

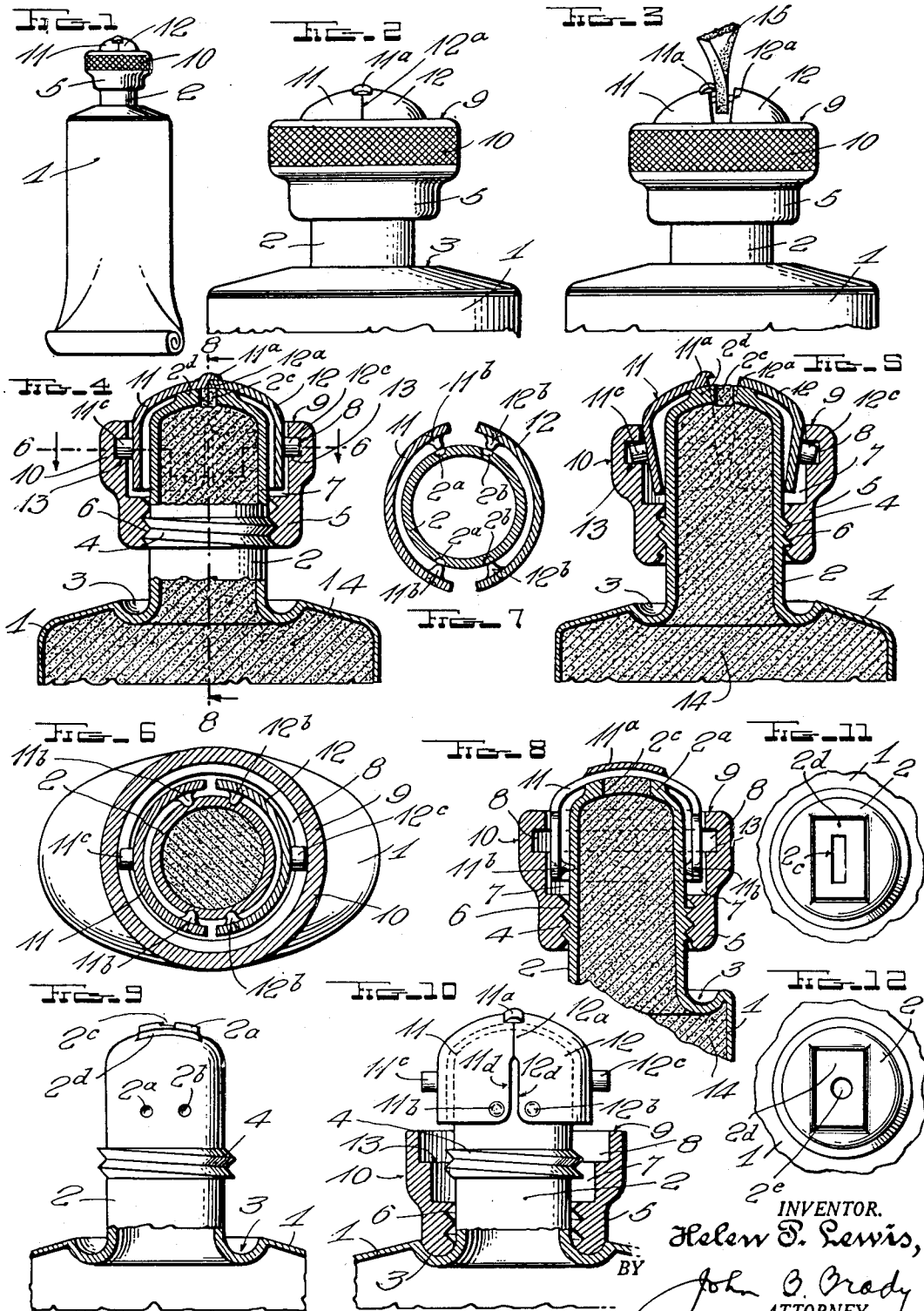
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CLOSURE FOR CONTAINERS

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CLOSURE FOR CONTAINERS

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16 Claims. (Cl. 221—60)

My invention relates broadly to containers and more particularly to an improved construction of closure for containers.

One of the objects of my invention is to provide an improved construction of closure which is particularly adapted for tubular containers and wherein the contents of the container may be maintained sterile, seepage prevented, and the use of the container made more convenient by avoiding possible loss of the usual cap from the container.

