Jan. 5, 1943. R. B. KINGMAN 2,307,224

LEAK-PROOF APPLICATOR CLOSURE FOR DISPENSING CONTAINERS

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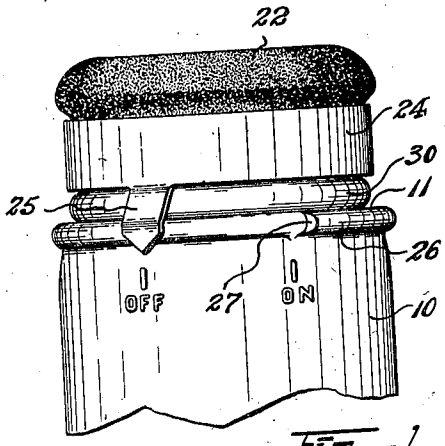


Fig. 1

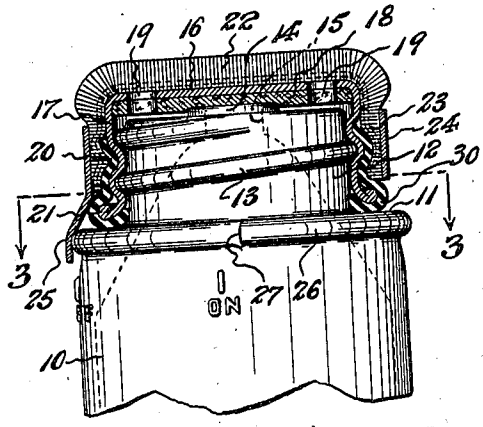


Fig. 2

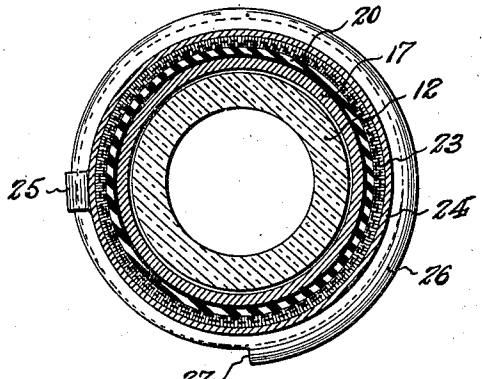


Fig. 3

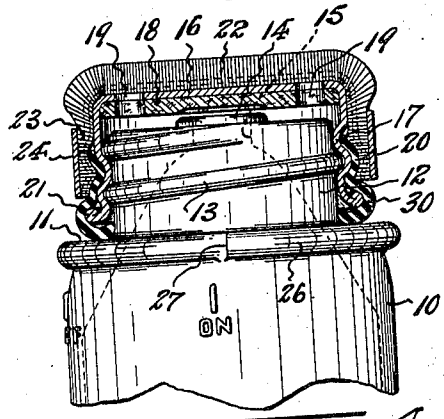


Fig. 4

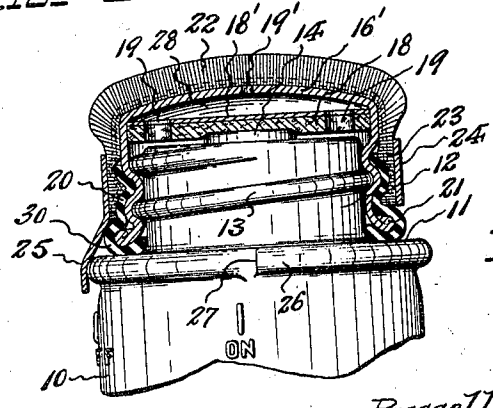


Fig. 5

INVENTOR.
Russell B. Kingman,
BY George D. Richards
ATTORNEY.

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LEAKPROOF APPLICATOR CLOSURE FOR DISPENSING CONTAINERS

Russell B. Kingman, Orange, N. J.

Application April 15, 1941, Serial No. 388,615

5 Claims. (Cl. 15—133)

This invention relates to improvements in dispensing containers and manipulatable closures therefor of the general type and kind disclosed in my co-pending application for United States Letters Patent Serial No. 365,418, filed November 13, 1940, now Patent No. 2,268,402, Dec. 30, 1941.

