June 22, 1937. J. N. LANDAU 2,084,529

CONTAINER CAP

Filed June 16, 1933 2 Sheets-Sheet 1

Fig. 1.

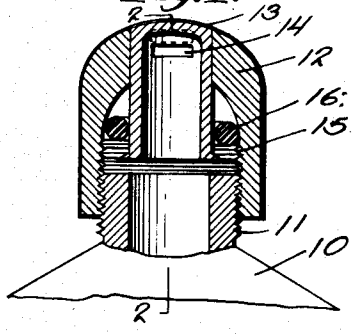


Fig. 2.

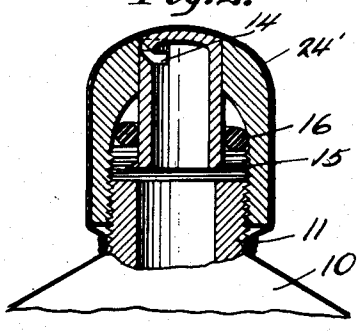


Fig. 3.

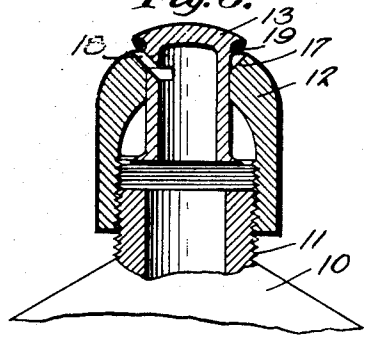


Fig. 4.

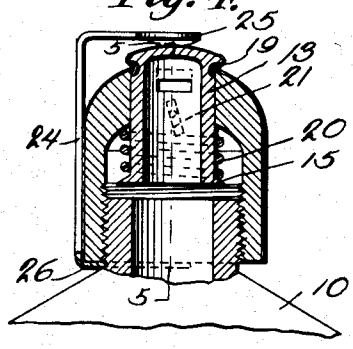


Fig. 5.

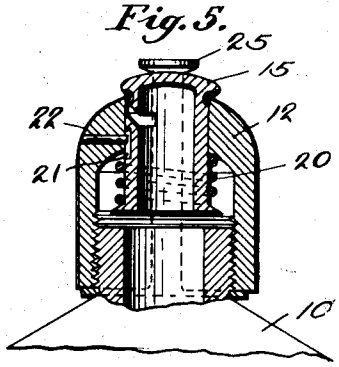


Fig. 6.

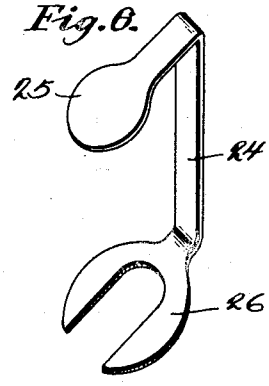


Fig. 7.

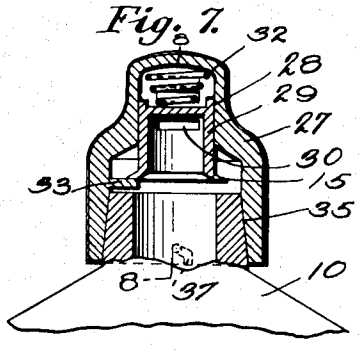


Fig. 8.

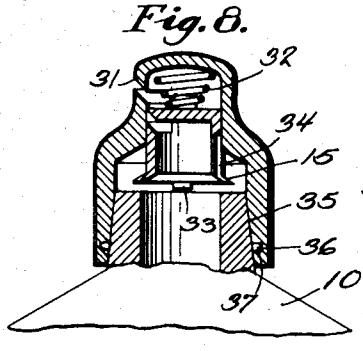


Fig. 9.

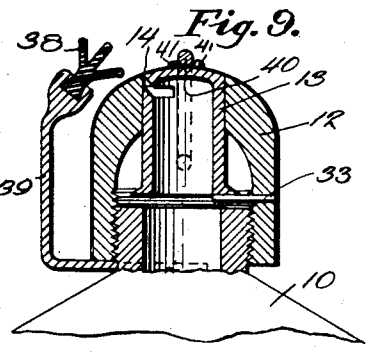


Fig. 10.

