Dec. 15, 1959 J. A. KUJANIK, JR 2,917,209

COLLAPSIBLE TUBE AND CAP

Filed Jan. 20, 1958 3 Sheets-Sheet 1

Fig. 1

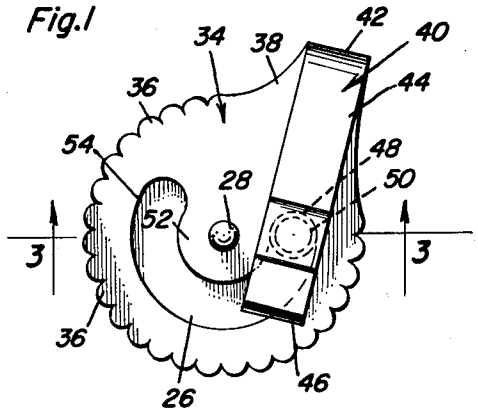


Fig. 2

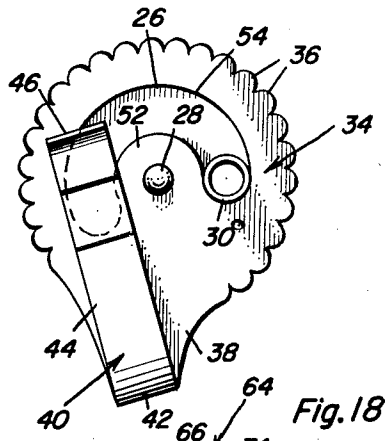


Fig. 3

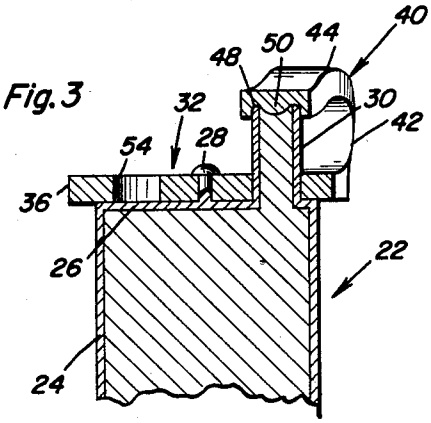


Fig. 18

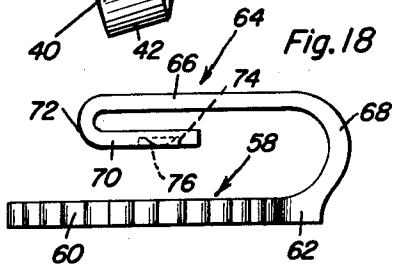


Fig. 4

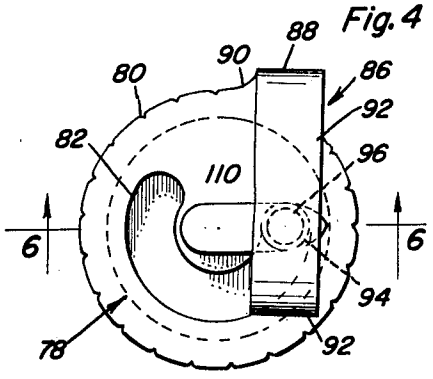
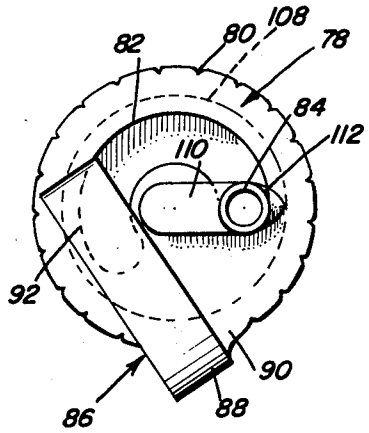


Fig. 5



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Dec. 15, 1959 J. A. KUJANIK, JR 2,917,209

