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3,217,933

TUBE SQUEEZER AND NOZZLE THEREFOR

Filed Dec. 18, 1963

FIG. 1

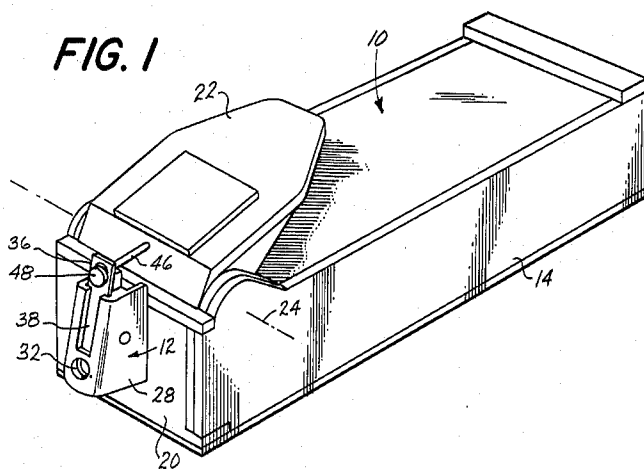


FIG. 2

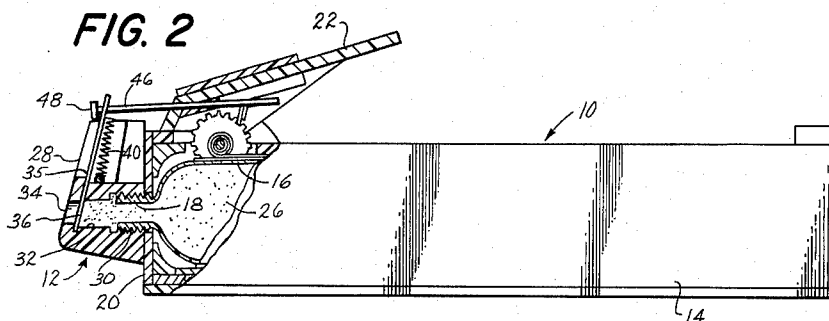


FIG. 3

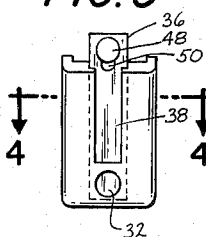


FIG. 4

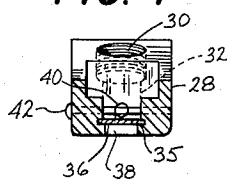
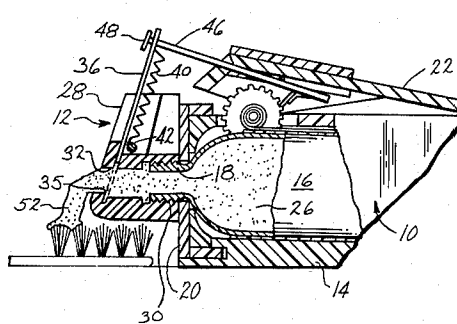


FIG. 5



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1 Claim. (Cl. 222-96)

This invention relates to tube squeezers for dispensing the contents of a collapsible tube, such as a conventional toothpaste tube, and deals more particularly with a tube squeezer having combined therewith a nozzle for positively controlling the discharge of material from the tube.

The general object of this invention is to provide a combined tube squeezer and nozzle wherein the nozzle operates to positively prevent the escape of material from the tube during non-use of the squeezer and is operated automatically to permit the discharge of material in response to operation of the operating member of the squeezer.

Another object of this invention is to provide a combined tube squeezer and nozzle wherein the nozzle is readily removable from the tube and tube squeezer to permit cleaning thereof.

Still another object of the invention is to provide a nozzle of the foregoing character which is readily removable from and replaceable on the tube in the tube squeezer so as to facilitate its removal from an exhausted tube and its replacement on a fresh tube when a fresh tube is required by the squeezer.

A further object of the invention is to provide a nozzle and tube squeezer combination wherein the nozzle if desired may be removed from the tube and tube squeezer and the tube squeezer thereafter operated without the nozzle and without impairment to its attractive appearance.

