Feb. 12, 1952 E. GRONEMEYER ET AL 2,585,381

DISPENSING DEVICE FOR DISPENSING LIQUIDS, SEMILIQUIDS AND POWDERS

Filed March 4, 1948

2 SHEETS—SHEET 1

Fig. 1.



Fig. 2.

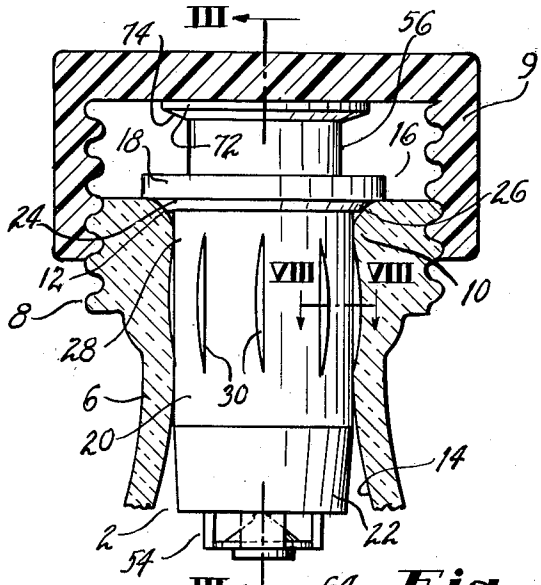


Fig. 3.

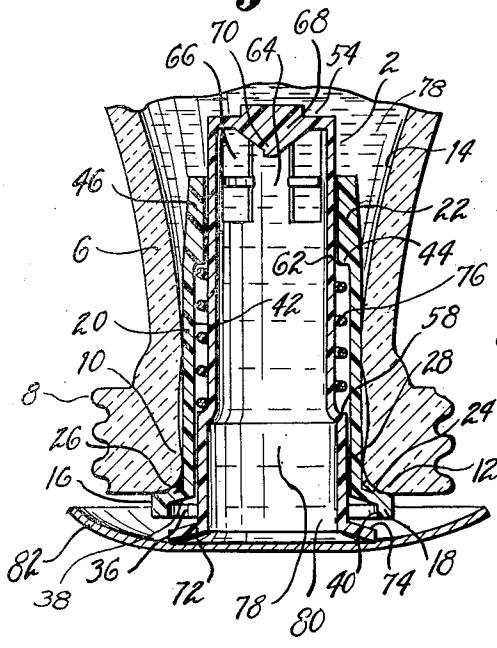
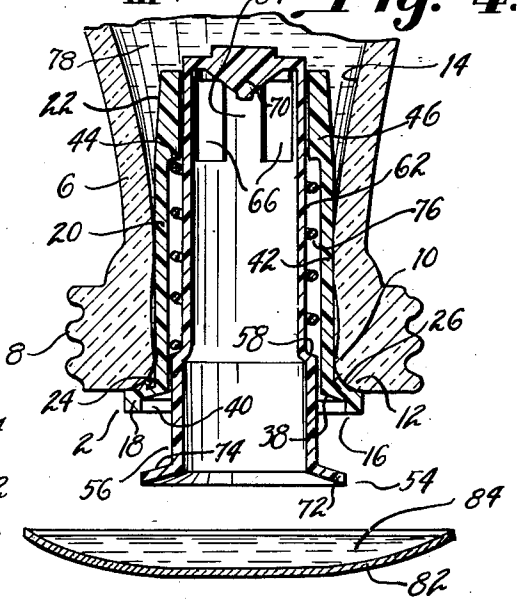


Fig. 4.



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2 SHEETS—SHEET 2

Fig. 5.

