July 1, 1958 H. H. GRUBER 2,841,310

DISPENSING DEVICE FOR COLLAPSIBLE TUBES

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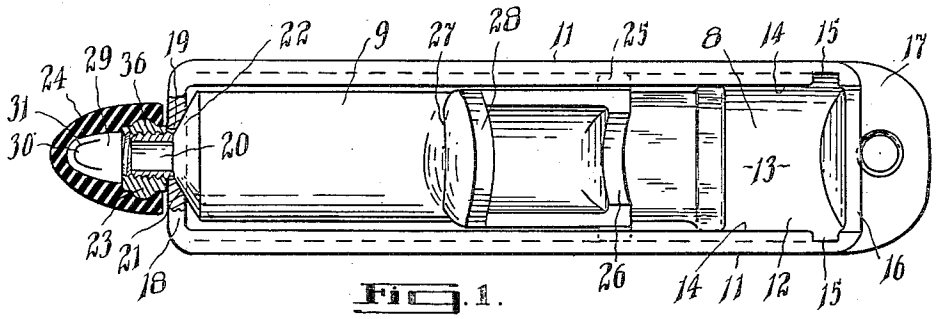


Fig. 1.

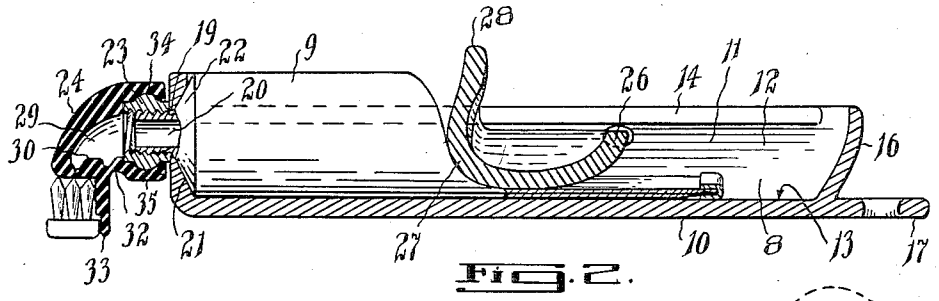


Fig. 2.

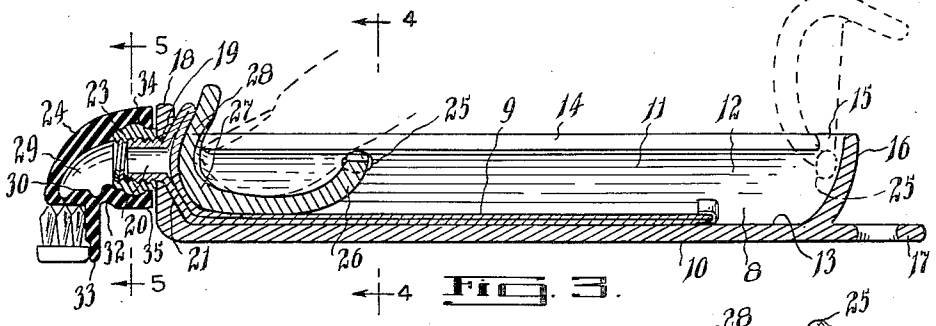


Fig. 3.

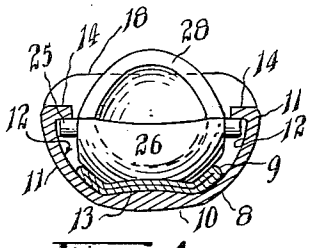


Fig. 4.

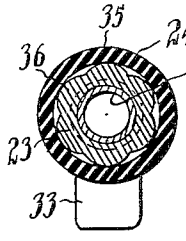


Fig. 5.

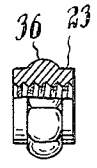


Fig. 6.

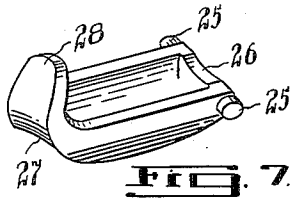


Fig. 7.