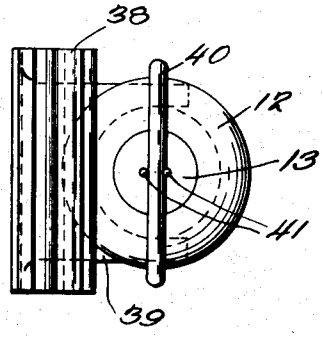


Fig. 11.

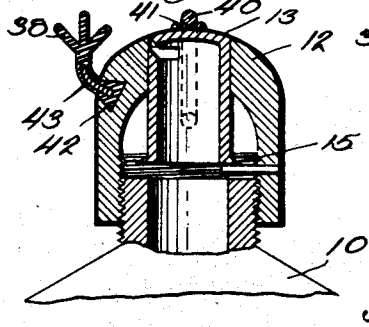
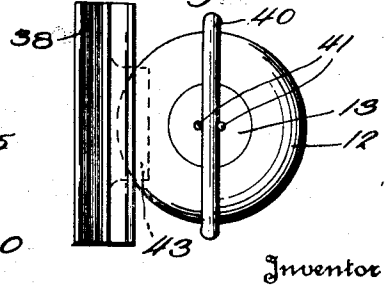


Fig. 12.



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By Chas. M. Fankhouser

Attorney

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CONTAINER CAP

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Fig. 13.

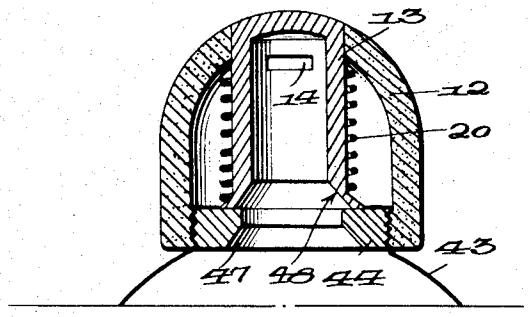


Fig. 14.

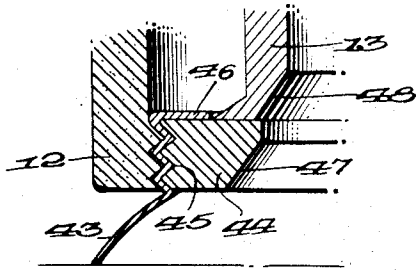
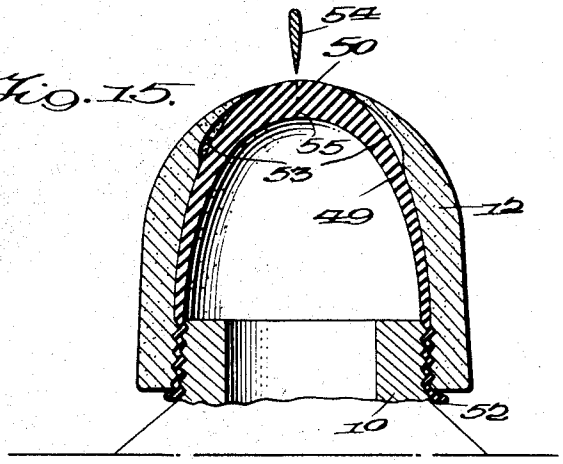


Fig. 15.



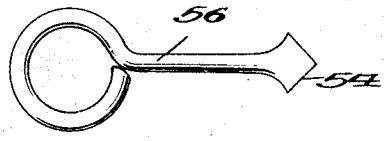


Fig. 16.

Fig. 17.

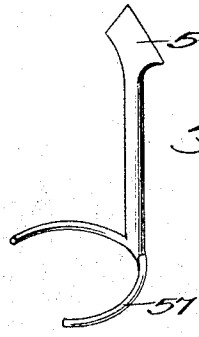
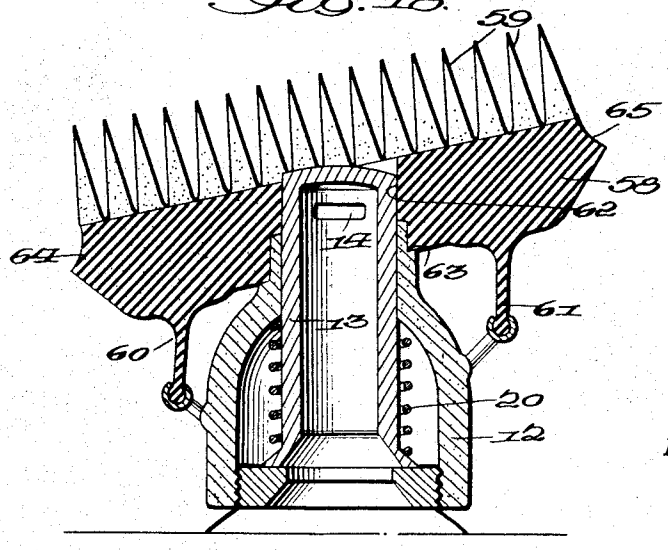


Fig. 18.



