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COLLAPSIBLE TUBE CLOSURE

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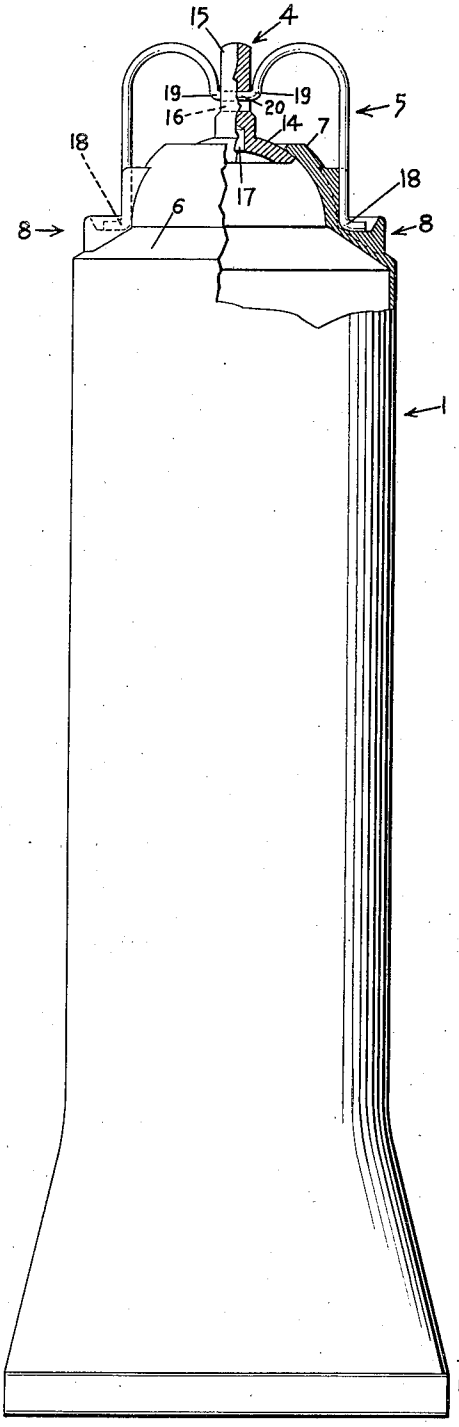


FIG. 1

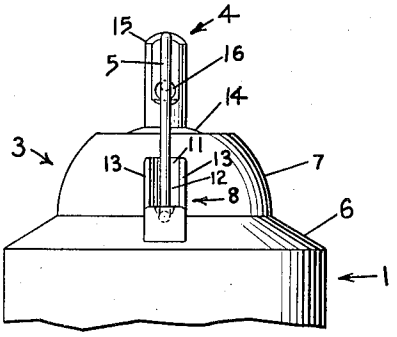


FIG. 2

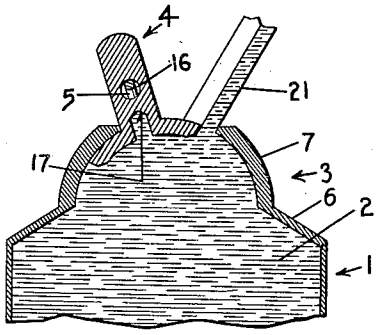


FIG. 3

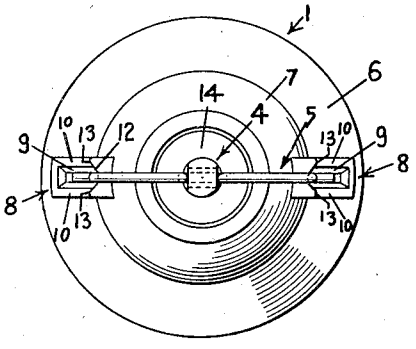


FIG. 4

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COLLAPSIBLE TUBE CLOSURE

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4 Claims. (Cl. 221—60)

My invention relates to closures, more particularly to closures for collapsible tubes ordinarily used for tooth pastes, shaving creams, and the like, and it consists in the combinations, constructions, and arrangements herein shown and described.

A primary purpose of my invention is to provide a closure of the type described which may be opened for the ejecting operation without removal of a part, such as the top on a tube of usual construction, thereby reducing the likelihood of loss of such part or cap.

A second object of my invention is to provide a closure of the type described which may be instantly opened and shut and retained in said positions by a simple mechanical operation.

A third object of my invention is to provide a device of the type described which, by requiring the use of a minimum amount of metal and only simple machining operations without the necessity of threading or other complex operations, will reduce the cost of manufacture to a minimum.

A fourth object of my invention is to provide a device of the type described which has few parts and does not get out of order easily.

Other objects and advantages will appear as the specification proceeds and the device will be more particularly defined in the appended claims.

My invention is illustrated in the accompanying drawing forming a part of this application in which

Figure 1 is an elevational view with parts thereof shown in section for clearness of illustration,

Figure 2 is a side elevational view of my device taken at right angles to the view of Figure 1, with the tube broken away,

Figure 3 is a longitudinal sectional view of the device showing the same in operative position, and

Figure 4 is a top plan view of the device.

