

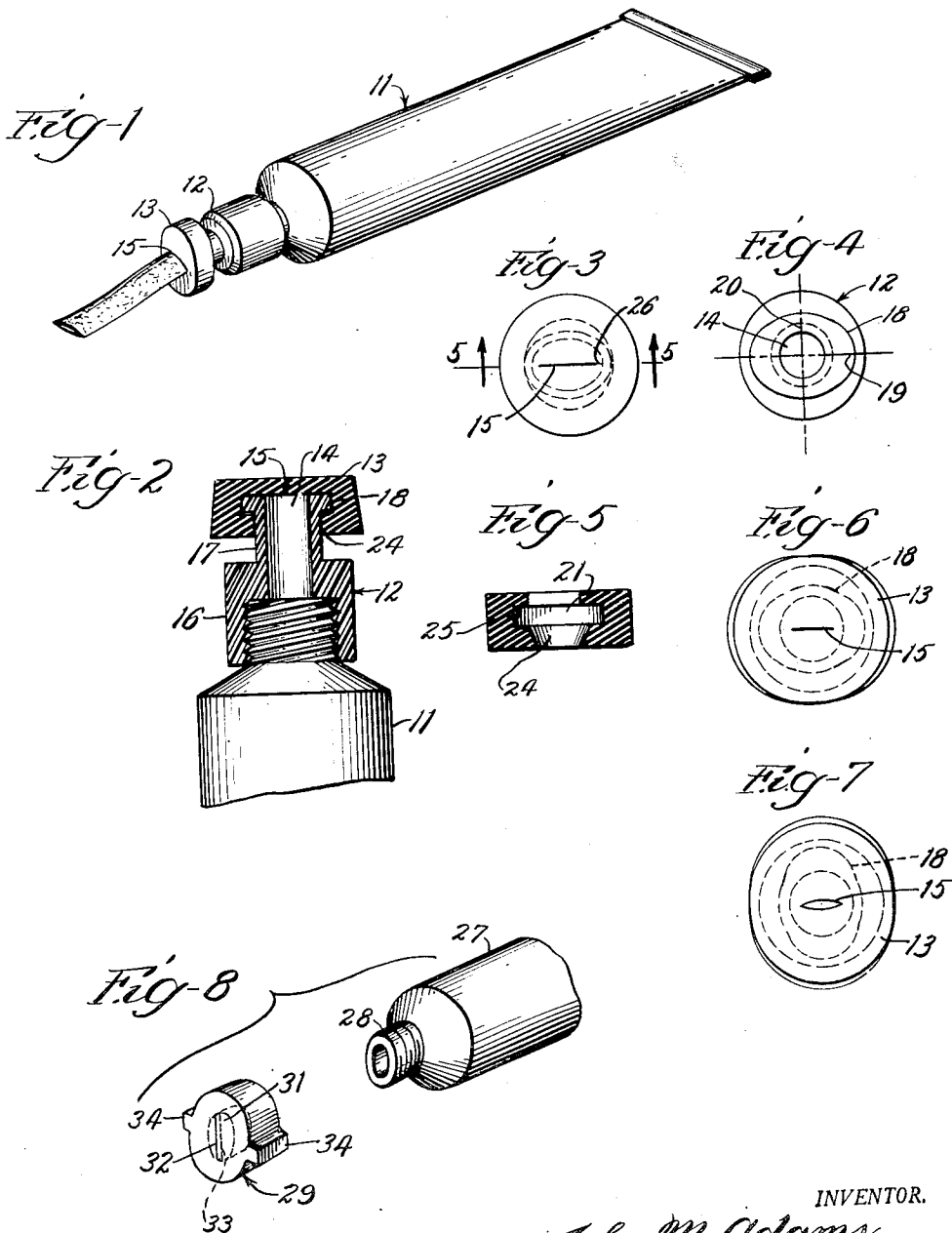
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SLITTED RESILIENT CLOSURE FOR CONTAINERS

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SLITTED RESILIENT CLOSURE FOR CONTAINERS

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This invention relates to a closure for containers from which pastes, liquids, powders, and like materials are to be dispensed.