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Patented June 22, 1937 2,084,529

UNITED STATES PATENT OFFICE

2,084,529

CONTAINER CAP

Joseph N. Landau, New York, N. Y.

Application June 16, 1933, Serial No. 676,151

11 Claims. (Cl. 221—60)

This invention relates to closures for containers and more particularly to closures for automatically dispensing fluent material from collapsible tubes and the like.

One of the objects of the invention is to provide a novel form of automatic closure which shall dispense fluent material at the end of the cap closure and longitudinally thereof.

Another object of the invention is to provide a closure cap of the character designated which shall be made of non-corrosive material.

Another object of the invention is to provide a closure cap of the character designated which shall provide an air seal and thereby protect the material from the deleterious effects of the atmosphere.

Another object of the invention is to provide a closure cap of the character designated which shall have a rotary motion simultaneous with its longitudinal motion, whereby a uniform flow of material may be dispensed from the cap.

Another object of the invention is to provide a cap of the character designated in which a movable cap member shall be operated by the pressure on the fluent material within the container to which it may be attached and returned to closed position by yieldable means associated therewith and forming a part of the closure structure.

Another object of the invention is to provide a retaining means for retaining the movable closure parts in a fixed position to prevent accidental discharge of fluent material.

Another object of the invention is to provide a novel form of massage device which shall be associated with the closure cap.

These and other objects of the invention will be more apparent from the following specification and drawings and more particularly set forth in the claims.

In the drawings:

Fig. 1 is a sectional view of a closure having an oblique side opening arranged in accordance with my invention,

Fig. 2 is a sectional view on line 2—2 of Fig. 1,

Fig. 3 is a sectional view showing a modification of the construction shown in Fig. 1,

Fig. 4 is a view partially in section of a retainer for the movable closure parts,

Fig. 5 is a sectional view on line 5—5 of Fig. 4,

Fig. 6 is a perspective view of the retainer element,

Fig. 7 is a sectional view showing a novel form of a closure and means for attaching the same to a container,

Fig. 8 is a sectional view on line 8—8 of Fig. 7,

Fig. 9 is a sectional view of a massage member associated with the closure member,

Fig. 10 is a top view of the apparatus shown in Fig. 9,

Fig. 11 is a sectional view of a modification of the apparatus shown in Fig. 9,

Fig. 12 is a top view of the apparatus shown in Fig. 11,

Fig. 13 is a sectional view of a modification of the closure cap as applied to a paper tube;

Fig. 14 is a sectional fragmentary view of the device shown in Fig. 13.

Fig. 15 is a sectional view of a closure cap embodying a yieldable dispensing member.

Fig. 16 is a plan view of a knife member for puncturing the yieldable member shown in Fig. 15,

Fig. 17 is a modification of the knife shown in Fig. 16, and

Fig. 18 is an enlarged sectional view of a closure cap and fluent material applicator unit.

In the operation of closures for containers such as those usually employed for dispensing fluent material from a collapsible tube by applying pressure to the tube, it is essential that these devices shall be positive in action and shall not be affected by corrosion of the parts as frequently occurs when such materials as tooth paste and shaving creams are dispensed. Furthermore these materials frequently contain acid ingredients which corrode the parts and prohibit their free movement which is necessary in discharging a uniform flow of material. Furthermore in the use of such closures heretofore employed where the materials are ejected or dispensed from a side opening, it has been difficult to distribute the material evenly on a brush or other receiving object, because of the projecting end member or protuberances extending beyond the dispensing portion of the cap.

