Oct. 1, 1957 F. L. KATES 2,808,186

CLOSURE FOR COLLAPSIBLE TUBES

Filed Nov. 30, 1954

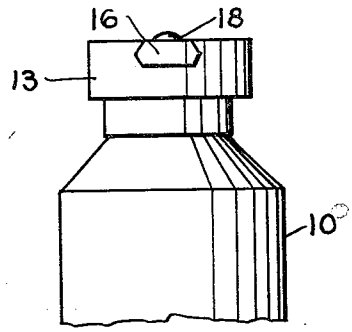


Fig. 1

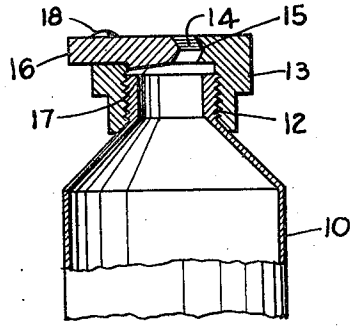


Fig. 2

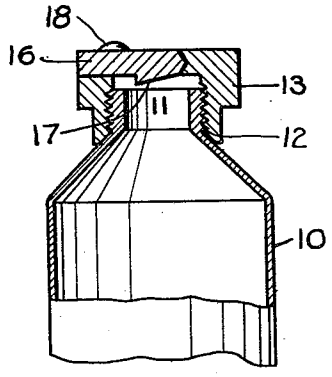


Fig. 3

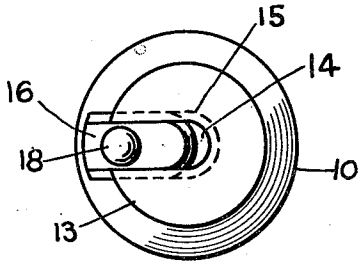


Fig. 4

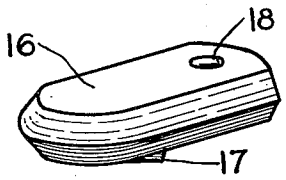


Fig. 5

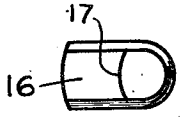


Fig. 6

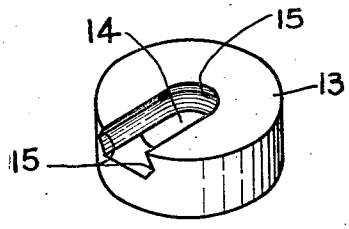


Fig. 7

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United States Patent Office 2,808,186 Patented Oct. 1, 1957

2,808,186

CLOSURE FOR COLLAPSIBLE TUBES

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Application November 30, 1954, Serial No. 472,036

1 Claim. (Cl. 222—561)

The present invention relates to collapsible tubes for dispensing tooth paste, shaving cream and other extrudable material, and more particularly to a valve controlled closure for economical removal of increments of material.

In tubes of the type to which the invention relates, the general practice is to equip such tubes with a removable cap in order to permit a suitable amount of the material to be pressed out when the cap is removed. This requires the use of both hands of the user, one to take off the cap and the other to hold the tube. When the cap has been removed it has to be laid aside, while the same hand holds a tooth brush, or other utensil, in order that the tube can be squeezed to eject the material. More often than otherwise the removed cap falls to the floor, or disappears down the drain, causing not only trouble but leaving the material in the tube exposed for leakage. Removable caps are a nuisance.

Various kinds of cap accessories have been tried to overcome the foregoing disadvantages of loose caps among which may be mentioned hand or pressure manipulated valves, both being expensive to manufacture, while the pressure type is objectionable by leakage due to the weight of bulk packaging. One form of hand control is shown in my prior Patent No. 2,186,644, wherein a dove-tailed slide valve serves as a control closure in a manner intended to solve the problem which the present invention has. However the dove-tail joint there shown has such intricate angles as to make fabrication a problem which defeats its object, and it has only now been solved by the present invention.

It is an object of the invention to provide a valve controlled cap for a collapsible tube wherein the extrusion of paste, or the like, takes place without removing the usual cap.

Another object is to provide a valve controlled cap for a collapsible tube which is operable by the hand holding the tube.

Another object is to provide a slidable closure in association with the cap of a collapsible tube wherein a slide guide form a leak-proof joint.

Another object is to provide a valve controlled cap wherein the control member need not be detached from the cap to become misplaced or lost.

A further object is to provide a novel stop means for limiting the opening of a cap to that necessary to extrude the amount of material to be used.

A still further object is to provide a valve controlled cap for tubes which is cheap to manufacture, is simple in operation and leak-proof in use or as packaged for shipment in bulk.

