May 12, 1936. B. C. BECK 2,040,638

CLOSURE CAP FOR DISPENSING TUBES AND THE LIKE

Filed Dec. 24, 1934

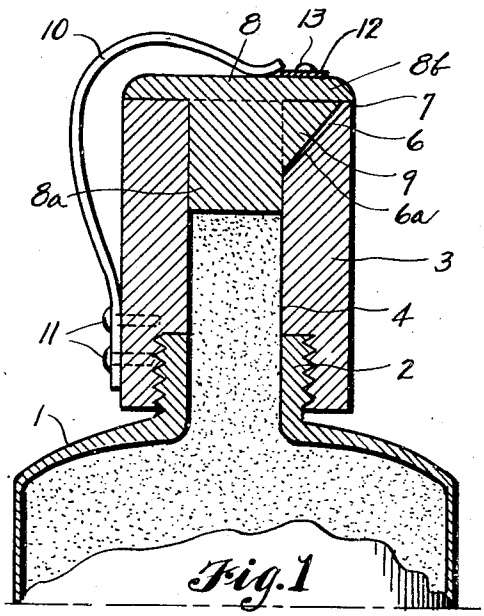


Fig. 1

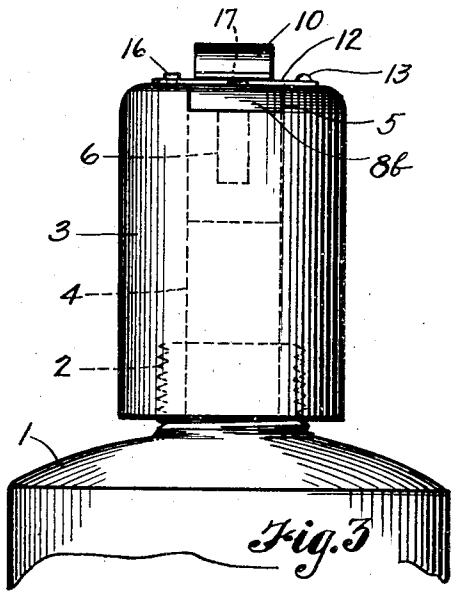


Fig. 3

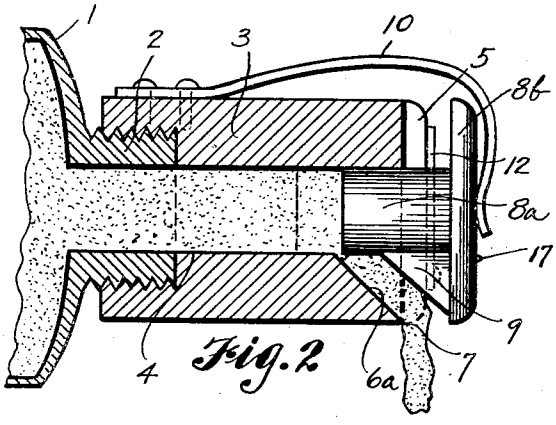


Fig. 2

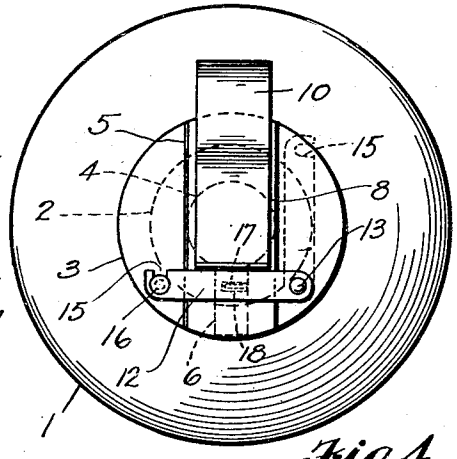


Fig. 4

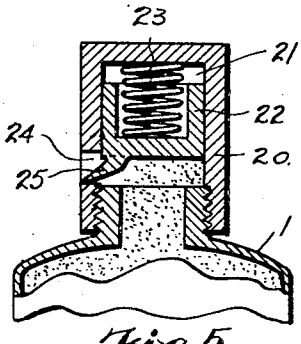


Fig. 5

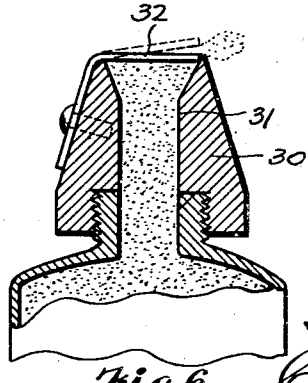


Fig. 6

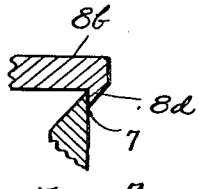


Fig. 7

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CLOSURE CAP FOR DISPENSING TUBES AND THE LIKE

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5 Claims. (Cl. 221—60)

This invention relates to sealing caps for collapsable, tubular containers, and the like, such for example, as those now extensively used for tooth paste, shaving cream, paste, and other fluid or semi-fluid substance which is dispensed from the tube by compressing or collapsing a part thereof.