One of the features of the present invention is the provision of a cap which shall be particularly adapted for dispensing fluent material longitudinally from a collapsible tube container having a central passage and a tubular member slidably mounted in the passage. The tubular member is provided with a closed top and a side delivery opening directed obliquely to the longitudinal axis of the cap. It will thus be noted that the relative movements of the tubular member and the cap cause the fluent material to be discharged longitudinally of the cap and not side ways as heretofore experienced in the dispensing caps now in general use. Another feature of this construction is that the ribbon of fluent ma-

terial may be caused to flow uniformly from the end of the closure member and this is of particular advantage in distributing a ribbon of material such as tooth paste on a brush, for example.

Referring more particularly to the drawings, there is shown in Figs. 1 and 2 a novel form of closure embodying my invention. In this illustrated embodiment, a collapsible tube 10 having a threaded nozzle 11 is closed by a cap 12 and a tubular member 13 slidably mounted in the central passage of the cap 12. It will be noted that the top wall closure for the tubular member has the same general configuration as the top contour of the cap 12. In other words, I prefer that the cap 12 shall be of dome shape so as to provide a neatly appearing closure which shall minimize any tendency for waste paste to collect around the end parts and dry or corrode in such a manner that frequently renders caps of this nature inoperable for the purpose intended. Near the top portion of a tubular plunger is a side oblique opening 14 forming one of the principal features of my invention. It will be noted that this opening is at the top of the slidable plunger and slopes upwardly and outwardly at about 45 degrees from the axis of the closure cap. When pressure is applied to the fluent material in the tube, it rises upwardly into the plunger 13, raising the same to cause the opening 14 to pass material obliquely and in ribbon form longitudinally of the closure. In order to limit the upward travel of the plunger member, the lower portion thereof is provided with a flange or other suitable stop member 15.

To further provide for the slidable movement of the tubular member 13 in the passageway of the closure 12, an annular gasket 16 is located on the tubular member so that it shall engage the inner cavity of the cap. This gasket serves to regulate the movement of the tubular member and thereby facilitate the operation of the tubular member to dispense a uniform flow of fluent material.

Referring to the modifications shown in Figs. 3, 4, and 5, the cap 12 is provided with a tapered recess 17 around the central passage. In this embodiment of my invention the tubular member 13 is provided with a tapered flange portion 18 at the top thereof which shall conform to the recess in the top of the closure so that when the tubular member is retracted, the contour of its top shall conform to that of the cap and thereby provide the same general neat appearance as heretofore described. In this embodiment of the invention the tapered fit between the cap end and the tubular member is sealed by means of a gasket 19 provided in the flanged portion of the tubular member. This gasket forms an air seal and thereby prevents any leakage of air to the material and thereby eliminates any caking or corroding effects of the material.

In the modification shown in Figs. 4 and 5, the flange portion of the tubular member extends above the curvature of the closure and the gasket 19 is located at the joint so that as the tubular member is retained in its retracted position by a spring 20, the contents of the tube are effectively sealed against any ingression of air.

Another feature of the present construction is the provision of means for twisting the tubular member 13 simultaneous with its longitudinal movement. This movement is accomplished by an inclined slot 21 provided in the tubular member 13. Arranged to engage the slot is a pin 22 mounted in the fixed portion of the cap. It will thus be noted that as the cap moves upwardly it will be given a rotary movement and this movement is very desirable because it minimizes any sticking effect caused by dry or caked materials. This rotary movement also causes the relative movement of the orifice surfaces and thereby permits a uniform flow of material from the cap outlet.

In the handling and shipping of collapsible containers of the character designated, it frequently happens that the tubes are accidentally squeezed and the material discharged and I overcome this difficulty by providing a retainer which shall grip the cap and engage the top of the tubular member to prevent its outward movement. The retainer of this type comprises an upright member 24 and an angular member 25 at the top portion thereof. The lower portion is provided with an angularly disposed fork-shaped member 26 which is adapted to engage the neck of the tube and the cap and thereby positively hold these parts in position to prevent any accidental discharge of material.

While I have shown the retainer 26 in the form of a detachable metal clip which grips the cap and tube neck, it is obvious that the detachable retainer may readily be made in other forms to perform the same function. For example, a covering of cellophane or other similar material indicated by numeral 24', may be secured over the cap and thus prevent the accidental discharge of material as well as keep the cap in a sanitary condition during shipment.

