

Sept. 5, 1944.

A. W. PRANCE
COLLAPSIBLE TUBE
Filed June 5, 1942

2,357,544

FIG. 1.

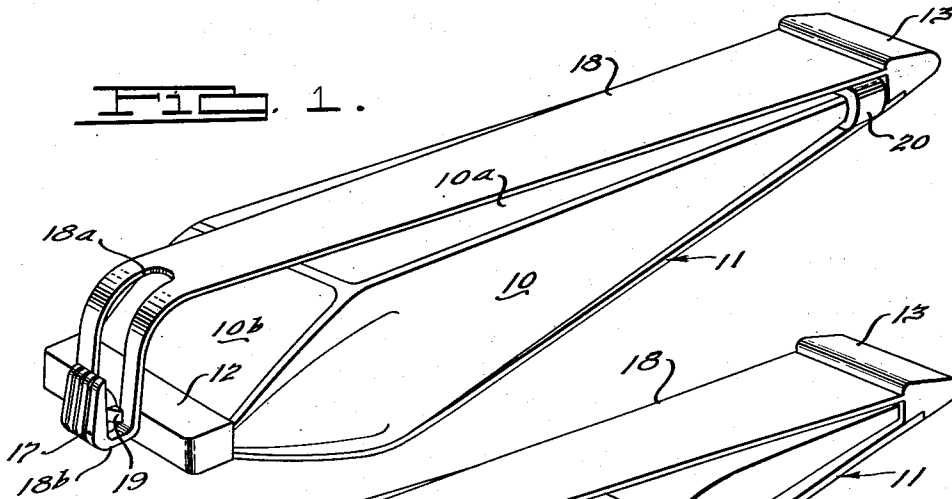


FIG. 2.

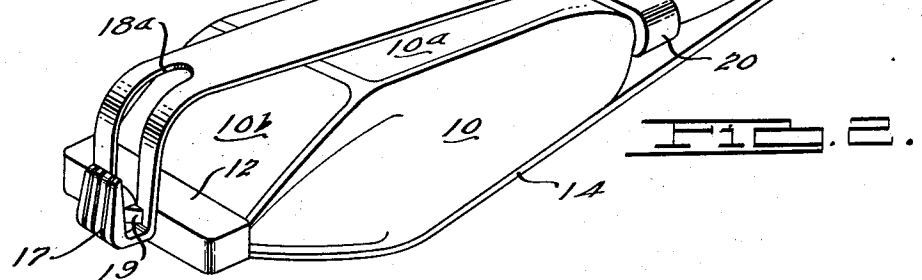


FIG. 3.

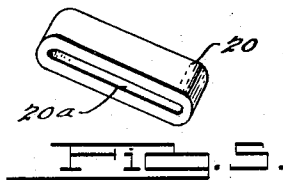
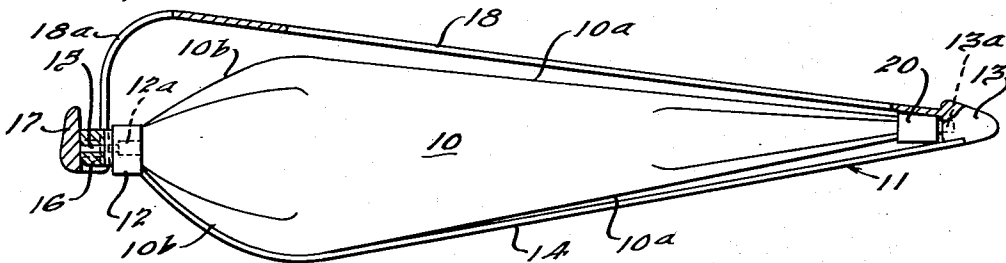
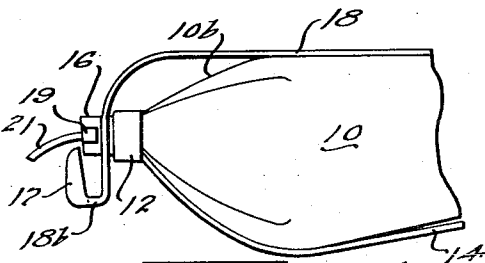


FIG. 5.

FIG. 4.



