June 30, 1953 R. PERKINS 2,643,794

SELF-SEALING COLLAPSIBLE TUBE

Filed June 17, 1948

Fig. 1.

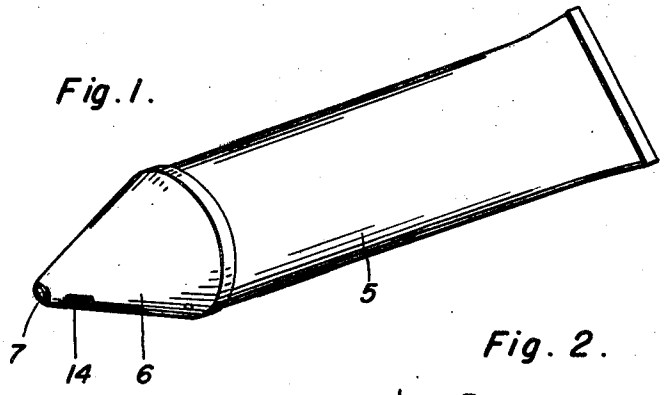
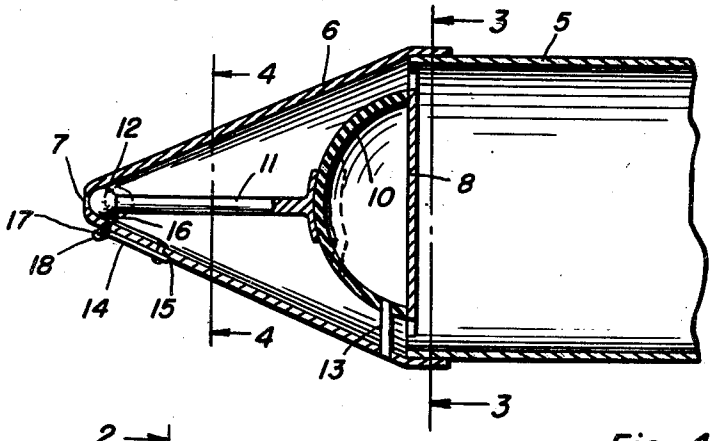


Fig. 2.



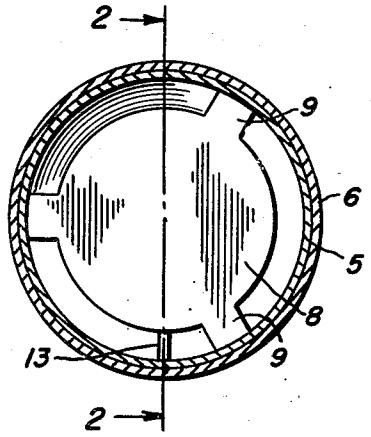
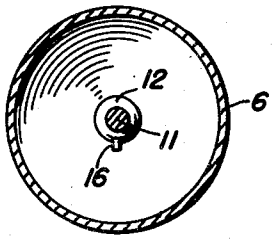


Fig. 3.

Fig. 4.



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SELF-SEALING COLLAPSIBLE TUBE

Roscoe Perkins, Fort Smith, Ark.

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3 Claims. (Cl. 222—92)

1

The present invention relates to new and useful improvements in collapsible tubes and more particularly to a self-sealing valve or closure for the tube.

An important object of this invention is to provide a self-sealing valve for collapsible tubes such as are used for containing toothpaste, shaving cream and the like and embodying means for automatically closing the valve and holding the valve in its closed position and in which the valve is responsive to internal pressure subjected to the tube when squeezing the tube to open the valve.

A further object of the invention is to provide an automatically controlled valve mounted in the neck of the tube to immediately seal the tube upon release of pressure from the contents of the tube and also to permit the valve to immediately open when pressure is brought to bear upon the contents of the tube.

A further object of the invention is to provide means for locking the valve in its closed position.

