The present invention relates to a captive cap closure and dispensing mechanism for containers of liquids such as toilet water, skin lotions, hair dressings and the like. The dispensing mechanism of this invention can also be used for dispensing paste-like materials such as toothpaste, toilet creams and the like; and for powders such as talcum and the like.

The primary object of this invention is to produce a captive cap closure and dispensing assembly which is easy to operate, provides for regulating the flow of materials, and which provides a dispensing position, a closed position and a locked-closed position by push-pull actuation.

The locked-closed position gives a positive closure condition which can be employed while the dispenser is used on receptacles in transit or when packed with luggage while traveling. The locked-closed position also provides an additional liquid-tight seal for the two-piece dispenser which is not present in the open or closed position.

Various other objects and advantages will be apparent as the nature of the invention is more fully disclosed. The novel features which are characteristic of this invention will be better understood by referring to the following description, taken in connection with the accompanying drawings in which a specific embodiment of the invention has been set forth for purposes of illustration.

The captive cap dispensing closure of this invention comprises a stationary inner spout adapted to be secured to the mouth of a container and a movable outer nozzle which is frictionally and slidably received by the stationary inner spout. The stationary inner spout has a head portion provided with a sealing plug and openings adjacent to the sealing plug. The stationary inner spout head is also provided with an outer generally annular sealing flange below the sealing plug. Below the head portion there is a tube provided with at least one generally annular outer locking flange near the lower portion of the tube.

Optionally a second or lower tubular portion can be provided below the stationary spout locking flange. The stationary inner spout is also provided with a base member below the locking flange with means for attachment to the mouth of a container. The means for attachment to the mouth of a container are conventional and include snap-on means, a frictional plug or screw threads. The movable outer nozzle has an orifice in its top which can frictionally and slidably receive the sealing plug of the stationary spout to seal off the orifice. The orifice is preferably sealed by a locking member. Below the top, the movable nozzle is formed into a sleeve area which carries an annular retention bead and a series of locking tentacles below the retention bead wherein the locking tentacles of the movable nozzle are adapted to snap over the locking flange of the stationary spout when the dispensing position. A series of locking projections is provided instead of an annular projection in order to facilitate the snap-on action of the projections. A tubular sleeve portion separates the retention bead from the retention tentacles. In order to assemble the two parts of the dispenser, the outer nozzle is snapped onto the stationary inner spout by the coaction of the sealing flange of the stationary spout with the retention bead of the movable outer nozzle. The retention bead of the outer nozzle acts as a limit stop between the sealing and locking flanges of the stationary spout while the sta-

tionary spout sealing flange is slidably engaged in sealing relationship by the inside of the sleeve of the movable outer nozzle. Since the stationary spout sealing flange can be scratched, deformed or marred in the process of handling the unit prior to or even after the final assembly of the stationary spout and movable nozzle, leakage would occur in the unit if this were the only seal particularly when the dispenser is not in an upright position as would occur in transit of the dispenser. Therefore, an additional seal is provided in the locked position by the coaction of the stationary spout locking flange and the lower sleeve of the movable nozzle. For satisfactory operation of the dispenser, it is preferable that the resistance to the sliding movement of the two pieces be kept to a minimum. Thus all points of contact between the two pieces are accomplished by point contact which defines an annular line instead of contacts embracing extended lengths of the contact surfaces.

The three positions of open, closed and locked-closed are attained by simply sliding the movable nozzle on the stationary inner spout. Thus, in the assembled position when the movable nozzle is raised so that its orifice is not in frictional and sealing relationship with the sealing plug, the materials from the container can be dispensed. As the movable nozzle is pushed down on the stationary spout the size of the orifice of the movable nozzle is decreased as it approaches the sealing plug. This provides a means for regulating the flow of the contents from the container.

By pushing the movable nozzle further down on the stationary spout, the sealing plug frictionally engages the orifice of the movable nozzle in sealing relationship to give a closed position. By pushing the movable nozzle further down on the stationary spout, the movable nozzle locking projections placed below the retention bead snap over the locking flange of the stationary spout to give the locked-closed position. By simply pulling upwards on the movable nozzle the locked-closed position can be released and the two-piece dispenser can then be placed in either the closed or open position.

