Jan. 10, 1967 W. E. SUMNER 3,297,205

PASTE DISPENSING DEVICE FOR COLLAPSIBLE PASTE TUBES

Filed Sept. 13, 1965

Fig. 1

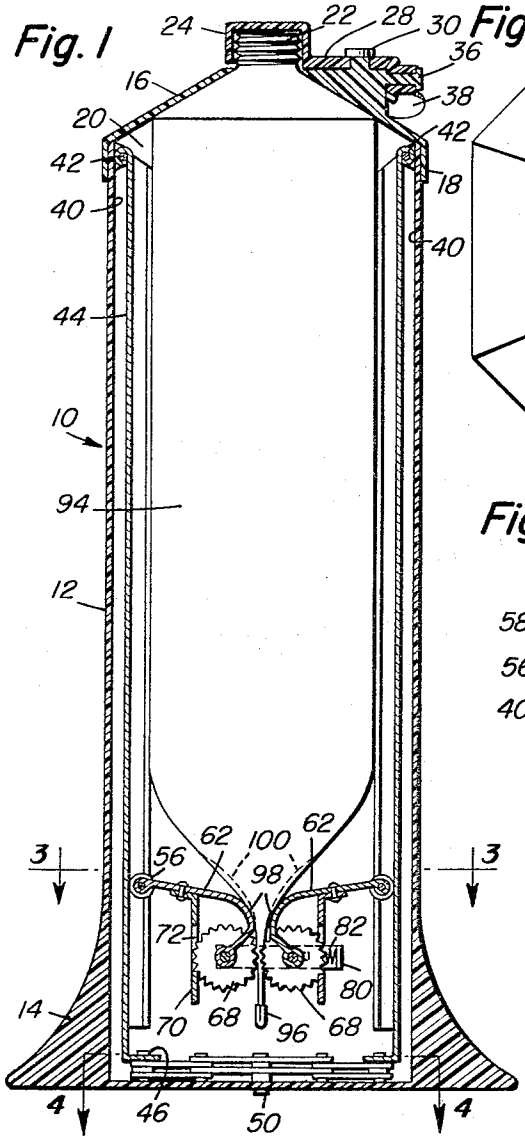


Fig. 2

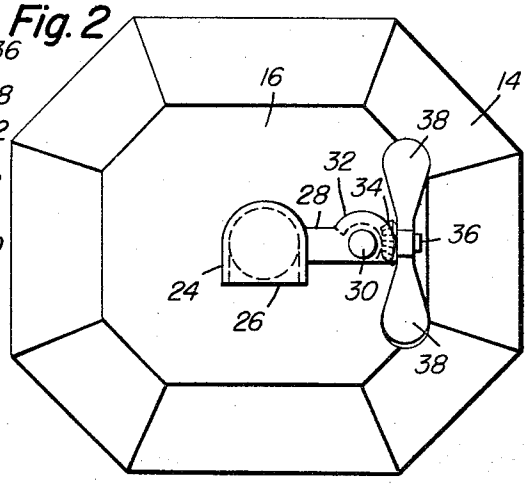


Fig. 3

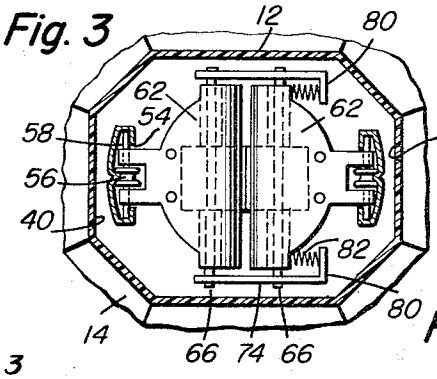


Fig. 7

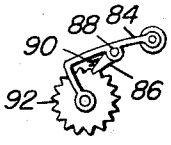


Fig. 4

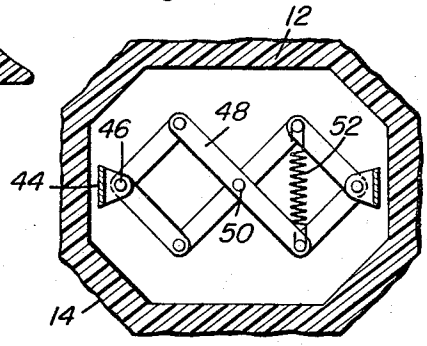


Fig. 5

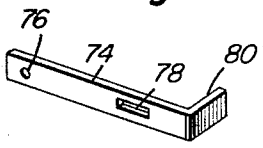
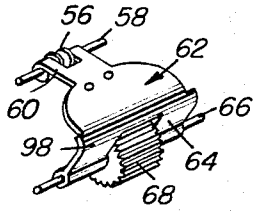


Fig. 6



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PASTE DISPENSING DEVICE FOR COLLAPSIBLE PASTE TUBES

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5 Claims. (Cl. 222—102)

This invention relates to a paste dispensing device for collapsible paste tubes.

