May 13, 1952 L. VITA 2,596,310

DISPENSING DEVICE FOR COLLAPSIBLE TUBES

Filed Dec. 27, 1951 2 SHEETS—SHEET 1

FIG. 2.

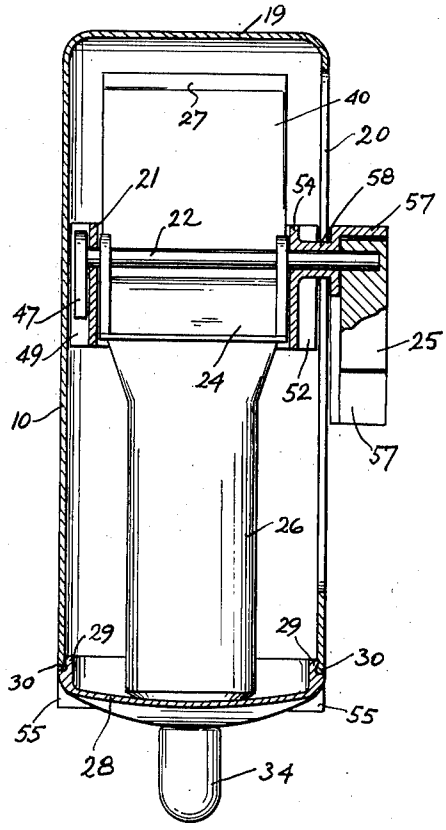


FIG. 1.

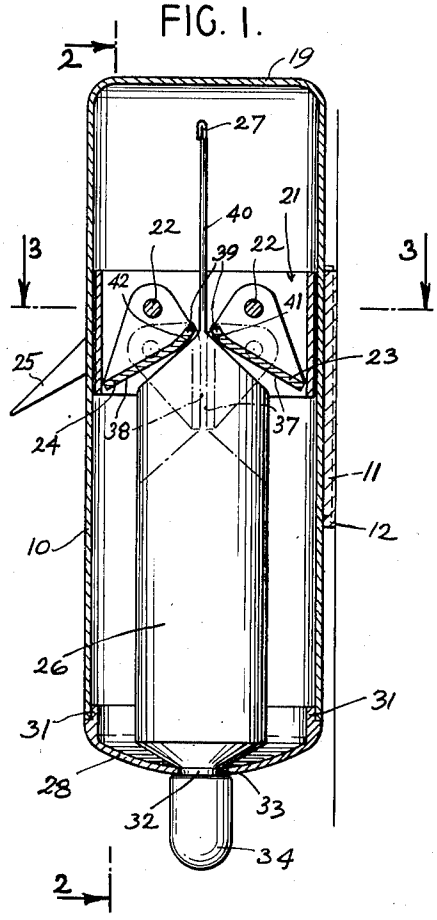


FIG. 3.

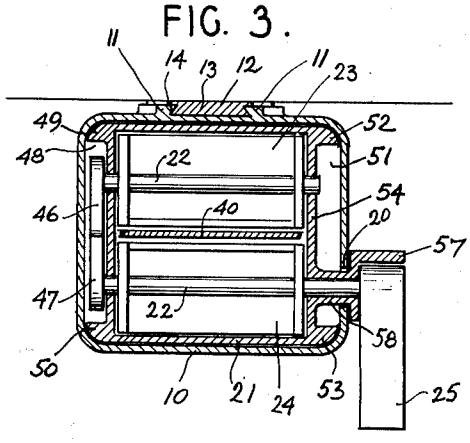


FIG. 8.

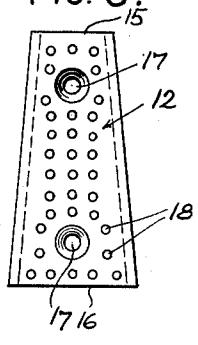
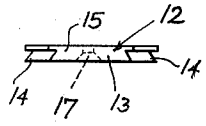


FIG. 9.



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FIG. 4.

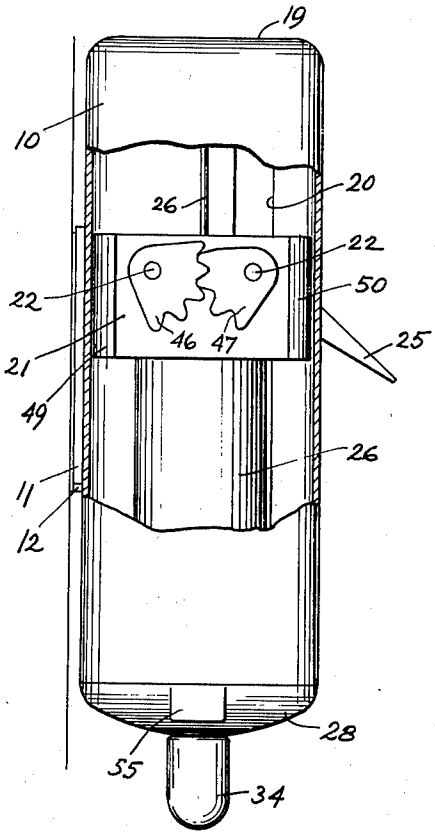


FIG. 5.

