

June 13, 1933.

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1,914,221

CLOSURE FOR COLLAPSIBLE TUBES

Original Filed July 27, 1931

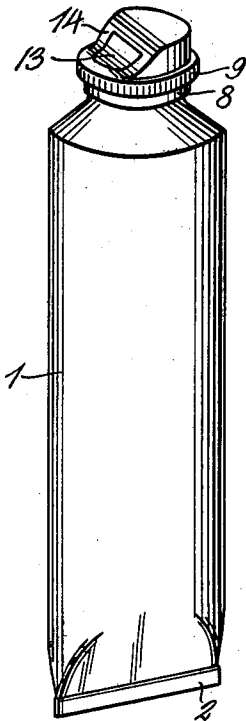


Fig. 1.

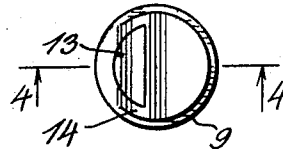


Fig. 2.

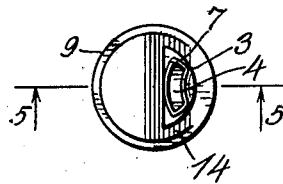


Fig. 3.

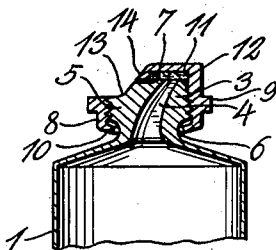


Fig. 4.

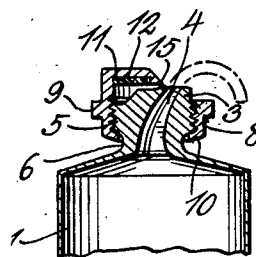


Fig. 5.

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CLOSURE FOR COLLAPSIBLE TUBES

Application filed July 27, 1931, Serial No. 553,353. Renewed December 1, 1932.

This invention relates to improvements in closures for collapsible tubes.

In the marketing of certain kinds of merchandise such as pastes of different kinds, vaseline, and ointments, etc., it is customary to employ collapsible tubes provided at one end with a tubular neck to which a screw cap is removably attached. When any of the contents of the tube is to be used, the cap is removed and pressure is then applied to the tube whereby a quantity of the material is extruded.

The removable caps have been found to be objectionable because they are easily dropped and therefore are often lost, wherefore it has been suggested to attach the caps to the tubes or to anchor them so that they cannot be lost or misplaced.

It is the primary object of this invention to produce an improved closure for a collapsible tube which shall be so constructed that it does not employ a removable cap but on the other hand a cap that is securely attached to the neck of the tube so that it can rotate through an angle of about 180 degrees and at the same time move slightly in the direction of the length of the tube.

Another object of this invention is to produce a closure that shall be so constructed that the parts can be readily cleaned and which will therefore remain sanitary.

A still further object of this invention is to produce a closure that will form a tight seal when it is in closed position and which will permit the material to be freely extruded when required.

The above and other objects of this invention, which will appear as the description proceeds, are attained by means of a construction and an arrangement of parts that will now be described in detail, and reference for this purpose will be had to the accompanying drawing in which the invention has been illustrated, and in which:

Fig. 1 is a side elevation of a collapsible tube showing the same provided with my improved closure;

Fig. 2 is a top view of the closure showing it in closed position;

Fig. 3 is a view similar to Fig. 2, but showing the closure in open position;

Fig. 4 is a section taken on line 4—4, Fig. 2; and Fig. 5 is a section taken on line 5—5, Fig. 3.

Numeral 1 represents a collapsible metal tube of the usual construction. After the tube has been filled, the lower end is pressed together and secured by means of a metal strip 2. The upper end of the tube is formed with a dispensing neck 3, which is usually integral with the tube. The neck has an opening 4 that communicates with the interior of the tube and opens at the top to one side of a diameter. The opening is preferably inclined with respect to the axis of the tube and neck somewhat, as shown in Figs. 4 and 5 with the result that when the tube is squeezed the contents will be extruded in an outwardly inclined direction as indicated by dot and dash lines in Fig. 5. The neck is provided with a short cylindrical zone 5 whose outer surface is threaded. That portion of the neck which lies between the lower end of the threaded zone and the top of the tube has been designated by numeral 6 and the upper end of this surface forms a shoulder to which reference will be made later. The metal about the upper end of opening 4 is raised as indicated at 7.

Secured to the neck is a cap having a cylindrical portion 8 whose inner surface is threaded and adapted to engage with the threads on the outer surface of zone 5. A knurled flange 9 surrounds the cylindrical portion 8 for convenience in turning the cap, although this is unnecessary as far as this invention is concerned. The lower end 10 of wall 8 is smooth on the inside and is crumpled inwardly so as to project into the recess 6 and so that it will engage the shoulder at the lower end of the threaded zone for the purpose of preventing the cap from being removed. When the cap is in sealing position, it occupies the position shown in Fig. 4, from which it will be seen that the inside of the cover is provided with a semi-circular recess 11 in which is located the cork pad 12. Recess 11 is so located that it will be directly over the opening 4 when

the cap is screwed down tight and the projection 7 will therefore embed itself in the cork so as to form an effective seal. The end of the neck and the cap are formed with cut away portions 13 and 14 that register with each other when the cap is in closed position, as shown in Figs. 1, 2 and 4. The end of the neck has a concave surface 13 that may extend to a diameter but which is preferably a segment that is less than a semi-circle. When material is to be dispensed from the tube the cap is turned in a direction in which it is moved upwardly by the action of the threads until the flange 10 engages the shoulder and prevents further rotation. By the simple expedient of putting the cap in the position shown in Figs. 3 and 5 and then crimping the lower end thereof the cap will come to a stop in the same position whenever it is opened. The parts are so proportioned that the cap requires to be turned through 180 degrees only from fully closed to fully open position, but the cap can be turned somewhat more or less without impairing the operation.