COLLAPSIBLE TUBE AND CAP

Filed Jan. 20, 1958 3 Sheets-Sheet 2

Fig. 6

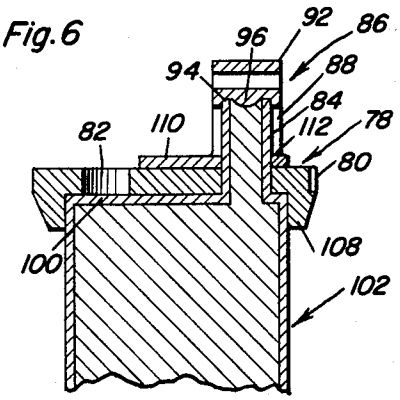


Fig. 7

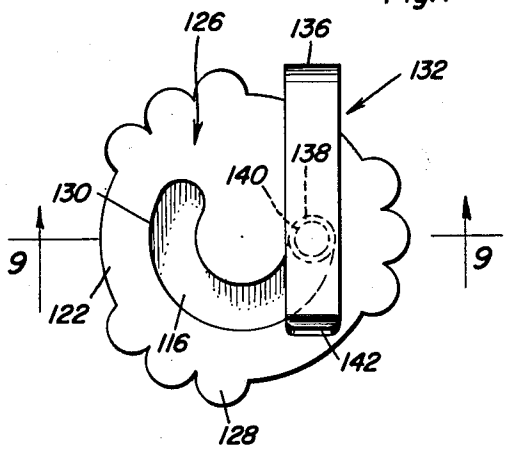


Fig. 8

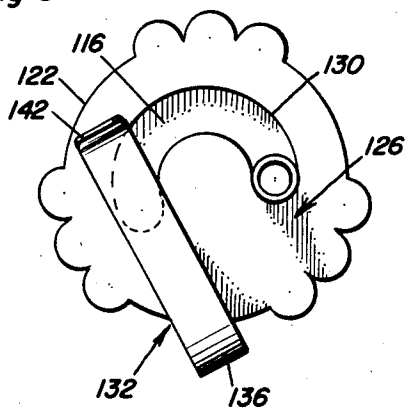


Fig. 9

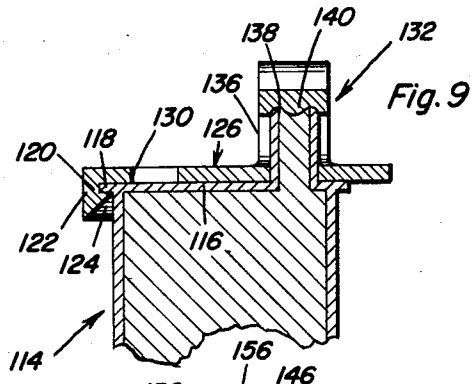


Fig. 16

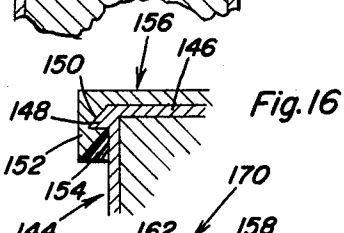


Fig. 17

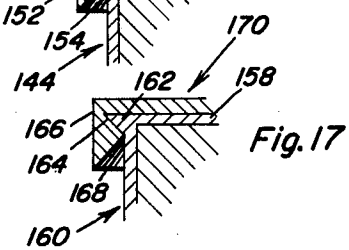
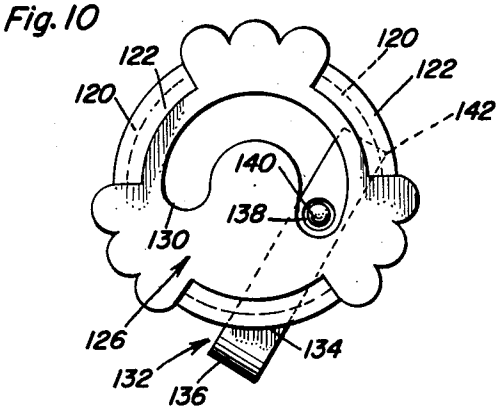


Fig. 10



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Dec. 15, 1959 J. A. KUJANIK, JR 2,917,209