It will be further noted in the illustrated embodiment of the invention shown in Figs. 4 and 5, that the tubular closure member 13 automatically closes the opening 14 by the action of spring 20, when the pressure on the container is released. By providing a sealing gasket of cork or other yieldable and non-corrosive material, any adhesion or sticking of the tubular plunger 13 to the cap 12, is reduced to a minimum because the material in the cap is sealed against any ingress of air and furthermore the external metallic joint usually employed and exposed to the air, is eliminated by this gasket seal. In other words, the gasket 19 is yieldably held in sealing relation with the top peripheral edge of the cap central passage, by means of the spring 20. The cap is thus automatically retained in closed position, except when fluent material is actually being dispensed and any opportunity for material to collect and dry on the closure joints and cause the same to stick, is reduced to a minimum. If for any reason the cap closure should stick, the rotary or twisting movement imparted thereto by the pin 22 and angularly disposed slot 21, immediately releases the same as soon as pressure is applied to the contents of the container.

Referring to the modification shown in Figs. 7 and 8, the movable parts are located entirely within the contour of closure cap 12 which is rigidly mounted on the neck or nozzle of the container 10 by a friction or screw connection as heretofore described.

In this embodiment of the invention, the cap 27 is provided with a central passage 28 into which is slidably fitted a tubular member 29, closed at the top and punched with an oblique side opening 30 near the top wall. Located in the cap 27 and near the top thereof is an oblique opening 31 which registers with the opening 30 when the tubular member is moved into dispensing posi-

tion by pressure applied to the container or collapsible tube to which it may be attached.

The tubular member is retained in a closed position by a spring 32 and a stop 33 formed on the inside of the cap 27. In order to facilitate the assemblage of the tubular member 29 into the cap, a slot 34 is provided in the side of the tubular member to receive the stop projection 33. When the tubular member is slipped past the stop and into close fitting relation in the cap passage, it is twisted at right angles so that the flanged bottom of the tubular member 29 shall rest on the stop and limit the inward movement caused by the spring 32.

It will thus be noted that the wall discharge openings 30 and 31 are inclined obliquely at about 45 degrees and thus permit the discharge of material obliquely to the axis of the cap and near the top so that a uniform flow of material shall be dispensed from the end of the cap.

The cap 29 is fitted to the container nozzle or top by a taper friction joint 35 and secured in this position by a bayonet joint connection indicated by pin 36 and angular slot 37.

Another feature of the present invention is the provision of a massage device 38 which shall be attached to the top of a tube or container of shaving cream or other lotion as shown in Fig. 9. In this embodiment of the invention the closure is similar to that heretofore described and adapted to dispense a ribbon of cream or fluent material from the top of the closure.

The massage device 38 comprises a plurality of angularly disposed soft rubber ribs positioned adjacent to the tube opening 14. The device is supported by a suitable bracket support 39 secured to the neck of the container 10. The arrangement is such that as the proper amount of cream is discharged on the rubber ribs, the supply is cut off by the return movement of the tubular member which acts as a valve cutoff. A bail member 40 is fixed to the cap so that the same may swing over the top of the tubular member and retain the same in closed position when the massage device is being used. The bail is retained in position by a pair of knobs 41—41 which permit the bail to snap into position and prevent any accidental discharge of material when the massage device is being used. These precautions are taken because in a device of this kind, the tube container for the massage fluid or cream is used as the handle for the massage device and any undue pressure would cause the material to actuate the tubular member and dispense material when it is not wanted and thereby be very wasteful of material as well as open to the objection of having excess material present.

The bail 40 engaging the top of the tubular member also provides a valve shut-off for fluent material which shall positively control the amount of material dispensed.

In the modification shown in Figs. 11 and 12 the massage device 38 is mounted directly on the cap 12 in a dove-tail shaped slot 42. The member 38 is reinforced by a rib member 43 which may be of metal or other rigid material.

While I have shown several modifications of the container cap constructed in accordance with my invention it will be noted that one important feature is the arrangement of the discharge orifice at substantially 45 degrees to the axis of the cap so that it shall dispense material longitudinally from the end of the closure in an even and uniform manner.

The closure members heretofore described are separable units which may be applied to the nozzle of any standard tooth paste or shaving cream collapsible tube container. Whichever form of closure is employed, the closure parts may be made of metal, or metal coated with paraffin, or the closure parts 12 and 13 may be made of non-metallic material such as hard rubber, bakelite or plastic material. I have found that bakelite material is very suitable for caps of this character as it eliminates any deleterious effects of corrosion and is most desirable from an artistic standpoint as closures made of bakelite may be made in many attractive color designs. The cap 12 may be made of black material and the tubular plunger 13 of a contrasting color, such as red, and appearing at the end of the cap as a red dot.