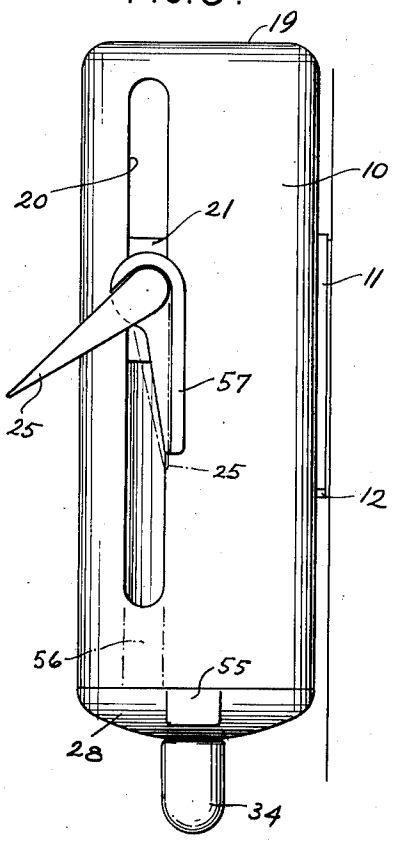
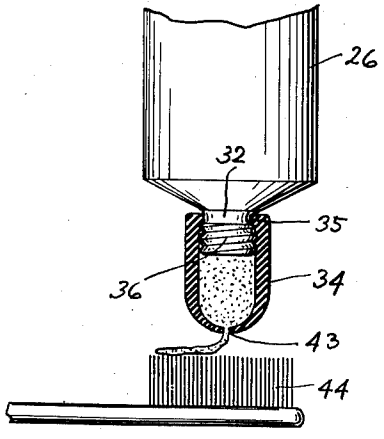


FIG. 6.



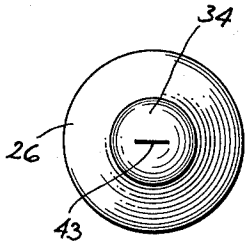


FIG. 7.

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DISPENSING DEVICE FOR COLLAPSIBLE TUBES

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Application December 27, 1951, Serial No. 263,577

3 Claims. (Cl. 222—103)

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This invention relates to dispensing devices and is especially adapted to be used for expelling paste from collapsible tubes. It is herein disclosed in some detail as embodied in a device for expelling tooth paste from a commercial type of collapsible tube containing the paste.

Collapsible tubes are widely used for dispensing tooth paste, and also for dispensing many other materials including shoe blacking, cosmetics, kitchen flavoring materials, various drugs, artists' and other colors, and, in fact, at times, almost every form of pasty or ointment material. Such tubes are very convenient but are open to several objections.

Usually a substantial percentage of the original contents is difficult to expel, in tooth paste it is estimated that 15% is thus lost. Often the contents of a tube is partly expelled and the tube set aside or left without the cap which is provided for closing it, and part of the contents hardens in the opening so that the remainder of the contents cannot be expelled and is either lost or is wastefully and partly removed through a newly made additional opening.

According to the present invention the foregoing and other objections and disadvantages are overcome, and a device is provided into which a collapsible tube of any of a wide variety of sizes is adapted to be readily placed, a special nozzle applied, if needed, and measured amounts of the tube contents adapted to be expelled by the mere swinging of a lever.

The device may include a nozzle adapted to fit the threaded opening of a wide variety of sizes of tubes, and to deliver the tube contents through a self-closing opening in an elastic nipple.

The device, in the form shown, includes a floating or slidable runner carrying a pair of cam-faced rolling devices with their faces normally spaced far enough apart to grasp the flattened end of a collapsible tube and preferably geared together.

In the form shown the rolling devices are carried on shafts journalled in the slidable runner and transversely of it, and one of the shafts may carry a lever lying outside of the housing in which the slidable runner slides, so that pulling on the lever turns its rolling device from an initial position in which the rolling devices are spaced apart to lie on opposite sides of the partly flattened end of a collapsible tube, turning its rolling device and the other rolling device concurrently.

To effect this concurrent turning the two shafts are shown as geared together at one side of the slidable runner. Further pulling on the lever

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turns the shafts further so that the rolling devices close on the tube between them, roll it far enough to begin to expel the desired amount of paste and finally close flat upon the tube completing the expulsion of the desired amount of paste and limiting the throw of the lever.