A further object of this invention is to provide a combined tube squeezer and nozzle wherein upon operation of the squeezer the tube material, particularly in the case of toothpaste or material of similar consistency, is dispensed from the nozzle in a neat appearing ribbon.

Other objects and advantages of the invention will be apparent from the following description and from the drawing forming a part hereof.

The drawing shows a preferred embodiment of the invention and such embodiment will be described, but it will be understood that various changes may be made from the construction disclosed, and that the drawing and description are not to be construed as defining or limiting the scope of the invention, the claim forming a part of this specification being relied upon for that purpose.

Of the drawing:

FIG. 1 is a perspective view of a tube squeezer and nozzle embodying the present invention;

FIG. 2 is a vertical view partly in elevation and partly in section of the tube squeezer and nozzle of FIG. 1 with the operating handle of the squeezer being shown in its normal or unoperated position;

FIG. 3 is a front elevational view of the nozzle of FIG. 1;

FIG. 4 is a horizontal sectional view taken on the line 4-4 of FIG. 3; and

FIG. 5 is a fragmentary view similar to the left-hand portion of FIG. 2 but showing the operating handle of the tube squeezer in its operated position.

Referring now to the drawing, the combination of the present invention is shown to consist in general of a tube squeezer 10 having combined therewith a nozzle 12 for controlling the discharge of material from the tube squeezer and especially for preventing the escape of material during periods of non-use.

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Considering first the construction of the tube squeezer 10, it includes an elongated body 14 which is hollow and of generally rectangular transverse cross section and adapted to receive a collapsible tube 16 having an externally threaded discharge spout 18 which extends through an opening in its forward end wall 20. Also at the forward end of the body 14 is an operating handle 22 which is supported for pivotal oscillating movement relative to the body about an axis, as indicated at 24, extending transversely of the body. FIGS. 1 and 2 show the handle in one limit of its movement relative to the body, and FIG. 5 shows it in the other limit of its movement. The operating handle position of FIGS. 1 and 2 is its normal or unoperated position, and the position of FIG. 5 may be referred to as its operated position. Connected with the operating handle 22 is a squeezing mechanism which operates in response to movement of the handle toward its operated position to squeeze the tube 16 to expel a portion of the material 26 contained in the tube from the spout 18.

The squeezing mechanism associated with the operating handle 22 may take various different forms without departing from the present invention. The illustrated tube squeezer 10 however is or may be similar to the tube squeezer shown and described in detail in my co-pending application entitled Collapsible Tube Squeezer, Ser. No. 294,905, filed July 15, 1963, to which application reference is made for a more detailed description of the squeezing mechanism and other parts of the squeezer.

Considering next the construction of the nozzle 12, this unit consists of a nozzle block 28 which may be formed of plastic or other suitable material. Provided in the block 28 is a first opening 30 which is threaded to conform with and to threadably receive the spout 18 of the tube contained in the squeezer 10. The nozzle block is separate from the squeezer body 14 and may be readily removed from or attached to the spout 18 by threading the same on the spout. Communicating with the threaded opening 30, and preferably axially aligned therewith as shown, is a second opening 32 which extends from the inner end of the threaded opening 30 to a point of discharge, represented at 34 in FIG. 2.

Also included in the nozzle block 28 is a slot 35 which slidably receives a blade or closure member 36 which may conveniently be made of a strip of sheet metal. The blade member is substantially wider than the diameter of the opening 32 and, as will be noted from FIGS. 2 and 5, the slot 35 is so arranged as to cross the path of the opening 32 so that the blade member is movable into and out of blocking relationship therewith, the blocking position of the blade being shown in FIG. 2 and the non-blocking position being shown in FIG. 5. As shown in FIGS. 1 and 3, the nozzle block may be relieved or cut-away as shown at 38 so that above the opening 32 the blade member is supported by the nozzle block only along the margin of its edges, thereby reducing the friction between the blade member and the nozzle block.

Behind the blade member 36 the nozzle block is recessed and receives a helical tension spring 40 which serves to bias the blade member toward the blocking position of FIG. 2. At its lower end the spring is fastened to a pin 42 which passes transversely through the nozzle block as shown best in FIG. 4, and at its upper end is fastened to the upper end of the blade member.