COLLAPSIBLE TUBE AND CAP

Filed Jan. 20, 1958 3 Sheets-Sheet 3

Fig. 11

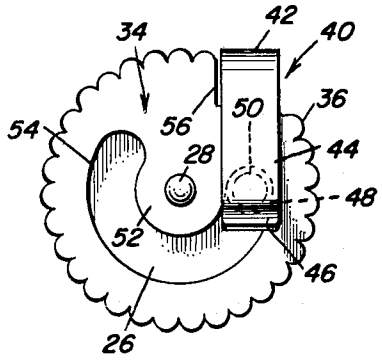


Fig. 12

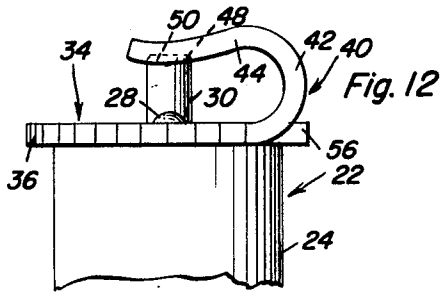


Fig. 14

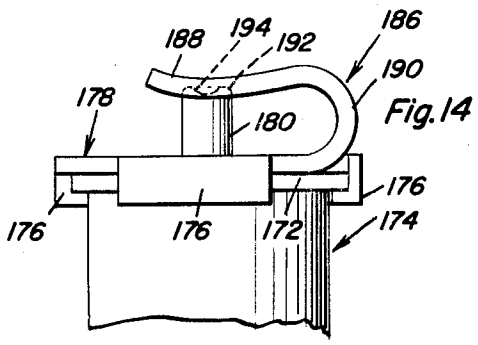


Fig. 13

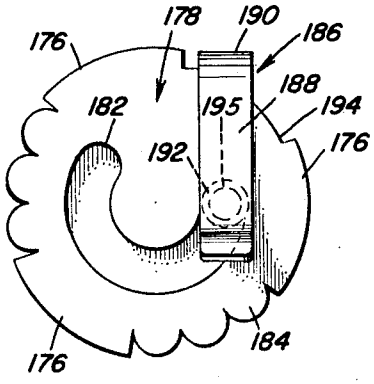


Fig. 19

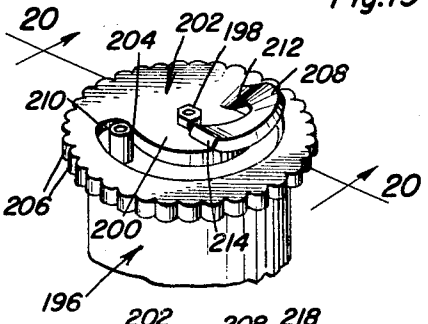


Fig. 20

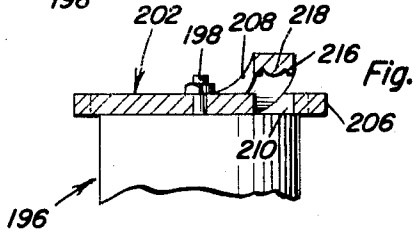
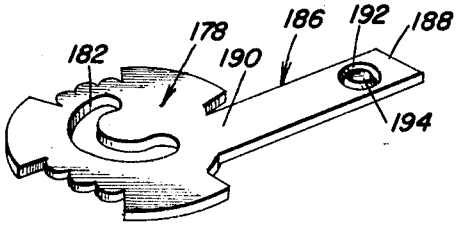


Fig. 15



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Patented Dec. 15, 1959

2,917,209

COLLAPSIBLE TUBE AND CAP

Joseph A. Kujanik, Jr., Gary, Ind.

Application January 20, 1958, Serial No. 709,871

12 Claims. (Cl. 222—512)

This invention relates to a novel and improved collapsible commodity (tooth paste or the like) tube and a closure or cap therefor, and has reference, more particularly, to a closure which is operatively attached to the tube-end so that it is always in place and cannot get lost.

A general object of the invention is to structurally, functionally and otherwise improve upon prior art adaptations in which a similar objective is carried out. To this end a novel construction has been evolved and produced which is susceptible to mass production techniques and economical manufacturing procedures using, if desired and preferred, an appropriate grade of commercial plastics for the cap, the tube, or both.

