Sept. 18, 1934. A. J. STREHS 1,974,348

PASTE TUBE CAP

Original Filed May 2, 1932

Fig. 1.

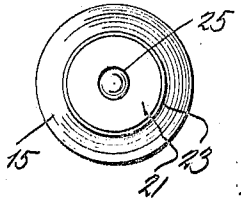


Fig. 3.

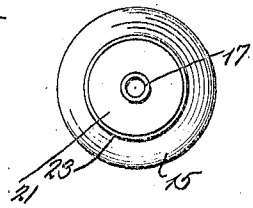


Fig. 9.

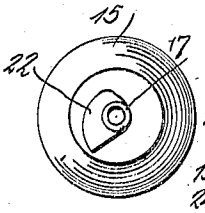


Fig. 11.

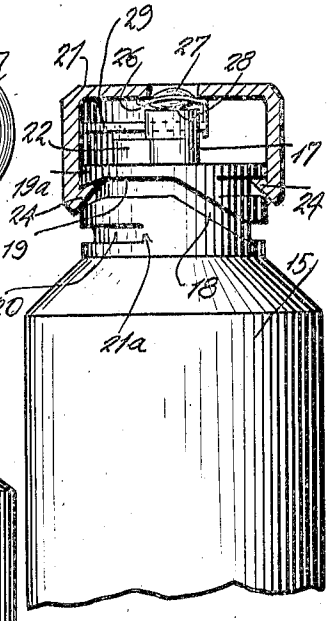


Fig. 2.

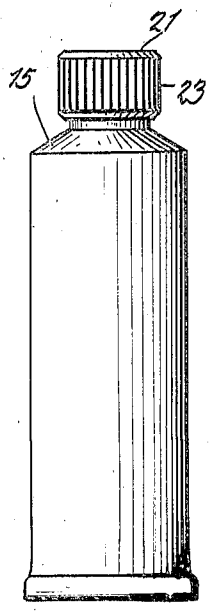


Fig. 4.

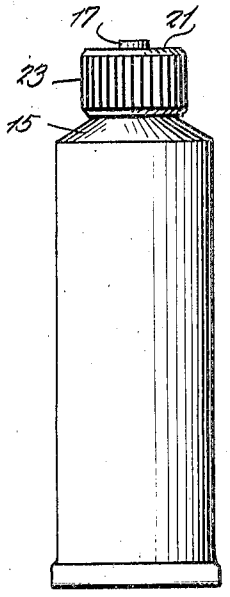


Fig. 10.

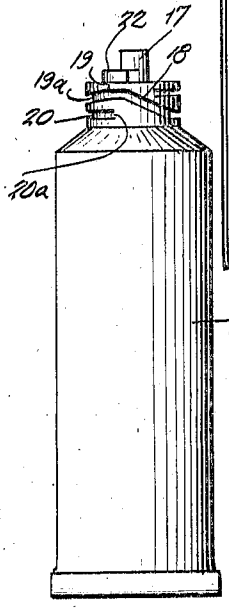


Fig. 12.

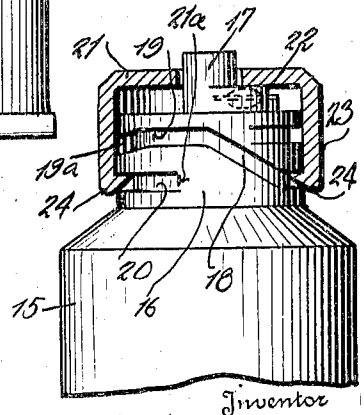


Fig. 5.

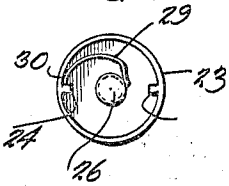


Fig. 7.

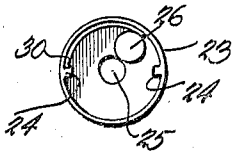


Fig. 6.

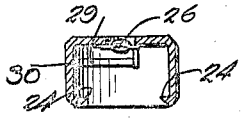
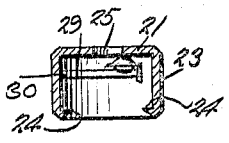


Fig. 8.



Inventor

A. J. Strehs.

By

Bryan & Lowry

Attorneys

Patented Sept. 18, 1934 1,974,348

UNITED STATES PATENT OFFICE

1,974,348

PASTE TUBE CAP

Adam J. Strehs, Miami, Fla.