It is an object of this invention to provide a device for conveniently dispensing paste, such as tooth paste or the like, to provide a device which may rest readily in upright position on a table or other supporting surface, and wherein, while so resting on a supporting surface, may be readily picked up to uncap the tube and dispense the tooth paste by pressures on opposite sides of the device.

A further object of this invention is to provide a tooth paste tube dispensing device which will provide the dispensing pressure progressively along the tube commencing from the bottom end toward the top or dispensing end of the tube and of the device.

A further object of this invention is to provide a tooth paste dispensing device which will progressively empty the tube as it is used and thus minimize the amount of paste wasted and left in the tube when it is discarded.

A further object of this invention is to provide a device wherein a new tube may be readily inserted in the device by removing the readily removable housing cover and the tube squeezing followers, then inserting the new tube, with its crimping bottom end between the followers, back into the device.

In brief, this tooth paste dispensing device consists of a housing which is generally oval or octagonal in cross-section to conform to the size of the tube it is to receive. The housing is generally flexible so that hand pressure applied thereto will be transmitted to the mechanism therewithin, the bottom of the housing being thickened and thus providing a supporting base. It is open at the top to receive the paste tube therethrough, and has a housing cover so shaped as to be preferably a snap fit thereon. The cover has an aperture through which the paste tube neck and mouth extend, and a tube neck mouth cap cover is pivoted on the housing cover and has an extending arm which is pivoted on the housing cover, and a beveled gear sector at the other end of the arm in mesh with a manually operable bevel gear for opening and closing the cap cover. The pressure transmitting mechanism in the housing includes a pair of opposed vertical tracks and a pair of followers, one on each track, each having a wheel for rolling on the tracks, and a serrated wheel journaled in each follower, urged toward each other, to progressively squeeze the paste tube as it travels up. The top of each track is pivoted at the top of the housing, and the bottom of each track is pivoted to the opposite end of a scissors assembly, yieldably urging them apart, but permitting each track to be squeezed toward the other to thus cause the follower and serrated wheels to operate.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawing, in which:

FIG. 1 is a sectional vertical view of the device of this invention, on line 1—1 of FIG. 2.

FIG. 2 is a top plan view of the device.

FIG. 3 is a section on line 3—3 of FIG. 1.

FIG. 4 is a section on line 4—4 of FIG. 1.

FIG. 5 is a perspective view of an L-shaped finger in the follower mechanism.

FIG. 6 is a perspective view of one follower.

FIG. 7 is a side elevation of a modified follower.

There is shown at 10 the paste tube paste dispensing device of this invention. Visibly from the outside, the device 10 includes a housing 12 of semi-flexible plastic or similar material generally octagonal or oval in cross section, and having an enlarged bottom providing a supporting base 14 generally flat on the bottom surface, and a housing cover 16 provided with a depending flange 18, shaped to conform to the shape of the housing 12, to snap fit over the top open end 20 of the housing. The housing cover 16 is generally frusto-conical shaped and has an opening through which the threaded tube neck 22 may extend, with its regular threaded cap removed. A cap cover 24, open at one side 26 as shown in FIG. 2, has an extending arm 28 pivoted at 30, the arm 28 terminating in a sector shaped bevel gear 32 in mesh with a circular bevel gear 34 pivoted on a pintle 36 integrally extending from the housing cover 16. Extending from the bevel gear 36 are a pair of upwardly extending wings 38 at an obtuse angle of about 135° to each other, so that manually depressing one wing 38 opens the tube neck 22, and depressing the other wing 38 closes the tube neck 22. At the top of each of the two narrower sides 40 of housing 12 there is pivoted at 42 the top end of a trackway 44, the bottom end of which is pivotally connected at 46 to the opposite ends of a scissors 48 pivotally anchored at 50 at the center of the base 14 and yieldably urged apart by the coil spring 52.

Each trackway 44 is somewhat W-shaped as shown in FIG. 3 with inturned flanges 54. Riding on the track 44 is a spool wheel 56 journaled on an extending axle 58 bearing in bifurcations 60 of a curved angle follower 62 having a second pair of bifurcations 64 serving as a bearing for the extending axle 66, a serrated wheel 68 being located on the axle 66 between the bifurcations 64. Depending from the bottom of the follower 62 is a yieldable ratchet plate 70 having a slot 72 the bottom end of which ratchets yieldably against the serrated wheel to permit rotation of the serrated wheel 68 in one direction only. The spool wheel axle extending ends 58 are held within the track flanges 54 to keep the spool wheel 56 riding on the track 44.