Another object of my invention is to provide an improved construction of closure particularly adapted for collapsible tubes for toothpaste, shaving cream, salve, paint, and other substances wherein the material is ejected from the top of the container in a ribbon-like or other formation and the top closed by a pair of coacting angularly movable shutter members.

Still another object of my invention is to provide an improved construction of closure for dispensing tubes having a slotted terminus comprising a pair of laterally movable shutter members adapted to be moved into a position for closing the slotted terminus in combination with a rotatable actuator for controlling the open or closed position of the laterally movable shutter members with respect to the slotted terminus of the tube.

A further object of my invention is to provide a construction of closure for collapsible tubes comprising in combination with the slotted terminus a pair of laterally movable shutter members and a rotatable actuator for opening or closing the shutter members with respect to the slotted terminus of the tube.

A still further object of my invention is to provide a method of manufacturing a closure for collapsible tubes in which a pair of angularly movable shutter members may be pivotally mounted on opposite sides of the slotted terminus of a tube and the flange of a rotatable actuator rolled laterally to form engaging means for projecting pins on said shutter members for permitting rocking movement to be imparted to said shutter members for opening or closing the shutter members with respect to the slotted terminus of the tube.

Still another object of my invention is to provide a construction of cap for a collapsible tube wherein the tube is provided with a terminus having a slotted extremity with an annular recessed seat intermediate the base of the terminus and the body structure of the collapsible tube for receiving the end of a rotatable actuator, which

is movable over the terminus of the tube to a position permitting the engagement of a pair of shutter members with opposite sides of the terminus, and the subsequent rolling of a flange on the rotatable actuator for engaging pins on the shutter members whereby rotatable movement of the rotatable actuator allows the shutter members to be opened and closed, with respect to the slotted terminus of the tube.

Other and further objects of my invention reside in the construction of closure cap and method of manufacturing the same as set forth more fully in the specification hereinafter following by reference to the accompanying drawing, in which:

Figure 1 is a side elevation of a collapsible tube provided with my improved closure cap; Fig. 2 is a side elevation on an enlarged scale of the upper portion of the tube showing the closure cap in its closed position; Fig. 3 is a similar view showing a knurled nut rotatable actuator moved downwardly and the two shutters forming a component part of the closure cap opened to the full extent in order to permit ejection of the contents in a ribbon-like or other formation; Fig. 4 is a central vertical longitudinal section showing the closure cap in closed position; Fig. 5 is a similar view with the parts shown in the position that they assume when the closure cap is open; Fig. 6 is a horizontal sectional view taken on line 6—6 of Fig. 4, which shows how the four integral pivotal studs engage their respective recesses in the tube neck; Fig. 7 is a similar view showing the integral studs on the lower ends of the two shutters forming part of the closure member prior to engagement with the neck of the tube; Fig. 8 is a vertical sectional view taken on line 8—8 of Fig. 4; Fig. 9 is a side elevation of the neck of the tube; Fig. 10 is a sectional view showing the method of assembly for the closure of my invention; Fig. 11 is a plan view of the neck of the tube showing a rectangular slot for permitting the ribbon-like ejection of the contents of the tube; and Fig. 12 is a modified form showing the opening formed in the upper end of the tube by a circular aperture.

My invention is directed to a construction of closure cap for tubular containers and method of forming the cap for producing a closure which is a permanent part of the container and is not removable from the container or subject to loss or misplacement as is usual in the present types of tubular containers in universal use. The structure of the closure cap of my invention is such that the contents of the container are protected

at all times and seepage of the contents prevented. The closure comprises a pair of shutter members which are pivoted on opposite sides of the tubular neck or terminus of the container being applied thereto by a suitable tool operative to project studs struck from the shutter members into recesses on opposite sides of the tubular neck or terminus for pivotally mounting the shutter members in position. The shutter members have limited angular movement for covering or uncovering an aperture in the end of the tubular neck or terminus. A rotatable actuator is disposed over the tubular neck or terminus and engages screw threads thereon. The rotatable actuator is provided with a rolled-over flange which engages pins carried by the shutter members for causing a rocking movement of the shutter members to open or close the aperture in the end of the tubular neck or terminus of the container. The rotatable actuator has a knurled circumferential periphery which may be manually gripped to effect rotation thereof in either direction for controlling the relative movement of the shutter members with respect to each other. The closure is simple and inexpensive in its construction for it is constituted by only three parts, that is, the neck of the tube, the knurled rotatable actuator, and the shutter members which are pivoted to the walls of the tubular neck or terminus.

