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(54) **Roll-on dispenser.**

(57) A wide roll-on dispenser has a fluid reservoir and an applicator roller mounted in a housing with a valve mechanism therebetween to control the flow of fluid from the reservoir to the roller, the valve mechanism being operated by movement of the housing with respect to the reservoir. In a preferred arrangement the housing is moved to operate the valve mechanism by applying and removing an over-cap.

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ROLL-ON DISPENSER

The present invention relates to roll-on liquid product dispensers and particularly to such dispensers having an elongated roller. In particular the present invention is directed to a roll-on liquid dispenser having an improved sealing arrangement.

In connection with roll-on dispensers having spherical rollers mounted in a socket, sealing of the container is frequently accomplished by providing an overcap that forces the spherical roller into the socket to seal a fluid opening at the base of the socket. Alternately there may be provided an overcap which sealingly engages the container around the socket.

This type of seal arrangement has been applied to wide roll on dispensers having an elongated roller, but the variation in shape between an elliptical roller and the sealing surfaces of the fluid opening can make effective sealing difficult. Likewise, it is difficult to obtain a good seal between an oval overcap and an oval container.

US Patent 4,723,860 shows an arrangement for a wide roll-on dispenser having a valve member positioned between the roller and the fluid opening. The valve member is biased by a spring into a closed position and opened by pressure from downward movement of the roller. This arrangement requires significant force by the user on the roller to initiate and continue fluid flow during use.

It is therefore an object of the present invention to provide a new and improved roll-on dispenser with an improved sealing arrangement.

In a preferred embodiment of the invention there is provided a roll-on dispenser with a sealing arrangement which automatically opens upon removal of the overcap and automatically closes upon replacement of the overcap.

In accordance with the present invention there is provided a liquid product dispenser which includes a liquid reservoir having a liquid outlet passage and a first valve member in the passage having a fixed relation to the reservoir. The dispenser further includes an applicator assembly which has a rotatable applicator roller mounted to a supporting housing. The housing includes a fluid passage for conducting fluid to the roller and an inlet passage mounted to the liquid outlet passage of the reservoir for receiving fluid therefrom and including a second valve member. The second valve member is moveable with respect to the first valve member to open and close the passage.

In a preferred embodiment the second valve member is fixed with respect to the applicator assembly housing and the housing moves towards and away from the reservoir to close and open the

passage. The movement towards and away from the reservoir may be activated by applying and removing an overcap.

For a better understanding of the present invention, together with other and further objects, reference is made to the following description, taken in conjunction with the accompanying drawings and its scope will be pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a partially cross-sectioned longitudinal elevation view of a roll-on fluid dispenser in accordance with the present invention.

Figure 2 is a cross-sectional view of the roller used in the Figure 1 dispenser.

Figure 3, is a longitudinal cross-sectional view of the housing member used in the Figure 1 dispenser;

Figures 3A and 3B are fragmentary views of parts of Figure 3 on an enlarged scale;

Figure 4 is a transverse cross-sectional view of the housing member shown in Figure 3;

Figure 5 is a cross-sectional view of the first valve member used in the Figure 1 dispenser.

Figure 5B is a fragmentary view of part of Figure 5 on an enlarged scale;

Figure 6 is a top view of the Figure 5 valve member.

Figure 7 is a partially cross-sectioned side elevation view of the overcap of the Figure 1 dispenser; and

Figure 7A is a fragmentary view of part of Figure 7 on an enlarged scale.

A preferred embodiment of the presentation invention is shown in Figure 1, which shows a wide bodied roll-on dispenser including a fluid bottle 12, a first valve member 14, an applicator assembly comprising a housing member 16 and roller 18 mounted thereon and an overcap 20.

Bottle 12 is moulded of conventional flexible plastic material and includes a generally cylindrical or elliptical lower portion 22 and an upper portion 24 which is extended in one longitudinal direction to conform to the elongated shape of roller 18. Bottle 12 includes a cylindrical neck 26 with a central outlet passage 28 and exterior threads.

First valve member 14 is screwed onto neck 26 by its lower portion 30 which is provided with internal threads to mate to the threads on neck 26. The upper portion of valve member 14 includes a cylindrical portion 32 and a valve plug 34, which are shown in greater details in Figures 5 and 6.