These color contrasts may be used to designate the nature of the material contained in the tube. For example, the red dot may indicate tooth paste, and a green dot may indicate shaving cream, etc. If the cap is covered with cellophane or other transparent material for protection or sanitary reasons as heretofore described, the contrasting colors are still visible to make a more attractive and suitable commercial package.

Referring to the modification shown in Figs. 13 and 14, there is shown a cap constructed in accordance with the present invention and applied to a paper collapsible container 43. One of the important features of this novel construction is the manner in which the cap 12 is secured to the neck portion of the paper container 43. Located at the upper portion of the paper tube is a neck ring or annular member 44 provided with external threads 45. The threads 45 are complementary to the threaded portion of the cap 12, and the paper material is positively secured between these threaded portions. In assembling the parts, the sides of the paper tube may be crimped over the top of the neck ring 44 as shown at 46 and thus enable the parts to be readily assembled as well as provide additional holding material. The lower portion of the neck ring 44 is beveled as indicated at 47 to provide a minimum resistance to the flow of material. The inner lower portion of the plunger 13 is beveled in a similar manner as indicated by numeral 48.

One of the important features of the present construction is that the paper sides are positively and neatly secured to the cap and neck members by mechanical connection and without the aid of any external clamping members or the application of any adhesive material which may disintegrate and subsequently result in damage by the separation of the paper from the cap parts.

Referring to the modification of the cap construction shown in Fig. 15, the dome-shaped cap 12 is designed and constructed to receive a yieldable dome-shaped member 49 arranged to fit within the cap and perform the dispensing operation when pressure is applied to the contents of the container and automatically close when the pressure is released. This member is preferably made of pure gum rubber and arranged with a relatively thick portion 50 at the top of the cap which is adjacent the tubular passage opening. The lower side walls of the dome are tapered or thin as indicated at 51 so that they may be clamped between the cap threads and the neck threads of the container. The lower rim of the rubber walls protruding beneath the lower rim of the cap 12 is provided with a rim or thick portion 52 which prevents the rubber from accidentally becoming loosened or otherwise separated from the adjoining members.

Another feature of this particular construction is the provision of an annular space **53** between the upper thick portion **50** and the top portion of the cap **12**. This space is necessary to provide for the proper action of the rubber to enable the cap to readily dispense fluid.

One important feature of providing an internal dome-shaped dispensing member of a good quality rubber is that corrosion is eliminated and caking reduced to a minimum. Another important feature of this novel construction is that the contents are positively sealed and all damage or waste from accidental discharge in shipment or otherwise is eliminated as is frequently the case in mechanical caps now in use.

In operation, when it is desired to use the contents of the container, the central thick portion of the dome is punctured by a sharp instrument **54** as indicated by the dotted line **55**. One form of a convenient instrument which may be packed with the container is shown in Fig. 16, and indicated by numeral **56**. In Fig. 17, the puncturing instrument **54** is shown provided with a yieldable clamp portion **57** which may be attached to the neck of the container **10** so that there is no danger of it becoming lost during shipment of the product.

The distributing or massage device shown in Fig. 18 is particularly desirable for applying massage and facial creams without handling the material with the hands. For example, in applying certain shaving creams it is necessary to use the fingers and this necessitates washing the hands before handling the razor for continuing the shaving operation. To obviate this inconvenience, I provide a brush distributor comprising a thick rubber base **58** and long rubber projections or bristles **59**. This distributor is secured to the container cap at an angle of about 45 degrees by suitable bracket members **60** and **61** respectively.

An aperture **62** is provided at the central portion of the distributor for passing material to the rubber projections **59**. In this particular construction, the cap **12** is provided with an annular upper rim portion **63** which shall fit the aperture **62** and prevent fluid from leaking downward past the cap in an objectionable manner

Another feature of this particular construction is that the plunger **13** normally projects through the base portion of the distributor. This construction aids the operation of the plunger and causes it to be positively forced inward when the distributor or applicator is applied to the person. Thus there is provided an automatic applicator which only utilizes or dispenses fluid when actually needed or intentionally applied and cannot be accidentally wasted.