Let us assume that the collapsible tube is provided with the closure described and that it is empty. To fill the tube the cap is rotated to open position, Fig. 5, and the material is then introduced through the open bottom; when the material begins to discharge through opening 4 the tube is full and the lower end is then closed and sealed; the cap is then turned to the position shown in Fig. 4 and the cap wiped clean. After the tube has been filled and it is desired to dispense some of its contents, the cap is rotated to the position shown in Fig. 5 and pressure applied to the tube, whereupon the material will be forced out. Owing to the inclined position of opening 4, the material will assume the position shown in Fig. 5. After the required amount of material has been extruded the cap is rotated to closed position and the sharp edge 15 of the cap shears the paste and the latter can then be removed by moving the tooth brush over the surfaces 13 and 14. Owing to the fact that the surfaces 13 and 14 are so fully accessible, the parts can be kept clean and in sanitary condition, as distinguished from similar devices where the end of the cap has a hole that registers with an eccentrically positioned opening in the neck.

Hole 4 may be of any suitable cross sectional shape and is preferably inclined, as shown, at some angle between 5 and 85 degrees. The threads are preferably of steep pitch so as to give considerable longitudinal movement for each rotation of the cap and the lower locking flange 10 may be formed from separate lugs if desired.

From the above it will be apparent that I have produced a simple closure for collapsible tubes, which is so constructed that

it can be opened and closed by rotating the cap through one half a turn and in which the parts are so shaped that the closure can be kept clean at all times.

Having described the invention, what is claimed as new is:

1. In a device of the type specified, in combination, a collapsible container, one end of which is provided with a neck having a passage extending therethrough, the neck having a cylindrical zone of larger diameter than the parts directly above and below, the outer surface of the zone being threaded, the end surface of the neck being cut away on one side of a diameter so as to form an inclined surface, the passage extending through the neck on the side opposite from the cut away portion, and a cover secured to the neck, the cover having a cylindrical portion threaded on its inner surface, a portion of the top of the cover being cut away, so that the cut portions form a continuation of the inclined surface of the end, and means for limiting the rotating of the cover in both directions.

2. A closure for a collapsible tube comprising, a neck portion having a cylindrical zone whose outer surface is threaded, the portion directly below the threaded surface being of smaller diameter, the end of the neck portion directly above the threaded zone being cut away on one side of a diameter so as to form an inclined surface, the neck having an opening that terminates in that portion of the end opposite the inclined surface, and a cup shaped cover enclosing the neck, the inner surface of the cover being threaded for engagement with the threaded surface of the zone, a portion of the top and side of the cover being cut away so that the cut edges in one position form extensions of the inclined surface on the end of the neck, the cover having portions of its lower edge bent inwardly so as to engage the reduced portion beneath the threaded zone and form a stop that limits the outward movement of the cap.

3. A closure for a collapsible tube comprising a neck portion having a cylindrical zone whose outer surface is threaded, the portion directly below the threaded surface being of smaller diameter, the end of the neck portion directly above the threaded zone being cut away on one side of a diameter so as to form an inclined surface, the neck having an opening that terminates in that portion of the end opposite the inclined surface, a cup shaped cover enclosing the neck, the inner surface of the cover being threaded for engagement with the threaded surface of the zone, the inner surface of the end of the cover having a depression, a portion of the top and side of the cover being cut away so that in one position the cut edges form extensions of the inclined surface on the end of the neck, the cover having portions of its lower edge bent inwardly so as to engage the reduced portion

beneath the threaded zone and form a stop that limits the outward movement of the cap and a gasket located in the depression in the inner surface of the remaining portion of the
5 end of the cover and adapted to be moved against the outer end of the neck to close the opening therein.

4. A closure for a collapsible tube comprising a neck portion having a cylindrical
10 threaded zone, that portion between the lower end of the threaded zone and the top of the tube being of reduced outside diameter whereby a shoulder is formed below the threaded zone, the neck extending above the threaded
15 zone, the end of the neck being cut away on one side of a diameter so as to form an inclined surface, the neck having an opening on the side opposite from the inclined surface, and a cup-like cap having the inner surface of its
20 cylindrical portion threaded to engage the threads on the threaded zone, a portion of the top and the side of the cap being cut away, the cut surfaces when the cap is in open position coinciding with the inclined
25 end surface, the lower end of the wall of the cap being bent inwardly so as to engage the shoulder beneath the threaded zone when the cap is rotated in one direction.

5. A closure for a collapsible tube comprising a neck portion having a cylindrical zone,
30 that portion between the lower end of the cylindrical zone and the top of the tube being of reduced outside diameter whereby a shoulder is formed below the threaded zone, the
35 neck extending above the cylindrical zone, the end of the neck being cut away on one side of a diameter so as to form an inclined surface, the neck having an opening on the side opposite from the inclined surface, a cup-like cap
40 having the inner surface of its cylindrical portion in rotatable engagement with the cylindrical zone, a portion of the top and the side of the cap being cut away, the cut surfaces when the cap is in open position coinciding with the inclined end surface, the
45 lower end of the wall of the cap being bent inwardly so as to engage the shoulder beneath the zone when the cap is rotated in one direction, the upper end of the neck having a raised
50 portion adjacent the opening and the inner surface of the end of the cap having a gasket adapted to be brought into contact with the raised portion to form a seal.

In testimony whereof I affix my signature.

WALTER B. STEWART.