As will be hereinafter disclosed with greater particularity the invention under advisement pertains to a collapsible tube which, unlike the type commonly on the market has a substantially flat rather than a conical or similar discharge end. In addition, instead of having the discharge neck or spout axially positioned, it is integral with the end of the tube but is eccentric or off-center. The complemental cap and its components is characterized by a disk or an equivalent body member which is mounted for rotation atop the tube-end. It embodies a flexibly resilient capping finger which snaps over the discharge end of the neck. It is mounted in such a way that it is preferably, but not necessarily, turned clockwise to achieve the capping and closing step and counter-clockwise to bring about the opening step.

As will be evident to the reader, having perused the various figures of the drawings, the basic or generic concept is reduced to practice through the medium of a number of embodiments of that concept. To this end and briefly summarized this generic aspect of the invention comprehends the adoption and use of a collapsible tube having a projecting discharge neck at one end of the tube, a flexibly resilient finger having a free end portion resting yieldingly atop the end of said neck and capping and normally closing the discharge end of the neck, and a manually turnable finger actuating member rotatably mounted atop said one end of said tube, said finger being connected to and carried by said actuating member, said finger being chiefly in a plane lateral to the axis of said neck.

Secondly, and also generically, the surface of the capping or closing finger which rests atop the neck or spout has a recess and an accompanying concentric boss. The boss is adapted to snap into the open end of the neck in such a manner that the neck-end seats in the recess. This cooperation of the parts effects a highly satisfactory closing action.

More particularly, the neck is operatively joined to said one end of the tube in an off-center position. The actuating member comprises a generally flat disk having an arcuate slot therein and said neck extends through and beyond said slot, said disk and finger being integral with each other and operable as an entity, said disk being of a diameter greater than the cross-section of said tube

with its outer marginal edge projecting beyond the tube surfaces and formed with anti-slipping finger-gripping elements.

As is evident the preceding general description pertains to the broad or generic interpretation of the invention. The more specific adaptations which stem therefrom will not be touched upon here but will be brought out in a systematic manner as the description proceeds.

In addition, other objects, features and advantages of the invention will become readily apparent from the following description and the accompanying drawings.

In the drawings wherein like numerals are employed to designate like parts throughout the views:

Fig. 1 is a plan view of one embodiment or form of the invention showing its construction and how the cap or closure serves to effect a closing of the discharge neck or spout.

Fig. 2 is likewise a plan view, similar to Fig. 1, showing the relationship of the parts with the cap open.

Fig. 3 is a section with parts in elevation taken on the line **3—3** of Fig. 1.

Fig. 4 is a plan view of a second embodiment of the invention and which, like Fig. 1 shows the capping or closing finger closed.

Fig. 5 is a view of the same with the finger in its open position.

Fig. 6 is a section on the line **6—6** of Fig. 4.

Fig. 7 is a plan view of a third modification or form of the invention with the finger in its closed position.

Fig. 8 is a plan view of the same with the finger open.

Fig. 9 is a section on the line **9—9** of Fig. 7.

Fig. 10 is a bottom plan view of the cap by itself.

Fig. 11 is a plan view similar to Fig. 1 and showing a slight modification.

Fig. 12 is a view in side elevation showing a fragmentary portion of the tube and the cap of the form seen in Fig. 11.

Fig. 13 is a plan view of another embodiment.

Fig. 14 is a side elevational view of the same.

Fig. 15 is a perspective view of the blank from which the cap of Figs. 13 and 14 are made.

Figs. 16 and 17 are fragmentary views showing slight variations of the keying means which stem from the simpler construction depicted in Fig. 9.

Fig. 18 is an edge elevation of a modified cap.

Fig. 19 is a perspective view of a further modification.

Fig. 20 is a section on the line **20—20** of Fig. 19.