In carrying out my invention I make use of an ordinary collapsible tube 1, which may contain tooth paste, shaving cream, or the like, 2. It is to the top of this tube that my device is attached. This closure comprises a body portion 3, a valve portion 4, and a valve control member 5.

The body portion 3 may be secured to the tube member 1 by any suitable means known in the art. It is equipped with a base part 6 and a spherical valve seat portion 7. Formed at the juncture of the base and valve seat portions and extending over parts of both of these elements are seats 8, consisting of horizontally extending caved-out portions 9 having walls 10 surrounding the same and vertically extending grooves 11 of V-shape formation in cross section, as indicated at 12 in Figure 4. This groove 11 is also bounded by vertically extending walls 13. The horizontally extending portions 9 of the seats 8 are situated on elements of the sphere forming the spherical valve seat 7. The purpose of these seats will soon be made clear.

The valve member 4 has a spherically formed valve member proper 14 adapted to seat in the portion 7 of the body part. At the upwardly extending portion 15 of the valve member 4 a horizontally extending slot 16 is formed. This slot is constructed of a diameter slightly in excess of the diameter of the wire forming the member 5, to facilitate assembly of the wire therein. The valve member 4 is hollowed out as shown at 17 in Figure 1 for facilitating assembly of the parts.

The member 5 which acts to retain the valve member in its seat in either the opened or shut position as will be later described, consists of a bent piece of wire or similar resilient material turned at its extremities as shown at 18 and bent at substantially its center as shown at 19 to form the rectilinearly extending horizontal part 20 in the center thereof. This resilient member is tensioned to exert upward pressure on the valve proper to retain the same in place and inward pressure on the walls of groove 11 for purposes that will soon be made clear.

From the foregoing description, the use and operation of my device is easily understood. The device is normally placed in the closed position as shown in Figures 1 and 2. When the operator desires to eject the paste or similar material from the tube, he simply uses his thumb or finger to exert pressure on the upstanding portion of the member 4, canting the valve member to either side of the seat members 8. The spring member 5 will be forced outwardly by a canting action exerted by the walls of the groove 11 during this motion of the valve member. The paste may then be ejected by squeezing the tube as indicated most clearly in Figure 3 at 21.

When the operator has ejected the paste and wishes to close the tube, he simply exerts a slight pressure on the upstanding portion of the valve member to return the same to the central closed position. This operation is facilitated by the inward curve of the slot 11 which curves towards the longitudinal center thereof and the coacting inward pressure of the spring member exerted thereon. In some cases, if the valve member is

not opened to any great extent, it will return to its closed position without aid of the operator.

The valve will be held in its seat at all times because of the positioning of the portions 18 of the resilient member on radii of the sphere on which the valve seat is formed.

The valve will have a tendency to return to its closed position at all times as stated above, due to the coaction between the resilient member and the walls of the groove 11.

The loops formed in the member 5 present an artistic appearance of my device and may be utilized to hang the same upon a nail or similar element.

It is thus seen that I have provided a closure for collapsible tubes and the like which does not require the removal of a part therefrom to open the same, thereby reducing to a minimum the liability of loss of a part such as a cap on ordinary tubes.

It is further seen that I have provided a closure of the type described which requires only a simple motion to accomplish the opening and closing functions.

It is still further seen that I have provided a device of the type described which will normally be retained in the closed or inoperative position.

It can also be easily understood that, due to the simplicity of the parts and the few machining operations required, cost of the device is reduced to a minimum.

I claim:

1. In a collapsible tube or the like, a valve seat having an opening, a valve member engageable with said valve seat and having a vertically extending member projecting through said opening, horizontally extending seats on the body of the tube beneath said valve seat, a vertically extending resilient member mounted in said seats and connected to said vertically extending member for maintaining the valve in seated position, and vertically extending seats engaging said resilient member to frictionally retain the same in a desired position.

2. In a collapsible tube a spherically-formed valve seat having an opening, a spherically formed valve member engageable with said valve seat and having a vertically extending member passing through said opening, a resilient member engaging with said vertically extending member and seats engageable with said resilient member, said seats being positioned on an element of the sphere on which the valve seat is formed whereby uniform tension is exerted upon said valve member in its various operative positions.

3. In a collapsible tube or the like a valve seat having an opening, a valve engageable with said valve seat and having a vertically extending member projecting through said opening, a resilient member engageable with said vertically extending member, and seats adjacent said valve seat for mounting said resilient member said resilient member mounting seats having walls extending inwardly and said resilient member being adapted to exert pressure inwardly against said resilient member mounting seats whereby said valve is normally urged to the closed position.

4. In a collapsible tube or the like a valve seat having an opening, a valve engageable with said seat and having a vertically extending member projecting through said opening, spring seats on either side of said valve seat, and a spring wire having its ends engaged with said last named seats and its median point with the vertically extending member to maintain the parts in position.

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