In dispensing type containers having a venting closure member threaded to the container neck in such manner that limited rotative movements thereof operate to open or close communication between the discharge mouth of the container and the closure member vent means, considerable difficulty has been experienced in so controlling outflow of a liquid content from the container as to prevent leakage of the liquid between the closure member and the container neck and thence onto the exterior surfaces of the container body, subject to disagreeable contact with the user's hand, and with the further disadvantage of soiling and staining labels or the like which may be applied to the external surfaces of the container body. Having these things in view, it is an object of this invention to provide manipulatable closure means, of the general type and kind above mentioned, including novel means for preventing leakage between the same and the body of the container to which the closure means is applied.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

Illustrative embodiments of this invention are shown in the accompanying drawing, in which:

Fig. 1 is a front elevation of the upper end portion of a dispensing container equipped with closure means according to this invention, the same being shown in its closed and sealing relation to the container discharge mouth, and with such closed condition so indicated; Fig. 2 is a view similar to that of Fig. 1, but showing the closure means in vertical cross-section; Fig. 3 is a horizontal sectional view, taken on line 3—3 in Fig. 2; and Fig. 4 is a view similar to that of Fig. 2, but showing the closure means in its open relation to the container discharge mouth.

Fig. 5 is a view similar to that of Fig. 2 showing a modified form of the closure means, the same being in container discharge mouth closing and sealing position.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

In the drawing, the reference character 10 indicates the body of a dispensing container adapted to hold a supply of fluent material desired to be dispensed. Illustratively, said material may be a liquid cleaning fluid such as commonly used for removing soil spots from garments and other materials, liquid polishing materials, liquid dyes, etc.; or, in fact, any fluent substance suitable for other selected specific uses. The container 10 is shown in the form of a glass bottle or jar, but it will be obvious that the same may alternately comprise a can, box or other receptacle form which may be made of metal, paper, plastics or any other suitable material.

The body 10 of the container may optionally be made in various design shapes, but preferably so as to terminate at its upper end portion in a top end shoulder portion 11 from which upwardly extends a neck portion 12 of reduced diameter having external screw-threads 13 formed thereon. Said neck portion 12 terminates in an upstanding mouth defining portion or flange 14 of further reduced diameter, said flange and neck portion being in concentric relation. The top of said flange 14 provides a seat to receive engagement of a sealing disc means operative to close and seal the open mouth 15 defined by said flange 14, as will presently appear.

Cooperative with the screw threaded neck portion 12 of the container is a closure member. This closure member comprises a closure cap having a top wall 16 and an annular skirt 17, the latter being formed to provide female screw-threads to cooperate with the male screw-threads 13 of the container neck portion 12, whereby said cap may be threaded onto the latter. Within the cap interior, and preferably affixed to and across the under side of the cap top wall 16 is a sealing disc 18 of a suitable fluid impervious material, the same being adapted to be carried down by the cap, when the latter is rotatively screwed down upon the container neck portion 12, so as to bring its central portion in engagement with the top of the mouth defining flange 14, so as to seal against the same in bridging and closing relation to the container mouth 15. Formed in the cap top wall 16 and in said sealing disc 18, in the portions thereof lying outwardly of the container mouth defining flange 14, i. e. between said flange and the annular skirt 17 of the cap, are one or more vents or emission openings 19.

Externally applied to and around the skirt 17 of the cap is a liquid impervious elastic sleeve 20, the lower marginal portions of which extend beyond the free edge or rim 21 of the cap for purposes subsequently explained. Applied exte-

riorly over the top wall 16 of the cap, so as to overlie the vents or emission openings 19 therein, is an applicator member 22, the marginal or skirt portions 23 of which are folded down and gathered around the skirt 17 of the cap and over and around those portions of said elastic sleeve 20 which are contiguous to the cap skirt 17. Said applicator member is formed from a pervious material, fabric or the like; and is preferably made of a textile pile fabric such e. g. as a mohair fabric. Means is provided for fastening the applicator member 22, together with said elastic sleeve 20, in the described assembled relation to the cap, the same comprising an external keeper ferrule or collar 24. This keeper ferrule or collar 24 is pushed downwardly and telescopically over and around the skirt portions 23 of said applicator member and underlying portions of the elastic sleeve 20, thereby to tightly and immovably wedge and bind these parts against the skirt 17 of the cap, so that the same are firmly and securely gripped and held in operative assembled relation to said cap. Connected with said ferrule or collar 24, preferably as an integral part thereof, and so as to depend from the lower margin thereof, is a combined indicator pointer and stop member 25, so shaped as to overhang the periphery of the container shoulder portion 11. Said indicator and stop means 25 is adapted to cooperate with a complimentary stop means with which the container body 10 is provided, whereby to limit the rotative manipulation of the cap to partially unscrew the same relative to the container neck portion 12, and thus lift and release the sealing disc 18 from normal closed and sealing relation to the container mouth. To this end there is integrally formed in connection with the periphery of the container shoulder 11 a stop portion 26 which terminates in a stop abutment 27 adapted to be disposed in the path of movement of said indicator and stop means 25 in the direction of rotative loosening or unscrewing movement of the closure member (as shown, in anticlockwise direction), whereby to oppose and limit movement of the indicator and stop means and cap in such direction. Said stop portion is preferably provided in the form of an eccentric rib adapted to taper from its stop abutment end so as to merge in the periphery of the container shoulder portion 11. When the closure member is turned in clockwise direction to move the cap downwardly on the container neck portion 12 to container mouth closing and sealing position, the indicator and stop 25 is spaced away from said stop abutment 27. The pointed extremity of the indicator and stop 25 cooperates with "off" and "on" indicating marks with which the container body is provided as shown, or, optionally, as displayed on a label applied to the container body.