With reference first to Figs. 1, 2 and 3 and particularly to Fig. 3 the collapsible tube is denoted by the numeral **22**, the body portion **24** being of plastic or equivalent sheet material and having a substantially flat circular top **26** with a central suitably headed integral pivot pin or stud **28** and an eccentric or off-center discharge neck or spout **30**. The numeral **32** designates a complemental unit which may be described as a cap, cover or closure means and which is characterized by a disk-like substantially flat-faced member **34**, the outer marginal periphery of which is serrated or scalloped to provide suitable finger-grips **36**. On one marginal portion there is an outstanding coplanar extension **38** which is gradually narrowed and fashioned into a capping finger **40**. This finger is flexibly resilient and has a curvate bend or bent portion **42** which joins with the finger proper **44** and which has a free and suitably flared end portion **46**. The underneath side thereof is provided with a recess **48** to accommodate the upper mouth or lip portion of the discharge neck or spout and at the center there is a suitably formed convex boss **50** which is adapted to snap into the neck to effect the desired closing thereof.

It will be seen that the central portion of the member **34** as denoted at **52** is pivoted to rotate or turn on the headed pivot **28**. There is an arcuate slot **54** formed in

said member and the eccentric neck **30** extends therethrough, making it simple to open and close the valving or capping finger **44** and its features **48** and **50** by turning the over-all cap either clockwise or counter-clockwise as the case may be. Fig. 1 shows the finger closed and Fig. 2 shows it open.

Since the radial extension **38** may not always be desirable and inasmuch as it may be equally desirable to design and construct the cap to enable it to be fitted into a square or nearly square box for packing the construction seen in Figs. 11 and 12 may be employed as an alternate adaptation. Moreover, inasmuch as Figs. 11 and 12 disclose approximately the same construction as already described (Figs. 1 to 3 inclusive) the same reference numerals are being applied to corresponding or like parts. In fact, a comparison of these five figures will show that the only difference is the omission of the extension or part **38** and the utilization instead of a cut-out marginal notch **56**. This is seen by comparing Figs. 11 and 12 and therefore the bend or bent portion **42** brings the entire finger approximately within the perimeter limits of the over-all cap.

It will be noticed that in Figs. 1 to 3 inclusive and Figs. 11 and 12 the body of the cap is centrally pivoted to the flat end of the tube. With reference to Fig. 18 this particular cap which is in alternate form is basically similar to the ones already described and this could be either a central pivotal attachment or attached in ways in which other forms of the invention, yet to be described, are applied and held in place. In any event the cap in Fig. 18 is denoted by the numeral **58** and has marginal finger-grips **60** and a marginal or radial extension **62** carrying the flexibly resilient capping finger means **64**. The finger proper is denoted at **66** and joins the extension **62** by way of a curvate resilient bend or bent portion **68**. The distinction here is that the free end portion **70** is joined by a return bend **72** to the finger proper and underlies the finger in spaced parallelism. The recess **74** and boss **76** are the same as already described.

Reference is now made to Figs. 4, 5 and 6. In these figures the flat disk-like cap or member is denoted by the numeral **78** the margin of which is provided with circumferentially spaced nicks **80** serving as appropriate finger-grips. The arcuate slot is denoted at **82** and this cooperates with the discharge neck **84** in the manner already described. The capping finger means is denoted at **86** and is joined by a bent portion **88** to the marginal extension **90**. The free end portion **92** is provided with a recess **94** and boss **96** functioning in the manner already described.

The discharge spout or neck **84** on the flat end **100** of the tube **102** operates in the eccentric arcuate slot **82** in a manner already described. It will be noticed that the bottom of the disk or cap **78** is here provided with an endless flange **108** which encircles the upper end of the tube. Also instead of centrally pivoting the cap a lateral holddown lug **110** is provided and this has an outer apertured end portion **112** which encircles the neck and is welded or otherwise secured to said neck. This lug overlies the median portion of the disc **78** in conjunction with the flange **108** provides a satisfactory rotatable and operating connection between the parts.

