June 29, 1926. 1,590,822

H. M. HEATH

COLLAPSIBLE TUBE

Filed Jan. 4, 1923

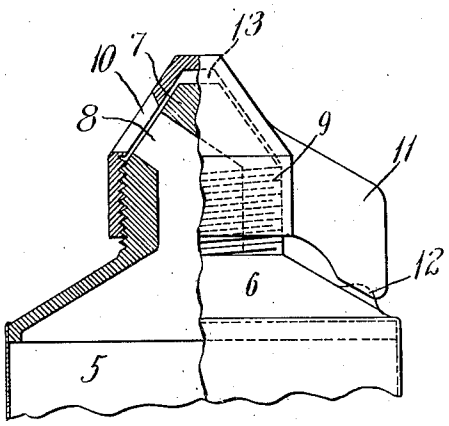


Fig. 1.

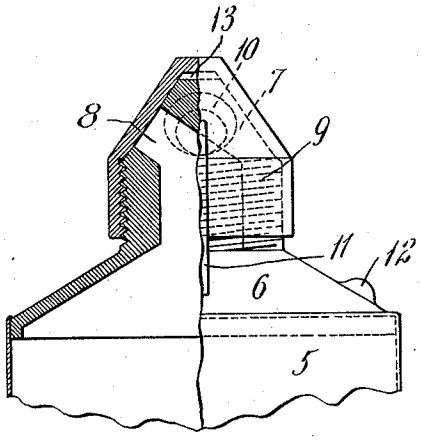


Fig. 2.

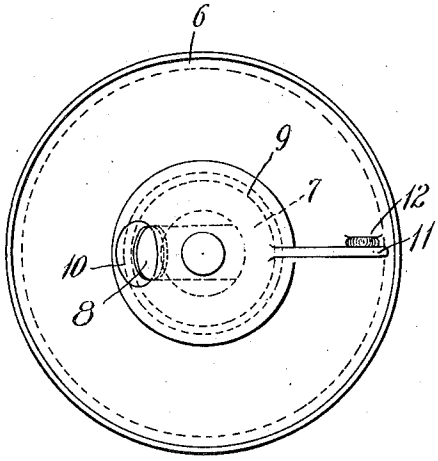


Fig. 3.

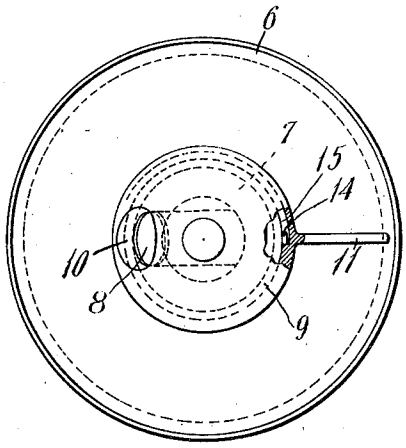


Fig. 4.

Inventor:
Herbert Milton Heath
by his atty.
Chas. F. Perkins

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UNITED STATES PATENT OFFICE.

HERBERT MILTON HEATH, OF AUGUSTA, MAINE.

COLLAPSIBLE TUBE.

Application filed January 4, 1923. Serial No. 610,689.

My invention relates to collapsible tubes such as are in common use for glue, art paste, cold cream, tooth paste and other toilet articles, and consists of improvements in the non-detachable caps for such tubes.

The principal objects of my invention are to provide a cap for a tube of the character specified which cannot become accidentally detached from the tube nor readily displaced, and by means of which the nozzle of the tube is easily opened and closed without requiring skill or care in adjusting the cap.

In the accompanying drawing illustrating my invention Fig. 1 is a side elevation partly in section of the top of a collapsible tube with the nozzle open, containing my invention. Fig. 2 is the same as Fig. 1 with the nozzle of the tube closed. Fig. 3 is a top plan view, and Fig. 4 is a top plan view showing a modification of the stop for the cap.

Like numerals indicate corresponding parts in all the figures of the drawing.

