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COLLAPSIBLE TUBE

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Fig. 1.

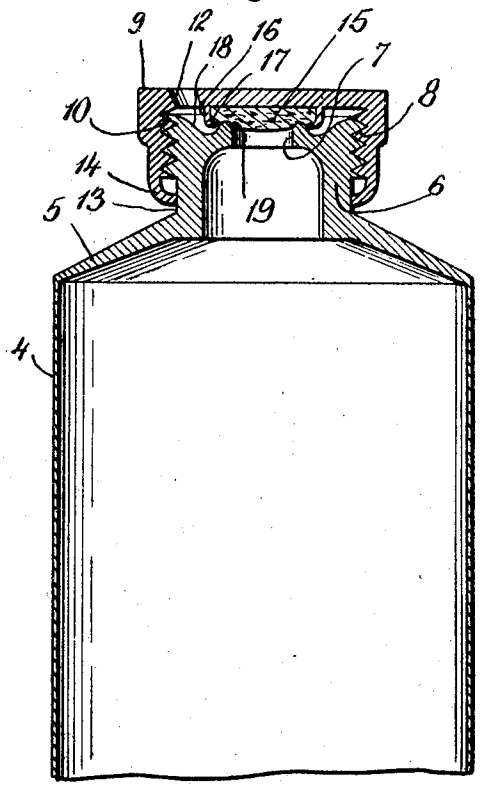


Fig. 2.

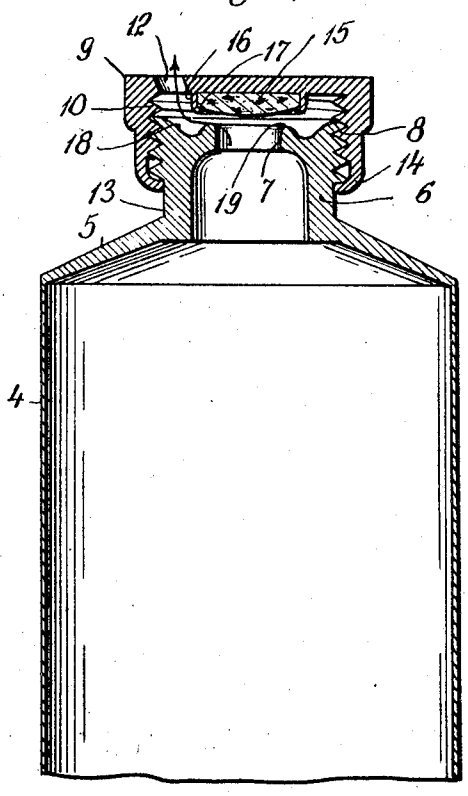
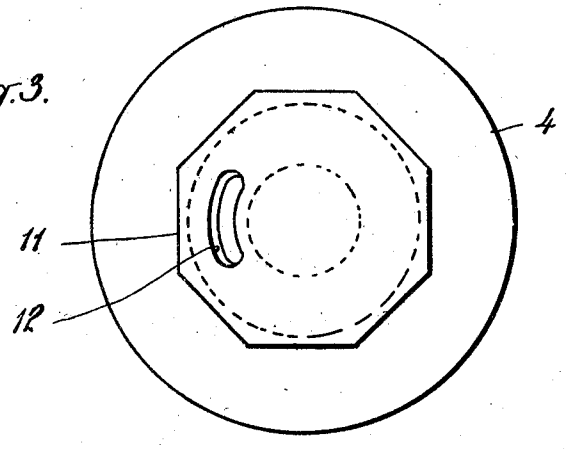


Fig. 3.



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UNITED STATES PATENT OFFICE.

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COLLAPSIBLE TUBE.