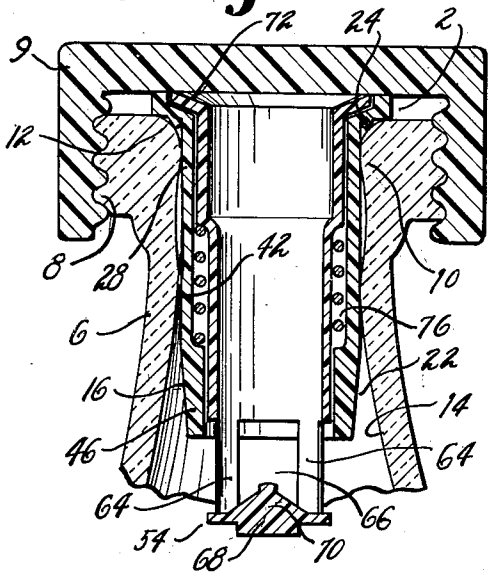


Fig. 6.

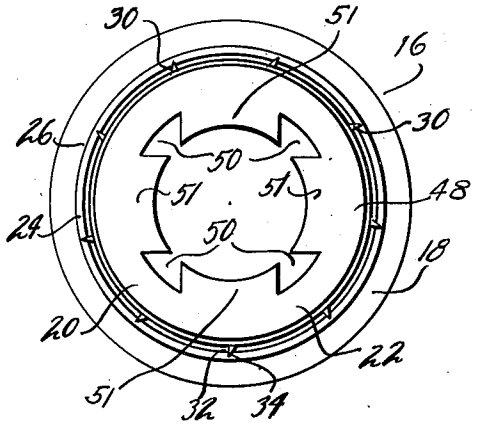


Fig. 7.

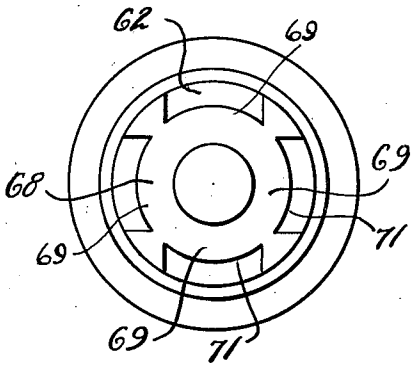
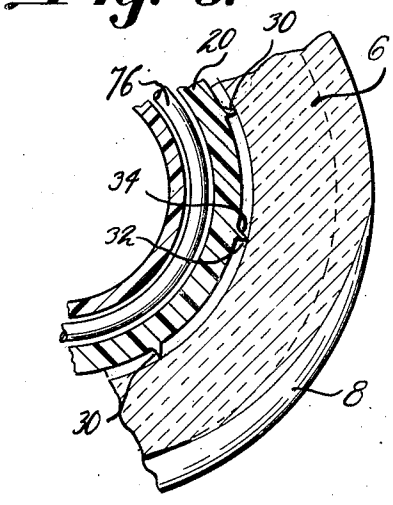


Fig. 8.



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Patented Feb. 12, 1952

2,585,381

UNITED STATES PATENT OFFICE

2,585,381

DISPENSING DEVICE FOR DISPENSING LIQUIDS, SEMILIQUIDS, AND POWDERS

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Application March 4, 1948, Serial No. 12,974

11 Claims. (Cl. 222—514)

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This invention relates to a device for dispensing liquids, semi-liquids, and powders. The dispenser of the invention is designed to dispense a measured predetermined quantity of material and to act either as the sole closure or as a supplementary closure for the container.

The invention has among its objects the provision of a simple, cheap, and easily maintained dispenser for dispensing measured quantities of liquids, semi-liquids, and powders.

A further object of the invention resides in the provision of the combination of a dispenser of the type indicated with a container, the dispenser fitting on or within the container and functioning either as the sole closure or as a supplementary closure for the container.

In its preferred embodiment the dispenser of the invention has as a still further object the provision of a dispenser in which at least the parts protruding outwardly from the container, the inner member of which conducts the dispensed material, are resilient and comparatively soft, whereby they both form a seal with an object against which they are pressed and do not mar or scratch articles with which they come into contact.

These and further objects of the invention will become more readily apparent in the following description of a preferred embodiment of the dispenser of the invention.