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DISPENSING DEVICE FOR COLLAPSIBLE TUBES

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5 Claims. (Cl. 222—103)

My invention relates to improvements in dispensers for collapsible tubes containing semi-liquid materials. More particularly the invention essentially concerns a dispensing device especially adapted for a tube of tooth-paste whereby a predetermined amount of the paste material may be discharged from time to time with facility and convenience.

According to the prior art structures, it has already been proposed to construct a dispenser of this kind in which a tube of the paste is secured by its neck and flattened progressively from its bottom end forwardly to cause ejection of the material in regulable quantities in accord with the needs of the user. The squeezing of the tube is accomplished by manually operable devices of various kinds. The usual screw cap is in some structures replaced by a special head incorporating a cut-off valve which is controlled by a tooth brush to regulate discharge of the paste material.

An object of the present invention is to produce a more efficient and reliable dispenser of this kind in which the squeezing mechanism is of an improved construction having certain salient features of advantage. The improved squeezer is designed for operation with a minimum of hand pressure and functions to assure that the entire contents of the tube will eventually be ejected in the final squeezing process. The utmost in economy is thus achieved in the use of the device.

Another and important object of the present invention is to provide a special closure head incorporating a cut-off valve of a novel and salient construction. This improved valve is designed to be controlled by the head of a tooth brush which is pressed against a finger element to effect the opening of the valve.

Still another object of the invention is to provide a more serviceable and efficient dispenser of the kind referred to.

A selected form of the invention is shown in the accompanying drawing, in which:

Fig. 1 is a top plan view of the improved dispenser depicting the neck portion of the tube and the capping head in section;

Fig. 2 is a longitudinal sectional view of the dispenser in which a brush head is depicted in a position for opening the cut-off valve;

Fig. 3 is a similar view but showing in particular the squeezer in its ultimate squeezing attitude;

Fig. 4 is a cross section on line 4—4 of Fig. 3;

Fig. 5 is a cross section on line 5—5 of Fig. 3;

Fig. 6 is a side view partly in section of the locking nut belonging to the capping head; and

Fig. 7 is a perspective view of the squeezing device.

In carrying out the invention there is provided a tube holding body, generally denoted at 8, of a length somewhat greater than the toothpaste tube 9, for which it is designed. Preferably the body is of a shallow channel shape in cross section comprising the bottom wall part 10, and the side walls 11 between which the tube 9 is loosely disposed.

Desirably the inner faces 12 of the side walls 11 are curved, and the inner face 13 of the bottom wall 10 is reversely curved. This compound curvature has the advantage of aiding in the flattening of the tube under the pressing action of the squeezing device. The upper edges of the side walls 11 define the channel opening and at this opening the said upper edges are provided with inturned lips 14 which are continuous with the side walls except for a gap 15 at each side near the end wall 16. The purpose of the gaps 15 will be dealt with later, but meanwhile it should be mentioned that end wall 16 is regarded as the top wall for the reason that the body 8 is supplied with a pierced lug 17 at this end for hanging the dispenser on a peg, hook, or comparable element projecting from a bathroom wall or equivalent support.

The lower end wall 18 of the body is pierced to provide an aperture 19 in which the neck 20 of the tube is freely inserted to project therefrom. The inner face of this end wall is chamfered, as at 21, about the area of the opening 19 to mate with the conical end wall 22 of the tube. The tube is secured in place by means of a lock nut 23 which has threaded engagement with the tube-neck and which together with the capping head 24 replaces the ordinary screw cap supplied with the tube by the manufacturer.

The squeezing device, detailed in Fig. 7, is novel and comprises a hollow elongated member fitting freely in the channel of the body 8 and capable of being swung on trunnions 25 between raised and lowered positions. The trunnions are disposed at the rear end 26 and are engaged under the lips 14. The trunnions are shown as of elliptical shape in cross section and have their minor axes transversely arranged and dimensioned to pass through the gaps 15 when the squeezer is swung to a fully raised position, indicated in dash lines in Fig. 3. In the lowered position shown in full lines in Fig. 3 the trunnions cannot pass through the gaps because the major axes of the elliptical trunnions are greater than the width of the gaps.

