Sept. 29, 1936. C. H. GEORGER 2,055,819

CLOSURE FOR PASTE TUBES

Filed Oct. 10, 1934

Fig. 1.

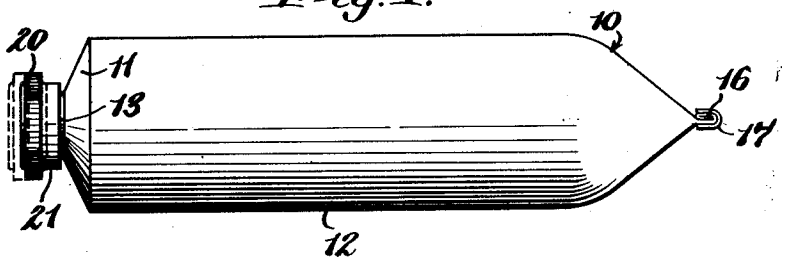


Fig. 2.

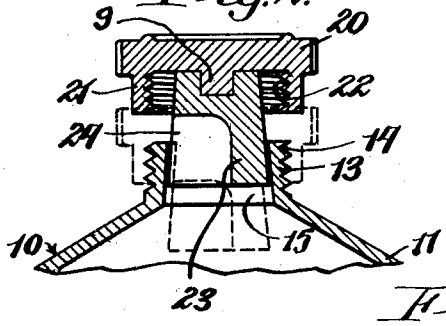


Fig. 4.

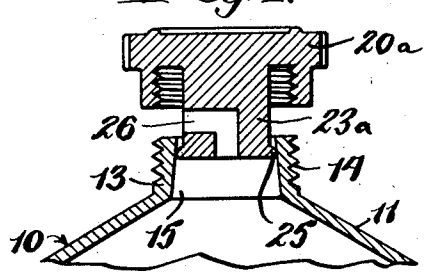


Fig. 3.

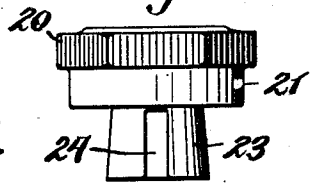


Fig. 5.

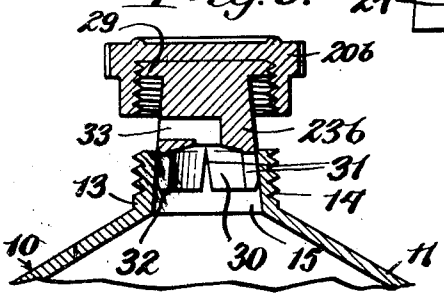
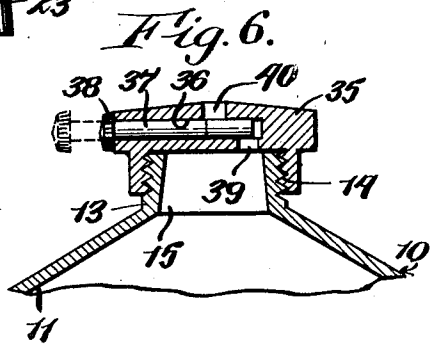


Fig. 6.



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CLOSURE FOR PASTE TUBES

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6 Claims. (Cl. 221—60)

This invention relates to a closure for paste tubes and more particularly to a captive cap for use in conjunction with tooth paste, shaving cream, unguents, ointments, food stuffs, such as anchovy paste, and the like.

The invention primarily relates to a captive cap of this character which completely avoids the necessity of manipulating the cap in using the contents of the tube, the cap being opened by the simple operation of pressing the end of the tube, this pressure forcing the cap outwardly to open a port through which the contents are discharged and the cap being replaceable to protect the contents of the tube against contamination by the simple operation of pressing the cap into place. By this means the contents of the tube are instantly available; the cap is instantly replaceable to protect the contents of the tube against contamination and the tube can be conveniently manipulated with one hand, this being particularly desirable, for example, where a doctor applies ointments. Further, being a captive cap, there is no danger of losing the cap or the disagreeable job of retrieving the cap from a floor or a drain.

The principal object of the invention is to provide such a captive cap which can be made and applied to a tube within the limits of cost necessarily imposed upon an article of this character. To this end the cap is made of extremely simple construction and is applied to the tube by the simple operation of fitting it forcibly through the neck of the paste tube. By this means not only is the cap itself of extremely inexpensive construction but requires no machining or special operations in applying it to the tube. This feature further permits the caps to be sold either in conjunction with paste tubes or as a separate article to be applied to paste tubes and further permits the cap to be used with a succession of tubes, it being merely necessary to pull out the cap and replace it in a fresh tube. Further, all operations in applying the cap, manipulating it and removing it are performed from the outside so that at no time is it necessary to enter the tube.