A two inch lever has been found satisfactory for the largest collapsible tube of the stiffest tooth paste, readily forcing the paste through the self-closing nozzle described below by an almost unconscious pressure on the lever.

Upon release of the lever the rolling devices may be turned back separating slightly and the weight of the slidable runner assists in utilizing the partly compressed tube as a wedge, the rolling devices open apart so the slidable runner slides or settles down on the tube to the point where the slanting faces of the rolling devices lie on the uncompressed part of the tube. In that position the flattened part of the tube projects upward through the opening between the rolling devices, ready to be seized by them when the lever is again pulled.

To facilitate operation of the lever it may stand adjacent a fixed lever, or a lever fastened to the other shaft, so the levers are easily pinched together by the fingers.

The elasticity of the shafts ordinarily provides the necessary play to enable the device to operate on a wide variety of collapsible tubes.

The device ordinarily includes a removable bottom cap for the housing in which the slidable runner moves, and usually that bottom is removed to insert the collapsible tube vertically upward, so that its closed end enters between the rolling devices and then pushes the slidable runner up. The bottom cap is then replaced and may be latched automatically usually with the projecting open end of the collapsible tube lying in an opening in the bottom cap.

Then an elastic cap adapted to securely hold on almost any size and shape of tube nozzle is placed on the nozzle, so that when the lever is operated, paste is pushed down and expelled through a self-closing slot in the elastic cap.

The device may be used as a fountain brush adapted to deliver a ribbon of paste of measured size, or may carry ears or ribs to attach it to a wall fixture as for toothpaste.

It is found that the elastic cap shown with internal peripheral ribs on its neck fits a wide range of collapsible tube necks, including practically every commercially marketed tube carrying tooth paste.

The housing usually includes a slot through

which projects the handle-carrying shaft, and also projects a fixed handle or finger rest near the handle so that the fingers of a hand naturally close upon the levers to easily expel the tube contents in the form of a flat ribbon.

In the accompanying drawings:

Fig. 1 shows a device of the present invention in section, seen from the side;

Fig. 2 is a transverse section;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a side view, partly in section, and seen from the opposite side of Fig. 1;

Fig. 5 is a side view seen from the opposite side of Fig. 4;

Fig. 6 is an enlarged view diagrammatically showing the arrangement of a nozzle;

Fig. 7 is an end view of a nozzle largely diagrammatic;

Fig. 8 shows a wall plate by which the device may be attached to the wall, if desired;

Fig. 9 is a view of the plate of Fig. 8 seen from above.

In the form shown, the dispenser includes a vertical synthetic plastic housing 10, carrying on its back overhanging ribs 11 forming ears adapted to slide on the face of a plate 12 which has a central boss 13 with overhanging edges 14, so that the ears 11 slide under the overhanging edges 14. The plate 12, as shown in Fig. 8, tapers from a small width at the top 15 to a greater width at the bottom 16, and may be provided with screw holes 17 so that it may be screwed to a wall and is also shown with smaller openings 18 so that if desired, instead of being screwed it may be cemented to a wall by a suitable cement which flows between the openings 18 and thereby holds the plate in place.

The housing 10 in the form shown is rectangular having, if desired, a closed top 19, and an elongated side slot 20 to accommodate a slidable handle described below. As thus far described, the housing is well adapted to be molded as a single piece out of plastic resin.

The housing shown carries a floating rectangular runner or slidable support 21 which carries journalled therein transverse shafts 22 adapted to be turned so as to cause cam face operating members 23 and 24 to be swung to and from each other by a handle 25.

The cam face members 23 and 24 are adapted to allow a collapsible tube 26 to be pushed up from below so that its thin end 27 passes between the cam face members 23 and 24, as shown in Fig. 1.

When the tube is thus pushed up, it may be held in place by a bottom cap or hood 28 having on two opposite faces overhanging ribs 29 adapted to catch on internal ribs 30 at the bottoms of the two opposing sides of the housing 10, so as to hold the hood 28. The hood 28 is shown with the straight rabbeted edges 31 to fit on the other sides of the housing 10 so that the hood 28 may be easily sprung into the housing 10 and support the tube 26 with the nozzle neck 32 of the tube 26 projecting through the opening 33 in the hood 28.

In this position an elastic delivery cap 34 which may be made of elastic rubber such as is used for the nipples of babies' feeding bottles, may be slipped over the nozzle 32 and held thereto by one or more internal peripheral ribs 35, and the end rib 35 often being sufficient when it springs beyond the first thread 36 of the tube nozzle.