The dispenser will be discussed primarily, in the following description, with reference to its application to the dispensing of liquid food products and drugs, although it is to be understood that it is not limited to such application. A satisfactory dispenser for use with foods and drugs must be one which is immune from attack by the material dispensed, simple in construction, and particularly must be one which may readily be cleaned and thus maintained in hygienic condition. Prior dispensers have not been satisfactory in the last regard, particularly for dispensing food products, since they have been complicated and difficult, if not impossible, to maintain in clean condition.

The present dispenser overcomes the difficulties encountered in the prior art since it is simple, consisting in its preferred embodiment of but three parts, is readily disassembled, and, when used in a preferred manner, is mounted within the neck of the container opening so that it may be covered, when not in use, by a cap. Details of the invention and its mode of operation will be apparent from the following description, of which the appended drawings are a part.

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In the drawings:

Fig. 1 is a view in side elevation of the preferred embodiment of the dispenser of the invention mounted in the neck of a bottle to which a cap may be affixed, the cap being removed in this view;

Fig. 2 is an enlarged view in vertical section through the axis of the neck of the bottle shown in Fig. 1, the dispenser not being sectioned, a cap being shown on the bottle in partially unscrewed position;

Fig. 3 is a view in vertical section through the axis of the bottle neck and dispenser, the bottle being inverted and the plunger of the dispenser being shown pressed inwardly to a dispening position;

Fig. 4 is a view in vertical section through the axis of the dispenser and bottle neck, the bottle being inverted, the dispenser plunger being in outwardly extended, sealing, position;

Fig. 5 is a view in vertical cross section through the bottle neck and dispenser, the view showing a cap in fully applied sealing position on the bottle. The section in Fig. 5 is taken at a position displaced 45° about the longitudinal axis of the dispenser from the sectioning planes of Fig. 3 and 4;

Fig. 6 is a view in bottom plan of the outer portion or sleeve of the dispenser;

Fig. 7 is a view in bottom plan of the inner part or plunger of the dispenser; and

Fig. 8 is an enlarged view in cross section through the dispenser transverse to the longitudinal axis thereof, the section being taken along the line VIII—VIII in Fig. 2.

The dispenser, in the preferred embodiment shown in the drawings and hereinafter described, is generally designated by the reference character 2. In Figs. 1–5, inclusive, such dispenser is shown as positioned within the neck 6 of the bottle 4. It is preferred that the dispenser, which itself functions as a selectively operable closure, be employed with a container provided with a further closure member. In the drawings, the neck of the bottle is shown as provided with exterior screw threads 8, on which may be screwed the cap 9 of the bottle.

The bottle neck is provided, at a point beneath its flared lip 12, with an inner constriction 10 below which the inner surface of the neck is of larger diameter, as shown at 14. The dispenser sleeve 16 is formed generally of cylindrical shape, having a main body portion 20, a radially directed flange 18 on the upper end thereof, and a lower slightly inwardly tapering portion 22 at

its bottom end. The diameter of body portion 20 is such that its zone 28 snugly and preferably sealingly engages the constricted portion 10 of the bottle neck, as shown in Fig. 2. A further seal between the dispenser and the bottle neck is provided by the depending sealing flange 24 attached to the bottom of flange 18 at a position adjacent body 20. The location and shape of sealing flange 24 are such that, when the dispenser is fully inserted into the bottle neck, the outer face 26 of such sealing flange sealingly engages lip 12 of the bottle.

The dispenser is stably held within the bottle neck, when sleeve 16 is made of an elastomeric material as in the preferred embodiment, by means of the plurality of spaced longitudinally directed ribs 30 on the body portion 20. Ribs 30 are so located, longitudinally of the dispenser, that they fit snugly within the enlarged portion 14 of the neck 6. The shape of such ribs in cross section is shown more clearly in Fig. 8, where one face of each rib, designated 32, is shown directed radially of the sleeve, and the other face 34 is shown disposed at a substantial angle to the radius. The upper and lower end of each rib is curved to merge gradually with the outer wall of the sleeve, as shown in Fig. 2.