The construction of the closure cap of my invention will be more clearly understood by a detailed consideration of the drawing wherein reference character 1 designates the collapsible tube or container to which the closure cap of my invention is applied. The container 1 has a tubular neck or terminus 2 connected therewith which is connected with the upper wall of the container 1 through an annular recess 3 whose function is to permit extended downward movement of rotatable actuator 5. The tubular neck or terminus 2 is provided with screw threads 4 grouped just below the middle of the tubular neck or terminus 2, as shown more clearly in Fig. 9. The threads 4 are pitched in such direction that rotary movement imparted to rotatable actuator 5 tends to move the rotatable actuator 5 in such direction that the internal screw threads 6 engage the screw threads 4 and move with respect thereto in such direction that the shutter members 11 and 12 controlled thereby are moved to closed position by clockwise movement imparted to the rotatable actuator 5 and are shifted to open position by counter-clockwise movement imparted to rotatable actuator 5. The rotatable actuator 5 is provided with a cylindrical recess 7 of a diameter sufficient to receive the lower skirt portion of the shutter member 11 and shutter member 12 when in closed position, illustrated in Fig. 4, and of a size sufficient to permit limited angular displacement of the lower skirt portions of the shutter members 11 and 12 when the shutter members 11 and 12 are in open position, as illustrated in Fig. 5. The rotatable actuator 5 is provided with an additional cylindrical recess 8 of a diameter larger than the cylindrical recess 7, providing an annular shoulder which forms the lower peripheral edge of an internal groove 13.

Fig. 5 illustrates the shutter members 11 and 12 in their extreme open position. It will be seen that the lower peripheral edges abut the cylindrical neck of the tube and this stops, incidentally, a further downward movement of the nut. Only about three-fourths rotation of the nut either way is necessary to open and close the shutter mem-

bers. No threads are exposed which might be mutilated or damaged when dropping the tube accidentally say, for instance, on a tile bathroom floor. Thus, the neck of the tube presents a clean-cut appearance. The material used is preferably a conventional lead and tin alloy, readily adapting itself for die casting.

The structure prevents positively the annoying loss of the cap inasmuch as the nut is always in engagement with the threads on the neck and the user does not have to waste valuable time to line up the internal threads within the conventional detachable cap with the threaded neck of an ordinary tube. Annular groove 3 serves a dual function of permitting proper assembly and preventing a casual overflow in a shaving tube, for example, from watery soap suds flowing down the side of the tube, while working up, for instance, a lather for shaving. The threaded rotary actuator 5 always engages the threads 4 whether the shutter members are open or closed.

The upper extremity of the tubular neck or terminus 2 is provided with an upwardly projecting raised portion 2d through which an aperture extends for the passage of material from the interior of the container. The aperture may be rectangular, as represented at 2c in Fig. 11, or circular, as represented at 2e in Fig. 12. The aperture is disposed in the center of the upwardly projecting raised portion 2d and provides a bearing surface over which the extreme upper portions of the shutter members 11 and 12 slidably move. The shutter members 11 and 12 form a tight closure and seal over the aperture 2c or 2e by reason of the overlapping construction of the shutter members 11 and 12. That is to say, shutter member 11 has a projecting lip 11a which coacts with the edge 12a of the shutter member 12 to form a tight seal and closure against the seepage of the paste-like material 14 from the container. The shutter members 11 and 12 are mounted in position with respect to the tubular neck or terminus 2 of the tube, as shown more particularly in Fig. 10. In this arrangement, the shutter members 11 and 12 are shown fitted in juxtaposition on the tubular neck or terminus 2. An appropriate tool is employed to insure that the two shutter members 11 and 12 are compressed properly relative to the tubular neck or terminus 2 for seating the projecting studs 11b and 12b, struck from the lower portion of the skirt of the shutter members 11 and 12 and seated in diametrically opposed recesses 2a and 2b formed in the cylindrical side wall of the tubular neck or terminus.