Cylindrical portion 32 includes an outwardly facing rib 40 which is designed to interact with inwardly facing ribs which are provided on housing members 16 as will be further described. Valve member 34 is supported by struts 36 which leave an open area between plug 34 and cylindrical member 32 for passage of fluid when the valve is open.

Figure 5B shows a modified edge for valve plug 34 wherein there is provided an annular groove on the upper surface of plug 34 and an outwardly facing ridge 36. The combination of groove 35 and ridge 36 provide flexibility of the edge of plug 34 to provide a more effective sealing of the plug to the mating valve member, which has an inwardly facing conical surface as will be described.

Housing member 16 is shown in cross-sectional views in Figures 3 and 4. As shown in Figure 3 housing member 16 includes an upwardly facing socket portion 42 having at its ends inwardly facing projections 44 which can be received in bores 46 provided at either end of elliptical roller 18, as shown in Figure 2, so that roller 18 is free to rotate about its central elongated axis within socket portion 42. The base of socket portion 42 includes a fluid inlet 46 which is provided with a second valve member 48 having an inner conical shaped surface for receiving and engaging valve plug 34 on valve member 14. Surrounding valve member 48 there is provided a cylindrical portion 50 which has an inner cylindrical surface provided with ridges 52, 54, 56 and 58 as shown in Figure 38. Cylindrical portion 50 is of a size which is selected to receive cylindrical portion 32 of valve member 14 in close fitting relation. Ridge 40 on cylindrical portion 32 is designed to interact with ridges 52, 54, 56 and 58 on cylindrical portion 50 such that when housing member 16 is mounted onto valve member 14 and pressed downwardly the lower ridge 58 of cylindrical portion 50 passes over ridge 40 and thereby locks housing member 16 onto valve member 14. Ridges 56 and 58 provide locking positions for the open and closed position of the valve formed by plug 34 and second valve member 48. Ridge 52 prevents excess downward movement of cylindrical member 50 onto cylindrical member 32. Housing member 16 further includes a housing skirt 60 which is arranged to surround a portion of the upper part of bottle 12 to provide rotational stability to housing 16 and also to aesthetically conceal the valve mechanism in the final package.

Those familiar with the art will recognise that the valve members can be interchanged so that plug 34 may be on housing 16 and conical valve surface 48 may be on valve member 14.

Overcap 20 is shown in Figure 7 and includes an aesthetically designed cap to cover roller 18

and housing member 16. The cap is designed with an inwardly facing rib 62 at the longitudinal ends of its lower edge in the form of an arc which crosses the end of the oval opening. Ridge 62 is positioned so that as the upper portion of overcap 20 contacts roller 18 ridge 62 locks beneath skirt 60 of housing member 16 as shown in Figure 1.

The invention as described provides a package assembly which facilitates filling the container and assembly of the package and which also provides a leak-proof packaging for the product which can be opened automatically and closed by removal and replacement of the overcap. In connection with filling of bottle 12 fluid may be added to the interior of the bottle prior to the assembly of valve member 14 to the threaded neck 26 of bottle 12. After the fluid filling, valve member 14 is screwed onto the bottle neck 12. Thereafter housing member 16, which has previously been provided with roller 18 snapped into position over projections 44 is applied to the valve member so that cylindrical portion 50 slides down and over cylindrical portion 32 whereby ridges 40 and 52, 54, 56, and 58 interact to provide a locking of housing 16 onto valve member 14. As the housing member is pushed to its lower most position whereby ridge 40 is adjacent ridge 52 valve plug 34 moves into position within conical second valve member 48 whereby the edges of plug 34 seal against the conical surface 48 to seal the container closed. Overcap 20 is then applied to the package. When the package is to be used by a consumer the consumer will remove overcap 20 generally by grasping it along its longitudinal sides such that the longitudinal ends having ridge 62 are moved slightly outward. The locking between ridge 62 and housing 16 will cause housing 16 to move in an upward direction as the overcap 20 is removed until stopped by ridges 56 or 58, thereby moving first valve member comprising plug 34 away from the second valve member comprising conical surface 48 and thereby opening a passage from the fluid bottle 12 into the socket portion 42 of housing member 16 whereby the fluid can be applied to roller 18. Continued upward pulling of the overcap 20 causes ridges 62 to release from the skirt 60 of housing member 16 so that the overcap can be completely removed and the applicator is ready for use.