A number of seals are provided by this dispensing closure to prevent leakage. In the closed or locked-closed position, the sealing bead of the movable nozzle is sealably engaged with the stationary spout plug. The constant sealing flange of the stationary spout is at all times in sealing engagement with a portion of the inner wall of the movable nozzle sleeve between the retention bead and top of the movable nozzle. When in the locked-closed position, the locking flange of the stationary spout provides a seal on the lower sleeve of the movable nozzle between the inner retention bead of the sleeve and the locking projections on the sleeve.

One or the other of the two members must be resilient. When a snap-on feature is desired, the movable nozzle may be rigid and the stationary member is made of a resilient and elastomeric material such as a natural or synthetic resin in order to permit the snap-on action of the movable nozzle to the stationary spout and the snap-on action of the locked-closed position. Illustrative of the resilient materials there can be mentioned polyethylene, polypropylene, nylon, natural or synthetic rubber, copolymers of vinyl chloride with vinyl acetate, copolymers of styrene and butadiene and the like. It is preferable that both members of the closure be made of a resilient material such as polyethylene.

FIGURE 1 is a cut-away sectional view of the preferred from of the closure assembly in the locked-closed position.

FIGURE 2 is a transverse section taken on the line 2—2 of FIGURE 1.

FIGURE 3 is a transverse section taken on the line 3—3 of FIGURE 1.
FIGURE 4 is a cut-away sectional view of the closure assembly of FIGURE 1 in the closed position.

FIGURE 5 is a cut-away sectional view of the closure assembly of FIGURE 1 in the open position.

Referring to the drawings wherein identical numerals refer to identical parts and first to FIGURES 1, 2 and 3, the numeral 10 designates a cut-away portion of a bottle adapted for snap-on engagement to a generally cylindrical and resilient stationary spout 12, while numeral 14 designates a generally cylindrical and resilient movable nozzle. The stationary spout is provided with snap-on means 16 for attachment to the mouth of the container 18, a sealing flange 20 to coact with the neck of the container, and a shoulder or stop 22 to limit the insertion of the container in the stationary nozzle. The parts 16 to 22 make up the base portion of the stationary spout. Above the base portion of the stationary spout there is an outer shoulder 24, a lower cylindrical tube 25 above the outer shoulder, an annular locking flange 26 above the lower cylindrical tube and an upper cylindrical tube 28 above the locking flange. The locking flange 26 makes a line of contact with a lower cylindrical sleeve 48 on the movable nozzle in the locked-closed position. The numeral 29 designates the inner wall of the tube 28. The parts 22 to 29 make up the neck portion of the stationary spout.

Above the upper cylindrical tube 28 there is an annular sealing flange 30 which makes line contact with the movable nozzle cylindrical sleeve 44 at all times and incorporates a radius lead for snap-on assembly of the movable nozzle and stationary spout. Also, the sealing flange 30 has sufficient head angle on its top and bottom so that outer member 14 is easily moved by virtue of the small contact line and the bead angles of flange 30. A cylindrical sealing plug 32 is integral with the sealing flange and is supported by webs 34 which define openings 36 therebetween. Parts 30 to 36 make up the head portion of the stationary spout. The stationary spout can also have knars or serrations 38 to facilitate its manipulation if it is screw-threaded to the container. The movable nozzle 14 comprises an orifice rim 40 and an inner sealing bead 41 which makes line contact with the sealing plug 32 and defines a circular orifice 42. The sealing bead 41 has a bead angle on top and bottom to facilitate ease of movement against the sealing plug. An enlarged collar 43 is below the orifice and comprises a cylindrical sleeve 44, an annular retention bead 46 at the lower portion of the collar, a second cylindrical sleeve 48 below the movable nozzle retention bead, and a series of locking projections 50 below the second sleeve, and a push-pull member 52 at the bottom of the movable nozzle. The retention bead 46 acts as a limit stop against the sealing flange 30 in an open position and has an adequate bead angle, i.e., the bead comes to a point, to facilitate assembly of the movable nozzle on the stationary spout. Preferably, the bottom portion of the movable nozzle is outwardly tapered as shown by numeral 54. The snap-on action of the movable nozzle retention bead is greatly facilitated by having the locking bead projections 50 on the inside of the tapered portion 54. The movable nozzle 14 can contain knars or serrations 56 to facilitate its manipulation.

