July 16, 1935. L. LOMBI 2,008,216

COLLAPSIBLE TUBE

Original Filed June 24, 1933

Fig. 1.

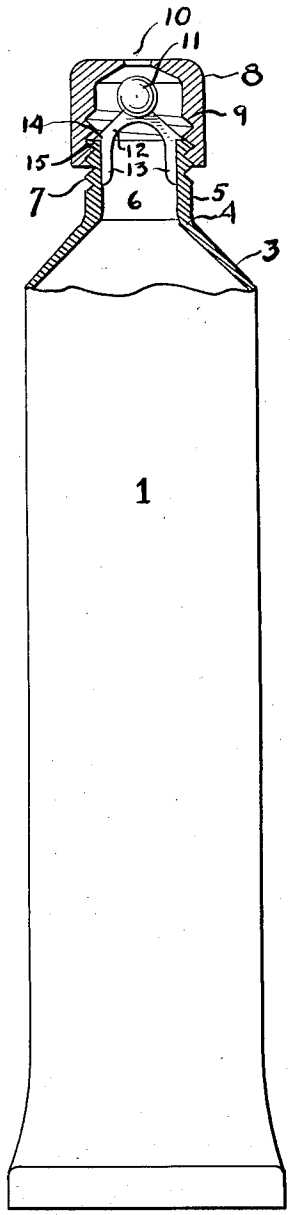


Fig. 2.

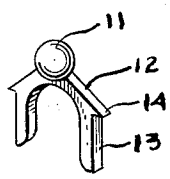
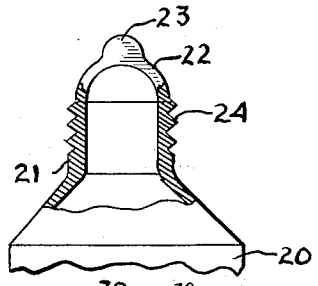


Fig. 3.



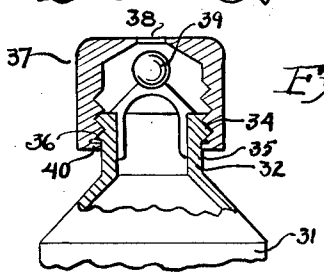


Fig. 4

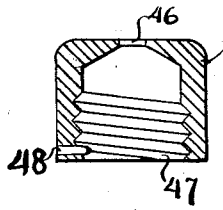


Fig. 5

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COLLAPSIBLE TUBE

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Application June 24, 1933, Serial No. 677,353
Renewed May 17, 1935

6 Claims. (Cl. 221—60)

This invention relates to collapsible tubes, and, more particularly to a collapsible tube provided with a valve cap which is adapted to permit quick opening and closing of the tube without necessitating the removal of the cap.

It is an object of the present invention to provide a collapsible tube with a valve cap which will perfectly seal the contents of the tube to permit packing, shipping, storing and handling and which can be opened and closed without requiring the usual removal of the cap.

It is another object of the present invention to provide a valve cap for a collapsible tube which opens and closes the tube by merely being turned and which is so secured to the tube that it cannot be detached and lost.

It is still another object to provide a valved collapsible tube which can be opened and closed by a slight turn and which can be maintained in a sanitary condition.

It is a further object of the present invention to provide a valved collapsible tube which has a simple construction, which is economical to manufacture, and which is inexpensive and available to all members of the public.

Other objects and advantages of the invention will become apparent from the following description taken in conjunction with the drawing, in which:—

Fig. 1 is an elevation view, partly in section of a collapsible tube embodying the present invention;

Fig. 2 is a perspective view of a part of the valve used in the collapsible tube illustrated in Fig. 1;

Figs. 3 and 4 are elevational views, partly in section and partly fragmentary, of modified embodiments of my invention; and

Fig. 5 illustrates a fragmentary view, partly in section, of a valve cap which cannot be completely unscrewed and detached from the collapsible tube.

Referring to the drawing, the reference character 1 designates a collapsible tube adapted to contain toothpaste, creams, and any other appropriate material. At the bottom of the tube a customary seal is provided while at the top of the tube the improved valve cap is located.

The tube is constituted of a thin wall 3 which tapers to a shoulder 4 and which terminates in neck 5. Within neck 5 is a passage 6 through which the contents of the tube are discharged. On the exterior of neck 5, a thread 7 is located. Satisfactory results may be obtained by the use of a heavy thread with a large pitch as shown in Fig. 1.

A cap 8 fits on the top of the tube to close and open the same. Within cap 8, an internal thread 9 is incorporated which mates with the external thread 7 of neck 5 and which enables the cap to be screwed upwardly and downwardly. When the cap is in its upper position, port 10 located in the head of the cap is open and the contents of the tube may be removed by collapsing the tube in the usual manner.

For closing the tube, cap 8 is moved to its lower position. In this position, port 10 coacts with valve 11 which is illustrated as of the ball type. The valve may be supported in any appropriate way but it is herein shown as mounted at the center of a narrow bridge 12. It is preferred to provide bridge 12 with a pair of legs 13 which make a frictional fit with the interior wall of neck 5. At the juncture of each leg and the bridge, a shoulder 14 is located to make contact with the top 15 of the neck and to prevent the valve from being forced into the tube.

By providing heavy threads with a large pitch, it is only necessary to turn the cap slightly in order to open or close the collapsible tube and it is unnecessary to remove the cap entirely as in conventional collapsible tubes.