To further aid in distributing the material and permit ready cleaning of the applicator, the end portions of the base are sloped downward and outward as indicated by numerals **64** and **65** respectively.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent is:

1. As a new article of manufacture, a closure for a container comprising, a cap having a central passage, a tubular cap member reciprocably mounted in the passage, said tubular member having a side opening directed outwardly and obliquely to the sides of said member and adjacent to the top thereof, whereby fluid may be dispensed in an endwise direction from said closure cap, and means for attaching the cap to the container.

2. As a new article of manufacture, a dome-shaped closure for a container comprising, a cap having a central passage opening extending therethrough, a tubular cap member reciprocably mounted and normally positioned in the passage so that the top portion of said tubular member shall conform to the contour of the cap, and a side opening directed outwardly and obliquely to the sides of said tubular member and adjacent to the top thereof, whereby fluid may be dispensed in an endwise direction from said closure cap.

3. As a new article of manufacture, a dome-shaped closure for a container comprising, a cap having a central passage opening extending therethrough, a tubular cap member reciprocably mounted and normally positioned in the passage so that the top portion of said tubular member shall conform to the contour of the cap, a side opening directed outwardly and obliquely to the sides of said tubular member and adjacent to the top thereof for directing fluid endwise from said closure, and means at the bottom of said tubular member for limiting the inward and outward movement of said tubular member in said passage.

4. As a new article of manufacture, a closure for a container comprising, a cap having a central passage, said central passage having a peripheral recess at the top portion thereof, a tubular cap body member reciprocably mounted in the passage, a side opening near the top of said member and directed obliquely to the sides thereof, said tubular member having a tapered flanged portion at the top thereof adapted to fit within the recess of said central passage and conform to the curved outside contour of the cap, and means for attaching the cap to the container.

5. As a new article of manufacture, a closure for a container comprising, a cap having a central passage, said central passage having a peripheral recess at the top portion thereof, a tubular cap body member reciprocably mounted in the passage, a side opening near the top of said member and directed obliquely to the sides thereof, said tubular member having a tapered flanged top, and a gasket seal interposed between the tapered flange and the recess surface of said central passage.

6. As a new article of manufacture, a closure for a container comprising, a cap having a central passage, said central passage having a peripheral recess at the top portion thereof, a tubular cap body member reciprocably mounted in the passage, a side opening near the top of said member and directed obliquely to the sides thereof, said tubular member having a tapered flanged top, a gasket seal interposed between the tapered flange and the recess surface of said central passage, and means at the lower portion of the tubular member for limiting the outward movement of said member.

7. As a new article of manufacture, a closure for a container comprising, a cap having a central passage, a tubular cap member reciprocably mounted in the passage, said tubular member having a side opening directed obliquely to the sides of said member and adjacent to the top thereof, and a gasket seal interposed between the reciprocable member and the walls of said central passage.

8. As a new article of manufacture, a closure for a container comprising, a cap having a central passage, a tubular cap member reciprocably mounted in the passage, said tubular member having a side opening directed obliquely to the sides of said member and adjacent to the top thereof, and means for imparting a rotary move-

ment to said tubular member during its reciprocatory movement in said passage.

9. As a new article of manufacture, a closure for a container comprising, a cap having a central passage, a tubular cap member reciprocably mounted in the passage, said tubular member having a side opening directed obliquely to the sides of said member and adjacent to the top thereof, a gasket member located at the top portion of said reciprocable member and adapted to engage the peripheral top portion of the walls of said passage, and means for causing the gasket to engage the walls of said central passage with a rotary movement and thereby effect a positive seal between said reciprocable member and the walls of said passage.

10. As a new article of manufacture, a closure for a container comprising, a cap having a central passage, a tubular cap member reciprocably mounted in the passage, said tubular member having a side opening directed outwardly and obliquely to the sides of said member and adjacent to the top thereof for directing fluid endwise from said closure, a yieldable member for automatically returning the tubular member to its normally closed position, and a stop member for limiting the inward and outward movement of the tubular member in said central passage.

11. As a new article of manufacture, a closure for a container comprising, a cap member having a central passage, a tubular plunger member movably mounted in said passage, said tubular member having an upwardly and outwardly directed side opening adjacent to the top wall thereof for directing fluid endwise from said closure, and yieldable means for positioning the tubular member in said passage.

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