The assembly of the closure cap will be fully understood when the several assembly steps are considered. That is, the rotatable actuator 5, in the form illustrated in cross-section in Fig. 10, is first telescopically introduced over the tubular neck or terminus 2 in its original form, as illustrated in Fig. 9, and is screw threaded in a counter-clockwise direction with internal screw threads 6 coacting with screw threads 4 to a position wherein the rotatable actuator passes down beyond the threads to a position in which the lower end of the rotatable actuator is seated in annular recess 3, as shown more particularly in Fig. 10. The depth of annular recess 3 is such that the rotatable actuator 5 may be moved downwardly to a limiting position which clears the lower edges of the skirt of the shutter members 11 and 12. In this position, a tool may be readily employed without interference from rotatable actuator 5 for mounting the shutter members 11

and 12 in position by forming inward projections 11b and 12b on the lower portions of the skirt of shutter members 11 and 12 in positions coacting with recesses 2a and 2b in the tubular neck or terminus 2. It will be observed that shutter members 11 and 12 each have cut-away edge portions 11d and 12d disposed adjacent each other and facilitating the alignment of the shutter members 11 and 12 in position with respect to the tubular neck or terminus 2.

The shutter members 11 and 12 carry projecting pins 11c and 12c respectively. These pins serve to impart angular movement to shutter members 11 and 12 when rotatable actuator 5 is revolved. In order to connect rotatable actuator 5 with pins 11c and 12c, the rotatable actuator 5 is moved vertically from the position illustrated in Fig. 10 to a position in which the internal screw threads 6 on rotatable actuator 5 engage external screw threads 4 on the tubular neck or terminus 2 and in a position where the shoulder intermediate cylindrical recesses 7 and 8 abut against the lower edges of pins 11c and 12c. When the rotatable actuator 5 has been shifted to the position just described, the upwardly projecting cylindrical portion of the rotatable actuator 5 may be swaged or spun over with the aid of a suitable tool to form an inwardly projecting flange 9 constituting the upper closure for the annular channel or groove 13 and in which the pins 11c and 12c are confined.

The exterior cylindrical wall portion of rotatable actuator 5 is knurled, as shown at 10, to permit the rotatable actuator to be grasped by the fingers, to facilitate rotative movement of rotatable actuator 5.

The angular movement of the shutter members 11 and 12 is confined to relatively narrow limits just sufficient to enable the shutter members 11 and 12 to clear the outside limits of the aperture 2c or 2e in the extremity of the terminus or tubular neck 2 in a position such as shown in Fig. 5. It will be observed that the shutter members 11 and 12 move directly in contact with the surface of the upwardly projecting raised portion 2d so that there is no space for the development of undesirable lost motion, play, or seepage of material from the collapsible tube 1. In ejecting the material, the shutter members 11 and 12 are moved back from the aperture 2c or 2e so that the ribbon-like or rounded form of the material may be ejected when squeezing the tube proper in the usual manner, as shown at 15 in Fig. 3, without interference from the shutter members 11 and 12. Upon clockwise rotation of rotatable actuator 5, under control of knurled edge 10, the shutter members 11 and 12 are angularly rocked to a position sealing the aperture 2d or 2e by means of the overlapping relationship of lip 11a with respect to edge 12a and preventing loss of further contents from the tube and substantially protecting the contents of the tube.

The closure cap of my invention is extremely simple and effective in its construction. The production process involved in the manufacture of the closure is simple and inexpensive and the convenience obtained in the use of the closure cap of my invention is so marked that the cap construction of my invention is to be preferred over forms of cap constructions heretofore available in the art.

While I have found the particular construction of the closure cap illustrated herein highly effective, I desire that it be understood that modifications of my invention may be made and

that I intend no limitations upon my invention other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. A closure for receptacles comprising in combination with a tubular neck or terminus screw threaded in an annular zone substantially in the middle thereof and apertured for the ejection of material from the container at the extremity thereof, a pair of shutter members pivotally mounted with respect to said tubular neck and laterally movable with respect to the apertured end of said terminus for opening and closing the aperture in the end of said terminus, and means engaged with the screw threads on said screw threaded neck or terminus for effecting the opening or closing operation of said shutter members.

2. A closure for a container having a tubular neck or terminus apertured at its extremity for the ejection of matter from said container comprising a pair of angularly rockable shutter members pivotally mounted with respect to the sides of said tubular neck and slidable in coacting relation to open or close the apertured extremity of said tubular neck or terminus, and manually operative rotatable means concentrically disposed about said tubular neck or terminus for effecting an opening or closing operation of said shutter members.