In the position shown in Fig. 1, the handle 25 may be depressed thereby turning its shaft 22 so as to turn cam shaped member 23 swinging its cam face 37 toward the tube 26 and simultaneously turning the opposite cam face 38 equally toward the tube 26 so that the cam faces first bring their end faces 39 against the compressed end flattened stretch 40 of the tube, and then bring their rolling faces 41 and 42 so as to roll on the tube, and incidentally drag the floating support 21 down on the tube, beginning to expel the tube contents as shown in Fig. 6, through a slit 43 in the tube onto a tooth brush 44. The width of the slit 43 is exaggerated as shown in Figs. 6 and 7 since it may be only a cut which normally lies closed, but it is opened by the pressure of the tube contents when the handle 25 is depressed and the contents flows out to the extent the handle is depressed, and then closes upon the contents ready to deliver another portion. It is found that almost any such delivery slit 43 will be satisfactory for such delivery without forcing off the hood 28.

To cause the cam faces 37 and 38 to move together their shafts 22 carry segmental gears 46 and 47 so that moving the handle 25 moves both cam faces 37 and 38 together and expels the contents of the tube symmetrically from both sides.

To provide space for the gears 46 and 47, they are shown as operating in a hollow 48 provided by small side edge extensions or ears 49 and 50 of the floating support 21.

In order to bring the cam shaped members 37 and 38 centrally of the housing 10, a corresponding opening 51 may be provided on the opposite side by extending the floating support to include ears 52 and 53 so as to space the inner wall 54 of the floating support 21 away from the wall of the housing 10.

To enable the hood 28 to be easily handled, it is shown as provided with finger pieces 55 so as to facilitate compressing the walls carrying the ribs 29.

To facilitate assembling of the device shown, the wall of the housing 10 through which projects the handle 25 may be molded first with the opening 20 continued as indicated diagrammatically at 56, and a separately molded panel later inserted and welded in place to close the bottom of the slot 20 as shown.

In order to facilitate the use of the handle 25 it is shown as lying adjacent a relatively fixed finger piece 57 springing from an extension 58 of the wall of the support 21 and projecting through the slot 20. This provides a simple pinching motion for operating the handle 25 as between a thumb on it and a finger on the finger piece.

It will be noted that immediately the handle 25 is released, the floating support 21 falls to again lie upon a new uncompressed part of the tube 26.

The lower ends of the cam faces 37 and 38 as shown in dotted lines compress the tube and then lie upon the compressed face 40 of the tube 26 at the limit of the throw of the handle 25. By suitably adjusting the throw of the handle 25 the device may take the form of a fountain for hand use in applying a measured amount of paste, paint or other material.

It has been usually found unnecessary to provide any spring to return the handle 25 and connected parts to clear a toothpaste collapsible tube.

Having thus described certain embodiments of my invention, what I claim as new is:

1. In a dispensing device, the combination with a housing having a slot, of a floating member

slidable in the housing, a pair of spaced parallel shafts journalled in the floating member to face opposite sides of a collapsible tube container supported in the housing, a cam faced member on each shaft, adapted to rest on the opposite sides of the tube and support the floating member, a flat extension of each cam faced member adapted to be swung toward the other to compress the sides of the tube between them, gears causing the shafts to turn together, and a handle fast to one shaft and projecting through the slot to be pressed downward to turn the shafts to cause the cams to roll against the tube and swing the extensions to compress the sides of the tube to expel the tube contents.

2. In a dispensing device, the combination with a rectangular housing having a vertical slot, of a floating rectangular member having sides slidable in the housing, a pair of spaced parallel shafts journalled in opposing sides of the floating member to face opposite sides of a collapsible tube container supported in the housing, a cam faced member on each shaft, adapted to rest on the opposite sides of the tube and support the floating member, a flat extension of each cam faced member adapted to be swung toward the other to compress the sides of the tube between them, gears causing the shafts to turn together, and a handle fast to one shaft and projecting

through the slot to be pressed downward to turn the shafts to cause the cams to roll against the tube and swing the extensions to compress the sides of the tube to expel the tube contents.

3. In a dispensing device, the combination with a rectangular housing having a vertical slot, of a floating rectangular member having sides slidable in the housing, a pair of spaced parallel shafts journalled in opposing sides of the floating member to face opposite sides of a collapsible tube container supported on the housing and having a nozzle projecting outside the housing, a delivery cap outside the housing and pierced by an opening, a cam faced member on each shaft adapted to rest on opposite sides of the tube and support the floating member, a flat extension of each cam faced member adapted to be swung toward the other to compress the sides of the tube between them, gears causing the shafts to turn together, and a handle fast to one shaft and projecting through the slot to be pressed downward to turn the shafts to cause the cams to roll against the tube and swing the extensions to compress the sides of the tube to expel the tube contents through the nozzle and cap.

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No references cited.