including, in combination with the neck or outlet of a container, a cylindrical hollow cap rotatably mounted on said neck, the upper part of said neck including outlet means, the upper end of said cap having a discharge orifice, a closure for said orifice, adapted to seal said cap against escape of the contents of said container, and means operated by rotation of said cap to move said closure away from and toward said discharge orifice.

2. A dispensing device including, in combination with the neck or outlet of a container, a cylindrical hollow cap, said neck or outlet having an annular flange, said cap having an internal annular bottom flange and an upper flanged portion to receive said neck flange, a washer between said neck flange and one of the flanged portions of said cap, the upper part of said neck including outlet means and an elongated aperture, the upper end of said cap having a central discharge orifice, and an enlarged recess forming part of said discharge orifice, a closure for said discharge orifice, said closure including a body portion to seat in said enlarged recess and a neck portion to enter said discharge orifice to seal said cap against escape of the contents of said container, and means dependent upon rotation of said cap to move said closure away from and toward said discharge orifice.

3. A dispensing device including, in combination with the neck or outlet of a container, a cylindrical hollow cap, rotatably mounted on said neck, the upper part of said neck including outlet means and an elongated aperture, the upper end of said cap having a central discharge orifice, a closure member for said discharge orifice, said closure member adapted to enter said discharge orifice to seal said cap against escape of the contents of said container, means dependent upon rotation of said cap to move said closure member away from said discharge orifice, said closure member moving means including a spiral screw secured to said closure body, said spiral screw traveling in said elongated aperture, the interior wall of said cap having a plurality of diametrically opposite vertical slots and said closure body having a plurality of wings positioned in and adapted to traverse said slots as said cap is rotated to move said spiral screw in said aperture in moving said closure member away from and toward said discharge orifice.

4. A dispensing device including, in combination with the neck or outlet of a container, a cylindrical hollow cap, said neck or outlet having an annular flange, said cap having internal flanged portions to receive said neck flange, the upper part of said neck including outlet means and an elongated aperture, the upper end of said cap having a central discharge orifice, a closure for said discharge orifice, said closure adapted to enter said discharge orifice to seal said cap against escape of the contents of said container, means dependent upon rotation of said cap to move said closure away from and toward said discharge orifice, said closure moving means including a spiral screw secured to the said closure, said spiral screw traveling in said elongated aperture, the interior wall of said cap having a plurality of slots and said closure body having a plurality of wings positioned in and adapted to traverse said slots as said cap is rotated to move said spiral screw in said aperture in moving said closure away from and toward said discharge orifice.

5. A dispensing device including, in combination with the neck or outlet of a container, a cylindrical hollow cap, said neck or outlet having an annular flange, said cap having an internal annular bottom flange and an upper flanged portion to receive said neck flange, a washer between said neck flange and one of the flanged portions of said cap, the upper part of said neck including outlet means and an elongated aperture, the upper end of said cap having a central discharge orifice and an enlarged recess forming part of said discharge orifice, a closure for said discharge orifice, said closure including a body portion to seat in said enlarged recess and a neck portion to enter said discharge orifice to seal said cap against escape of the contents of said container, means dependent upon rotation of said cap to move said closure away from said discharge orifice, said closure moving means including a spiral screw secured to the under side of said closure body, said spiral screw traveling in said elongated aperture, the interior wall of said cap having a plurality of diametrically opposite vertical slots and said closure body having a plurality of wings positioned in and adapted to traverse said slots as said cap is rotated to move said spiral screw in said aperture in moving said closure away from and toward said discharge orifice.

6. A dispensing device including, in combination with a container having a neck pro-

vided with a discharge opening at its outer end, a hollow cap mounted on said neck for non-spiral rotation thereon and having a discharge orifice at its outer end, a valve movable in said cap to close said orifice, and means operating upon rotation of said cap in one direction to move said valve toward said orifice and upon rotation of said cap in the opposite direction to move said valve away from said orifice.

7. A dispensing device including, in combination with a container having a neck provided with a discharge opening at its outer end, a hollow cap mounted on said neck for rotation thereon and having a discharge orifice at its outer end, a valve in said cap movable relative to the latter and also relative to said neck, and means operated by rotation of said cap in one direction to positively move said valve to close said orifice and upon rotation of said cap in the opposite direction to positively move said valve to open said orifice.

8. A dispensing device including, in combination with a container having a neck provided with a discharge opening at its outer end, a hollow cap mounted on said neck for rotation thereon and having a discharge orifice at its outer end, a valve in said cap movable relative to the latter and also relative to said neck, and screw means partially carried by said valve and operating upon rotation of said cap to move said valve to open and close said orifice.

9. A dispensing device including, in combination with a container having a neck provided with a discharge opening at its outer end, a hollow cap mounted on said neck for rotation thereon and having a discharge orifice at its outer end, a valve in said cap movable relative to the latter and also relative to said neck, and means operating upon rotation of said cap to move said valve spirally relative to said neck to open and close said orifice.

10. A dispensing device including, in combination with a container having a neck provided with a discharge opening at its outer end, a hollow cap mounted on said neck for non-spiral rotation thereon and having a discharge orifice at its outer end, a valve bodily movable in said cap to close said orifice, and means operating upon rotation of said cap in one direction to move said valve bodily toward said orifice axially of said cap and upon rotation of said cap in the opposite direction to move said bodily valve away from said orifice axially of the cap.

11. A dispensing device including, in combination with a container having a neck provided with a discharge opening at its outer end, a hollow cap mounted on said neck for non-spiral rotation thereon and having a discharge orifice at its outer end, a valve in said cap bodily movable within and axially of the latter toward and away from said neck, and screw means partially carried by said valve and operating upon rotation of said cap thus to move said valve to open and close said orifice.

12. A dispensing device including, in combination with a container having a neck provided with a discharge opening at its outer end, a hollow cap mounted on said neck for non-spiral rotation thereon and having a discharge orifice at its outer end, a valve in said cap movable relative to the latter and also relative to said neck, and means operating upon rotation of said cap to move said valve spirally and away from and toward said neck to open and close said orifice.

In testimony whereof I hereby affix my signature.

GEORGE LIPSHITZ.