Upon completion of use the overcap 20 is applied over roller 18 and housing member 16 whereby the top of overcap 20 engages roller 18 and upon continued placement of the overcap onto the container roller 18 pushes housing member 16 downwardly thereby to close the valve formed by plug 34 and conical surface 48. Simultaneously ridge 62 locks beneath skirt 60 of housing member 16 thereby to be prepared for opening the container upon subsequent removal of the overcap 20.

While there has been described what is believed to be the preferred embodiment of the invention, those skilled in the art will recognise that other and further modifications may be made thereto without departing from the spirit of the invention, and it is intended to claim all such changes and modification as fall within the true scope of the invention.

Claims

1. A liquid product dispenser comprising a liquid reservoir having a liquid outlet passage, a first valve member in said passage having a fixed relation to said reservoir, an applicator assembly including a rotatable applicator roller mounted to a supporting housing, said housing including a fluid passage for conducting fluid to said roller, said housing including an inlet passage mounted to said liquid outlet passage of said reservoir for receiving fluid therefrom and including a second valve member, said second valve member being moveable with respect to said first valve member to open and close said passage.

2. A dispenser as claimed in claim 1 wherein said second valve member is fixed with respect to said applicator assembly housing and wherein said applicator assembly housing is moveable with respect to said reservoir to open and close said passage.

3. A dispenser as claimed in claim 2 wherein said applicator assembly housing is arranged for movement toward and away from said reservoir to close and open said passage.

4. A dispenser as claimed in claim 3 wherein there is further provided an overcap for covering said applicator roller and wherein said overcap is arranged to engage said applicator assembly to move said assembly toward said reservoir and close said passage when said overcap is applied and to move said applicator assembly away from said reservoir and open said passage when said overcap is removed.

5. A roll-on fluid product dispenser, comprising: a bottle member, including a fluid reservoir and a fluid outlet opening, said fluid outlet opening including a first valve member in a fixed relation to said fluid reservoir;

and an applicator assembly, said assembly including a roller rotationally mounted to a housing, said housing including an inlet passage mounted to said fluid outlet opening of said bottle member for receiving fluid therefrom and for conveying said fluid to said roller, and said housing including a second valve member, said housing and said fluid outlet opening being arranged for relative movement of said housing toward and away from said fluid res-

ervoir to move said second valve member toward and away from said first valve member to open and close said fluid outlet opening.

6. A product dispenser as claimed in claim 5 wherein said roller is elongate and wherein said roller is rotationally mounted to said housing for rotation about its elongate axis.

7. A product dispenser as claimed in claim 6 wherein said roller is rotationally mounted by pivot connections to said housing at each of its elongate end points.

8. A product dispenser as claimed in claim 5 wherein said fluid outlet opening has a cylindrical outer surface and at least one circular rib projecting outwardly therefrom and wherein said housing has a cylindrical inner surface for concentrically surrounding said outlet opening and at least one circular rib projecting inwardly therefrom, whereby said housing can move in the direction of said concentric cylindrical axes to open and close said valve members and said rib projections interact to limit said movement.

9. A product dispenser as claimed in claim 8 wherein one of said cylindrical surfaces has further smaller circular rib projections, for releasably retaining said housing member in position.

10. A product dispenser as claimed in claim 5 wherein one of said valve members comprises a conical surface and the other of said valve members is circular.

11. A product dispenser as claimed in claim 10 wherein said valve members are surrounded by respective first and second concentric cylindrical members, said cylindrical members interengaging each other and forming a fluid passage.

12. A product dispenser as claimed in claim 5 wherein there is provided an overcap for covering said roller and wherein said overcap is arranged to engage said applicator assembly to move said assembly and said housing toward said fluid reservoir when said overcap is applied and to pull said assembly and said housing away from said reservoir when said overcap is removed.

13. A product dispenser as claimed in claim 12 wherein said overcap pushes said roller toward said reservoir when said overcap is applied.

14. A product dispenser as claimed in claim 13 wherein said overcap has a lower edge with at least one inwardly projecting rib, and wherein said rib engages a portion of said housing to move said housing away from said reservoir when said overcap is removed.