The blade member 36 is operated in response to the movement of the operating handle 22 of the tube squeezer and in such a manner that as the operating handle is moved toward its operated position the blade member is moved out of blocking relationship with the opening 32. This permits the material 26 of the tube to pass through the nozzle as the tube is squeezed by the squeezing mech-

anism in response to actuation of the handle. The operation of the blade member is further such that as the operating handle is returned toward its normal position, the blade member is returned toward its blocking position.

Various different means may be provided for coordinating the movement of the blade member with the movement of the operating handle 22, and in the present instance this means is shown to consist of a small rod 46 having a head 48 on one end thereof. The rod 46 passes through an opening 50 in the upper end of the blade member 36 and is frictionally retained in an opening passing through the operating handle 22. The frictional restraint is such that the rod may be grasped by hand and readily pulled from the operating handle 22. Thereafter the rod may be moved from the blade opening 50 to disconnect the blade from the operating handle and to thereby permit the nozzle block to be unthreaded from the tube spout 18. When replacing the nozzle on the spout 18, the nozzle block is first threaded onto the spout and thereafter the rod 46 is inserted by hand through the opening 50 in the blade member and in the opening in the operating handle. One particular advantage afforded by the use of the rod 46 as the means for connecting the blade member to the operating handle is that, in the event it is decided to use the tube squeezer 10 without the nozzle 12, both the nozzle 12 and the rod 46 may be removed therefrom so as to leave the tube squeezer 10 with an attractive and clean appearance.

It will also be noted from FIGS. 2 and 5 that due to the fact that the second opening 32 extends for some distance beyond the blade member 36, the material 26 as it leaves the nozzle 12 will be formed into a neat round ribbon, such as shown at 52 in FIG. 5, similar to the ribbon which would be dispensed from the tube without the use of the squeezer. It should also be noted that after the operating handle 22 is moved a sufficient distance from its normal position to move the blade out of blocking relationship with the opening 32, the operating handle may thereafter be oscillated within the remaining range of its movement to effect the dispensing of any desired amount of material without the blade being returned to its fully closed or blocking position, thereby obtaining a substantially continuous flow from the nozzle.

I claim:

The combination of a tube squeezer comprising a body for holding a tube to be squeezed and having a forward end beyond which end the spout of such a tube projects, said tube squeezer also comprising a squeezing mechanism including an operating handle oscillatable in predetermined opposite directions relative to said body and which squeezing mechanism is operable to squeeze such tube to eject a portion of its contained material from said spout in response to movement of said operating handle in one of said opposite directions, said operating

handle being located adjacent said forward end of said body for oscillation about an axis extending transversely of said body and including a generally forwardly directed opening therein, a nozzle block separate from said tube squeezer having a first opening for receiving the spout of said tube and a second opening extending from the inner end of said first opening to a point of discharge for conducting the material contained in said tube from said spout to said point of discharge, means in said first opening for releasably connecting and disconnecting said nozzle block from said spout while said tube remains in place in said squeezer, said nozzle block including a slot arranged generally transversely to said second opening and extending from one side of said block through and beyond said second opening, a blade member slidably received in said slot and movable relative to said nozzle block between a closed position at which it blocks flow of said material through said second opening and an open position at which it is out of blocking relationship with said second opening, said slot and blade being spaced a substantial distance from said point of discharge so that said second opening extends for some distance beyond said blade and so that after passing said blade the material ejected from said tube is reformed to a cross-sectional shape conforming to that of said second opening in the event it passes the zone of said blade while said blade partially blocks said second opening, said blade having an exposed portion extending beyond said second opening which exposed portion has an opening passing there-through, said nozzle block further including two spaced side walls defining a recess therebetween located behind said blade, a pin fixed in said walls and passing through the bottom of said recess, a helical tension spring located at least in part in said recess and connected at one end to said pin and at its other end to said blade to urge said blade toward its closed position, and an elongated blade actuating part passing through said opening in said blade and releasably received in said opening in said operating handle so that said part may be removed from said operating handle and said opening in said blade to permit removal and replacement of said nozzle block with respect to said tube spout.

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