Sept. 23, 1924. 1,509,419

S. B. COLGATE ET AL

COLLAPSIBLE TUBE

Filed Dec. 17, 1923

Fig. 1.

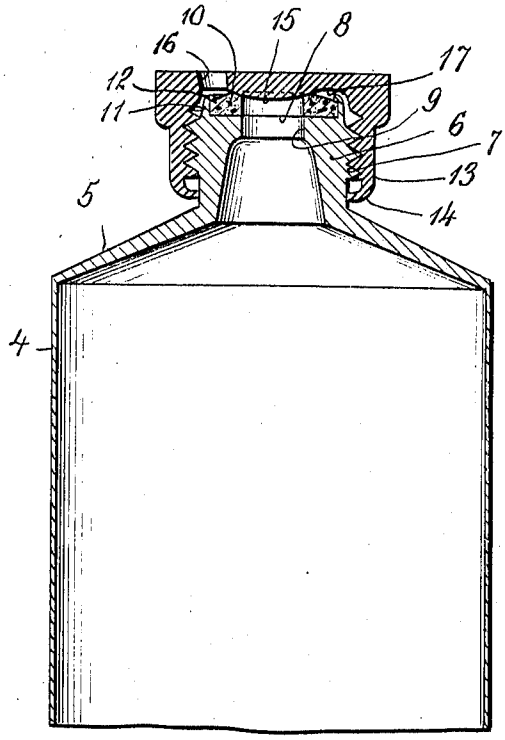


Fig. 2.

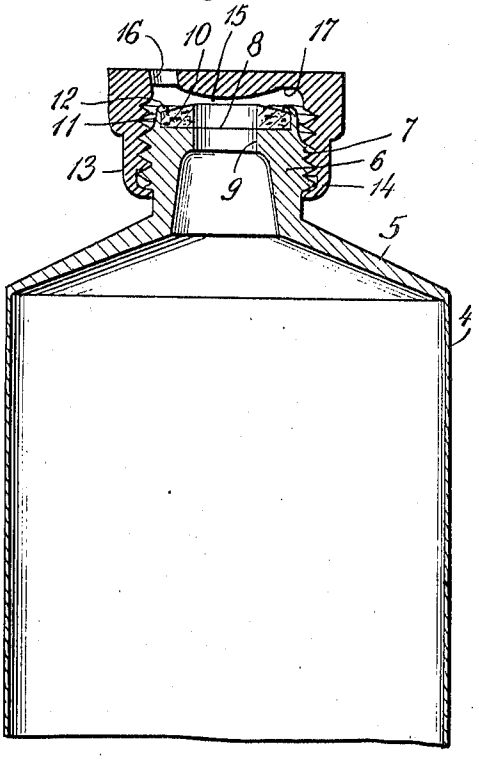
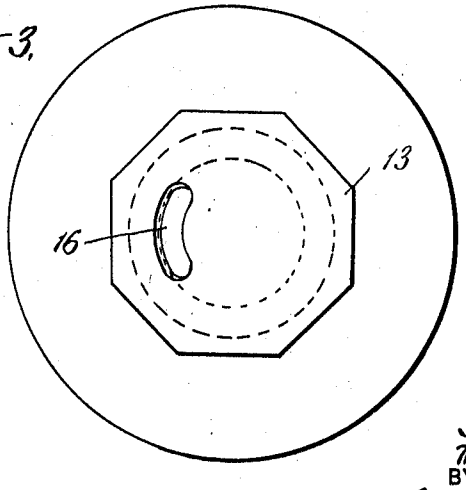


Fig. 3.



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Patented Sept. 23, 1924. 1,509,419

UNITED STATES PATENT OFFICE.

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COLLAPSIBLE TUBE.

Application filed December 17, 1923. Serial No. 681,067.