Sleeve 16, in the embodiment described, is made of a resilient, rather soft, material which allows the ribs to be deformed, upon reception of the dispenser within the bottle neck, sufficiently for the ribs to pass the constricted portion 10, after which they resume their normal shape. Ribs 30 provide a path for the escape of air from the bottle during application of the dispenser to the bottle, and thus there is no tendency for the dispenser to leave its fully seated position. The sawtooth shape of the ribs allows them to be easily deformed. The dispenser may be most readily inserted and removed by turning it in a counterclockwise direction in Fig. 8, so that the ribs are deformed most easily.

Flange 18 of the sleeve 16 is provided with an annular well 36, the bottom wall of which is slanted, as shown at 38, and the side wall of which is vertical, as shown at 40. Body portion 20 of the sleeve is provided with an inner cylindrical side wall portion 42 of relatively thin section, such side wall portion terminating at the shoulder 44, where the bottom thickened portion 46 of the sleeve begins. The sleeve is completed by a bottom flange 48, the configuration of which will be more readily apparent in Fig. 6. As shown, such flange is provided with a plurality, in this instance four, of angularly spaced openings 50, such openings being guideways of dovetail shape. Intermediate each pair of openings 50, flange 48 has an inwardly projecting portion 51, the inner edges of projections 51 lying on a circle coaxial with the longitudinal axis of body 20.

The inner portion or plunger of the dispenser, which fits within sleeve 16 and is reciprocable longitudinally thereof, is generally designated 54. Such plunger has an upper cylindrical portion 56 of such diameter as to fit snugly but slidably within portion 20 of the sleeve. Part 56 of the plunger terminates at the inwardly directed offset or step 58 by which it is connected to the lower cylindrical portion 62, such lower portion having a diameter somewhat less than that of portion 56. Step 58 is located, in the embodiment shown, at a distance about one-fourth of the length of the plunger below the top of the plunger. Portion 62 is provided at its bottom with a plurality of angularly spaced openings 66,

such openings in the embodiment shown having a height about one-fourth the length of the plunger. Between each adjacent pair of openings, the plunger at its bottom is provided with a vertical strut 64 of dovetailed cross section, the struts 64 being so spaced and of such dimensions that each snugly and sealingly fits within the corresponding opening 50 in the flange 48 of the sleeve. Struts 64 connect the bottom closure disc 68 of the plunger to the main body thereof. Such closure disc has an upwardly directed conical nib 70 on its upper face to facilitate the escape of air from the dispenser as the material to be dispensed flows into the dispenser. Disc 68 has a shape in bottom plan as shown in Fig. 7, in which four equally spaced portions 69 having outer edges 71 of circular shape are shown. The circle on which surfaces 71 lie, is coaxial with the longitudinal axis of the plunger 54 and is of a diameter slightly greater than the diameter of the circle upon which surfaces 52 of the sleeve 48 lie. In the preferred embodiment, both plunger and sleeve are made of elastomeric material, more fully to be disclosed below, which is of such character that portions 69 of the plunger closure disc may be snapped past parts 51 of the sleeve flange in assembling or disassembling the dispenser. In normal use of the dispenser, parts 69 of the plunger remain below or beyond parts 51 of the sleeve, as shown in Figs. 2 and 4.

The plunger is provided at its upper edge with an upwardly and outwardly directed flange 72 having an under surface 74. The shape and dimensions of flange 72 and surface 74 are such that flange 72 may be disposed wholly within well 36 of the sleeve, preferably with a clearance of a few thousandths of an inch on both sides and bottom. Thus, when the cap 9 of the bottle is screwed tightly down on the dispenser, it effects a seal with the top annular surface of flange 18 of the sleeve.

The dispenser is completed by a helical coil spring 76 disposed within the sleeve and between the shoulder 60 provided by step 58 on the plunger and the shoulder 44 on the inner surface of the sleeve. The dispenser plunger assumes the position shown in Fig. 4 when it is in container closing position. The plunger assumes such position when the bottle cap is removed, if the dispenser is used with such supplementary closure, or when the dispenser is used by itself and no pressure is exerted on the plunger against the action of spring 76.