Application May 2, 1932, Serial No. 608,771
Renewed August 28, 1933

21 Claims. (Cl. 221—60)

This invention relates to certain new and useful improvements in paste tube cap.

The primary object of the invention is to provide a paste tube for containing and dispensing cream, paste, liquids or other viscous substances provided with a closure cap permanently carried by the dispensing end of the tube and operable by a cam movement for opening and closing the passage through the discharge nozzle of the paste or dispensing tube.

A further object of the invention is to provide a paste tube cap of the foregoing character in which the cap has an opening therein normally closed by a spring supported valve which is shifted to an inoperative position by a cam connection between the cap and neck of the paste tube with the discharge nozzle of the tube projected through the cap opening.

With the above and other objects in view that will become apparent as the nature of the invention is better understood, the same consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawing and claimed.

In the drawing:—

Figure 1 is a top plan view of the improved paste tube and cap with the cap in its closed position;

Figure 2 is a side elevational view of the paste tube and cap in closed position;

Figure 3 is a top plan view of the tube and cap with the latter in open position and the discharge nozzle of the tube projected through the cap;

Figure 4 is a side elevational view showing the cap in its open position with the discharge nozzle projected therethrough;

Figure 5 is a bottom plan view of the cap removed from the paste tube with the closure valve for the cap opening in closed position;

Figure 6 is a cross-sectional view of the cap shown in Figure 5 with the valve in closed position;

Figure 7 is a bottom plan view of the cap with the valve in open position;

Figure 8 is a cross-sectional view of the cap with the valve in open position;

Figure 9 is a top plan view of the paste tube with the cap removed and illustrating the cam device for the operation of the closure valve for the opening in the cap;

Figure 10 is a side elevational view of the paste tube with the cap removed illustrating the cam or thread shoulders upon the neck of the tube with which the cap is engaged;

Figure 11 is a fragmentary side elevational view of the paste tube with the cap shown in section in its closed position with respect to the discharge nozzle of the tube; and

Figure 12 is a fragmentary side elevational view, similar to Figure 11 showing the cap in section and in open position with respect to the discharge nozzle of the tube.

Referring more in detail to the accompanying drawing, the reference character 15 designates a collapsible tube of the character usually employed in containing and dispensing tooth paste, shaving cream, ointments, or other viscous substances, the discharge end of the tube having a relatively large neck 16 carrying a centrally disposed discharge nozzle 17 of lesser diameter than the neck 16. The neck 16 is provided with an external thread or cam groove 18 merging at opposite ends into upper and lower annular grooves 19 and 20 respectively with which the cap 21 is associated. As shown in Figures 11 and 12 the lower annular groove 20 terminates at 21*a* in spaced relation to the cam groove 18 while the upper annular groove 19 in spaced relation to the entrance end of the cam groove 18 has a downward inclination 19*a* for purposes presently to appear. As shown more clearly in Figures 9 to 11, a cam lug 22 is superposed on the upper face of the tube neck 16 and extends radially of the discharge nozzle 17, being spaced below the upper terminal end of the nozzle.

The closure cap 21 carries an annular skirt or side flange 23 carrying at its free edge, diametrically opposite inwardly directed lugs 24 working in the cam groove 18 and annular grooves 19 and 20. The top wall of the closure cap 21 is provided with a central opening 25 of a diameter to permit the passage of the discharge nozzle 17 therethrough in a manner to be presently described and said opening 25 is normally closed by a valve device 26 having upper and lower bulbous portions 27 and 28 respectively for engagement with the walls surrounding the opening 25 in the cap and the opening in the discharge nozzle 17 as shown in Figure 1. The valve device 26 is carried by a spring arm 29 that is anchored at one end as at 30 to the inner face of the annular flange 23, the normal position of the spring arm 29 positioning the valve device 26 so that the upper bulbous portion 27 thereof is received in the opening 25 in the top wall of the closure cap 21.

When the cap 21 is in its closed position with respect to the discharge nozzle 17 of the paste tube 15, the lugs 24 carried by the cap are dis-

