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J. E. SEMMES, JR

COLLAPSIBLE TUBE

Filed Feb. 11. 1921

*Fig. 1.*

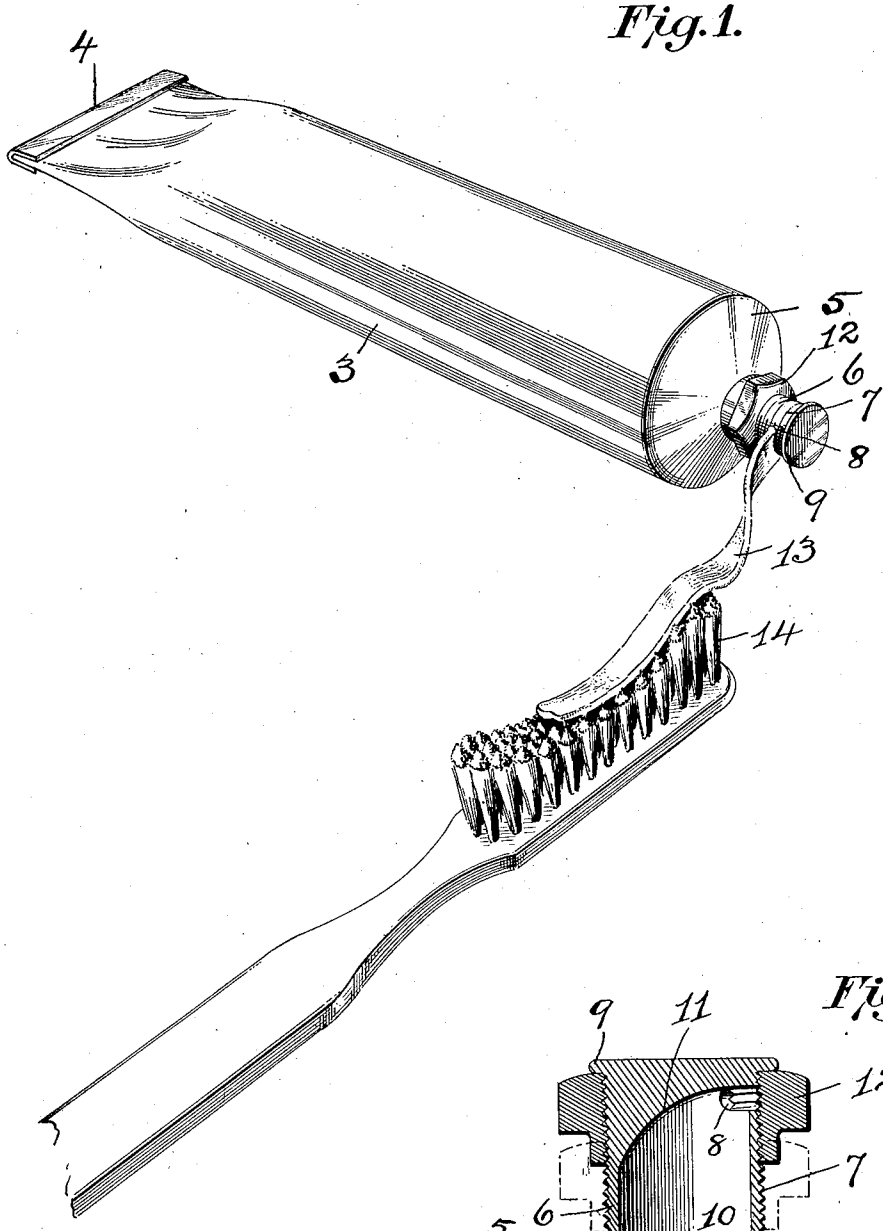



*Fig. 2.*




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# UNITED STATES PATENT OFFICE.

JOHN E. SEMMES, JR., OF BALTIMORE, MARYLAND.

## COLLAPSIBLE TUBE.

Application filed February 11, 1921. Serial No. 444,147.

*To all whom it may concern:*

Be it known that JOHN E. SEMMES, JR., a citizen of the United States, residing at Baltimore, in the State of Maryland, has invented certain new and useful Improvements in Collapsible Tubes, of which the following is a specification.

This invention relates to improvements in collapsible tubes and has particular reference to an improved nozzle structure for tubes such as are commonly employed as containers for tooth-paste, salves, paints and other pastes or semi-fluids.

One object of the invention is to provide an improved nozzle structure for collapsible tubes whereby the discharge-opening thereof may be more conveniently opened and closed.

Another object is to provide an improved device for closing the discharge opening of collapsible tube nozzles whereby the closing element cannot be detached or removed from the nozzle and become lost and which avoids the necessity of bringing the closing element into registration or engagement of screw threads after said element has been moved to a position to uncover said discharge opening, and

A further object of the invention is to provide a simple and inexpensive rotating closure for the discharge-openings of the nozzles of collapsible tubes wherein the closure cannot become disengaged, and in which the contents may be directed toward the outlet of the nozzle when the tube is compressed.