Another object of the present invention is to provide such a cap which can be applied to common form of paste tubes as now made. By this means it is unnecessary to modify the paste tube in any way to accommodate the cap, thereby retaining all of the advantages in point of cheapness of manufacture which characterizes present day paste tubes and at the same time providing the additional advantages of a sanitary cap which is opened by the simple operation of pressing the tube and closed by pushing it back in place.

A further object of the present invention is to provide such a captive cap which is inserted by merely pressing it into the neck of the tube, in which there is absolutely no danger of the cap being forced out of the tube while in use. In spite of the fact that the cap is applied by merely pressing it in position it has been found that it is impossible to force it out of the tube through excessive pressure on the tube even though such pressures are sufficient to burst the tube.

A further object of the present invention is to provide such a cap which can be readily made of phenol-formaldehyde condensation products as well as metal, the former materials having increasing popularity in caps where sanitation is a prime consideration.

Another purpose of the present invention is to provide such a captive cap which can be formed to discharge the paste material in any desired form, such as in a flat ribbon, a triangular ribbon, etc.

Another object of the present invention is to provide such a cap which can be adapted either for discharge at the side of the neck of the tube or can be adapted for discharge out of the end of the cap, although the form of the invention discharging from the side of the neck of the tube presents many advantages over that discharging from the end of the cap.

Another purpose of the invention is to provide such an inexpensive and easily manipulated captive cap which can be locked in its closed position so that during shipment or while the user is travelling the cap can be locked closed and there is no danger of the contents of the tube being accidentally discharged.

In the accompanying drawing:

Fig. 1 is a side elevation of a standard paste tube equipped with a cap embodying the preferred form of my invention.

Fig. 2 is a longitudinal fragmentary section through the cap and tube shown in Fig. 1.

Fig. 3 is a side elevation of the preferred form of cap shown in Figs. 1 and 2, detached from the tube.

Fig. 4 is a view similar to Fig. 2 showing a modified form of the invention.

Figs. 5 and 6 are views similar to Figs. 2 and 4 and showing still further modified forms of my invention.

The paste tube 10 is of common form made in the usual manner from a single disk of tin or

other soft metal. The disk is formed to provide a round tapering end head 11, the sides of which are extruded to form a thin walled tubular body 12 and the center of which is formed to provide a neck 13, threads 14 being rolled on the outside of the neck in the usual and well known manner. It will be noted that the opening through the inside of the neck 13 is tapered as indicated at 15. After the tube so formed is filled from its rear open end the edges 16 of the tubular part 12 of the tube are brought together, interlocked and usually held closed by a small clip 17. The invention relates to the provision of a captive valve and cap for such a standard tube which is applied entirely from the outside of the tube and in the preferred form shown in Figs. 1–3 the captive cap comprises an upper cap-shaped part 20 which can be of any suitable form and has an annular depending rim 21 which is internally threaded as indicated at 22, so that this cap-shaped portion can be screwed onto the threads 14 of the tube. Attached to the inside of the cap is a central depending stem 23 which is circular in cross section and is slightly tapered so that its lower end is larger than its upper end, this stem cover being generally of the shape of an inverted cork. This tapering form of the stem 23 is an important feature of my invention and it is important that the lower or larger end of the stem 23 closely fits the upper or contracted end of the tapering outlet orifice 15 in the neck of the paste tube. This stem is directly inserted in the orifice 15 of the tube and its enlarged end is of sufficient size so as to provide a close fit in passing through the contracted end of the opening 15 and so that a slight pressure is necessary to force it into the neck of the paste tube. In one side of the stem 23 a relatively deep slot or groove 24 is provided. This slot or groove can be of any shape depending upon the form of ribbon or stream of paste which is desired, but is preferably of substantial depth, extending beyond the center of the stem as shown. The taper shown in the drawing is, of course, greatly exaggerated.

Any suitable means can be provided for attaching the stem 23 to the cap 20 and as shown the cap 20 is provided on its inside with a central small boss 9 which is forcibly fitted in a correspondingly shaped hole provided in the adjacent end of the stem 23. Such a connection permits the cap to be made by standard dies and avoids the complications necessarily present in molding the cap in one piece, although, of course, the cap can be molded in one piece, as illustrated in Fig. 4.