15. A roll-on fluid product dispenser, comprising:

a bottle for containing fluid having a neck;
a first valve member attached to the outlet opening of said neck and in fixed position therewith, said valve member including at least one outlet fluid

passage;

an applicator assembly comprising an elongate roller mounted to a housing member for rotation about its elongate axis, said housing member including a fluid passage communicating with said roller and having a fluid inlet mounted to said first valve member and having a second valve member in fixed relation to said housing member, said applicator assembly being movable between first and second positions on said first valve member to close and open said outlet fluid passage; and an overcap arranged to cover said applicator assembly, said overcap engaging said applicator assembly when applied thereto to move said applicator assembly to said first position and said overcap engaging said applicator assembly to move said applicator assembly to said second position when removed therefrom.

16. A dispenser as claimed in claim 15 wherein said bottle neck is cylindrical and has external threads and wherein said first valve member is screwed onto said threads.

17. A dispenser as claimed in claim 15 wherein said first valve member and said fluid inlet have facing coaxially cylindrical surfaces to provide for relative axial movement between said first and second positions.

18. A dispenser as claimed in claim 17 wherein said cylindrical surfaces are provided with ribs for limiting said axial movement.

19. A dispenser as claimed in claim 15 wherein one of said valve members comprises a plug having at least one circumferential passage and the other of said valve members comprises a circular fluid passage arranged to be closed by said plug.

20. A dispenser as claimed in claim 19 wherein one of said valve members has a conical sealing surface.

21. A dispenser as claimed in claim 15 wherein said housing member includes a skirt member surrounding said first and second valve members.

22. A dispenser as claimed in claim 21 wherein said overcap includes an oval rim surrounding the opening thereof and wherein said rim includes inwardly facing ribs for engaging said skirt member.

23. A dispenser as claimed in claim 21 wherein said ribs are arranged at the elongate ends of said oval rim.

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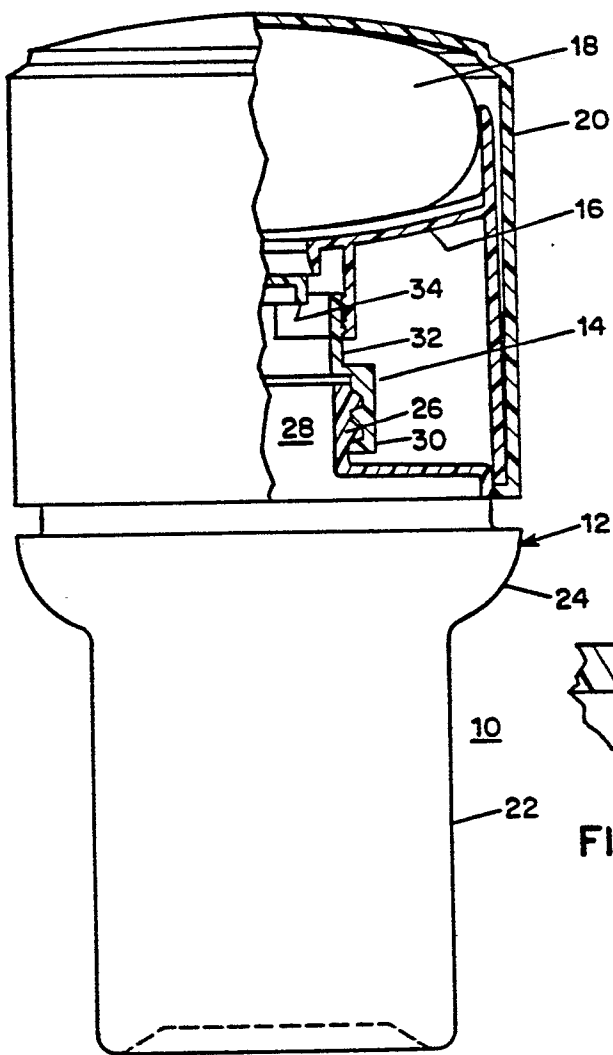