The two followers 62 are yieldably urged toward each other by a pair of L-shaped fingers 74 each having an aperture 76 and a slot 78 which are extended over the ends of serrated wheel axles 66, which axle ends may then be peened over so as to hold the fingers 74 in place. The short angle legs 80 of the fingers 74 each have a small coil spring 82 biased between the adjacent follower 62 and its inner side.

The modified follower 84 shown in FIG. 7 differs from that at 62 by having a ratchet pawl 86 pivoted thereto at 88 and urged by spring 90 into engagement with its serrated wheel 92. Otherwise this follower 84 is mounted and operates the same as the follower 62.

The tooth paste tube 94 is placed through the temporarily opened top 20 at the housing 12 with its conventional bottom crimped end 96 extending just between the followers 62 or 84. If necessary, the follower assembly may be easily lifted out the open top and be placed over crimped tube end 96 and then placed back on the tracks 44 and dropped down to the bottom of the track. The housing cover 16 is then placed in position as shown.

In operation, the opposite sides of the housing 12 are manually squeezed adjacent the bottom end just before it thickens into the base 14, while one cap wing 38 is depressed to open the cap 24. This causes the spool wheels 56 to ride up somewhat, applying a squeezing action between the angles 98 of the followers 62 where they press against the opposite sides of the tube 94 until the proper amount of tooth paste is ejected, meantime pivoting somewhat at these angles 98 and squeezing the springs 82 of L legs 80. This also causes the serrated

wheels **68** to rotate slightly against the squeezed sides of the tube **94**, the pawl and ratchet action of the end of the ratchet slot **72** pulling the serrated wheel with it. When released, there will be an air gap between the follower angles **98** and the adjacent squeezed sides of the tube as at **100**. Next time the housing **12** is squeezed, the spool wheels **56** again ride up the tracks **44** and the serrated wheels **68** ride up the previously squeezed sides of the tube until the follower angles **98** again contact the sides of the tube **94**, the yieldable ratchet plates **70** permitting rotation of the serrated wheels **68** in this direction. Then, when the follower angles **98** contact the sides, they squeeze the tubes as above described, repeating the cycle to eject tooth paste.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. A paste dispensing device for collapsible tubes comprising an elongate housing of flexible material open at one end through which a collapsible paste tube may be inserted, the opposite end being closed and having a flaring base extending therefrom, two opposed trackways pivoted at their top ends to said housing adjacent said open end, a scissors connecting means pivoted at its center to said housing base, the bottom ends of said trackways being pivoted to the opposite ends of said scissors connecting means, yieldable means urging said scissors to space said trackway bottom ends apart, said trackways each comprising a track countersunk below inturned flanges of said trackways, a pair of opposed followers, each follower having a spool wheel riding on said track and having an extending axle retained within said trackway flanges, each follower comprising a curved acute angular member bifurcated at each end, one pair of bifurcations providing bearings for said spool wheel extending axle, a serrated wheel riding on another extending axle having a bearing in said other pair of bifurcations, a slotted yieldable ratchet plate secured on and depending from said follower angular member between said spool wheel and the curved angle of said curved member, said serrated wheel extending into the slot of said depending plate an ratcheting against the slot end, and means yieldably urging said serrated wheels toward each other, whereby when said housing is manually squeezed, the bottom ends of said trackways are pivoted toward each other, causing said angular followers to squeeze a paste tube extending between said followers and between said serrated wheels to eject paste from an open end thereof, said scissors connecting means urging said bottom ends of said trackways apart when manual pressure is released, said serrated wheels being held by said ratchet plates against reverse rotation as said followers are pulled slightly away from the paste tube by their said spool wheels to provide a gap therebetween, into which gap said followers advance on the next squeezing action, as said serrated wheels then rotate until the followers again contact the paste tube to repeat the cycle of operation.

2. The device of claim **1**, said urging means comprising a pair of L-shaped fingers, each finger having a pair of axle end receiving apertures in the long leg thereof, one aperture of each pair being elongated and compressible spring means biased between the short L legs and said serrated wheel bearings.

3. The device of claim **1**, and a removable housing cover snap fitted on the open end of said housing, said cover having an aperture for the paste tube dispensing neck to extend therethrough, and a closure cap for said neck pivoted on said housing cover.

4. The device of claim **3**, said closure cap having an extending arm terminating in a bevel gear sector, said cap being pivoted to said housing cover through said extending arm, a beveled gear journaled on said housing cover in mesh with said gear sector, and manually actuatable means for rotating said beveled gear to move said closure cap to and from the closing position.

5. The device of claim **4**, said manually actuatable means comprising a pair of wings secured to said beveled gear at an oblique angle to each other.

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