In the accompanying drawings, Fig. 1 represents a side elevation of the neck portion of a collapsible tube showing the closure cap as assembled with the control valve of the invention; Fig. 2 represents a vertical section of the same showing the valve in open position; Fig. 3 represents a like section showing the valve in closed sealing position; Fig. 4 represents a top plan of the tube showing

the valve in open position; Fig. 5 represents a perspective of the valve; Fig. 6 represents a bottom plan of the same; and Fig. 7 represents a perspective of the cap prior to assembly of the valve.

Referring to the drawings, a collapsible tube **10** is shown of the type usually in general use for dispensing paste or other material by extruding it through an outlet passage **11** in the externally threaded neck **12**, which is an integral part of the tube **10**. A closure cap **13**, is threaded about the neck **12**, and according to the invention does not require removal in the extruding of the material.

For the purpose of such extrusion, the cap **13**, is formed with a radially disposed slot **14**, opening outward at the perimeter of the cap **13**. The two sides and end of the slot **14**, are routed to form a groove **15**, which is continuous, except for the end opening, and has a V-shape throughout its length. The slot **14** forms a way for a flat slide valve **16**, which has a length substantially equal to the length of the slot **14**, so that it normally serves as a closure for the outlet passage **11**. The two sides and inner end of the valve **16** are V-shaped complementally to the V-shaped groove **15**, so that the valve is retained as a relatively movable part of the cap **13**, while free to slide radially outward and open the passage **11** as required.

In order to limit the opening movement of the valve **14**, its bottom face is formed with an arcuate, transversely disposed stop **17**, which projects into the cap to contact the inner wall thereof when the slide valve has moved to its open position. The valve **16** is made of a material sufficiently yielding in character so that in assembling it in the cap it will yield to permit the stop **17** to snap into position, after which the valve cannot be removed, but is limited in movement to that required to open the passage **11**. To carry out this desired snap action, the depending stop is formed as a shoulder for spaced juxtaposed relation to the inner periphery of the cap when assembled, and with a bottom inclined face converging from the shoulder inwardly towards the center of the cap, whereby the stop also functions as a wedge to deform the valve sufficiently for proper assembly. Preferably the material of the valve **16** is a plastic capable of permitting the required flexing for entrance of the stop **17**.

For opening and closing the valve **16**, a projecting thumb piece **18**, is fixed to or formed integral with the top face of the valve for easy manipulation thereof.

Particular attention is directed to the V-shaped inner face of the slot **14** because, unlike dove-tailed construction, the slot can be routed out in one operation, thus not only reducing the cost of manufacture but resulting in an interlock with the complemental V-edge of the valve. This interlock provides the necessary friction to hold the valve in its closed position while also forming a leak-proof joint, which latter is not possible if such were of dove-tail configuration. The latter is furthermore too expensive to make for practical commercial purposes and is uncertain as a leak preventing joint.

It will now be apparent that a novel valve controlled cap for collapsible tube has been devised wherein a cap becomes permanently attached to its tube while an associated valve controls the dispensing of material through the cap. The through slot in the cap communicates with the neck passage of the tube and a valve slidably assembled in the slot opens and closes to dispense or shut off the feeding of material.

In assembling the parts, the slot having been formed in the cap with its three walls routed into a V-shaped groove, and the valve properly dimensioned to interfit with the slot with its three sides formed with the V-shaped edge, the valve can now be inserted into the slot with sufficient pressure to compress the valve body so that the stop enters and snaps back of the inner wall of the cap. Thus in one position the valve seals the outlet of the

tube, and in its other position opens the outlet for discharge purposes. This latter position is limited by the stop contacting the cap wall.

Having now shown and described my invention, I claim:

A closure for collapsible tubes, comprising a cap for assembly as a component part of a collapsible tube, said cap having a radial slot in its top opening through the perimeter of said cap at one end, said slot having a V-shaped groove extending along both sides and across its closed end, a valve of flexible material slidably mounted in said slot having a V-shaped edge complemental to said groove, and a stop member depending from the bottom of said valve in the form of a shoulder and a bottom

inclined surface, said shoulder being in spaced juxtaposed relation to the inner periphery of said cap when assembled and said surface converging upwardly towards the center of the cap, whereby when pressing the valve into place the stop member acts as a wedge causing said valve to yield until the shoulder snaps within said cap.

References Cited in the file of this patent

UNITED STATES PATENTS

2,186,644	Kates	Jan. 9, 1940
2,663,463	Benbury	Dec. 22, 1953
2,687,831	Miller	Aug. 31, 1954