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COLLAPSIBLE TUBE

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6 Claims. (Cl. 222-96)

This invention relates to collapsible containers and particularly to a collapsible container, tube or the like having the walls thereof formed of a fibrous material treated with a liquid composition to stiffen the fibers therein and to impart a desirable flexibility or pliability to the material for the purposes of facilitating discharge of the tube contents.

Collapsible containers, such as tubes for various types of pastes or creams, are conventionally formed of a metallic material sufficiently pliable so that upon being squeezed or materially deformed the tube contents will be discharged. In order that these metal tubes may be easily squeezed or collapsed to discharge their contents, it is necessary to manufacture them with extremely thin metal walls which frequently crack or fracture due to manipulation and permit the paste contents to escape. In addition to the danger of contamination the use of metal in the fabrication of these tubes also has a disadvantage due to the fact that the tube walls retain their deformed shape and become extremely wrinkled and distorted rendering it difficult to discharge all of the contents. Satisfactory substitute material for the fabrication of such collapsible tubes has heretofore been sought, especially in the plastic field and the availability of such substitutes has become more desirable due to the shortage of metals employed in the manufacture of the tubes.

It has been found that a satisfactory substitute material may be produced by treating fibers or fibrous material with a liquid composition, such as a resinous plastic material. This substitute material has been found to be satisfactorily pliable to permit discharge of the tube contents by squeezing and also sufficiently inert to eliminate any danger either of contaminating the tube contents or of the chemicals used in the various creams or pastes attacking or chemically reacting with the plastic composition used in treating the fabric material of which the tube is formed. However, in attempting to use this substitute material difficulty has been encountered in insuring complete discharge of the contents.

It is, therefore, an object of the invention to provide a collapsible container formed of a fibrous material impregnated or coated with a plastic composition and a frame connecting the ends of the container together so that the container may be readily collapsed and the contents completely discharged without longitudinal deformation of the container.

It is another object of the invention to provide a collapsible container for flowable substances or the like and a frame or holding means to support the container comprising a fibrous material having its fibers stiffened by a treatment with a liquid composition, and means provided inde-

pendent of said holding means to assist in the removal of the substances from the container.

It is a further object of the invention to provide a collapsible container for flowable or paste-like substances in which the walls of the container are formed of a fibrous material treated with a liquid or plastic composition to stiffen the fibers therein, a frame or holding means being provided to support the container and a means associated with the frame arranged in such manner as to permit manipulation to control the discharge of the container contents.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawing forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a view in perspective illustrating a collapsible tube embodying the invention.

Fig. 2 is a view in perspective similar to Fig. 1 showing the tube in use after partial discharge of the contents.

Fig. 3 is an elevated view partly in section of the tube shown in Fig. 1.

Fig. 4 is a fragmentary view in elevation showing the contents being discharged from the tube.

Fig. 5 is a perspective view illustrating the discharge slide.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawing, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

The collapsible container illustrated in the drawing comprises generally a wedge-shaped body 10 having oppositely tapered portions 10a and 10b. The container body 10 may be formed of a fibrous material, such as silk, rayon, broadcloth, etc., made leakproof and stiffened by a coating of resinous plastic composition applied to the surfaces thereof by any suitable process well known in the art. The fibrous material is preferably immersed in a bath of liquid resinous composition so as to thoroughly impregnate the fibers thereof. After treatment the material remains sufficiently flexible or pliable to provide a satisfactory material for use in the fabrication of collapsible containers.

The container body 10 is supported within a holding or dispensing frame generally designated at 11 which comprises two sealing members or end pieces 12 and 13 preferably formed of a hardened resinous plastic composition. The sealing members or end pieces are provided, respectively,

with slots 12a and 13a, as shown in Fig. 3, which are adapted to receive the tapered ends 10a and 10b of the container body 10. The tapered ends may be secured and sealed within the slots 12a and 13a of the sealing members 12 and 13 in any suitable manner well known in the art.

The end pieces 12 and 13 are further interconnected by a longitudinally extending distance bar or member 14 shaped, as shown in Fig. 3, to conform generally to the tapered walls 10a and 10b of the container body 10. The distance member 14 may be formed of a hardened resinous plastic material or it may be formed of metal and secured at its opposite ends to the inner edges of the sealing members 12 and 13 in any suitable manner. The distance member 14 as shown is of the same width as the width of the end pieces 12 and 13. It should be understood, however, that the width of the member may be varied as desired. It is also important to note that the distance member 14, together with the end pieces 12 and 13 form the carrying frame for the container body 10 and hold the container body against deformation in a longitudinal direction.