Many contrivances have been suggested for more easily and efficiently dispensing materials from collapsible containers, but these have not been entirely satisfactory, some of their more common deficiencies being that they must be removed from the containers in order to permit the container contents to be dispensed, and thus are too often contaminated, misplaced, or lost; or their high cost of manufacture prohibits their use with inexpensive containers, such as collapsible tubes; or they fail to prevent leakage of container contents.

My invention contemplates the elimination of many of the shortcomings heretofore associated with such devices, and has as an important object the provision of a container having novel means for controlling the discharge of pastes, liquids, powders, and similar materials from containers therefor.

Another object is to provide a novel closure device which may be readily secured to and removed from containers, which is simple to operate, efficient in its operation, and inexpensive to manufacture.

A still further object is to provide a novel closure structure for containers which will prevent the entrance therethrough of foreign matter which might contaminate the container contents.

My invention in all its aspects will be best understood by reference to the accompanying drawings together with the detailed description thereof. In the drawings:

Fig. 1 is a view in perspective of one embodiment of my invention as applied to a paste container;

Fig. 2 is a longitudinal sectional view showing the container closure in detail;

Fig. 3 is a plan view of a closure cap which forms part of my invention;

Fig. 4 is a plan view of a collared neck element used in conjunction with the closure cap of Fig. 3;

Fig. 5 is a sectional view of the closure cap of Fig. 3, along the line 5-5;

Fig. 6 is a plan view of the closure cap of Fig. 3, mounted on the collared element of Fig. 4, so that the major axis of the collared element is parallel to the incision 15 of the closure cap of Fig. 3;

Fig. 7 is a plan view of the structure shown in Fig. 6, with the major axis of the collared element of Fig. 4 perpendicular to the incision 15 of the closure cap of Fig. 3; and

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Fig. 8 is a view in perspective of another embodiment of the invention.

My invention, generally, contemplates a dispensing neck structure which may be screwed or otherwise secured to the end of a container, and which has a rotatable cap formed of a distortable material which cooperates with an oval portion of the dispensing neck to open or close a slit in the cap.

The invention is exemplified in several embodiments hereinafter described. However, it is to be understood that these are illustrative only, and that they are not to be construed as limiting the invention to any specific form, except as may be required by the claims appended hereto, since modifications within the scope of my invention will readily present themselves to those skilled in the art.

In the form of the invention shown in Figs. 1 through 7, a container 11, which may be a collapsible tube, as illustrated, has a collared neck element 12 screwed to the discharge end thereof, as shown in Figs. 1 and 2. A cap 13 is rotatably mounted on the neck 12 and covers the discharge orifice 14 therein. The neck element 12 is made of a rigid material which may be suitably plastic, glass, metal, or the like, and has a body portion 16, neck portion 17, and collar 18, which collar projects laterally beyond the neck 17 and is shaped generally in the form of an oval having a major axis 19 and a minor axis 20 (best shown in Figs. 2 and 4).

The cap 13 is made of a resilient distortable material such as, for example, rubber, and is provided with an incision 15 through the end of the cap 13 opposite the neck-receiving end thereof. The cap 13 is further provided with a recess 21 in the body thereof for receiving a portion of the neck element 12, the recess 21 having a cross-section which is diametrically similar to, but somewhat smaller than, the collar 18 of neck element 12. The inner wall section 24 of the cap 13 is preferably sloped inwardly, as shown in Fig. 5, in order to effectuate a uniform gripping of the neck portion 17 of neck element 12. The flanged edges of the collar 18 are receivable in a groove 25 which bounds at least a portion of the periphery of the cap recess 21, the groove being preferably narrower than the flanged edge of the collar 18 for obtaining a tighter fit.