3. A closure for a container having a tubular neck or terminus apertured at its extremity for the ejection of matter from said container comprising a pair of angularly rockable shutter members pivotally mounted with respect to the sides of said tubular neck and slidable in coacting relation to open or close the apertured extremity of said tubular neck or terminus, and a rotatable device engaging said tubular neck or terminus and rotatable within predetermined limits for effecting an opening or closing operation of said shutter members.

4. A closure for a container having a tubular neck or terminus apertured at its extremity for the ejection of matter from said container comprising a pair of angularly rockable shutter members pivotally mounted with respect to the sides of said tubular neck and slidable in coacting relation to open or close the apertured extremity of said tubular neck or terminus, and a rotatable sleeve having a portion thereof internally screw threaded for engaging coacting screw threads on said tubular neck or terminus, and another portion thereof engaging members carried by said shutter members for effecting, by rotary movement, an opening or closing operation of said shutter members.

5. A closure for a container having a tubular neck or terminus apertured at its extremity for the ejection of material, comprising a pair of shutter members each pivotally mounted with respect to the walls of said tubular neck or terminus and laterally rockable to cover or uncover the apertured extremity of said tubular neck or terminus, an actuating device carried by each of said shutter members, and a rotatable sleeve having one end thereof engaged with said tubular neck or terminus and the other ends thereof engaged with the actuating members on said shutter members, said sleeve being rotatable through predetermined limits for effecting an opening or closing operation of said shutter members.

6. A closure for a container having a tubular neck or terminus apertured at its extremity for

the ejection of material, comprising a pair of shutter members each pivotally mounted with respect to the walls of said tubular neck or terminus and laterally rockable to cover or uncover the apertured extremity of said tubular neck or terminus, an actuating device carried by each of said shutter members, a rotatable sleeve having one end thereof internally screw threaded for coaction with screw threads on said tubular neck or terminus, and having the other end thereof internally grooved for receiving said actuating members whereby rotative movement imparted to said sleeve through predetermined limits operates to effect an opening or closing operation of said shutter members.

7. A closure for a container having a tubular neck or terminus apertured at its extremity for the ejection of material, comprising a pair of shutter members each pivotally mounted with respect to the walls of said tubular neck or terminus, said shutter members each having a depending skirt extending concentrically about said tubular neck or terminus when said shutter members are in closed position with respect to the apertured end of said tubular neck or terminus, a rotatable sleeve member internally screw threaded at one end thereof for engaging screw threads on said tubular neck or terminus and having a cylindrical recess in the other end thereof enveloping the depending skirt of each of said shutter members, and means carried by each of said shutter members and engaged by the upper end of said rotatable sleeve member for effecting an opening or closing operation of said shutter members with respect to the apertured end of said tubular neck or terminus under control of angular rotary movement of said rotatable sleeve member within predetermined limits.

8. A closure for containers having a tubular neck or terminus apertured at the extremity thereof for the ejection of material and screw threaded in an annular zone located at substantially the middle of said tubular neck or terminus, the combination of a pair of shutter members pivotally mounted on said tubular neck or terminus and rockable to a position concentric with respect to said tubular neck or terminus for closing the apertured extremity of said tubular neck or terminus, and means for rocking said shutter members to a position in which the apertured extremity of said tubular neck or terminus is uncovered for the ejection of material therethrough.

9. A closure for containers having a tubular neck or terminus apertured at the extremity thereof for the ejection of material and screw threaded in an annular zone located at substantially the middle of said tubular neck or terminus, the combination of a pair of shutter members pivotally mounted on said tubular neck or terminus and rockable to a position concentric with respect to said tubular neck or terminus for closing the apertured extremity of said tubular neck or terminus, and a rotatable actuator engaging means carried by said shutter members for rocking said shutter members to a position in which the apertured extremity of said tubular neck is uncovered for the ejection of material therethrough.

10. A closure for containers having a tubular neck or terminus apertured at the extremity thereof for the ejection of material and screw threaded in an annular zone located at substantially the middle of said tubular neck or terminus,

the combination of a pair of shutter members pivotally mounted on said tubular neck or terminus and rockable to a position concentric with respect to said tubular neck or terminus for closing the apertured extremity of said tubular neck or terminus, a pin member carried by each of said shutter members in a position above the centers of the pivots thereof, and a rotatable actuator surrounding said shutter members and having an annular groove therein engaging said pin members for effecting an opening and closing operation of said shutter members with respect to the apertured extremity of said tubular neck or terminus.