Reverting to the aforementioned recess and boss as shown for example at **48** and **50** in Figs. 1 to 3, this construction is desirable because it seals the neck or spout better and is easier to manufacture. Plastic or similar material may be heated and held over a round hollow piece of metal similar to the spout, and a small amount of pressure applied forming this circular groove or recess. A cap with this construction is easily opened, in that the convex cam-like boss in its recess rides up over the lip of the spout.

Also and reverting to Fig. 18 it will be evident that the cover can be used as a handle. In case a manufacturer wanted a deeper recess, this cover will work most effectively. The cover handle would be grasped with the thumb and index finger, pulled out and turned. With some commodities there is a chance for a portion thereof to pile up under the cover just in back of the recess. In this cover, there is an open area to help eliminate that possibility.

Furthermore and with reference to the embodiment seen in Figs. 4, 5 and 6, it will be seen that Fig. 6 shows the endless flange **108** encircling the outside circumference of the disk portion of the cap. This flange works in conjunction with the large retainer and the small retainer which are located on the spout of the tube. It keeps the cap in the proper relation to these retainers. These retainers hold the cap to the tube. They are perpendicular to the slot in the cap in which the spout travels. The flange causes the two retainers to remain perpendicular to the slot; otherwise, without the flange, the outer edge of the cap, when operated, would travel toward the center of the tube and the two retainers would line up with the slot in the cap, consequently, causing the cap to fall off the tube. This feature is necessary. The tube, retainers, and the spout may be one-piece construction. If the tube is made of plastic, it could be made in two pieces; one piece consisting of the spout, retainers, and top portion of the tube; the other piece consisting of the bottom or circular part of the tube. This cap should be made of material which is flexible.

Also it may be added that the spout or neck of the tube could be sealed during the manufacturing process, and that some of the caps could be attached to the tube by the consumer, and the tip or end of the spout punctured with a pointed instrument and made ready for use.

Again and in reference to Figs. 4, 5 and 6 the instructions for application of the cap are: Apply forward movement to cap and apply slight pressure to center of cap, thus causing the center of the cap to slide under the retainer. Then with a slight pressure with the thumb, the cap revolves in a clockwise direction until the lip around the circumference of the cap slips over the outside of the tube, thus holding the cap on the tube.

With reference now to Figs. 7 to 10 inclusive and observing Fig. 9 to begin with the tube **114** has a flat top **116** having an outstanding marginal keying flange **118** to accommodate the keying groove **120** provided in the cooperating circumferentially spaced attaching and retaining flanges **122**. The bottom of the flange **124** is beveled to facilitate snapping the cap or body member **126** in place in a seemingly obvious manner. The circumferentially spaced finger-grips are denoted at **128**, the arcuate slot at **130**. The finger **132** as seen in the bottom plan in Fig. 10 has one end **134** joined to the margin by way of the springy bend or bent portion **136**. The recess is denoted at **138** and the boss at **140**. The free flared or terminal end of the finger is denoted at **142**.

If instead of using the simple keying means seen in Fig. 9 one prefers the tube **144** (Fig. 16) may be provided on its top **146** with an outstanding bevel edged flange **148** fitting into a corresponding undercut keying groove **150**. This groove is formed in the segmental depending flange portion **152** the bottom of which is beveled at **154** to facilitate application and keying of the parts. The body of the cap is here denoted as an entity of the numeral **156** and has the same basic construction with slot and finger means already described.

Again and in reference to Fig. 17 the flat top **158** of the tube **160** has a V-shaped keying flange **162** to accommodate the correspondingly fashioned or cut keying groove **164** in the flange means **166**. Here again a beveled surface **168** is provided on the flange means. The body member of the cap is denoted at **170**.

With reference now to Figs. 13, 14 and 15 a similar construction is provided wherein a marginal flange **172** on the top of the tube **174** serves to accommodate circumferentially spaced hook-shaped keying flanges or members **176** on the cap **178**. The neck **180** extends

through the arcuate slot **182** and finger-grips are provided at **184**. The finger for capping the neck is denoted at **186** and has a free flared end portion **188**, the finger is joined to the cap by way of a resilient bend or bent portion **190**. Here again a recess is provided at **192** with a central closing boss **194**. The construction seen in these several figures is similar to that depicted in Fig. 11 wherein the accommodation notch for the finger connection is somewhat longer as denoted at **195** in Fig. 13. Here instead of using a central pivot as in Fig. 11 the keying is accomplished by the hook-like flanges **176** engaging over the endless keying flange **172** on the tube. The blank from which the cap is fashioned is depicted in Fig. 15.