To dispense the contents of the bottle, shown in this instance as a liquid 78, the bottle is inverted as shown in Fig. 3, and the flange 72 of the plunger is engaged with a surface which will seal the outer end of the opening 80 through the plunger. In Fig. 3 such surface is shown as a spoon or spatula 82 having a broad inner surface uniformly engaging the outer lip of the plunger flange 72, which will deform somewhat to form a seal with the spoon. The plunger is then pressed inwardly of the bottle thereby opening the ports provided by openings 66 which previously were closed. Liquid 78 then flows from the bottle into the plunger to fill the space therein provided by the opening 80, as shown in Fig. 3. The plunger is then allowed to travel outwardly of the bottle by moving the bottle and the spatula or spoon 82 relatively away from each other. During such travel the flange 72 of the plunger remains in contact with the spoon, by reason of the pressure exerted on the plunger by the spring 76, and thus liquid does not leak from the outer

end of the plunger. Only when the plunger has resumed the position shown in Fig. 4, in which openings 66 are fully disposed within part 46 of the sleeve and portions 69 of the closure disc of the plunger contact and overlap the portions 51 of the end flange of the sleeve and thus communication between the space within the bottle and passage 80 has been shut off, is the measured quantity of liquid 84 allowed to flow from the outer end of the passage 80 through the plunger. This occurs, of course, when the spoon and plunger are removed from contact. The dispensed quantity of liquid is determined by the volume of the bore 80 in the plunger when such plunger is in its outer, sealing, position.

In the preferred embodiment of the dispenser, both plunger and sleeve are made of a semi-rigid elastomeric plastic and the spring 76 is made of strainless steel. It is preferred to make the plunger and sleeve of polyethylene, a commercially available product one brand of which is sold under the trade-mark "Polythene" and is made by the Du Pont company. Such plastic is durable and sufficiently rigid for the purpose in hand, but still is markedly resilient and is soft enough not to mar any articles with which it comes into contact. In addition, such material is immune or substantially immune from attack by almost any known reagent. Another elastomeric plastic material which may advantageously be employed for the plunger, the sleeve, or both, is polyvinyl acetal. One brand of such material is that made by the Du Pont company and designated "Butacite." Other suitable elastomeric plastic materials from which the plunger and sleeve of the dispenser may be made include cellulose acetate, cellulose nitrate, ethylcellulose, polyvinyl formal, polyvinyl acetate, polyvinyl butyral, and vinylidene chloride. It is to be understood, however, that within the broad teaching of the invention the sleeve and plunger of the dispenser of the invention may be made of any known constructional material, such as metal, rigid plastic material, etc., suitable for the purpose in hand, and that the spring may be made of any desired spring material such as spring metal.

Although the dispenser has been described as operating by pressing its plunger inwardly with a spatula or spoon, it is obvious that the plunger may be pressed inwardly by the palm of one's hand, as in the case of dispensing shaving lotion, with one's head, in dispensing shampoo, both of which will form a seal or an approximate seal with flange 72 of the plunger, or that a surface such as that of an article of furniture may be employed to press the plunger inwardly of the container when the dispenser is employed on a can or bottle containing furniture polish. In such last application, the dispenser of the invention, when its sleeve and plunger are made of an elastomeric plastic such as one of those listed above, is particularly desirable since these parts will not scratch the furniture when the plunger is pressed against it to dispense the polish.

Although we have described and illustrated a preferred embodiment of the dispensing device of the invention and have indicated illustrative applications thereof, it is to be understood that the invention is not limited to such construction, since it may be varied considerably as to details, and that the dispenser of the invention is capable of use to advantage in many other applications. The scope of the invention is therefore defined by the appended claims.