A still further object is to provide a device of this character of simple and practical construction, which is efficient and reliable in use, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of a collapsible tube embodying the present invention;

Figure 2 is an enlarged fragmentary longitudinal sectional view of the neck of the tube showing the valve positioned therein; and

Figures 3 and 4 are transverse sectional views taken respectively on the lines 3—3 and 4—4 of Figure 2.

Referring now to the drawings in detail wherein for the purpose of illustration I have disclosed a preferred embodiment of the invention the numeral 5 designates a collapsible tube such as used for dispensing toothpaste, shaving cream or similar material and provided with a conical neck 6 suitably secured to one end of the tube, the neck being constructed of rigid material and having a discharge opening 7 in its outer end.

A rigid circular plate or disc 8 is secured in the tube 5 adjacent the inner end of neck 6 by means of a plurality of tabs or tongues 9 projecting outwardly from the edges of the plate and suitably secured internally of the tube to center the plate 8 in the tube spaced from the walls thereof.

2

A semi-spherical rubber or similarly compressible cup 10 is suitably secured at its edges to the outer surface of the plate 8 to position the cup in the neck 6 forwardly of the plate and to the center of the cup is suitably secured a rigid valve stem 11 having a ball valve 12 at its front end seated in the opening 7 on the inside of the neck.

A vent tube 13 extends from one side of the cup 10 outwardly through the neck 6.

In the operation of the device the rubber cup 10 is normally maintained in its expanded position as shown by the full lines in Figure 2 of the drawings whereby the valve 12 is forced forwardly to close the discharge opening 7 in the neck. When the tube 5 is collapsed by squeezing the same in the usual manner the contents of the tube is forced forwardly into the neck around the plate 8 and the pressure thereof subjected to the cup 10 will collapse or contract the cup as shown by the dotted lines in Figure 2 whereby to retract the valve 12 and discharge the contents of the tube through the opening 7. Upon releasing pressure on the tube 5 the cup 10 will automatically expand to its normal position to close valve 12, the cup being vented by a vent tube 13.

The valve 12 may be held in its closed position by means of a resilient latch plate 14 secured at one end to the neck 6 by a rivet or the like 15, the front end of plate 14 being bent angularly as shown at 16 and slidable through an opening 17 in the neck behind the valve 12 to hold the valve in its closed position. The front end of plate 14 is formed with a finger gripping lip 18 to retract the locking plate and free the valve for opening movement.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in the art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

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

1. A closure for collapsible tubes comprising a rigid neck on a tube having a discharge opening,

a compressible member supported in an internal centrally spaced apart relation with respect to the neck, a vent tube connected to the compressible member and leading outwardly through the neck to the atmosphere, and a closure member for the opening engaged with the compressible member and movable into an open position by internal pressure in the tube subjected to the compressible member to collapse the latter.

2. A self-sealing closure for collapsible tubes comprising a rigid neck for a tube, said neck having a discharge opening, a rigid plate supported in the tube with the edges of the plate spaced from the sides of the tube, a rubber cup secured at its edges to the front surface of the plate to close the cup, said cup being responsive to internal pressure in the tube to contract the cup, a stem projecting from the cup, and a closure head on the stem for said opening, said cup normally holding the closure in a closed position and opening the closure by a contracting movement of the cup, and automatically operable latching means carried by the neck and adapted for engagement behind the head for holding the head in its closed position.

3. A self-sealing closure for collapsible tubes comprising a rigid neck for a tube, said neck having a discharge opening, a rigid plate supported in the tube with the edges of the plate

spaced from the sides of the tube, a rubber cup secured at its edges to the front surface of the plate to close the cup, said cup being responsive to internal pressure in the tube to contract the cup, a stem projecting from the cup, and a closure head on the stem for said opening, said cup normally holding the closure in a closed position and opening the closure by a contracting movement of the cup, and automatically operable latching means carried by the neck and having one end projecting into the neck outwardly thereof behind the head to hold the head in a closed position.

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