11. A container comprising a casing, a tubular neck or terminus for said casing apertured at its extremity for the ejection of material therefrom, an annular recess interconnecting the base of said tubular neck or terminus with the wall of said casing, screw threads formed on said tubular neck in an annular zone substantially in the middle of the length of said tubular neck, a pair of shutter members each having a depending skirt pivotally mounted in substantially diametrically opposite positions on said tubular neck, and angularly rockable within predetermined limits for opening and closing the apertured extremity of said tubular neck, and a rotatable actuator engaged over said tubular neck and having the end thereof initially receivable within the annular recess at the base of said neck and movable to a position in which internal screw threads on said rotatable actuator engage the screw threads on said neck, and means carried by said rotatable actuator for engaging members carried by said shutter members for effecting an opening and closing operation of said shutter members with respect to the apertured end of said tubular neck.

12. A closure for a container of a type which has a tubular neck or terminus screw threaded in an annular zone substantially midway of the length thereof and slotted at its extremity for the ejection of material from the container comprising in combination a screw threaded sleeve engageable with said tubular neck or terminus and removable to a position remote from the extremity of the terminus, a pair of shutter members disposed in pivotal relation to the tubular neck or terminus for normally closing the apertured extremity of the terminus, actuating members on said shutter members, said screw threaded sleeve being shiftable to a position enveloping and actuating members on said shutter members and a flange on said screw threaded sleeve engageable with the actuating members on said shutter members for effecting, by rotative movement of said sleeve, an opening or closing operation of said shutter members.

13. In a container for paste-like materials, a main body portion for the container, a tubular neck, an annular recess interconnecting said tubular neck with said main body portion of the container, said tubular neck having screw threads disposed in an annular zone along the length of said neck and having an apertured extremity for the ejection of paste-like materials from the body portion of the container, said neck having recesses disposed in the wall thereof in substantially diametrically opposite positions, a pair of angularly rockable shutter members having lateral portions extending over the apertured extremities of said tubular neck and skirt portions extending substantially concentric with the wall of said tubular neck, said skirt portions being in-

5 dented to provide pivotal connections with the recesses in the wall of said tubular neck, a pin member carried by each of said shutter members, a rotary actuator having internal screw threads adjacent one end thereof, said actuator being initially movable to a position within the annular recess at the base of said tubular neck and being engageable with the screw threads on said neck and with the pin members on said shutter members for effecting an opening and closing operation of said shutter members with respect to the apertured extremity of said neck.

10 14. A closure for containers comprising a tubular neck apertured at its extremity, a pair of laterally movable shutters, and manually controlled rotatable means concentrically disposed about said tubular neck adjustable for effecting a closing and opening operation of said laterally shiftable shutters with respect to the apertured extremity of said neck.

15 15. In a closure for containers, the combination of a tubular neck or terminus apertured at its extremity for the ejection of paste-like material, a pair of shutter members conjointly forming a substantially semi-spherical cover for closing the apertured end of said tubular neck, each of said shutter members having a depending skirt normally disposed concentrically of said tubular neck and pivotally connected therewith, and means for rocking said shutter members from a

position in which the lower extremity of the skirts thereof abut with the wall of the said tubular neck with the apertured extremity of said neck uncovered for the ejection of material to a position in which said shutter members are closed to form the said substantially semi-spherical cover over the apertured extremity of said tubular neck.

16. In a closure for containers, the combination of a tubular neck or terminus apertured at its extremity for the ejection of paste-like material, a pair of shutter members conjointly forming a substantially semi-spherical cover for closing the apertured end of said tubular neck, each of said shutter members having a depending skirt normally disposed concentrically of said tubular neck and pivotally connected therewith, a rotary actuator connected with the said tubular neck and engaging members carried by said shutter members for rocking said shutter members from a position in which the lower extremity of the skirts thereof abut with the wall of the said tubular neck with the apertured extremity of said neck uncovered for the ejection of material to a position in which said shutter members are closed to form the said substantially semi-spherical cover over the apertured extremity of said tubular neck.

HELEN P. LEWIS.

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