FIGURE 4 is a cut-away sectional view of the closure assembly of FIGURE 1 in the closed position. It can be seen that the locking projections 50 are above the locking flange 26, the movable nozzle retaining bead 46 has moved upwardly with respect to the tube 28 while the sealing flange 30 is still in frictional and sealing engagement with the sleeve 44. The orifice sealing bead 41 is free of the sealing plug 32 so that material from the receptacle can be dispensed through the orifice 42.

What is claimed is:

1. A self-contained interlocked two-piece dispensing unit for a bottle comprising a resilient and generally cylindrical stationary inner spout said stationary inner spout comprising an integrally formed base portion, neck portion and head portion, said base portion comprising a snap-on retention bead for attachment to a container, a sealing wall between the snap-on retention bead sealing about the neck of a container and an inner shoulder above said sealing wall to limit the insertion of the container in the base portion, said stationary inner spout neck being above the base portion and comprising a lower tube, a locking flange above the lower tube, and an upper tube above the locking flange, said stationary spout head comprising an outer annular sealing flange above the stationary spout upper tube and webs integral with said sealing flange separated by openings supporting an integrally and centrally formed cylindrical sealing plug; and a resilient movable outer nozzle having a tapered top with a centrally formed annular orifice defined by a thinned-out inner annular rim and an annular inwardly receiving said sealing plug, an enlarged sleeve below the tapered top having an annular inner retention bead at its bottom portion snapped over the stationary spout sealing flange, an outwardly tapered skirt below said inner retention bead said skirt terminating in an outwardly disposed flange for push-pull manipulation of the movable nozzle, and a second sleeve below the movable nozzle retention bead slidably receiving said sealing plug, an annularly shaped member below said second sleeve snapped over the locking flange, and wherein the unit can attain an open position by sliding the movable nozzle upwards on the stationary spout so that the orifice of the movable nozzle is unobstructed by the sealing plug, a closed position by sliding the movable nozzle downwardly to frictionally and sealably engage the sealing plug and a locked-closed position by sliding the movable nozzle further down on the stationary spout so that the locking projections of the movable nozzle snap over the locking flange of the stationary spout.

2. The dispensing unit of claim 1 wherein the sealing bead of the movable nozzle makes an annular point contact with the sealing plug and the sealing flange and locking flange of the stationary spout makes annular point contact with the outer annular portion of the movable nozzle.

3. A self-contained interlocked two-piece dispensing unit for containers comprising a homogeneously integral generally cylindrical stationary inner spout having a base portion, neck portion and head portion, said base portion having means for fluid tight engagement about the neck of a container, said spout neck comprising a lower cylindrical tube having at its top end an outwardly disposed locking flange having tapered converging surfaces terminating in an annular point, and a cylindrical upper tube above the said locking flange, said upper tube having an outer diameter less than that of the lower tube, said stationary spout head comprising an outwardly disposed sealing flange having tapered converging surfaces terminating in an annular point and webs separated by openings supporting a centrally formed elongated cylindrical sealing plug; and homogeneously integral resilient movable outer nozzle axially slidably on the inner spout, said nozzle having a tapered top with a centrally formed annular orifice defined by a thinned-out annular rim having an inwardly disposed sealing bead with tapered converging surfaces terminating in an annular point slidably receiving the spout sealing plug in annular point contact, an enlarged cylindrical sleeve below the nozzle top, an annular inwardly disposed retention bead having tapered converging surfaces located at the bottom of said enlarged cylindrical sleeve.
sleeve, said retention bead snapped over the spout head sealing flange and free of contact with the stationary spout upper tube, an outwardly tapered skirt below said nozzle retention bead terminating in an outwardly disposed flange to facilitate push-pull actuation, a second sleeve below the movable nozzle retention bead axially and slidably receiving the stationary spout locking flange in annular point contact sealing relationship, a plurality of inwardly disposed locking projections below said second sleeve, and in substantially the same horizontal plane as the skirt push-pull flange, said locking projections having tapered converging surfaces adapted to snap over the stationary spout locking flange.

4. The dispensing unit of claim 3 wherein the inner spout is resilient and wherein the means for securing the unit to a container comprises an enlarged base skirt below an integral annular rim adapted to snap over the lip bead surrounding the mouth of a container.

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