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To all whom it may concern:

Be it known that I, MARTIN HILL ITTNER, a citizen of the United States, residing at Jersey City, in the county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Collapsible Tubes; and I 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 is constructed of soft metal in the usual form and at one end terminates in a nozzle. The walls of the nozzle and of the tube at the nozzle end are of slightly increased thickness so as to provide rigidity and the other end of the tube is closed with the usual clip after the contents have been placed in it. The nozzle extends some distance beyond the end of the tube and is threaded on its external surface. A cap is then threaded on the nozzle and the marginal edge extends beyond the threads and is spun or pressed inwardly so as to lie close to the wall of the nozzle so that when the cap is screwed outwardly the inturned edge will engage the threads and so prevent the cap from being entirely removed. The nozzle has a central orifice through which the contents of the tube may be discharged and the face of the nozzle, which is annular, is provided with a depression so as to form an up-standing seat adjacent the orifice. The cap carries a circular flange on its inner face and a packing washer such as cork or other similar material, placed in this flange prior to the threading of the cap on the nozzle and the edge of the flange is then turned in over the edge of the disc so as to overlie and slightly compress this edge. This circular flange lies opposite the depression in the face of the nozzle so that when the cap is screwed inwardly this disc will bear against the circular seat formed in the face of the nozzle and the flange will extend a slight distance into the depression. The cap is also provided with an opening, preferably of elongated shape, located at one side and communicating with the depression.

With this arrangement it is possible to screw the cap down so as to force the packing disc tightly against its seat without possibility of the flange by which the packing disc is held striking against the nozzle itself. The line of bearing of the disc against the seat is located quite close to the inwardly turned portion of the flange so that the pressure of the seat against the disc is ap-

plied close to the rim of the disc and therefore quite near that portion of the disc which is under compression. The compression of the inwardly turned portion of the flange exerted upon the disc increases the resiliency of the latter, and repeated seating of the disc will, therefore, have less tendency to give the disc a permanent set than would be the case if the disc were unconfined near the region of the application of pressure. This manner of mounting the disc with its periphery confined also prevents any possibility of the disc working loose from the holding means and further prevents any of the paste within the tube from working under the edge of the disc and thus preventing a tight sealing of the tube. This new method of constructing the tube and cap, therefore, not only permits the tube to be effectively sealed but the contents may be readily discharged without the complete removal of the cap and loss of the cap is thereby obviated. Also, the manipulation of the cap may be performed by one hand, which is a great convenience when the contents are to be discharged upon a brush.

In the accompanying drawings I have illustrated that embodiment of the invention which is now preferred, and in these drawings,

Fig. 1 is a cross-sectional view of the end of the tube showing the cap in place to seal the tube,

Fig. 2 is a view similar to Fig. 1 but showing the cap displaced so as to permit discharge of the tube contents,

Fig. 3 is a top view of Fig. 1, showing the discharge opening through the cap.

Referring now to these drawings, the body of the tube is designated as 4, and this is constructed of a thin soft metal, which may readily be collapsed or rolled up in the usual way so that the contents are discharged. The tube terminates at the nozzle end in a conical portion 5 of increased thickness of wall, this conical portion in turn terminating in a nozzle 6, also made quite rigid by providing walls of increased thickness. The nozzle is provided with a central orifice 7 through which the contents of the tube may be expelled and on its external surface are formed screw threads 8.

The cap 9 is internally threaded as at 10 and its outer upper surface is preferably made polygonal, as at 11, so that the cap may be readily grasped and turned one way or the other. Also at one side the cap has an opening 12 preferably made in an elongated shape so that the contents of the tube will be discharged in a somewhat ribbon-like form. It will be noted that the threads 8 formed on the cap project beyond the surface 13 which thus provides a channel extending around the wall of the nozzle below the threads. The rim 14 of the cap extends downwardly beyond the threaded portion thereof and this rim is turned or spun inwardly so as to lie closely adjacent to the wall of the nozzle below the threads, entering the channel 13. This rim, it will be noted, lies spaced a considerable distance from the lowermost thread when the cap is in a position to close the orifice, as illustrated in Fig. 1, and this spacing of the rim from the threads permits the cap to be screwed outwardly to a distance sufficient to permit the packing disc, later to be described, to be completely unseated from the orifice but the engagement of the rim with the threads prevents the cap from being completely removed from the nozzle.