The rear end wall 26 of the squeezer is curved upwardly to the trunnions. The front wall 27 thereof is curved forwardly and slightly backwardly to terminate in an upwardly projecting finger 28. This frontal part forms a rounded nose against which downward and/or forward pressure may be applied by means of the operator's finger or thumb, which is placed in the hollow of the squeezer as indicated in Fig. 3. The external bottom and side faces of the squeezer are curved in a compound manner to mate with the curved inner faces 12 and 13 of the body 8.

With this arrangement the squeezer can be placed lightly on the tube and sufficient manual pressure can be applied to cause a required amount of material to discharge from the tube. The tube can be progressively flattened and when it is practically empty the nose of the squeezer can be forwardly pressed against the neck 22 to force material therefrom in the final ejection operation—see Fig. 3.

The head 24 is made of polyethylene, rubber, or other resilient material. It provides a discharge passage 29 leading from the opening in the neck 20 to an orifice controlled by a cut-off valve 30. This valve is integrally formed from a side wall portion of the head by severing the material on a curved line, indicated at 31, Fig. 1, and leaving an attached section serving as a hinge element 32 by which the cut-off valve may be opened and closed. An actuating finger 33 is integrated with the cut-off valve to extend outwardly at the base or hinged part 32.

This arrangement enables the valve 30 to be opened by pressing against the actuating finger 33 with the head portion of a tooth brush when the tooth brush is proper-

ly positioned at the valve for receiving a charge of the paste for a cleansing operation.

This saves time and effort on the part of the user, and moreover is exceedingly convenient.

The head 24 is mounted on the nut 23 in a swivel manner to enable it to be turned to any desirable or convenient angle to locate the valve element where it is most needed by the user. The swivel connection is effected by an annular recess 34 in the base 35 of the head in which an interrupted annular flange 36 is shouldered to rotate. The flange 36 is formed around the perimeter of the nut 23 as an integral part thereof. The interfitting connection of the nut and the head is accomplished by stretching the base of the head over the nut. To turn the nut for screwing it on and off a tube, the base of the head is squeezed by hand to grip the nut against turning independently of the head.

From the preceding description it will be manifest that the invention provides a highly efficient and serviceable dispenser, and that the specific disclosure may be varied within the scope of the appended claims.

What I claim is:

1. A dispenser for a collapsible tube, comprising a channel-shaped body having side walls with upper edges and being receptive to the tube, inturned lips provided on said side walls to extend along the same at said upper edges, a squeezing device fitted freely in the channel of said body and having a front end and a rear end, said front end being curved to present a tube abutment face, and said rear end having aligned trunnions projecting outwardly from the sides of the squeezing device and engaged under said lips to enable the squeezing device to be swung downwardly on the tube with a compressing action and to be moved along the body for progressively compressing the tube.

2. A dispenser as defined in claim 1, in which the body has a front wall which is pierced to provide an opening for the neck of the tube, the area about the opening being chamfered to mate with the conventional conical end wall of the tube from which the neck extends, and in which the squeezing device is hollow to receive the thumb or a finger of a hand of the user for application of pressure and the front face of the squeezing device is rounded on a curvature to most effectively flatten the conical end-wall section of the tube against said front wall of the body.

3. A dispenser as defined in claim 1, in which the squeezing device is hollow, and in which the front end of the squeezing device is upwardly extended to present a finger.

4. A dispenser as defined in claim 1, in which the internal surface of the body and the external surface of the squeezing device are of mating contours in transverse cross section and comprise a curved bottom section and reversely curved side wall sections.

5. A dispenser as defined in claim 1, in which the lips terminate short of an end wall of the body to provide a gap for each of the trunnions, and in which the trunnions are elliptical in cross section with the minor axis of the ellipse dimensioned to pass through the gap but not the major axis, the minor axis normally residing in a plane substantially at right angles to the gaps and requiring that the squeezing device be swung away from its general position for its removal from the body of the dispenser.

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