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O. SMITH

1,850,606

CLOSURE FOR FLEXIBLE TUBES

Filed March 18, 1929

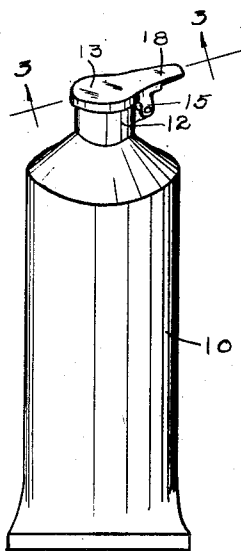


FIG.-1

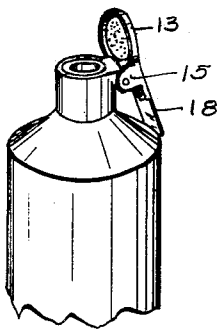


FIG.-2

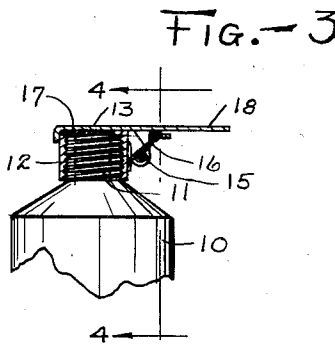


FIG.-3

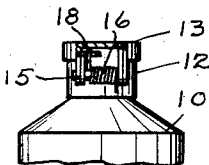


FIG.-4

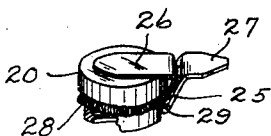


FIG.-5

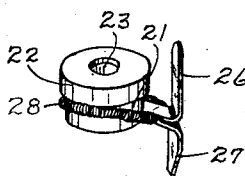


FIG.-6

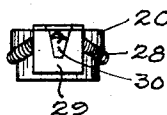


FIG.-7

FIG.-8

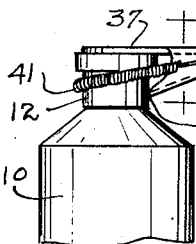
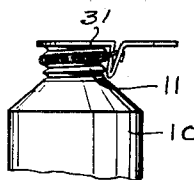


FIG.-9

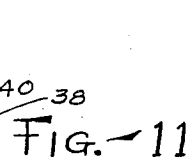
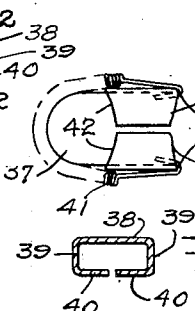


FIG.-11

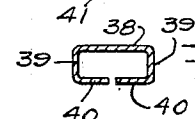


FIG.-12

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UNITED STATES PATENT OFFICE

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CLOSURE FOR FLEXIBLE TUBES

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This invention relates to dispensing apparatus, which is used particularly in connection with dispensing of tooth paste, shaving cream, and other materials of a plastic nature, which are usually sold in compressible tubes. Such tubes are usually provided with a threaded cap, which must be removed before the material can be ejected from the tube. Such caps, due to their small size and shape, are easily lost or are apt to roll off the support upon which they are placed, thus resulting in considerable inconvenience to the user.

The principal object of my invention is to provide a closure for a compressible tube of the character described, which permits the material to be ejected from the tube in a satisfactory manner without necessitating removal of the closure bodily from contact with the tube. This invention also contemplates a closure which may be used either with or without the cap, which normally is supplied with the tube at the time of purchase.

In the drawings, I have shown a number of forms of my invention, wherein Fig. 1 is a perspective view of a compressible tube, having one form of closure mounted thereon; Fig. 2 is a similar view with the closure shown in open position; Fig. 3 is a view through the closure taken on the line 3—3 in Fig. 1; Fig. 4 is a section taken on the line 4—4 in Fig. 3; Fig. 5 is a perspective view of a modified form of closure; Fig. 6 is a perspective view of the closure shown in Fig. 5 in open position; Fig. 7 is a rear view of the closure shown in Fig. 5; Fig. 8 is a side elevation of a second modification of closure used without the usual cap; Fig. 9 is a side view of a third modification of closure construction; Fig. 10 is a side view of a fourth modification; Fig. 11 is a bottom plan view of the closure shown in Fig. 10 and Fig. 12 is a section taken through the closure on a plane indicated by the line 12—12 in Fig. 10.

