Feb. 24, 1931. R. H. LIEBERTHAL 1,794,023

COLLAPSIBLE TUBE

Filed Dec. 16, 1929

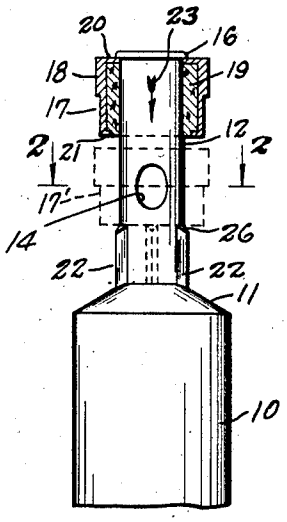

Fig. 1.

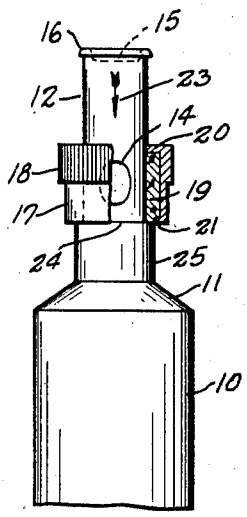

Fig. 3.

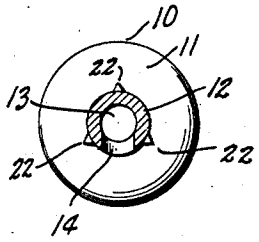

Fig. 2.

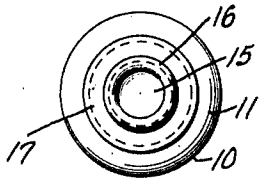

Fig. 4.

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UNITED STATES PATENT OFFICE

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COLLAPSIBLE TUBE

Application filed December 16, 1929. Serial No. 414,324.

This invention relates to collapsible tubes such as are to be used as receptacles and dispensers for liquid or semi-liquid material such as tooth paste, toilet preparations, medicated jellies or the like.

It is an object of this invention to provide an improved dispensing means and an improved closure means for said dispensing means, which closure means can not get lost or separated from the tube and which may easily be kept clean and sanitary at all times.

With the foregoing and other objects in view, this invention comprises certain constructions, combinations and arrangements of parts as set forth, disclosed and claimed in the following specification considered in connection with the accompanying drawing.

In this drawing

Fig. 1 is an elevation of one embodiment of this invention, showing the dispensing end of the collapsible tube with the closure means in section.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 shows a fragmentary elevation of another embodiment of this invention, and

Fig. 4 is a view looking down from the top of Fig. 3.

There is shown at 10 a collapsible tube of the form usually used to contain toilet preparations such as tooth paste, shaving cream and the like, having a substantially thicker end wall 11 from which projects a reduced neck portion 12. As shown, this end wall 11 may slope more or less from the tube to the neck as is the usual construction, but the slope is immaterial.

This neck 12 is hollow as shown at 13 and has an opening formed in its side at 14, the neck 12 thus serving as a conduit in dispensing the material in the tube 10 through the opening 14. The end of neck 12 is closed as at 15 to prevent the material in the tube from escaping therethrough and this closed end 15 is rolled over as at 16 to form a flange of greater diameter than the diameter of the neck 12.

The flange 16 forms an end stop for a cylindrical closure cap 17 which is longitudinally slidable on neck 12. This cap 17 is formed of a suitable metal or material such as a phenolic condensation product, and is preferably roughened or knurled as at 18 to facilitate manipulation of the same, it being sufficient to provide this knurling adjacent the upper edge of the cap only. A sealing and friction material is provided within the cap and comprises a thin cylinder 19 of cork, cork composition or other similar material mounted within the cylindrical wall of the cap. A flange 20 on cap 17 serves to retain the sealing material 19 within the cap, and also serves as a stop to abut against the flange 16 when the cap is slid longitudinally to the end of neck 12 to allow the opening 14 to be available and another flange 21 is formed at the other end of cap 17 to assist in locking cylinder 19 within the cap although this flange 21 may not contact with the neck 12 as does flange 20.

Just as the flange 16 serves as a stop means for cap 17 when it is slid longitudinally to the end of neck 12 to move it to the opening position, another stop means is provided to assure that the cap 17 will rest over the opening 14 and thus seal the tube when the cap 17 is slid longitudinally toward the end wall 11. One form of stop means is shown in Figs. 1 and 2 and comprises a plurality of longitudinal ribs 22 formed on neck 12 starting at the end wall 11 and stopping sufficiently below the opening 14 so that the cap 17 will completely close the opening 14 when its lower end 21 abuts against the shoulders on the ends of the ribs 22. The ribs 22 preferably project above the surface of the neck 12 a distance not greater than the thickness of the closure or cap 17. Two of these ribs will be preferably spaced apart a distance somewhat greater than the width of opening 14 and arranged or located so the space or recess formed by this pair of ribs will be in alignment with opening 14.