With these, and other objects in view, the invention is illustrated in the accompanying drawing, wherein,—

Fig. 1 shows a collapsible tube having a discharge-nozzle embodying the invention,—the closure on the nozzle being moved to uncover the discharge-outlet and a strand or strip of the paste projected therefrom and being applied to a tooth-brush, and

Fig. 2 illustrates, on an exaggerated or a much enlarged scale, a vertical sectional detail of the nozzle and the improved closure,—the latter being in position to close the discharge-opening.

Referring to the drawing the numeral 3 designates a collapsible tube which is permanently closed at the end 4 and which is provided at the opposite end with a breast 5, from which there projects a tubular nozzle 6.

The circumference of the nozzle 6, is provided with screw-threads 7 and a segmental slot or discharge-opening 8 is formed in the nozzle-wall which opening extends through the external threads. The direction of this opening with respect to the longitudinal axis of the nozzle is entirely immaterial in so far as the present invention is concerned but preferably the opening extends circumferentially around the nozzle and in a direction at right angles to the nozzle-axis.

The extreme outer end of the nozzle 6 is provided with an annular enlargement or bead 9 that is of a greater diameter than the threaded portion whereby said enlargement or bead may form a stop shoulder for a purpose that will presently be explained.

On the interior, the nozzle 6 has a central passage 10, which communicates with the interior of the collapsible tube and this passage has a curved wall 11 which latter extends from that edge of the segmental slot or discharge-opening 8, that is nearest to the stop-shoulder 9, to the diametrically-opposite side of the passage, and said wall also curves inwardly toward the breast 5. This arrangement and location of curved wall forms a guiding surface, which curves diametrically across the nozzle-passage, and terminates at the outermost edge of the slot so that the material being forced outwardly by compressing the tube, will be directed to the slot itself and freely discharged.

On the nozzle 6 I provide a rotatable element 12 which may be termed the closure. This rotatable closure has the form of a nut in that it is internally screw-threaded so as to engage the screw-threads 7 on the circumference of the nozzle and thereby be made to travel in a direction longitudinally on the nozzle when the nut is rotated or revolved.

It is therefore obvious that if the rotatable element or nut 12 be revolved it will travel toward the stop-shoulder 9 or away from said shoulder according to the direction of rotation, but in no event can said nut be removed from the nozzle because of the stop-shoulder 9 at the outer end and the breast 5 of the tube at the inner end of the nozzle.

By reference to Fig. 2 of the drawing it will be seen that when the nut is advanced on the nozzle until it contacts with the stop-shoulder 9, it will completely cover the segmental slot or discharge-opening 8, and that

to uncover said opening, it is only necessary to rotate the nut in a direction that will cause it to travel backwardly on the nozzle sufficiently toward the breast to expose the outlet.

When the nut has been moved to uncover the discharge-opening, as illustrated in Fig. 1 of the drawing, pressure applied to the end 4 of the tube 3, in the usual manner will force the contents forward while the curved wall 11, will direct the material laterally to the discharge-outlet 8, through which it will pass in a form corresponding to the shape of said outlet. In this instance the opening 8 has the form of a slot so that the material passing therethrough will have the form of a ribbon or strip 13, which latter in the case of a tooth-paste, may be readily spread or laid upon the bristles 14 of a tooth-brush.

After a sufficient quantity of the paste has been dispensed, the nut 12, may be rotated so as to travel outwardly on the nozzle toward the stop-shoulder 9 and by this travel will cover the slot or opening 8 and cut-off further discharge of paste.

As the nut cannot pass the shoulder 9 it cannot be accidentally or intentionally removed from the nozzle, consequently the nut will not be lost or mislaid, neither can it become broken off as is possible with hinged or screw caps heretofore in common use.

It will be noted that by forming the slot in a direction with the threads on the nozzle instead of longitudinally of the nozzle and at right angles to the threads, only a slight movement of the nut is necessary to either cover or uncover that slot, and by locating the slot near the outer end of the nozzle and moving the nut toward the breast to uncover the slot, the discharge of the material will take place above the nut so that when the nut is returned to close the slot any particles of paste that protrude from the slot will be cut-off by the upper side of the nut.

Having described my invention, I claim,—

The combination with a collapsible tube having a breast with a tubular nozzle projecting from the center of the breast said nozzle being closed at its outer end and having an annular stop-flange at its closed end and being externally screw-threaded from the stop-flange toward the breast and said nozzle having a segmental slot which extends in a direction at right angles to the axis of the nozzle which slot is located nearer to the stop-flange on the nozzle than the breast,—and the interior of the nozzle having a curved wall that extends diametrically across the nozzle to the segmental slot and a nut on the nozzle and entirely closing the segmental slot when it is seated against said stop-flange.

In testimony whereof I affix my signature.

JOHN E. SEMMES, Jr.