We claim as new the following:

1. A dispenser comprising an outer sleeve member the inner end of which is adapted to fit into an opening in a container, a hollow plunger member having an opening adjacent its outer end located within the sleeve in sealing relation therewith and slidable longitudinally thereof, yieldable means to urge the plunger in an outward direction so that when the plunger is in its outer extended position its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a transverse inwardly extending flange member, said flange member having an opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the opening in the flange member, the means connecting the closure member to the plunger providing lateral openings therethrough, at least one of the group of members consisting of the flange and closure member being made of a resilient material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member through the opening in the flange after which the resilient part or parts regain their normal shape and function as a valve and also as a stop means limiting travel of the plunger in an outward direction.

2. A dispenser comprising an outer sleeve member the inner end of which is adapted to fit into an opening in a container, a hollow plunger member having an opening adjacent its outer end located within the sleeve in sealing relation therewith and slidable longitudinally thereof, guide means to cause the plunger to travel axially of the sleeve and to restrain it from rotation with respect thereto, yieldable means to urge the plunger in an outward direction so that when the plunger is in its outer extended position its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a transverse inwardly extending flange member, said flange member having an opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the opening in the flange member, the means connecting the closure member to the plunger providing lateral openings therethrough, at least one of the group of members consisting of the flange and closure member being made of a resilient material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member through the opening in the flange after which the resilient part or parts regain their normal shape and function as a valve providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter adapted to be inserted within the container and also as a stop means limiting travel of the plunger in an outward direction.

3. A dispenser comprising an outer sleeve member the inner end of which is adapted to fit into an opening in a container, a hollow plunger member having an opening adjacent its outer end located within the sleeve in sealing relation therewith and slidable longitudinally thereof, yieldable means to urge the plunger in an outward direction so that when the plunger is in its outer extended position its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a transverse inwardly extend-

ing flange member integral therewith, said flange member having a central opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the central opening in the flange member, the means connecting the closure member to the plunger being longitudinal struts spaced around the wall of the plunger and integral therewith, the flange on the sleeve having a plurality of openings around the central opening and open thereto, each of such plurality of openings being of substantially the same cross-sectional shape as and snugly receiving one of the struts, at least one of the group of members consisting of the flange and closure member being made of a resilient material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member through the opening in the flange after which the resilient part or parts regain their normal shape and function as a valve providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter adapted to be inserted within the container and also as a stop means limiting travel of the plunger in an outward direction.

4. A dispenser comprising an outer sleeve member the inner end of which is adapted to fit into an opening in a container, a hollow plunger member having an opening adjacent its outer end located within the sleeve in sealing relation therewith and slidable longitudinally thereof, yieldable means to urge the plunger in an outward direction so that when the plunger is in its outer extended position its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a transverse inwardly extending flange member, said flange member having a central opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the central opening in the flange member, the means connecting the closure member to the plunger being longitudinal struts spaced around the wall of the plunger and integral therewith, the flange on the sleeve having a plurality of openings around the central opening and open thereto, each of such plurality of openings being of substantially the same cross-sectional shape as, and snugly receiving, one of the struts, at least one of the group of members consisting of the sleeve and plunger being made of an elastomeric plastic material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member through the opening in the flange after which the resilient part or parts regain their normal shape and function as a valve providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter adapted to be inserted within the container and also as a stop means limiting travel of the plunger in an outward direction.

5. A dispenser comprising an outer sleeve member the inner end of which is adapted to fit into an opening in a container, a hollow plunger member having an opening adjacent its outer end located within the sleeve in snug relation therewith and slidable longitudinally thereof, yieldable means to urge the plunger in an outward direction so that when the plunger is in its outer extended position its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a transverse inwardly extending flange member, said flange member having a central opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the central opening in the inwardly extending flange member, the means connecting the closure member to the plunger being longitudinal struts spaced around the wall of the plunger, the flange on the sleeve having a plurality of openings around the central opening and open thereto, each of such plurality of openings being of the same cross-sectional shape as, and sealingly receiving, one of the struts, the plunger, struts, and closure member being integral, and the sleeve and flange being integral, both sleeve and plunger being made of an elastomeric plastic material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member and struts through the central opening and the openings around the central opening, respectively, in the inwardly extending flange after which the parts regain their normal shape and function as a valve providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter adapted to be inserted within the container and also as a stop means limiting travel of the plunger in an outward direction.