The cork or other lining 19 fits the neck of the tube sufficiently tight so that the resultant friction will hold the closure over the opening 14 under all usual conditions, but will permit the closure to be forced along the neck to expose the opening for discharge of material. It will be noted that as the opening extends radially of the tube pressure

on the body of the tube cannot force the closure from the opening by pressure of the paste or other material in the tube.

An arrow 23 is formed on neck 12 in alignment with opening 14 and serves to indicate the position of the opening when the cap is in the closing position.

In operation, the cap 17 is retained in the closing position 17′ through the frictional contact between the neck 12 and the cylinder of sealing material 19 within the cap, while the arrow serves to indicate the position of opening 14. To discharge the material from the tube 10, the cap 17 is slid longitudinally along the neck until it abuts against the flange or stop 16, and then the tube 10 is squeezed or rolled as is customary. The material, as tooth paste for instance, is thus forced through the opening, and when sufficient material has been dispensed, the cap is then slid back to the position 17′, and any surplus material on the neck will be pushed down into the aligned recess or space between the ribs from where it may be easily removed as by holding the closed tube under a flowing faucet.

In the embodiment shown in Figs. 3 and 4, the stop means for the cap 17 in closing position comprises a shoulder 24 integrally formed about the neck 12 between opening 14 and end wall 11, the cap in closing position abutting against this shoulder and in order that the tube may be drawn from the mold this shoulder may be provided by enlarging the neck between the shoulder and the end wall as indicated at 25.

It is to be especially noted that the shoulders 26 at the ends of ribs 22 and shoulder 24 being spaced from the end wall 11 prevent the closure from being forced down against the end wall, and thus prevents surplus paste which might be at the discharge opening 14 being carried down against the end wall 11. This is very objectionable in the old type of closures and tubes as it makes the tube very messy and unattractive and the paste is held between the end walls of the closure and body portions in such a manner as to be difficult to remove. The tube, therefore, is soon very unattractive and unsanitary. With either of my improved constructions, however, the surplus material is never forced down against the end wall 11, but is exposed on the surface of the neck above this end wall where it can be easily wiped off or washed off by holding in a stream of water from a faucet.

Having thus set forth the nature of my invention, what I claim is:

1. A collapsible tube having a body portion forming a container, a reduced neck portion connected to the body by an end wall and having a side opening therein for discharge of material from the tube, a tubular closure embracing and frictionally engaging the neck portion and slidable longitudinally thereon to and from a position over said opening, and said neck portion being provided with a stop shoulder spaced from the end wall to engage the closure and limit its movement toward the end wall and hold it spaced from the end wall when in closed position.

2. A collapsible tube having a body portion forming a container, a reduced neck portion connected to the body by an end wall and having a side opening therein for discharge of material from the tube, a tubular closure having a nonmetallic lining frictionally engaging the neck portion, said closure being slidable longitudinally on said neck portion to cover and uncover said opening, means to prevent removal of the closure from the neck portion, and a stop shoulder on said neck portion spaced from the end wall to hold the closure spaced from the said wall when in closed position.

3. A collapsible tube having a body portion forming a container, a reduced neck portion connected to the body portion by an end wall and having a side opening therein for discharge of material from the tube, an imperforate closure embracing said neck portion and slidable longitudinally thereon to and from a position over said opening, and one or more stop shoulders on the outer surface of the neck portion spaced from the end wall to hold the closure spaced therefrom when in position over the opening, said shoulder or shoulders being of a height not greater than substantially the thickness of the walls of the closure.

4. A collapsible tube having a body portion forming a container, a reduced neck portion connected to the body portion by an end wall and having a side opening therein for discharge of material from the tube, an imperforate closure embracing said neck portion and slidable longitudinally thereon to and from a position over said opening, and a pair of longitudinal spaced ribs on the outer surface of said neck portion between the closure and the end wall and forming stop means to hold the closure spaced from the end wall when in closed position, said ribs being so located that the space between them is in alignment with said opening and they form a recess to receive any material that might be forced along the neck from said opening by said closure.

5. A collapsible tube having a body portion forming a container, a reduced neck portion connected to the body portion by an end wall and having a side opening therein for discharge of material from the tube, an imperforate closure embracing said neck portion and slidable longitudinally thereon to and from a position over said opening, said closure comprising a metal tube and a cork lining frictionally engaging the surface of the neck portion, and a pair of longitudinal

spaced ribs between the opening and the end wall and so located that the space between them is in alignment with said opening and provides a trough or recess to receive any material that may be forced along the neck portion from the opening when the closure is moved to closing position, said ribs also providing stop shoulders to hold the closure spaced from the end wall when in closing position.

In testimony whereof I affix my signature.

ROBERT H. LIEBERTHAL.