In applying the cap to a paste tube for shipment the stem 23 of the cap is inserted in the opening 15 of the paste tube and the cap screwed down. It will be seen that this can be done either before or after the tube is filled and it will be seeen that this is accomplished entirely from outside the tube and requires no special machinery. When the user receives the tube he unscrews the cap so as to free the lock between the cap and the tube and then presses the paste tube, the pressure on the contents forcing the stem 23 outwardly until the upper end of the groove 24 is exposed. The contents of the tube are then discharged in the form of a ribbon through the groove 24, the form of the ribbon depending upon the shape of the channel 24. Inasmuch as the lower enlarged end of the stem 23 is closely fitted in the upper or contracted end of the opening 15, the stem and cap cannot be forced out regardless of how much pressure is applied to the tube. This pressure is, of course, relieved by the escape provided through the groove 24 and the friction provided by the tight fit of the lower enlarged end of the stem 23 against the upper contracted end of the orifice 15 is sufficient to prevent the captive cap from being forced out of the tube even though sufficient pressure is applied to burst the tube. At the same time the insertion of the stem 23 in the neck of the tube does not require any great amount of force in order to secure this result. It will further be observed that by reason of the tapering form of the orifice through the neck 13 and the stem 23 this frictional stop does not come into action until the upper end of the groove 24 is completely exposed.

To close the tube it is, of course, merely necessary for the user to press down the cap 20, this operation closing the port formed by the groove 24 and protecting the contents of the tube against contamination. It is, of course, unnecessary for the user to screw the cap down in normal use, this feature being only provided for shipment of the tube or when the user is travelling and when there is a possibility of pressure being accidentally applied to the tube.

In Fig. 4 is shown a different form of the invention in which a cap and stem are made in one piece. The tube is of standard form and therefore the same reference numerals have been applied. The stem 23*a* of the cap 20*a* are shown as molded in one piece and this stem instead of being tapered is of cylindrical form and at its extreme end is enlarged to provide a rounding bead 25 so as to provide the necessary enlarged diameter at the extreme end of the stem. This bead 25 is closely fitted in the contracted part of the opening 15 of the tube, as in the preferred form of the invention and it will be appreciated that this form of stem functions in exactly the same manner as the tapering stem shown in Figs. 1–3. Also in this form of the invention, instead of providing a groove in the side of the stem, a passage 26 is provided which extends upwardly through the center of the stem and then extends laterally to the side of the stem. It will be seen that any shape of ribbon can be provided by shaping the passage 26 to provide this desired shape of ribbon.

While the forms of the invention shown in Figs. 1–4 are entirely adequate for all shaving and tooth pastes it is possible that with heavy pastes and tubes additional securement may be needed to insure the retention of the cap in the tube regardless of how much pressure is applied to the tube. With such heavy pastes the form of the invention shown in Fig. 5 could be used. In this form the cap 20*b* is made of standard form and the stem 23*b* is provided with an enlarged head 28 at its upper end, this head being externally threaded and screwed tightly into the cap 20*b* so as to securely unite the stem and cap. The lower end of the stem 23*b* is hollowed out, as indicated at 30, and the depending skirt so formed is slit at regular intervals, four slits being illustrated, as indicated at 31. The lower end of the skirt so formed is also provided with an external bevel 32. As in the form of the invention shown in Fig. 4, a central passage 33 leads from the center of the hollowed out portion 30 to the exterior of the stem which, when exposed, provides a discharge port for the paste.

In applying the form of cap shown in Fig. 5 to a paste tube the bevel 32 is engaged with the inside of the neck 13 of the tube and the cap is forced inwardly. Inasmuch as the lower end of the stem 23*b* is slit the stem yields or compresses inwardly so as to permit the passage of the stem

into the neck of the tube, the bevelled edges 32 forcing the sides of the stem inwardly. When once inserted, the lower end of the stem expands to its normal condition and the tube is securely anchored against being forced completely out of the tube and at the same time permits pressure to be applied to the contents of the tube to force the stem outwardly far enough to open the port 33.

In the form of the invention shown in Fig. 6 the cap 35 is screwed onto the threaded neck of the paste tube and is provided with a radially extending tubular passage 36 in which a stem 37 is slidingly fitted. This stem is preferably formed with a head 38. The inner end of the passage 36 is connected by a port 39 with the inside of the paste tube and the cap is also provided with a central port 40 which extends from the outside of the cap to the passage 36. The port 39 preferably connects with the passage 36 at a point beyond the end of the stem 37 so that upon applying pressure to the tube the contents press against the end of the stem 37 and force it outwardly until it uncovers the port 40 whereupon the contents of the tube are discharged through this port. It will be understood that the opening 40 can be in the form of a slot so as to facilitate the application of the paste to a tooth brush or the like.