The incision 15 is cut through the end of the cap 13 opposite the collar-receiving portion thereof, so that it runs along in the direction of the longer axis of the recess 21, as shown in Fig. 6. With the relative positions of collar 18 and cap 13 as shown in Fig. 6, the sides of

the incision 15 are closed due to the outward pressure applied against those edges of the cap 13, which are generally along the longer axis 19 of the collar 18, and consequently against the sides of incision 15. Since the incision 15 in the cap 13 is preferably cut through with a narrow sharp implement, and since the natural resiliency of the rubber forming the body of the cap 13 provides enough pressure against the sides of the incision 15 to keep the incision substantially closed when the cap is not mounted on the neck 12, it is readily seen that the additional pressure against the sides of the incision 15, caused by mounting the cap 13 over the collar 17, as shown in Fig. 6, further increases the proximity of the sides of the incision 15 to each other. With the elements positioned as in Fig. 6, this pressure on the sides of the incision 15, together with the snugness with which the edges of the groove 25 engage the edges of the collar 18, and the similar relationship of the sloped walls 24 and neck 17 (Figs. 2 and 5), is sufficient to prevent the contents of container 11, for example, tooth paste, from passing through the incision 15, even when a substantial amount of force is exerted on the tube 11. For the same reason, ingress of foreign matter through the cap 13 is likewise prevented.

By turning the cap 13 approximately 90° so that the relative positions of the cap 13 and the collar 18 are as shown in Fig. 7, whereby the major axis 19 of the collar 18 becomes substantially perpendicular to the major axis 26 of the recess 21, the combination of tension and compression forces acting on the cap 13 opens the incision 15, as shown in Fig. 7.

Another embodiment of my invention is shown in Fig. 8, wherein a container 27 is provided with a hollow neck 28 substantially oval in axial cross-section, and a cap 29 formed of a resilient flexible rubber-like material. The cap 29 is equipped with a recess 31 for receiving, gripping and holding neck 28 of container 27. The recess 31 has a cross-section which is generally oval and whose periphery is geometrically similar to, but somewhat smaller than the periphery of the oval cross-section of neck 28. Furthermore, the inner walls of the recess 31 are preferably sloped inwardly to provide a better gripping surface at the neck-receiving end of the cap 29. The cap 29 is likewise equipped with an incision 32 which enters the recess 31, and which runs in the direction of the major axis 33 of the recess 31. For convenience in rotating the cap there are provided lugs 34, as shown.

In operation the cap 29 is mounted on the neck 28 so that the long axes of each are parallel with respect to each other. In this position the incision 32 is closed and precludes the passage of materials therethrough. Rotating the cap 29 approximately 90° results in the sides of incision 32 being stretched apart to permit discharge of the contents of the container 27.

For convenience in gripping the cap 29 there may be provided ears or lugs 34 suitably secured to the sides of the cap or formed integral therewith.

Although I have shown certain specific elements in the foregoing embodiment of my invention, it is not intended to exclude therefrom numerous modifications which will readily occur to those skilled in the art. For example, though I have shown in Figs. 1 and 2 a collared neck 12 which is screwed onto a container 11, it is to be understood that the neck 12 can be made

an integral part of the container 11, or secured thereto in other ways. Furthermore, in connection with the groove 25 shown in Fig. 5, it is to be understood that this groove may be formed as part of an unbroken periphery within the recess 21 of the cap 13, or it may be formed only along a portion of said periphery. It is likewise clear that gripping means for the cap 13 and 29 may be other than those shown, such as, for example, serrations in the outer sides of the caps, cross-hatching of the sides, and the like, and though I have described and shown my invention as embodied for use with a specific container, viz: a collapsible tube, it is obviously applicable to other types of containers.

The invention above described provides a simple and efficient means for sealing in and releasing the contents of containers. It is adaptable, as is readily seen in the form shown in Figs. 1 and 7, for repeated use since once a container has become empty the device can be readily removed therefrom and applied to a new container. Furthermore, it possesses a distinct advantage over the closure caps which are commonly used with such containers as tooth paste tubes and the like, in that it is unnecessary to remove the cap from the container in order to dispense the contents therefrom, thus eliminating the annoying consequences of a lost or misplaced cap.