6. A three-part dispenser consisting of an outer sleeve member having a transverse outwardly directed flange on its outer end, the sleeve being adapted to fit on a container with the inner end of the sleeve extending into the container opening and the flange resting on the surface of the container surrounding the opening, a hollow plunger member located within the sleeve in sealing relation therewith and slidable longitudinally thereof, the outer end of the plunger being open and located substantially in a plane transverse to the axis of the plunger, the outer end of the plunger being provided with a flange flaring outwardly from the outer end of the plunger, yieldable means to urge the plunger in an outward direction so that its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a transverse inwardly extending flange member, said flange member having a central opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the central opening in the inwardly extending flange member, the means connecting the closure member to the plunger being longitudinal struts spaced around the wall of the plunger, the flange on the sleeve having a plurality of openings around the central opening and open thereto, each of such plurality of openings being of the same cross-sectional shape as, and sealingly receiving, one of the struts, the plunger, struts, and closure member being integral, and the sleeve and flanges being integral, both sleeve and plunger being made of an elastomeric plastic material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member and struts through the central opening and the openings around the central opening, respectively, in the inwardly extending flange after which the parts regain their normal shape and function as a valve providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter adapted to be inserted within the con-

tainer and also as a stop means limiting travel of the plunger in an outward direction.

7. The combination of a container having a neck, the neck having an opening therethrough communicating with the space within the container, the container being provided with a removable closure member spanning the top of the neck and means to hold the closure member on the neck in sealing relation thereto, and a dispenser mounted predominantly within the neck and wholly beneath the closure member, the dispenser comprising an outer sleeve member the inner end of which extends into the container neck, the outer end of the sleeve being provided with a transverse outwardly directed flange, said flange lying upon the upper edge of the neck of the container, a hollow plunger member having an opening adjacent its outer end located within the sleeve and slidable longitudinally thereof, yieldable means to urge the plunger in an outward direction so that when the container closure member is removed from the container the plunger assumes its outer extended position in which its outer end protrudes from the outer end of the sleeve and past the neck of the container, stop means to limit travel of the plunger in such outward direction, a selectively operable valve means providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter inserted within the container, the valve means being located at a zone spaced substantially from the outer end of the sleeve and being formed by parts of the sleeve and plunger, the valve means being so constructed and arranged that it is closed when the plunger is in its outer extended position and that it is open when the plunger is depressed substantially from such outer extended position, the outer end of the plunger being depressed to a position at least flush with the outer end of the flange on the sleeve when the closure member is applied in sealing position against such flange, the flange on the sleeve being made of an elastomeric plastic material.

8. A dispenser comprising an outer sleeve member having a transverse outwardly directed flange on its outer end, the sleeve being adapted to fit on a container with the inner end of the sleeve extending into the container opening and the flange resting on the surface of the container surrounding the opening, a hollow plunger member located within the sleeve in sealing relation therewith and slidable longitudinally thereof, the outer end of the plunger being open and located substantially in a plane transverse to the axis of the plunger, the outer end of the plunger being provided with a flange flaring outwardly from the outer end of the plunger, the flange on the sleeve being provided with a well in its outer surface, the well in the sleeve and flange being of such dimensions as completely to receive therewithin flange on the plunger when the latter is in its fully depressed position, yieldable means to urge the plunger in an outward direction so that its outer end protrudes from the outer end of the sleeve, stop means to limit travel of the plunger in such outward direction, a selectively operable valve means providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter adapted to be inserted within the container, said valve means comprising a port through the wall of the sleeve at a location spaced substantially from the outer end of the sleeve, the plunger having an imperforate portion thereof cooperating with the port and selectively functioning as a closure therefor, the valve means being so constructed and arranged that it is closed when the plunger is in its outer extended position and that it is open when the plunger is depressed substantially from such outer extended position, the sleeve and plunger each being integral and being made of semi-rigid elastomeric plastic material.