Referring now to Figs. 1 to 4, 10 indicates a compressible tube having a neck 11 which is threaded in the usual way. A closure illustrated in these figures replaces the usual cap and comprises a sleeve 12 which is suitably threaded internally to engage the threads on

the neck 11. The sleeve is open at the top and is intended to be closed by a cap or closure 13, which is hinged intermediate the ends thereof, as at 15, to the cap. A coil spring 16 embraces the pivot pin and functions normally to urge the cap into closed position. That portion of the cap directly over the opening may have a cork lining, as at 17, to assist in maintaining an air tight seal. When the tube is used, the free end 18 of the closure may be pressed downwardly until the cap assumes the position shown in Fig. 2, and thereafter the tube is compressed until the desired amount of material is expelled. When pressure on the end 18 is released, the cap automatically resumes the closed position.

The closure just described necessitates a sleeve which is threaded to correspond with that of the tube. As the threaded portions of different tubes vary in size, and as it is desirable to have one closure which will fit tubes of different size, I have shown a form which is intended to be used in a satisfactory manner upon tubes of varying size. To this end, 20 indicates a cap which is usually mounted on the tube, when purchased, and which has a customary shoulder 21, directly beneath the knurled finger grip portion 22.

The cap is removed and is punctured, as at 23, to provide a hole of sufficient size through which the tube contents may easily flow. The closure for this pierced cap then may comprise a single strip of metal which is bent intermediately in the form of a U, as at 25. The strip also has one portion 26 extending in one direction away from the U-shaped portion, and another portion 27 extending in the opposite direction from the U-shaped portion. The part 26 provides a closure for the opening in the cap, and the part 27 provides a finger rest upon which pressure may be exerted to uncover the opening. A spring 28 is shown as extending around the cap directly beneath the shoulder, and as being anchored to the closure by having the opposite ends thereof fastened together within the U-portion 25. By making the U-portion longer than the depth of the knurled part 22, the bottom edge 29 can be

pivoted against the shoulder when the closure is moved from the position shown in Fig. 5 to that shown in Fig. 6. A convenient way of fastening the end of the spring to the closure is to strike up a small lip 30 in the outer wall of the U to admit the ends of the spring. When the spring is assembled and the walls of the U are pressed together, the ends of the spring are firmly gripped between the lip and the associated wall.

If it is desired to use the type of closure shown in Fig. 5 without the cap, it is only necessary to increase slightly the size of the closure part until the normal tube opening is completely covered as shown at 31 in Fig. 8.

In Fig. 9 another form of closure is shown as a one piece member which is bent immediately in the form of a V with one arm, as at 32, engaging the top of the pierced cap and another arm, as at 33, extending downwardly and terminating adjacent the bottom of the cap. This arm may have a lip 34 struck upwardly therefrom and on the inner side thereof, for enabling the ends of the coiled spring 35 which embraces the cap to be attached thereto.

The construction shown in Fig. 10 is somewhat similar to that shown in Fig. 9 with the exception that the closure part 37 has an extension 38 in the same plane for a finger rest. Between the end of the finger rest and the cap, the metal is extended downwardly, as at 39, and then inwardly, as at 40, thus providing ears which make a suitable arrangement for anchoring the ends of a coil spring 41. The inner edges 42 of the parts 40 may be curved to make a snug fit against the sleeve portion of the cap.

The closure made in accordance with my invention is advantageous in that it provides a simple device which normally remains in contact with the tube opening with sufficient degree of pressure to prevent escape of the material and at the same time eliminates the necessity for the removal of the threaded cap each time the tube is used. While I have explained my invention as comprising an accessory to a tube, nevertheless, if desired, it may form part of the tube as purchased.

I claim:

1. In combination, a container having a threaded neck and having an opening adjacent the end of the neck, a closure member for said opening, said member comprising a flat strip having a portion thereof overhanging the edge of the container neck and providing a finger rest, and having the intermediate portion thereof bent downwardly and co-operating with the end of the container to provide a pivot about which the closure may be turned, and a coil spring extending around the container neck and having the ends thereof attached to the downturned portion and functioning normally to urge the closure against the container.

2. In combination, a container having a threaded neck, a cap in threaded engagement with the neck and having an opening therein through which the contents of the container may be expelled, said cap having a hand grip portion and a reduced portion therebeneath, a closure for said opening, part of the closure being adapted to engage said cap, and yieldable means extending around the cap and co-operating with the closure for normally urging it into closed position upon the container.

3. In combination, a collapsible tube having a threaded neck, and having an opening at the end of the neck through which the contents of the tube may be expelled, a closure for said opening, said closure having a portion thereof overhanging the edge of the neck and providing a finger depressible portion, there being part of the closure extending downwardly and inwardly and engaging the tube to provide a pivot for the closure, and means embracing the neck for holding the closure on the tube, there being yieldable means associated with the closure for normally holding it in closed position.

4. In combination, a container having a neck portion, a pivoted closure therefor, and yieldable means extending around the neck of the container and acting upon the closure to perform the double function of retaining it on the closure and of urging it into closing position.

In testimony whereof, I hereunto affix my signature.

ORVILLE SMITH.