With reference now to Figs. 19 and 20 this is an ideal and highly practical embodiment and it will be seen that the flat topped tube **196** has a central pivot **198** to accommodate the portion **200** of the disk or cap member **202**. Here again the projecting neck or spout **204** operates in the arcuate slot. The finger-grips are denoted at **206**. The principal feature here is that the capping tongue is novel and distinct from the rest of the forms so far described, for here the tongue **208** is struck out from the disk and defines the slot **210**. It is joined or integrated at one end at **212** and the free flared end **214** is in the same arc as the slot and effects a highly satisfactory closure by way of the recess **216** and accompanying boss **218** as seen in Fig. 20. This cap could be made from a round piece of plastic. In manufacture the slot could be stamped out and the cover pressed out with one end left attached to the body cap. The recess could be made in the same operation. A small amount of this material from the other end of the slot could be cut off in the stamping and pressing operation and discarded. This cap requires less material than the other caps. Also, this particular cap is easier to manufacture because the cap may be stamped out, the cover pressed, the recess in the cover formed, all in one operation.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. For use as a container and dispenser for tooth paste and the like comprising a collapsible tube having a neck at the discharge end of said tube, a flexibly resilient finger having a free end portion resting yieldingly atop and capping and normally closing the discharge end of said neck, and a manually turnable finger actuating member rotatably mounted atop said one end of said tube, said finger being connected at one end to and carried by said actuating member, said finger being chiefly in a plane lateral to the axis of said neck, that surface of the finger which rests atop the neck having a recess and a boss arranged centrally in the recess, said recess and boss constituting a closing cap for the neck and said boss projecting releasably into the end of the discharge passage in said neck, said neck being operatively joined to the discharge end of said tube in an off-center position, said member comprising a generally flat disk having an arcuate slot therein and said neck extending through and beyond said slot, said disk and finger being integral with each other and operable as an entity, said disk being of a diameter greater than the cross-section of said tube with its outer marginal edge projecting beyond the tube surfaces and formed with anti-slipping finger-gripping elements.

2. The structure defined in claim 1, and wherein said disk is pivotally connected at its central portion to a corresponding portion of said one end of the tube.

3. The structure defined in claim 1, and wherein said disk has a depending marginal flange rotatably surrounding the body portion of said one end of the tube, and a disk holddown and retaining member resting upon, but not secured, at its inner end to a central imperforate portion of said disk, the outer end of said member being apertured, embracing and fixed to said neck, said disk being thus sandwiched between the tube-end and retaining member and rotatable relative thereto.

4. For use as a container and dispenser for tooth paste and the like comprising a collapsible tube having a neck at the discharge end of said tube, a flexibly resilient finger having a free end portion resting yieldingly atop and capping and normally closing the discharge end of said neck, and a manually turnable finger actuating member rotatably mounted atop said one end of said tube, said finger being connected at one end to and carried by said actuating member, said finger being chiefly in a plane lateral to the axis of said neck, that surface of the finger which rests atop the neck having a recess and a boss arranged centrally in the recess, said recess and the boss constituting a closing cap for the neck and said boss projecting releasably into the end of the discharge passage in said neck, said neck being operatively joined to the discharge end of the tube in an off-center position, said member comprising a generally flat disk having an arcuate slot therein and said neck extending through and beyond said slot, said disk and finger being integral with each other and operable as an entity, said disk being of a diameter greater than the cross-section of said tube with its outer marginal edge projecting beyond the tube surfaces and formed with anti-slipping finger-gripping elements, said finger being disposed in a plane spaced from the plane of the disk, one end of the finger having a curved return-bend which is joined with said disk.