FIG. 1

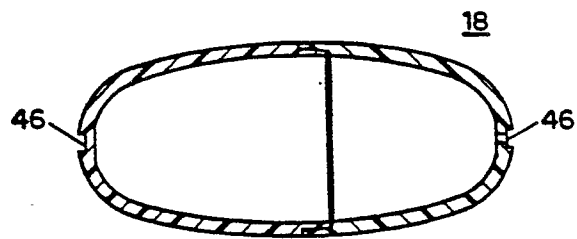


FIG. 2

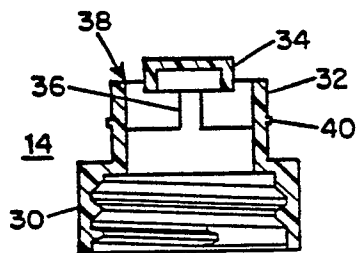


FIG. 5

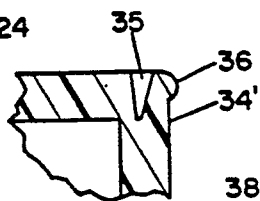


FIG. 5B

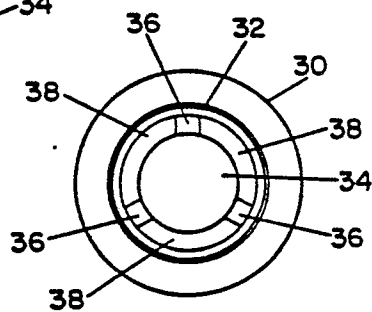


FIG. 6

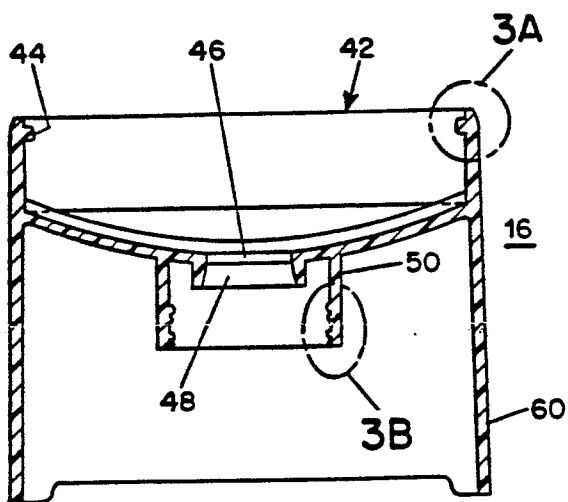


FIG. 3

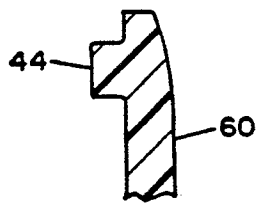


FIG. 3A

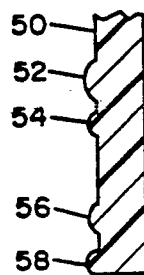


FIG. 3B

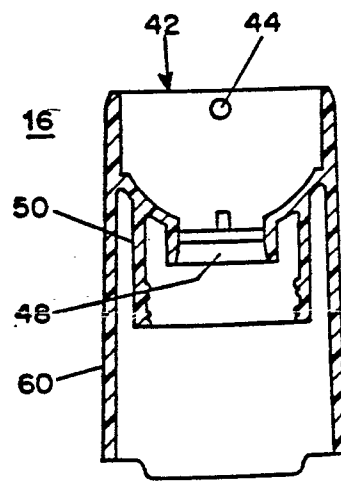


FIG. 4

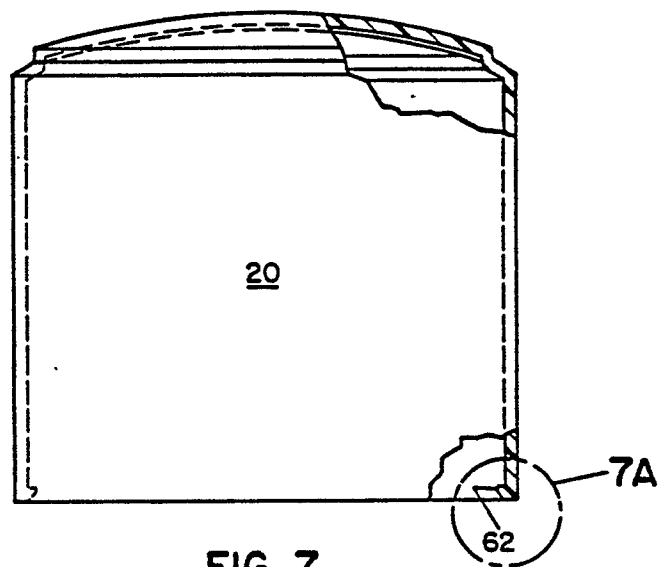


FIG. 7

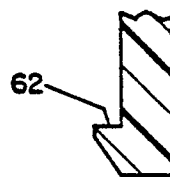


FIG. 7A