posed in the upper annular groove 19 in the neck 16 of the tube with one of the lugs engaged with the inclined portion 19a of the upper annular groove 19 for causing the cap to move in a downward direction to bind the valve device 26 in closed position with the bulbous portion 27 extending into the cap opening 25 and the bulbous portion 28 closing the opening in the discharge nozzle 17 so that the paste tube is securely closed and the contents thereof maintained in a clean and sanitary condition. When it is desired to dispense material from the tube 15, the closure cap 21 is rotated in a counter-clockwise direction, the lugs 24 rapidly moving through the cam groove 18 to lower the cap on the neck 16 and to align the cam lug 22 with the spring arm 29. Continued rotation of the closure cap causes the cam lug 22 to move the spring arm 29 against the tension thereof and to laterally displace the valve device 26 to the positions shown in Figures 7, 8 and 12 so that continued movement of the cap will cause the discharge nozzle 17 to be projected through the cap opening 25 into the position shown in Figure 12, whereupon the contents of the tube may be readily dispensed therefrom. The cap is moved to a closed position relative to the tube and discharge nozzle 17 by a reverse or clockwise rotation of the same to assume the closed position illustrated in Figure 7. It will be observed that the upper annular groove in the neck 16 of the tube is of a construction to prevent complete removal of the cap 21 from the tube neck so that the cap is permanently carried by the tube but movable over the neck portion thereof for opening and closing the discharge nozzle and limited in such movements to prevent loss of the cap.

From the above detailed description of the invention, it is believed that the construction and operation thereof will at once be apparent and while there is herein shown and described the preferred embodiment of the invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

I claim:—

1. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, a cap engaged with the neck and having an opening therein through which the nozzle is adapted to be projected and a valve device forming a closure for the cap opening and nozzle.

2. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, a cap engaged with the neck and having an opening therein through which the nozzle is adapted to be projected and a valve device forming a closure for the cap opening and nozzle, the connection between the cap and tube neck including a cam groove and cooperating lugs constructed to prevent complete removal of the cap.

3. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, a cap engaged with the neck and having an opening therein through which the nozzle is adapted to be projected and a valve device forming a closure for the cap opening and nozzle, the connection between the cap and tube neck including a cam groove and cooperating lugs, and cooperating means carried by the cap and neck for moving the valve device to open and closed positions during operation of the cap.

4. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, said neck having an external cam groove, a closure cap for the tube having side lugs received in the cam groove and a top opening through which the nozzle is adapted to be projected, a tensioned valve device closing the cap opening and discharge nozzle and a cam lug cooperating with the valve device for moving the same to open and closed positions during operation of the cap.

5. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, said neck having an external cam groove, a closure cap for the tube having side lugs received in the cam groove and a top opening through which the nozzle is adapted to be projected, a tensioned valve device carried by the cap closing the cap opening and discharge nozzle and a cam lug cooperating with the valve device for moving the same to open and closed positions during operation of the cap.

6. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, said neck having an external cam groove, a closure cap for the tube having side lugs received in the cam groove and a top opening through which the nozzle is adapted to be projected, a tensioned valve device carried by the cap closing the cap opening and discharge nozzle and a cam lug carried by the tube neck cooperating with the valve device for moving the same to open and closed positions during operation of the cap, and said cap lugs moving into engagement with the cam shoulder for tightly closing the valve device on the discharge nozzle during closing movement of the cap.

7. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, said neck having an external cam groove, a closure cap for the tube having side lugs received in the cam groove and a top opening through which the nozzle is adapted to be projected, a tensioned valve device carried by the cap closing the cap opening and discharge nozzle, a cam lug carried by the tube neck cooperating with the valve device for moving the same to open and closed positions during operation of the cap, and said valve device having upper and lower bulbous portions respectively entering the cap opening, and open end of the discharge nozzle.

8. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, said neck having an external cam groove, a closure cap for the tube having side lugs received in the cam groove and a top opening through which the nozzle is adapted to be projected, a tensioned valve device carried by the cap closing the cap opening and discharge nozzle, a cam lug carried by the tube neck cooperating with the valve device for moving the same to open and closed positions during operation of the cap, and said valve device having upper and lower bulbous portions respectively entering the cap opening and open end of the discharge nozzle.

9. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, said neck having an external cam groove, terminating at its ends in inner and outer annular grooves, a cam shoulder in the outer groove, a closure cap for the tube having side lugs received in the cam groove and a top opening through which the nozzle is adapted to be projected, a tensioned valve device carried by the cap closing the cap opening and discharge nozzle and a cam lug carried by the tube neck cooperating with the valve device for moving the same to open and closed positions during operation of the cap.

10. In dispensing apparatus, a collapsible tube,

a neck and discharge nozzle at one end of the tube, said neck having a cam groove terminating at its inner and outer ends in annular grooves, a tube cap having lugs working in the grooves, said cap having a top opening therein through which the nozzle is projected when the cap is moved to open position, a valve device carried by the cap and normally alined with the cap opening and nozzle when the cap is in closed position and a cam lug on the neck engaged with the valve device during opening movement of the cap to displace the cam device laterally of the cap opening and nozzle when the cap is moved to closed position.