The method of assembling the elements of the closure member after the cap part thereof has been screwed tightly home in container mouth closing position, so as to obtain the proper and accurately predetermined coordination of the stop and indicating markings, is attained in the manner and with the advantages fully disclosed in my aforesaid co-pending application Serial No. 365,418, now Patent 2,268,402.

When the cap of the closure member is screwed home upon the threaded neck portion 12 of the container, the lower marginal portions of the elastic sleeve 20 depending below the cap rim 21, are brought into engagement with the surface of the container shoulder portion 11, with tendency to turn or curl inwardly toward the neck portion 12, thus providing an annular sealing gasket member 30. The sealing gasket member 30 thus provided tensionally bears against said surface of the container shoulder portion 11 in close hugging contact therewith, and preferably, although not necessarily, in such manner that its free inner marginal portion will likewise contact and thrustingly bear against the surface of the container neck portion 12 which adjoins the surface of the container shoulder portion 11. Thus the sealing gasket member 30 acts as a seal against outflow of any liquid outwardly beyond the same which may seep downwardly between the cap skirt 17 and the container neck portion 12.

The sealing gasket member 30 being composed of elastic and liquid impervious material, will not relax its tensional thrust against the container body when the cap is partially rotated and loosened to effect an open condition of the closure member, and consequently will maintain its pressure contact with the container so as to effectively obstruct and prevent outflow of liquid exteriorly beyond the same, under open as well as closed conditions of the closure member. It will therefore be obvious that not only is outward leakage of liquid efficiently prevented at all times, but loss of liquids of volatile character by evaporation is likewise prevented; the latter effect being a very important consideration in connection with the commercial distribution of certain classes of liquid products packed in dispensing containers; such e. g. as volatile spot cleaning liquids, grease solvents and the like.

The annular sealing gasket member 30, although adapted to effectively thrust against an exterior surface of the container with sealing effect at all times, will, nevertheless, readily slide or slip on the engaged surfaces so as not to unduly impede or prevent operative rotative manipulation and movement of the closure member relative to the container neck portion. Preferably the elastic sleeve 20 and its sealing gasket member 30 is made of soft vulcanized rubber, and, in such case, frictional resistance to slippage thereof relative to the container surfaces contacted thereby may be reduced, if desired, without loss of sealing effect, by providing the portions of the container surface engaged thereby with a film of a suitable lubricating substance.

In Fig. 5 is shown a somewhat modified form of the closure member having the leakage prevention sealing gasket means of this invention. In this modified construction the cap of the closure member is provided with a domed top wall 16' having a single vent opening 19' centrally located therein beneath the applicator member 22. The sealing disc 18 is supported or backed by a rigid backing plate 18', the margins of which engage the juncture of the top wall 16' and the skirt 17 of the cap, thus bridging the concave underside of the cap top wall so as to provide a chamber 28 communicating with said vent opening 19', while at the same time rigidly backing the sealing disc 18 for sealing engagement with the top of the container mouth defining flange 14. Provided in said sealing disc 18 and its backing plate 18' are the outlying vents 19 to afford communication between the interior of the container and said chamber 28 when the closure member is in open condition. This modified form of closure member is especially adapted for use in dispensing a liquid to the central

portion of the applicator member, whereby said portion may be used as the primary applicator of the dispensed liquid to the surface desired to be treated thereby, while the outlying or marginal portions of the applicator surface are kept comparatively clean for service as a buffing or polishing medium in completing the effective application of the dispensed liquid to the surface treated thereby.