To all whom it may concern:

Be it known that we, SAMUEL BAYARD COLGATE and MARTIN HILL ITTNER, both citizens of the United States, and residents, respectively, of Orange, county of Essex, State of New Jersey, and Jersey City, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Collapsible Tubes; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to collapsible tubes commonly used for containing plastic or pasty materials which are to be discharged in small quantities from time to time. More specifically the invention is directed to the provision of a tube with a discharge nozzle which has an improved closure cap by which the orifice may be sealed so as to prevent contamination or accidental loss of the contents.

Collapsible containers of this type are in wide use at the present time for holding toilet creams, tooth paste, and the like, and these materials frequently have a tendency to become hard upon exposure to the air. It is, therefore, desirable to provide a closure which effectively seals the container when the latter is not in use, not only to prevent this hardening but also for sanitary reasons. Such a closure should close the container tightly and should be of such construction that it may be readily operated either to open or close the discharge orifice. These containers ordinarily consist of a tube of relatively soft metal, one end of which is permanently closed by a clip or other similar device after the tube has been filled. The other end of the tube is provided with a nozzle, through which the contents may be forced by collapsing the body of the tube. The closure for this nozzle frequently takes the form of a cap threaded on the nozzle and having a packing disc of some sort whereby the discharge orifice may be closed. The ordinary closure cap is objectionable because it must be completely removed from the nozzle to permit discharge, and consequently as the caps are quite small they are readily lost.

The present invention is intended to provide a tube of the type described which has a dispensing nozzle provided with a cap which is held permanently in position thereon but which is capable of adjustment so that the tube may be sealed or the contents expelled through the nozzle in the ordinary manner. This cap is also provided with a packing disc of an improved form by means of which the orifice may be tightly closed so as to prevent leakage when the tube is not in use.

The new tube has a nozzle of the usual type formed with slightly thickened walls so as to provide the desired amount of rigidity. This nozzle has screw threads extending beyond its external surface, these threads being spaced below the face of the nozzle. The cap is similarly threaded so that it may be screwed in place on the nozzle and its marginal edge is spun or turned inwardly so as to lie close to the wall of the nozzle and thus strike the threads and serve as a stop for the extreme outward movement of the cap. On the face of the nozzle is a packing washer having a central opening in registry with the orifice through the nozzle. This washer is held in place by means of a flange extending upwardly from the face of the nozzle around its periphery, the edge of the flange being turned inwardly so as to overlie and confine the edge of the washer. This washer is preferably somewhat conical in shape; that is, with a greater thickness adjacent its opening than at its periphery and the confinement of the periphery under the edge of the flange not only serves to hold the washer in position but also to compress its rim. The cap is formed with increased thickness at its center so as to provide a dome, the highest point of which is opposite the center of the orifice. Also the cap has an opening at one side of the dome. With this arrangement when the cap is screwed inwardly the dome will bear against the washer adjacent the opening and since the washer is slightly yielding the dome will make a tight contact and thus effectively seal the orifice. When the contents of the tube are to be discharged the cap will be screwed outwardly so that the dome clears the washer and thus when the tube is collapsed the contents will pass over the edge

of the washer and out through the opening in the cap.

That embodiment of the invention which is now preferred is illustrated in the accompanying drawings, in which—

Fig. 1 is a longitudinal cross-sectional view through a portion of the tube and the nozzle and cap, this figure showing the cap in sealing position,

Fig. 2 is a view similar to Fig. 1, with the cap freed from the washer so as to permit the discharge of the contents,

Fig. 3 is a top view showing the opening through the cap.

In these drawings the tube 4, formed of soft metal in the usual way, terminates at one end in a slightly conical portion 5 of increased thickness of wall, this conical portion terminating in a nozzle 6 provided with screw threads 7, extending beyond the outer wall thereof. These threads are spaced inwardly from the face 8 of the nozzle. The nozzle has a central orifice 9 through which material contained within the tube may be discharged, and lying on the face of the nozzle with its opening in registry with the orifice, is a packing washer 10 which may be of cork or other similar resilient material. Extending upwardly around the rim of the face is a flange 11 having an inturned margin 12 which overlies and confines the washer.