In Fig. 3, a preferred embodiment of the invention is illustrated. An integral construction is utilized which may be formed during the manufacture of the collapsible tube. In this embodiment, a collapsible tube 20 has a neck 21 mounted at the top thereof. Projecting from the top of the neck and formed integral therewith is a narrow bridge 22. At the center of the bridge, a ball valve 23 is provided. On the exterior of neck 21, a thread 24 is provided to mate with the internal thread of cap (not shown). By utilizing the aforesaid integral construction, the use of separate parts is obviated. Of course, the valved collapsible tube functions the same as the one illustrated in Fig. 1.

Referring more particularly to Fig. 4, which illustrates another embodiment of the invention, reference character 31 designates a collapsible tube terminating in neck 32, which may be provided with a bridge and ball valve as shown in either Figs. 2 or 3. Around the upper portions of the neck, external threads 34 are located which project slightly beyond the exterior wall 35 of the neck. In this manner, a recess and shoulder 36 are formed below the threads. These threads mate with the internal threads of the cap 37 which has a port 38. A ball valve 39 is provided to coact with the port so as to close the tube when the cap is screwed down. In order to pre-

vent the cap from being completely unscrewed and detached from the collapsible tube, the lower portion of the cap is provided with an internally projecting lug 40 which makes contact with the shoulder 36. The lug may be made by upsetting the lower edge of the cap after it has been screwed on the tube.

When the cap is made of a plastic material such as bakelite it may be preferable to provide an inwardly projecting pin which may be fastened in the lower portion of the cap as is illustrated in Fig. 5. In this embodiment, reference character 45 represents the modified cap which is shown to be provided with internal threads 47 and port 46 located in the top thereof. In the lower skirt of the cap a pin 48 is fastened in some appropriate manner such as by a frictional fit, riveting, etc. The pin is adapted to engage the shoulder 36 of the neck when the valve is in its open position. In this manner, the cap may be provided with means for positively and absolutely preventing its removal and consequent loss.

It is to be observed that the present invention provides a collapsible tube which effectively and efficiently seals the contents of the tube, preventing the contents from leaking out, or being exposed to the air while permitting quick opening of the tube and removal of the contents.

It is likewise to be noted that the present invention provides a valve cap which permits the contents of a collapsible tube to be discharged without completely removing the cap.

With the aforesaid construction, it is impossible to lose or mislay the cap and to leave the contents of the tube exposed to the air with its accompanying trouble and annoyance to the user.

It is to be further observed that the present invention provides an improved collapsible tube which insures sanitary handling of the contents, and is free from the objection of having a recess in the port of the tube wherein the contents may lodge when the tube is closed and thus become hard, unclean, and in a condition tending to clog the port.

Although the present invention has been described in connection with certain preferred embodiments, it is to be observed that modification and variations may be resorted to, as those skilled in the art will readily understand. Modifications and variations are understood to be within the appended claims. Thus, a pyramidal or conical shaped valve may be substituted for a ball, the port may be lined with a yielding material, such as cork, soft metal, or the like or the port may be sealed shut for packing purposes which may be punctured by the user. Furthermore, in place of the inwardly projecting lug 40 or pin 48, an outwardly projecting lug may be provided on the neck adapted to coact with a stop on the cap which prevents the cap from being turned or unscrewed more than a certain fixed part of a revolution as one skilled in the art will readily understand.

I claim:—

1. A collapsible container comprising a tube, a neck at one end thereof, a bridge having a valve integral therewith, said bridge making a force fit with the internal periphery of the neck, shoulders on said bridge for preventing the same from being forced into said tube, a cap coacting with the neck, a port located at the top thereof adapted to coact with said valve to effect closure of the tube, and means for preventing the cap from being completely unscrewed.

2. A collapsible container comprising a tube, a neck at one end thereof, external threads thereon, a recess and shoulder around the neck below the threads, a bridge located at the mouth of the neck, shoulders on said bridge for preventing the bridge from being forced into the neck, a valve supported by said bridge, an internally threaded cap coacting with the neck, a port in the top of the cap adapted to coact with the valve when the cap is screwed down, to effect closure of the same, an internally projecting pin in the lower edge of the cap adapted to fit in the said recess formed by the threads of the neck, whereby the tube may be opened and closed by turning the cap without the complete removal of the same.

3. A closure for a collapsible tube which comprises a neck, a bridge fitting into said neck, shoulders on said bridge for preventing the same from being forced into said tube, a valve supported by the bridge, a cap adapted to coact with the neck of the collapsible tube, said cap having a port located in the top of the said cap adapted to coact with the valve to effect closure of the tube, and an internally projecting flange located around the lower portion of the cap adapted to prevent the cap from being completely removed.

4. In a collapsible tube having a valve closure comprising a bridge, a valve thereon, a plurality of legs adapted to fit into the neck of said tube and a plurality of outwardly projecting shoulders integral with said bridge adapted to seat on the mouth of the said neck and prevent the valve from being forced into said tube.

5. A closure for a collapsible tube having a neck, said closure comprising a bridged valve adapted to fit in the neck of said tube, shoulders on said bridged valve resting on the mouth of said neck, and a cap adapted to coact with the neck of said collapsible tube, said cap having a port located in the top of the said cap adapted to coact with the valve to effect closure of the tube.

6. A closure for a collapsible tube having a neck, said closure comprising a bridged valve fitting into said neck, outwardly projecting shoulders thereon for preventing the same from being forced into said tube, and a cap adapted to coact with the neck of said collapsible tube, said cap having a port located in the top of the said cap adapted to coact with the valve to effect closure of the tube, and means whereby the tube may be opened and closed by turning the cap without removing the same.

LOUIS LOMBI.