It is the principal object of this invention to provide a cap for such containers, having a discharge opening with which a closure member is associated for an automatic opening incident to a certain pressure created against the tube contents by a collapsing pressure applied to the tube and which closure automatically closes incident to removal or relief of this dispensing pressure.

Another object of this invention is to provide a closure member that will effect a clean cut off of the material dispensed and form a tight and effective seal whereby there will be no drying or gumming of excess material, due to exposure to air, that might cause the closure member to stick.

Still another object resides in the provision of means for locking the closure against accidental opening.

Other objects reside in the details of construction and combination of parts, and in their mode of operation as will hereinafter be described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawing, wherein—

Fig. 1 is an enlarged, cross sectional view of a dispensing cap for a collapsable tube, applied in accordance with the present invention.

Fig. 2 is a cross sectional view of the cap, showing the position of the closure member during a dispensing operation.

Fig. 3 is a side view of the cap with the closure in closed position.

Fig. 4 is a top view of the same parts.

Fig. 5 is a cross sectional view of a cap of an alternative form of construction.

Fig. 6 is a cross sectional view of another alternative form of cap.

Fig. 7 is a sectional detail illustrating a specific form of cut off lip.

Referring more in detail to the drawing—

1 designates the upper portion of what may be a collapsable tube, equipped at its end with an exteriorly threaded neck 2 onto which a cap 3, embodying the present invention, is threaded in a tight connection. This might, however, be any other form of connection either permanent or disconnectable.

The cap 3 has a delivery passage 4 axially thereof and registering at its inner end with the discharge opening of the tube neck. The passage leads through to the outer end of the cap and at its outer end opens into a slot 5 that is formed across the outer face of the cap, diametrically thereof; this lot having a width equal to the diameter of the passage 4 but comparatively shallow, as will be observed by reference to Fig. 3.

Leading laterally from the upper end portion of the passage 4 and opening into the slot 5 is a delivery channel 6. The bottom wall 6a of this channel, as shown clearly in Figs. 1 and 2, extends obliquely from the passage 4 to the upper periphery of the cap, providing a sharp cut off edge, as seen at 7.

Applied to the cap 3 is a closure member 8. This has a cylindrical plug portion 8a slidably fitted in the outer end of the passage 4 and integral with a cross plate 8b at the outer end of the plug portion adapted to seat within the slot 5 and one end of the cross bar is adapted to engage tightly against the cut off edge 7 thereby to close and seal the channel 6. A web portion 9 is formed on the side of the plug portion and extends along the bar 8b to near the end, and this web is fitted in the channel 6. It has an oblique under, or lower, edge 9a that practically conforms to the slope of the wall 6a. The length of the plug portion 8 is such that its inner end extends somewhat beyond the lower end of channel 6 and when it is lifted to uncover the entrance to channel 6, as seen in Fig. 2, the web portion still is not entirely unseated from the channel and this prevents the closure member turning sidewise relative to the groove 5.

To automatically seat the closure member 8, there is provided a leaf spring 10 that is attached at one end to the cap, as at 11, and it is curved to extend along the side of the cap and to overlie the outer end thereof and bears against the closure to urge it to closed position, as in Fig. 1. The spring member 10 is sufficiently long that it permits the closure to be moved to unseated position, as in Fig. 2, without interference therefrom.

To lock the closure against accidental opening, a cross bar 12 is provided. This is pivoted at one end by a stud or rivet 13 at one side of slot 5 in a manner permitting the other end of the bar to swing about the pivot directly across the slot and bar 8b when the closure is seated. The swinging end of the bar has a laterally opening notch 15 to receive a headed stud 16 on the cap

when the bar is swung across the bar 8b to lock the closure, as in Fig. 4. Also, there is a boss 17 on the closure bar 8b arranged to seat in a recess 18, in the cross bar to hold the latter yieldingly in place.