Another important advantage lies in the effectiveness of the seal created by the novel construction and operational relationship, to each other, of the dispensing neck and the closure cap, which prevents leakage from the container and ingress of foreign substances into the container.

I claim as my invention:

1. A container having a main body portion, a hollow neck threadably secured thereto, an oval collar connected to and diametrically wider than the said neck, and a rotatable cap for said collar formed of a flexible material, one end of said cap having an oval opening extending into the body of the cap to form an oval cavity therein, the opposite end of the cap having an incision therethrough in the direction of the longest cross-sectional diameter of said oval opening.

2. A container having a main body portion, a hollow neck portion opening into the main body portion, an elliptical collar threadably secured to and wider than said neck portion, and a rotatable cap therefor, said cap being formed of a flexible material; one end of said cap having a cross-sectional elliptical opening extending into the body of the cap to provide a cross-sectional elliptical cavity therein, the major and minor axes of said opening and said cavity being smaller than the corresponding axis of said collar, and the opposite end of said cap having an incision therethrough in the direction of the major axis of said elliptical opening.

3. A container having a main body, a hollow neck connected to and opening into the main body, an elliptical collar threadably secured to and diametrically wider than said neck, and a rotatable cap therefor formed of a flexible resilient material; one end of said cap having an opening extending into a cross-sectionally elliptical cavity in the body of said cap, said opening being circumferentially smaller than said neck and stretchably openable to uniformly grip the outer portion of said neck, and the said cavity having lateral dimensions smaller than the corresponding dimensions of said collar, and hav-

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ing stretchable side walls for grippingly contacting the outer edge surfaces of said collar, and a slit in the end of the cap opposite said opening.

4. A container having a hollow neck elliptical in axial cross-section, and a rotatable cap therefor, formed of a flexible material, and having an open recess elliptical in axial cross-section therein, the said cross-sections being geometrically similar and the major and minor axes of the first cross-section being greater than the corresponding axes of the last said cross-section, the inner side walls of said recess sloping inwardly to the said recess opening whereby to form an opening diametrically smaller than the said neck, and an incision through the end of the cap opposite the said recess opening, in the direction of the major axis of said recess.

5. In a container having a hollow neck, an adapter for the neck formed of a rigid material open at both ends and threadably connected to the neck and having its own neck portion and an elliptical collar portion connected to and diametrically wider than said adapter neck portion, a rotatable cap for the said adapter, formed of a flexible material and having a recess, elliptical in axial cross-section therein, the major and minor axes of said recess being smaller than the corresponding axis of said collar, and an incision in the end of the cap opposite said recess opening, the said incision running in the direction of the major axis of said cavity.

6. In a container having a hollow neck, an adapter for the neck formed of a rigid material open at both ends threadably connected to the neck and having a neck portion and an elliptical collar portion connected to and diametrically wider than the said adapter neck portion, a ro-

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tatable cap for said adapter formed of a flexible material, one end of said cap having an opening extending into the body thereof to form a cross-sectional elliptical recess therein, a groove in the body of the cap forming the peripheral boundaries of an ellipse cross-sectional of the recess, the major and minor axes of said groove cross-sectionally elliptical recess being smaller than the corresponding axis of said collar, and an incision through the opposite end of said cap in the direction of the major axis of said recess.

7. A paste dispensing package comprising a container for the paste having an open-ended hollow neck elliptical in axial cross-section for passage of paste therethrough, and a rotatable cap therefor formed of a rubber material and having a recess opening into one end thereof, said recess having an axial cross-section diametrically similar to but smaller than the first said cross-section, the inner side walls of said recess sloping inwardly to define the opening of said recess so that said opening is diametrically similar to but smaller than corresponding cross-sections of said recess, and an incision in the end of the cap opposite the neck-receiving opening, said incision running in the direction of the longest axis of said recess.

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