Threaded on the nozzle is a cap 13, the lower edge 14 of which is turned inwardly so as to lie close to the wall of the nozzle and thus the diameter of this lower edge is less than the diameter of the threads. Consequently when the cap is screwed outwardly to the position illustrated in Fig. 2 this inturned edge will bear against the threads and prevent the complete removal of the cap. The face of the cap, as at 15, is domed, the highest point of this dome lying opposite the center of the orifice and the surface of this dome will seat against the highest portion of the washer and thus close the orifice when the tube is to be sealed. The cap is also provided with an opening 16, preferably of elongated form, through which the contents of the tube may be discharged. The particular shape here illustrated provides a discharge opening through which the plastic material will flow in the form of a ribbon. It will be noted that the flange 11 has a slightly greater diameter than the dome and thus lies opposite a relatively thin portion of the cap as at 17. Thus, when the cap is forced downwardly to its extreme inward position the dome will bear against the packing washer and seal the orifice effectively, while the flange 11 lying opposite the thin portion of the cap will not come in contact with it. In this way the sealing of the cap is brought about entirely by contact of the dome with the washer and there is no likelihood of the metallic parts coming in contact and thus preventing a good contact between the dome and the washer.

It will be seen that the tube as thus described has many advantages. When it is in use there is no possibility of the cap being lost or mislaid and the tube may be quickly closed. The packing washer provides a tight seal and since the dome bears against the cap over a relatively small area there is little likelihood of the plastic material remaining on the washer in such a way as to permit leakage. Furthermore, the washer is tightly confined in place and the pressure exerted upon it by the cap will tend to hold it more firmly confined while the release of this pressure will have no tendency to cause the washer to be displaced. Also, with this arrangement there is no opportunity for the contents to enter between the washer and the face of the nozzle so as to prevent the dome from being firmly seated against the washer. The tube as described has the further advantage that it may be opened, the contents discharged, and the tube closed with one hand. This method of operation is a great convenience, especially when the contents of the tube are to be discharged upon a brush.

We claim:

1. A collapsible container comprising a tube with a nozzle having screw threads on its outer surface lying below the face thereof, a central orifice in the nozzle, a packing washer lying on the face of the nozzle and having its opening in registry with the orifice, a flange extending upwardly from the face of the nozzle around the rim of the washer and having an edge overlying this rim, a cap threaded on the nozzle, means on the cap for preventing its complete removal from the nozzle, a dome formed on the lower face of the cap in registry with the orifice, this dome being of less diameter than the circular flange, and an opening through the cap at one side thereof.

2. A collapsible container comprising a tube with a nozzle having screw threads on its outer surface, an orifice through the nozzle, a packing washer lying on the face of the nozzle around the orifice, a flange extending upwardly from the face of the nozzle and having an inturned edge overlying and compressing the rim of the washer so as to give the washer a greater thickness at its opening than at its periphery, a cap threaded on the nozzle and having a marginal edge of less diameter than the threads on the nozzle, a dome formed on the inner face of the cap and of less diameter than the flange on the nozzle, and an opening through the cap at one side of the dome.

3. A collapsible container comprising a tube of relatively soft metal with a nozzle having thickened walls, screw threads extending from the wall of the nozzle, a cen-

tral orifice in the nozzle, a packing washer lying on the face of the nozzle about the orifice, a central flange extending upwardly from the face of the nozzle about its periphery and having an inturned edge adapted to overlie and compress the washer, a cap threaded on the nozzle and having its marginal edge inturned so as to engage against the nozzle threads when the cap is screwed outwardly, a circular depression in the inner face of the cap forming a central dome, this depression having a diameter substantially equal to the diameter of the circular flange and being of sufficient depth so that when the dome seats against the washer the flange will be clear of the cap, and an opening through the cap at one side of the dome.

In testimony whereof we affix our signatures.

SAMUEL BAYARD COLGATE.
MARTIN HILL ITTNER.