At its forward end the tapered portion 10b of the container body 10 is secured within the end piece 12 and is provided with a narrow opening (not shown) communicating with the slot 12a which in turn communicates with an opening 15 extending centrally through a nozzle 16 integrally formed as a part of the end piece 12.

The outer end of the nozzle 16 is normally sealed by a slidable capping or closure member 17 which is integrally attached to an L-shaped spring member 18. The spring member 18, normally under outward tension, may be formed of a resinous plastic material or of metal and is secured at one end in any suitable manner to the end piece 13. The spring member 18 may be formed as an integral extension of the end piece 13. Adjacent its opposite end the spring member 18 is provided with a centrally disposed slot 18a, the inner edges of which are adapted to straddle and slidingly contact the outer side surfaces of the nozzle 16. Stop members 19 integrally formed with and located upon opposite sides of the nozzle 16 are adapted to bear against the shoulder 18b of the spring member 18 to limit the outward movement of the spring member.

A shiftable slide bar or discharge slide 20 preferably formed of a hard resinous plastic material embraces the tube or container 10. This slide is provided with a transversely extending opening or slot 20a adapted to receive the flattened end of the container body 10 adjacent the end piece 13. Thus, as illustrated in Fig. 2, the discharge slide may be manually shifted from the end piece 13 toward the end piece 12 as the contents of the container are extruded or discharged.

To use the collapsible container to extrude the contents therein manual pressure may be exerted on the spring member toward the container body 10 to effect a release of the slidable capping member 17. Upon slight additional pressure the spring member contacts the surfaces of the container as shown in Fig. 4, thus causing the contents 21 of the container to flow evenly out of the opening 15. Upon releasing the spring member 18, the capping member 17 moves upwardly across the opening 15 into capping position. The capping or closure member 17 will

tightly seal the discharge opening in the nozzle by reason of the fact that the end face of the nozzle and the coating face of the closure 17 are tapered or wedge shaped, as illustrated. As the contents of the container are extruded, the shiftable slide bar 20 may be moved manually forward from the end piece 13 toward the end piece 12, thus preventing backflow of the contents to the rear of the container and insuring a substantial body of the contained material adjacent the opening 15 of the container.

I claim:

1. A collapsible tube having an outlet at its front end, a pair of transverse members secured to the ends of the tube, one of said members having a fixed outlet registering with the outlet in the tube, a spring bar secured to the member at the rear end of the tube and provided with a closure slidable upon the member at the front end of the tube into and out of position to close said outlets.

2. A collapsible tube having an outlet at its front end, a pair of transverse members secured to the ends of the tube and sealing the same, one of said members having a fixed outlet registering with the outlet in the tube, a spring bar secured to the member at the rear end of the tube and provided with a closure slidable upon the member at the front end of the tube into and out of position to close said outlets.

3. A collapsible tube having an outlet at its front end, a pair of members sealing the front and rear ends of the tube, the front member having a projecting neck provided with an outlet registering with said first named outlet, a spring bar connected at one end to the rear member, the opposite end of the bar being slotted to embrace said neck and having a closure movable with the bar into and out of position to close said outlets.

4. A collapsible tube having an outlet at its front end, a pair of members sealing the front and rear ends of the tube, the front member having a projecting neck provided with an outlet registering with said first named outlet, a spring bar connected at one end to the rear member, the opposite end of the bar being slotted to embrace said neck and having a closure movable with the bar into and out of position over the end of said neck to close said outlets.

5. A collapsible tube having an outlet at its front end, a pair of members secured to the front and rear ends of the tube, the front member having a projecting neck provided with an outlet registering with said first named outlet, a spring bar connected at one end to the rear member, the opposite end of the bar being slotted to embrace said neck and having a closure movable with the bar into and out of position to close said outlets.

6. A collapsible tube having an outlet at its front end, a pair of members secured to the front and rear ends of the tube, the front member having a projecting neck provided with a passage therethrough permanently communicating with said outlet, a spring bar connected to the rear member and extending longitudinally along the tube and provided with an angular portion slotted to slidingly embrace said neck, said portion terminating in a closure spaced therefrom and shiftable across the end of said neck to open or close said passage.

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