Referring to the drawing, 5 is an ordinary collapsible tube made of any suitable material such as tin, lead, zinc, aluminum or alloys approximately five thousandths of an inch thick and sufficiently soft to yield to the pressure of the fingers. 6 is the shoulder of the tube made of heavier stock than the main portion of the tube, approximately twenty-five thousandths of an inch in thickness, and having a nozzle 7 formed integral therewith and provided with an external screw thread as shown. The top of the nozzle 7 is smooth and conical in shape; it has a lateral opening 8 near its top. 9 is a cap for the nozzle having an integral screw thread adapted to engage the screw thread on the nozzle 7. The cap 9 is provided with a lateral opening 10 of the same size and form as the opening 8 in the nozzle 7, said openings 8 and 10 being so located that they are in alignment when the cap is turned up to a predetermined extent and form an outlet for the contents of the tube. When the cap 9 is turned down to its full extent the opening 8 in the nozzle is closed thereby. Secured to or forming an integral part of the cap 9 is a handle 11 designed for turning the cap to open or close the nozzle 7. A stud 12 is provided on the shoulder 6 of the tube against which the handle 11 impinges when the openings 8 and 10 register with each other and form an outlet for the contents of the tube. The stud 12 forms a stop for the handle 11 and thus limits the upward movement of the cap 9 on the nozzle 7 so that the cap 9 cannot be detached or displaced in the course of opening the outlet to the tube.

I prefer to form the stud 12 by stamping or striking it out from the shoulder 6. The top of the cap 9 on the inside is conical shape being complementary in form to the conical top of the nozzle 7 so that when the cap is turned down by means of the handle 11 for the purpose of closing the outlet of the tube, the conical surface of the nozzle and the conical surface of the cap bind upon each other under the pressure exerted on the handle by the fingers, to such an extent that the cap in the ordinary course of use of the tube will not be accidentally turned. This arrangement affords a perfectly tight closing of the tube.

I provide a small space 13 between the top of the nozzle 7 and the inside of the top of the cap 9 when the cap is turned down to its full normal extent when the tube is new. In the course of use there is a tendency of the cap to become worn on the inside and of the nozzle to become worn on the conical shape portion. The space 13 compensates for this wear so that as the parts become worn the cap may still be forced down firmly on to the nozzle by the pressure on the handle 11.

In Fig. 4 I have shown a modification of the stop illustrated in the other figures of the drawing, which consists of a stud 14 secured to the nozzle 7 near its base, which engages a groove 15 formed in the inside of the cap 9. The handle 11 is so located upon the cap 9 with reference to the location of the stud 12 in Figs. 1, 2 and 3, and to the stud 14 in Fig. 4, that when the cap 9 is being turned up on the nozzle 7 the handle in Figs. 1, 2 and 3 will contact with the stud 12 when the openings 8 and 10 in the cap 9 and the nozzle 7 coincide. Likewise in the modification shown in Fig. 4, when the cap 9 is being turned up by the handle 11, and the end of the groove 15 contacts with the stud 14, the openings 8 and 10 in the cap 9 and the nozzle 7 coincide and form an outlet for the contents of the tube.

The movement of the handle 11 for the purpose of closing the outlet of the tube is in the direction shown by the arrow in Fig. 3, and may be moved in that direction until the

inner conical surface of the cap binds hard upon the conical surface of the nozzle.

It is obvious that in the above described construction the cap cannot become accidentally removed from the nozzle and neither can it be subject to the objection which is incident to non-detachable caps that are removable and may become displaced and require some degree of care in adjusting them to the nozzle when being applied for the purpose of closing the tube.

What I claim and desire to secure by Letters Patent is:—

1. In a collapsible tube the combination of a nozzle composed of ductile metal having a screw threaded base, and a conical top combined with a cap therefor having an internal screw thread adapted to engage the screw thread of said nozzle, and having a conical formation in its upper portion adapted snugly to fit the top of said nozzle, lateral openings in said cap and nozzle located relatively so that when said cap is turned down on said nozzle said openings are closed, and a chamber located between said cap and the extremity of said nozzle.

2. In a collapsible tube the combination of a nozzle composed of ductile metal having a screw threaded base, and a conical top combined with a cap therefor having an internal screw thread adapted to engage the screw thread of said nozzle, and having a conical formation in its upper portion adapted snugly to fit the top of said nozzle, lateral openings in said cap and nozzle located relatively so that when said cap is turned down on said nozzle said openings are closed, a chamber located between said cap and the extremity of said nozzle, and means for stopping the upward movement of said cap when said openings are in alignment.

3. In a collapsible tube the combination of a nozzle composed of ductile metal having a screw threaded base, and a conical top combined with a cap therefor having an internal screw thread adapted to engage the screw thread of said nozzle, and having a conical formation in its upper portion adapted snugly to fit the top of said nozzle, lateral openings in said cap and nozzle located relatively so that when said cap is turned down on said nozzle said openings are closed, and means for stopping the upward movement of said cap when said openings are in alignment consisting of a handle on said cap and a stud located in the shoulder of said tube in the path of said handle.

In testimony whereof I have hereunto set my hand this 22nd day of December 1922.

HERBERT MILTON HEATH.