9. The combination of a container having a neck, the neck having an opening therethrough communicating with the space within the container, the container being provided with a removable closure member spanning the top of the neck and means to hold the closure member on the neck in sealing relation thereto, and a dispenser mounted predominantly within the neck and wholly beneath the closure member, the dispenser comprising an outer sleeve member the inner end of which fits into the opening in the container, a hollow plunger member having an opening adjacent its outer end located within the sleeve in sealing relation therewith and slidable longitudinally thereof, yieldable means to urge the plunger in an outward direction so that when the plunger is in its outer extended position its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a traverse inwardly extending flange member, said flange member having an opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the opening in the flange member, the means connecting the closure member to the plunger providing lateral openings therethrough, at least one of the group of members consisting of the flange and closure member being made of a resilient material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member through the opening in the flange after which the resilient part or parts regain their normal shape and function as a valve and also as a stop means limiting travel of the plunger in an outward direction.

10. The combination of a container having a neck, the neck having an opening therethrough communicating with the space within the container, the container being provided with a removable closure member spanning the top of the neck and means to hold the closure member on the neck in sealing relation thereto, and a dispenser mounted predominantly within the neck and wholly beneath the closure member, the dispenser comprising an outer sleeve member the inner end of which fits into the opening in the container, a hollow plunger member having an opening adjacent its outer end located within the sleeve in sealing relation therewith and slidable longitudinally thereof, yieldable means to urge the plunger in an outward direction so that when the plunger is in its outer extended position its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a transverse inwardly extending flange member integral therewith, said flange member having a central opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the central opening in the flange member, the means connecting the closure member to the plunger being longitudinal struts spaced around the wall of the plunger and integral therewith, the flange on the sleeve having a plurality of openings around the central opening and open thereto, each of such plurality of

openings being of substantially the same cross-sectional shape as and snugly receiving one of the struts, at least one of the group of members consisting of the flange and closure member being made of a resilient material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member through the opening in the flange after which the resilient part or parts regain their normal shape and function as a valve providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter inserted within the container and also as a stop means limiting travel of the plunger in an outward direction.

11. The combination of a container having a neck, the neck having an opening therethrough communicating with the space within the container, the container being provided with a removable closure member spanning the top of the neck and means to hold the closure member on the neck in sealing relation thereto, and a three-part dispenser mounted predominantly within the neck and wholly beneath the closure member, the dispenser consisting of an outer sleeve member having a transverse outwardly directed flange on its outer end, the sleeve fitting on the container with the inner end of the sleeve extending into the container opening and the flange resting on the surface of the container surrounding the opening, a hollow plunger member located within the sleeve in sealing relation therewith and slidable longitudinally thereof, the outer end of the plunger being open and located substantially in a plane transverse to the axis of the plunger, the outer end of the plunger being provided with a flange flaring outwardly from the outer end of the plunger, yieldable means to urge the plunger in an outward direction so that its outer end protrudes from the outer end of the sleeve, the sleeve having at its inner end a transverse inwardly extending flange member having a central opening therethrough longitudinally of the sleeve, the inner end of the plunger having connected thereto a transverse closure member of the same shape as but slightly larger than the central opening in the inwardly extending flange member, the means connecting the closure member to the plunger being longitudinal struts spaced around the wall of the plunger, the flange on the sleeve having a plurality of openings around the central opening and open thereto, each of such plurality of openings being of the same cross-sectional shape as, and sealingly receiving, one of the struts, the plunger, struts, and closure member being integral, and the sleeve and flanges being integral, both sleeve and plunger being made of an elastomeric plastic material so that the plunger may be assembled in operative position in the sleeve by thrusting the closure member and struts through the central opening and the openings around the central opening, respectively, in the inwardly extending flange after which the parts regain their normal shape and function as a valve providing the sole communication between the interior of the plunger and the exterior of the sleeve in that portion of the latter inserted within the container and also as a stop means limiting travel of the plunger in an outward direction.

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