Having now described my invention, I claim:

1. A dispensing container comprising, a body having an externally screw-threaded neck and a shoulder portion at the juncture of said body and neck, said neck terminating in a container mouth defining portion of reduced diameter, a closure cap threaded onto said neck, said cap having an internal sealing disc to close and seal said container mouth when the cap is screwed home, said disc having vent means spaced outwardly from said mouth defining portion, said cap having vent means in its top wall in communication with said disc vent means, an elastic sleeve around said cap sides, said sleeve having a free lower end portion extending from said cap to form an extensible resilient annular sealing gasket member to thrustingly engage the body shoulder portion, a pervious applicator member having skirt portions folded down around the cap sides, and a tubular keeper ferrule telescopically engaged over superposed portions of said applicator member skirt portions and elastic sleeve operative to affix said parts to the cap sides, said body having a stop projection extending from the periphery of its shoulder portion, and said ferrule having a stop element dependent therefrom for cooperation with said stop projection to limit opening movement of said cap.

2. A dispensing container comprising, a body having an externally screw-threaded neck and a shoulder portion at the juncture of said body and neck, said neck terminating in a container mouth defining portion of reduced diameter, a closure cap threaded onto said neck, said cap having an internal sealing disc to close and seal said container mouth when the cap is screwed home, said disc having vent means spaced outwardly from said mouth defining portion, said cap having vent means in its top wall in communication with said disc vent means, an elastic sleeve around said cap sides, said sleeve having a free lower end portion extending from said cap to form an extensible resilient annular sealing gasket member to thrustingly engage the body shoulder portion, a keeper ferrule to clamp said sleeve to the cap sides, said body having a stop projection extending from the periphery of its shoulder portion, and said ferrule having a stop element dependent therefrom for cooperation with said stop projection to limit opening movement of said cap.

3. A dispensing container comprising, a body having an externally screw-threaded neck and a shoulder portion at the juncture of said body and neck, said neck terminating in a container mouth defining portion of reduced diameter, a closure cap threaded onto said neck, said cap having an internal sealing disc to close and seal said container mouth when the cap is screwed home, said disc having vent means spaced outwardly from said mouth defining portion, said cap having vent means in its top wall in communication with said disc vent means, an elastic sleeve around said cap sides, said sleeve having a free lower portion terminating in an inturned marginal portion thereby providing a resilient annular sealing gasket member engaging the container body substantially within the juncture of its shoulder and neck portions, a keeper ferrule to clamp said sleeve to the cap sides, said body having a stop projection extending from the periphery of its shoulder portion, and said ferrule having a stop element dependent therefrom for cooperation with said stop projection to limit opening movement of said cap.

4. A dispensing container comprising, a body having an externally screw-threaded neck and a shoulder portion at the juncture of said body and neck, said neck terminating in a container mouth defining portion of reduced diameter, a closure cap threaded onto said neck, said cap having an internal sealing disc to close and seal said container mouth when the cap is screwed home, said disc having vent means spaced outwardly from said mouth defining portion, said cap having vent means in its top wall in communication with said disc vent means, an elastic sleeve around said cap sides, said sleeve having a free lower portion terminating in an inturned marginal portion thereby providing a resilient annular sealing gasket member engaging the container body substantially within the juncture of its shoulder and neck portions, a pervious applicator member having skirt portions folded down around the cap sides, and a tubular keeper ferrule telescopically engaged over superposed portions of said applicator member skirt portions and elastic sleeve operative to clamp said parts to the cap sides, said body having a stop projection extending from the periphery of its shoulder portion, and said ferrule having a stop element dependent therefrom for cooperation with said stop projection to limit opening movement of said cap.

5. A dispensing container comprising, a body having an externally screw-threaded neck and a shoulder portion at the juncture of said body and neck, a closure cap threaded onto said neck, said cap having vent means to communicate with the interior of the body when the cap is loosened on said neck, an elastic sleeve around and affixed to said cap sides, said sleeve having a free lower end portion extending from said cap to form an extensible resilient annular sealing gasket member to thrustingly engage the body shoulder portion in both closed and loosened open positions of said cap, and means to limit the rising loosening movement of said cap.

RUSSELL B. KINGMAN.