5. For use as a container and dispenser for tooth paste and the like comprising a collapsible tube having a neck at the discharge end of said tube, a flexibly resilient finger having a free end portion resting yieldingly atop and capping and normally closing the discharge end of said neck, and a manually turnable finger actuating member rotatably mounted atop said one end of said tube, said finger being connected at one end to and carried by said actuating member, said finger being chiefly in a plane lateral to the axis of said neck, that surface of the finger which rests atop the neck having a recess and a boss arranged centrally in the recess, said recess and boss constituting a closing cap for the neck and said boss projecting releasably into the end of the discharge passage in said neck, said neck being operatively joined to the discharge end of the tube in an off-center position, said member comprising a generally flat disk having an arcuate slot therein and said neck extending through and beyond said slot, said disk and finger being integral with each other and operable as an entity, said disk being of a diameter greater than the cross-section of said tube with its outer marginal edge projecting beyond the tube surfaces and formed with anti-slipping finger-gripping elements, the end of the tube carrying said neck having flange means and cooperating marginal portions of said disk having groove means releasably and rotatably keyed on said flange means.

6. For use of a container and dispenser for toothpaste and the like, a collapsible tube having a substantially flat discharge end and an off-center outwardly projecting discharge neck, a substantially flat disk superimposed on and centrally pivoted on said tube-end, said disk having an eccentric arcuate slot and said neck extending through and beyond said slot, said disk also having an extension on its marginal portion gradually decreased in width and formed with a resilient finger with one end free and the other end joined to the extension by way of a resilient bend, the free end of said finger normally overlying and closing the discharge end of said neck.

7. For use of a container and dispenser for tooth paste

and the like, a collapsible tube having a substantially flat discharge end and an off-center outwardly projecting discharge neck, a disk having substantially flat surface seated for rotation atop said discharge end, said disk having a depending marginal flange surrounding and rotatable about the cooperating end portion of the body portion of the tube, said disk having an off-center arcuate slot through and beyond which said neck extends, also having a resilient finger with one end joined marginally to said disk and the other end alined with and normally closing the discharge end of said neck, said neck having a lateral lug integral therewith, one end of said lug resting freely atop a central portion of said disk, said disk being interposed between the end of the tube and lug and partially held in place by the lug and neck.

8. A closure for a collapsible tube having a generally flat end and an off-center discharge neck comprising a generally flat disk having an off-center arcuate slot, circumferentially spaced marginal finger-grips and circumferentially spaced depending segmental portions each with a keying groove, the bottom surfaces of said portions being bevelled so that the closure, which is made of resilient plastic material, may be readily snapped over a keying flange provided therefor said cooperating end portion of said tube, said disk also having a marginally attached resilient finger overlying the disk in spaced relation, the free end of said finger being adapted to normally cover and close the discharge end of said neck.

9. The structure defined in claim 8, and wherein said flange has a bevelled peripheral edge, said segmental portions being grooved and the cross-section of the groove corresponding with the cross-section of the flange.

10. For use as a container and dispenser for tooth paste

and the like comprising a collapsible tube having a projecting discharge neck at one end of the tube, a flexibly resilient finger having a free end portion resting yielding atop the end of said neck and capping and normally closing the discharge end of the neck, and a manually turnable finger actuating member rotatably mounted atop said one end of said tube, said finger being connected to and carried by said member, said finger being chiefly in a plane lateral to the axis of said neck, said neck being communicatively and operatively joined to said one end of said tube in an off-center position, said member comprising a plastic disk rotatably mounted on said one end and having an arcuate slot through and beyond which said neck projects, and a flexibly resilient neck-closing finger having one end joined with said disk at one end of the slot, the other end of said finger being free and adapted to rest yieldingly atop the discharge end of said neck.

11. The structure defined in claim 10 and wherein said finger comprises a tongue which is formed integrally with the disk during the time said slot is being formed.

12. The structure defined in claim 10 and wherein said finger comprises a curved tongue struck out from the disk leaving a slot in said disk, said tongue being shorter than the slot and the general arcuity of the tongue, in plan, corresponding to the arcuity of said slot.

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