Located centrally on the under face of the cap is a packing disc 15 made preferably of cork or other similar, somewhat resilient material. The cap has a circular flange 16 which extends downwardly from its inner face and the disc is of a size which permits it to be slipped within this flange with a close fit. The outer edge 17 of the flange is then turned inwardly so as to overlie and slightly compress the rim of the disc. The face of the nozzle will be seen to have a depression 18 spaced a short distance from the orifice and this depression has such a shape as to form a comparatively narrow seat 19 located closely adjacent to the orifice. This seat is of slightly smaller diameter than the packing disc so that the flange 16 lies opposite the depression and will enter it when the cap is screwed downwardly to force the disc against the seat. It will be seen from an examination of Fig. 1, that the seat engages the disc quite close to the compressed portion of the disc and the compression which serves to prevent the disc from coming loose from the cap also acts to give the disc a greater degree of resilience along the line at which contact is made with the seat; that is, this confining pressure acts to compress the fibres of the disc so that repeated seating of the latter will not tend to cause a permanent set which would result in the formation of a depression in the face of the disc along the line where the seat bears against it.

When the tube is in use, the cap will be screwed outwardly until the rim 14 bears against the threads thus preventing further movement. The disc is now spaced a short distance from its seat and when the tube is collapsed in the usual way the contents will be discharged through the orifice thence through the opening 12. When a sufficient amount of material has been discharged the cap will be screwed down as shown in Fig. 1, so as to force the disc against its seat and thus tightly close the orifice 7. The tube may then be handled without possibility of

accidental discharge of its contents and it will also be seen that when it is in use the impossibility of completely removing the cap from the nozzle avoids the inconvenience resulting from the loss of the cap. In addition to the several advantages above pointed out, the new tube is inexpensive to manufacture and performs the desired function without the use of additional wires or other devices frequently used to secure the cap to the tube. The manipulation of the cap to open or close the tube is easy and may be done by the thumb and forefinger of one hand while the tube is held in the palm by the other fingers. This is a great convenience when a small amount of the contents is to be discharged upon a brush.

I claim:

1. A collapsible container comprising a tube with a nozzle having screw threads formed on the external surface thereof, a central orifice in the nozzle, a depression in the face of the nozzle spaced from the orifice to form a seat, a cap threaded on the nozzle, means on the cap engaging the nozzle to prevent complete removal of the cap, a circular flange on the inner face of the cap, a packing disc lying within the flange, the latter having an inturned edge overlying the rim of the disc, and being positioned opposite and adapted to enter the depression when the disc is against the seat, and an opening through the cap communicating with the depression.

2. A collapsible container comprising a tube having a nozzle at one end, screw threads formed on the external surface of the nozzle, a channel formed around the nozzle below the threads, a central orifice in the nozzle, a depression in the face of the nozzle spaced from the orifice to form a narrow seat, a cap threaded on the nozzle and having an inturned edge entering the channel, a packing disc mounted on the inner face of the cap above the orifice, a circular flange extending from the inner face of the cap about the disc and having an inturned edge overlying and compressing the edge of the disc, the flange being positioned opposite and adapted to enter the depression close to the seat when the disc is seated thereon, and an opening through the cap near one edge thereof.

3. A collapsible container comprising a tube of relatively soft metal and having a nozzle, screw threads extending outwardly from the face of the nozzle, a central orifice in the nozzle, a depression in the face of the nozzle surrounding the orifice and forming a narrow seat, a cap threaded on the nozzle and having an inturned rim of less diameter than the threads, a circular flange extending from the inner face of the cap with its center in the axis of the orifice, and having a diameter substantially equal to that of the depression, a cork disc lying within the flange, the flange having an inturned edge overlying and compressing the rim of the disc, this edge terminating close to the line of bearing of the disc against the seat, and an opening through the cap near one edge thereof.

In testimony whereof I affix my signature.

MARTIN HILL ITTNER.