11. In dispensing apparatus, a collapsible tube, a neck and discharge nozzle at one end of the tube, said neck having a cam groove terminating at its inner and outer ends in annular grooves, a tube cap having lugs working in the grooves, said cap having a top opening therein through which the nozzle is projected when the cap is moved to open position, a valve device carried by the cap and normally alined with the cap opening and nozzle when the cap is in closed position and a cam lug on the neck engaged with the valve device during opening movement of the cap to displace the cam device laterally of the cap opening and nozzle when the cap is moved to closed position, the cap being moved toward the outer end of the neck when moved to closed position and the outer annular groove in the neck having a cam shoulder for engagement with the lugs to cause slight inward movement of the cap relative to the neck for binding the valve device on the discharge nozzle, locking and preventing displacement of the cap.

12. In dispensing apparatus, a tube having a neck and discharge nozzle at one end and a cap for the tube longitudinally movable over the neck and having a top opening alined with the nozzle and through which the nozzle is projected when the cap is moved inwardly on the neck to open position, and closure means for the nozzle confined within the cap and rendered operable upon movement of the cap on the neck to be shifted into and out of engagement with the nozzle.

13. In dispensing apparatus, a tube having a neck and discharge nozzle at one end and a cap for the tube longitudinally movable over the neck and having a top opening alined with the nozzle and through which the nozzle is projected when the cap is moved inwardly on the neck to open position, closure means for the nozzle confined within the cap and rendered operable upon movement of the cap on the neck to be shifted into and out of engagement with the nozzle, and said cap and neck being cooperatively constructed to cause intimate contact of the closure means with the nozzle when the cap is moved to closed position.

14. In dispensing apparatus, a tube having a neck and discharge nozzle at one end and a cap for the tube longitudinally movable over the neck and having a top opening alined with the nozzle and through which the nozzle is projected when the cap is moved inwardly on the neck to open position, closure means for the nozzle confined within the cap and rendered operable upon movement of the cap on the neck to be shifted into and out of engagement with the nozzle, the closure means for the nozzle being moved into closed relation with respect to the nozzle when the cap is moved outwardly of the neck to closed position and said cap and neck being cooperatively constructed to cause the cap at its limit of outward movement to be moved slightly inwardly for binding the closure means on the nozzle.

15. As a means for controlling the opening and closing of the passageway of a capped structure by rotative movements of the cap, a tubular member permanently positioned relatively to the cap axis, a support carrying the tubular member, a cap carried by the support having an opening into which the member can extend, said cap having a connection with the support with the connection permitting limited relative rotative and longitudinal movements of cap and support, whereby said tubular member may enter or be freed from said cap opening, and a closure member carried by and movable relatively to the cap and adapted to be moved into and out of position in advance of the free end of the tubular member by the rotation of the cap.

16. Means as in claim 15 characterized in that the closure member when in advance of the free end of the tubular member will be advanced into the cap opening by additional cap rotation.

17. Means for controlling the opening and closing of the passageway of a capped structure by movements of the cap relative to the structure, comprising a tubular member permanently positioned in line with the cap axis, a support carrying the tubular member, a cap movable on the support and having a central opening through which the tubular member may be projected, means for limiting movements of the cap on the support and operative to prevent disassembly, and means operated by movements of the cap to form a closure for the tubular member when the latter is disposed inwardly of the cap opening.

18. Means as in claim 17, characterized in that the closure means for the tubular member is confined within the cap and is movable transversely of the longitudinal axis of the tubular member.

19. Means as in claim 17, characterized in that the closure means for the tubular member is carried by the cap and is movable transversely of the longitudinal axis of the tubular member between the latter and outer end of the cap to overlie the outer end of the tubular member and register with the opening in the cap.

20. Means for controlling the opening and closing of the passageway of a capped structure by movements of the cap relative to the structure, comprising a tubular member permanently positioned relative to the cap axis, a support carrying the tubular member, a cap movable on the support and having an opening through which the tubular member may be projected, means for limiting movements of the cap on the support and operative to prevent disassembly, a resilient closure member carried by and movable relative to the cap and adapted to move into and out of position in advance of the outlet end of the tubular member by movement of the cap, and means carried by the support and cooperating with the closure member for controlling movements thereof during movements of the cap.

21. Means as in claim 20, characterized in that the resilient closure member when in advance of the outlet end of the tubular member will be advanced into the cap opening by additional cap movement.

ADAM J. STREHS.