From the foregoing it is apparent that all of the forms of my invention show a very simple captive cap which can be produced at a very low cost, the more particularly in that it contains no moving parts and is applied to a paste tube entirely from the outside and as easily as a screw cap. At the same time the cap is reliably held in place and requires the user to merely press upon the tube to obtain a discharge of the contents and to merely press the cap back in position to seal the tube and guard against contamination of the contents. Further, the invention can be applied either as a part of the original tube or can be sold as an accessory which the user can apply to standard paste tubes.

I claim as my invention:

1. A paste tube having a collapsible body and an outlet orifice in its neck and a captive closure therefor, said closure comprising a stem directly removable and insertable in said orifice and slidable therein, said stem having a closed outer end, a contracted portion and an enlarged portion at its inner end which enlarged portion is closely fitted to said orifice, said stem being slidable outwardly by pressure applied to the paste within said tube and being provided with a passage open to the interior of the tube and terminating at its opposite end in a port provided in the side wall of said contracted portion at a distance from its inner end to permit the escape of paste upon the engagement of the enlarged portion of said stem with the wall forming said orifice.

2. A paste tube having a collapsible body and an outlet orifice in its neck, said outlet orifice tapering to an outer contracted portion and a captive closure therefor, said closure comprising a stem directly removable and insertable through said orifice and slidable therein, said stem having a closed outer end, a contracted portion and an enlarged portion at its inner end closely fitted to the contracted portion of said orifice and disposed between said contracted portion of said orifice and said collapsible body, said stem being slidable outwardly by pressure applied to the paste within said tube and said stem being provided with a passage opening at one end into the interior of the tube and terminating at its opposite end in a port provided in the side wall of said stem at a distance from said enlarged portion and which is normally closed by said neck and uncovered by the outward movement of said stem upon the engagement of the contracted portion of said orifice and the enlarged portion of said stem so as to permit the discharge of paste through said passage upon continued application of pressure to said tube following the engagement of said enlarged portion of said stem with the contracted portion of said orifice.

3. A paste tube having a collapsible body and an outlet orifice in its neck, said outlet orifice tapering to an outer contracted portion and a captive closure therefor, said closure comprising a stem directly removable and insertable through said orifice and slidable therein, said stem having a closed outer end, a contracted portion and an enlarged tapered portion at its inner end closely fitted to the contracted portion of said orifice and disposed between said contracted portion of said orifice and said collapsible body, said stem being slidable outwardly by pressure applied to the paste within said tube and said stem being provided with a passage opening at one end into the interior of the tube and terminating at its opposite end in a port provided in the side wall of said stem at a distance from said enlarged portion and which is normally closed by said neck and uncovered by the outward movement of said stem upon the engagement of the contracted portion of said orifice and the enlarged portion of said stem so as to permit the discharge of paste through said passage upon continued application of pressure to said tube following the engagement of said enlarged portion of said stem with the contracted portion of said orifice.

4. A paste tube having a collapsible body and an outlet orifice in its neck and a captive closure therefor, said closure comprising a stem directly removable and insertable in said orifice and slidable therein, said stem having a closed outer end, a contracted portion and an enlarged portion at its inner end which enlarged portion is closely fitted to said orifice, said stem being slidable outwardly by pressure applied to the paste within said tube and being provided with a passage open to the interior of the tube and terminating at its opposite end in a port provided in the side wall of said contracted portion at a distance from its inner end to permit the escape of paste upon the engagement of the enlarged portion of said stem with the wall forming said orifice and means for latching said stem in its closed position.

5. A paste tube having a collapsible body and an outlet orifice in its neck and a captive closure therefor, said closure comprising a stem directly removable and insertable in said orifice and slidable therein, said stem having a closed outer end, a contracted portion and an enlarged portion at its inner end which enlarged portion is closely fitted to said orifice, said stem being slidable outwardly by pressure applied to the paste within said tube and being provided with a passage open to the interior of the tube and terminating at its opposite end in a port provided in the side wall of said contracted portion at a distance from its inner end to permit the escape of paste upon the engagement of the enlarged portion of said stem with the wall forming said orifice, and means for securing said stem in its closed position comprising screw threads provided on said stem and engageable with threads provided on said neck when said stem is completely inserted.

6. A paste tube having a collapsible body and an outlet orifice in its neck and a captive closure therefor, said closure comprising a stem directly removable and insertable in said orifice and slidable therein, said stem having a closed outer end, a contracted portion and an enlarged portion at its inner end which enlarged portion is closely fitted to said orifice, said stem being slidable outwardly by pressure applied to the paste within said tube and being provided with a passage open to the interior of the tube and terminating at its opposite end in a port provided in the side wall of said contracted portion at a distance from its inner end to permit the escape of paste upon the engagement of the enlarged portion of said stem with the wall forming said orifice and a cap threaded on the outer closed end of said stem and having additional internal threads engaging external threads provided on the neck of said tube.

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