With the device so constructed, it is used as follows: Assuming it has been applied to a tube 1 and that it is desired to dispense some of its contents, the user first swings the bar 12 to released position, as seen in dotted lines in Fig. 4. He then presses in on the tube in a manner to cause its contents to exert an unseating pressure against the plug 8a and the latter to move outwardly under the restraining pressure of spring 10. When the plug uncovers the passage 6, contents of the tube will be exuded as illustrated in Fig. 2 and this will continue as long as collapsing pressure is exerted against the tube. As soon as this pressure is relieved, the spring 10 pushes the plug back to closing position and the bar 8b engages the cut off edge 7 to give a clean cut off of material and to cooperate with the part 8a in double sealing the container. Then if it is desired, the lock bar 12 may be swung back to locking position, but this would not be generally required so long as the tube is not to be packed away or carried in the pocket.

In Fig. 5, I have shown an alternative form, wherein a cap 20 is threaded onto the tube, and has an interior chamber 21 containing a slidably mounted piston 22. A coiled spring 23 is located between the outer end of the cap and the piston to urge the latter inwardly. In the side of the cap 20 is a discharge opening 24 and projecting thereinto from the piston is a cut off and closure member 25. When it is desired to dispense contents from the tube, it is collapsed by pressure thereagainst so that a pressure of its contents is exerted against the piston, lifting the latter and thereby opening the outlet 24. When this pressure against the piston is relieved, the spring moves the piston downwardly and seats the cut off member 25 to close the outlet and cut off the exuded contents, thereby eliminating the necessity of wiping it off across the brush.

In Fig. 6 is another alternative construction, wherein a cap 30 is applied to the tube and this has a discharge passage 31 leading through to its outer end, a leaf spring 32 is attached to the cap and has a free end overlying the outlet. Pressure against the tube walls causes its contents to exert a lifting pressure against the spring 32 from the opening thereby to permit discharge of material; and it automatically closes when the pressure is relieved.

In Fig. 7 is shown an alternative cut off for the device of Fig. 1, wherein the bar 8b is provided with a depending lip 8d adapted to effect a shearing action with the edge 7.

It will be understood that there may be changes in details of construction without departing from the spirit of the invention and therefore it is not desired nor is it the intention that the claims shall be limited to the details herein illustrated, but shall be given an interpretation that is commensurate with the invention disclosed.

The novel features of the invention are believed to reside in the automatic operation of the device incident to pressure on the tube and the fact that the cut off of material at the discharge opening is clean cut, making it unnecessary to wipe it off with the tooth brush which manifestly is unsanitary, and the double sealing of the outlet by the closure device.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent, is—

1. The combination with a collapsable container having a discharge neck, of a cap applied to said neck and having a slot therein across its outer face and having a discharge opening from the neck leading to said slot and having a lateral discharge channel from said discharge opening extending along the slot to one end thereof, a closure member disposed in the said slot and having a plug portion extended therefrom into said discharge opening, a spring fixed to the cap and bearing against the closure to hold it yieldingly in closed position and permitting outward movement thereof, incident to compression of the contents to a position at which said plug uncovers the entrance to the lateral discharge channel.

2. The combination with a collapsable container having a discharge neck of a cap applied to said neck having a slot therein across its outer face, and having a discharge opening from the neck leading to said slot and having a lateral discharge channel from said discharge opening extending along the slot to one end thereof, a closure member comprising a bar seated in said transverse slot, a plug portion integral with the bar and slidably fitted in said discharge opening, a web portion integral with the bar and plug and fitted in said lateral channel, a spring attached to the cap to bear inwardly against the closure thereby to normally hold the bar seated in said transverse slot and said plug portion closing the lateral slot.

3. The combination with a collapsable container having a discharge neck, of a cap applied to said neck and having a discharge opening from the neck to the outer face of the cap and having a lateral discharge channel leading from the said discharge opening along the outer face of the cap to the side edge thereof; the base of the said channel meeting the side edge of the cap at an acute angle to form a cutting edge, a closure member having a plug portion extended into the said discharge opening and having an outer end part thereof adapted to overlie the discharge channel and to engage in biting contact with said cutting edge, and a spring fixed to the container and bearing against the closure to urge it to closed position.

4. A device as in claim 3 wherein the inner end of the plug closes the discharge opening of the cap below the said lateral channel prior to the outer end part of the closure coming into biting contact with the cutting edge.

5. A device as in claim 3 wherein the lateral channel has a straight bottom surface and there is a web portion between the plug and outer end portion of the closure located in the lateral channel and having its lower edge sloped at a lesser angle relative to the axis of the cap to provide an open space in the channel as the lower end of the web and outer end of the cap come into closing contact with the inner and outer ends of the lateral channel.

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