Nov. 25, 1952 W. R. J. JACOBSOHN 2,619,265

CLOSURE PLUG AND COAXIAL APERTURED SEALING CAP FOR CONTAINERS

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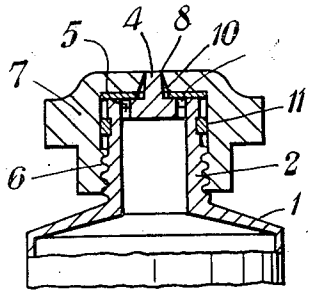


Fig. 1.

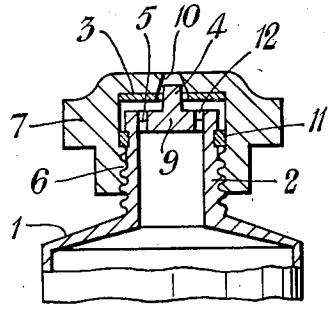


Fig. 2.

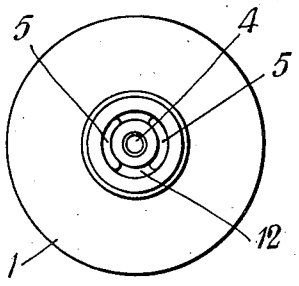


Fig. 3.

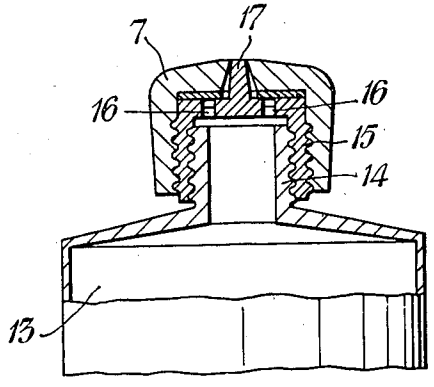


Fig. 4.

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CLOSURE PLUG AND COAXIAL APERTURED SEALING CAP FOR CONTAINERS

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3 Claims. (Cl. 222—521)

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This invention relates to closures for containers such as bottles, tubes or the like, for liquids, semi-liquids and pastes or the like.

Screw threaded closure caps for tubes, especially collapsable tubes and bottles and other containers, have generally to be removed before the contents of the containers can be utilized. This is a disadvantage in many cases since the cap is easily lost or is apt to become dirty on the inside, especially for example, when the contents of the container are skin oils such as are used when sun-bathing, when the cap often picks up sand, dirt or the like, thus hindering the subsequent closing of the container. This gives rise to a further disadvantage when the contents are such that they should not be exposed to the air for any considerable period. Moreover, containers which are not properly closed cannot be packed with other articles, as their contents may damage such articles if they are in the same package. Various proposals have, therefore, been made to dispense in a simple manner with the screwing off of the caps. An object of the present invention is to provide a closure for containers for liquids, semi-liquids and pastes, which is readily applicable to mass-production methods and which can be manufactured on usual machines without any high degree of accuracy avoiding complicated structures.

With the closure of the present invention, the usual form of screw threaded cap is maintained whilst it is of no importance whether the cap is secured against entire removal or not, so that the closure cap itself can be used as at a standard tube or bottle closure. The main object, however, is to provide for the removal of the contents of the container without the necessity of removing the cap.

To this end the invention broadly comprises a closure for containers for liquids, semi-liquids, pastes or the like, with an externally screw threaded neck on the container and a screw threaded cap with a port in the top cooperating therewith, the apertures in the neck being arranged in an annular groove around the centre line of the neck and sealed in closed position by the inside face of the cap covering the annular groove with or without the use of a sealing ring. In most cases a sealing ring will be required and this arrangement prevents the sealing ring from jamming and thus preventing turning of the cap as no part of the ring can be pressed into the apertures thus forming projections on the ring while at the same time an annular projection of the ring developing over the annular groove contributes to the effective sealing of the contents of the tube or other container.

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To avoid collection of dirt in the open port of the cap, a plug may be provided on top of the neck entering into the port in closed position. The cross-section of the plug and the cross-section of the port in the cap is preferably of such a shape that the plug comes into contact with the port in a line only at about its upper end and without any actual sealing effect, leaving between its outer surface and the inner surface of the port an annular space of substantially triangular nozzle-like cross-section so that the plug is not parallel to the curved surface of the port of the cap. For example, the plug and the port may be frustro-conical in shape but the angle of inclination of the port is made greater than the corresponding angle of the plug. Alternatively, the plug may be cylindrical in shape and the port frustro-conical.

The closure may be modified by making the neck with the apertures and the plug a separate set to be screwed on or otherwise connected to the container which then may keep its original form unaltered. The cap may be provided with a device to restrict its movement within certain limits.

The closure is illustrated by way of example in the accompanying drawing, in which:

Figure 1 shows one embodiment of the invention in cross-section with the cap in "closed" position;

Figure 2 is a cross-section with the cap in "open" position;

Figure 3 is a plan of the top of the container, while

Figure 4 is a sectional view of another embodiment of the invention in particular for bottle closures with a separate plug part on the neck of the container.

In the embodiment of the invention illustrated in Figures 1, 2 and 3 of the drawing, a bottle or tube 1 has a neck 2 which at the closed end 9 formed by a transverse wall is provided with

apertures 5 and a frustro-conical plug 4. A screw threaded cap 7 cooperates with the externally screw threaded part 6 of the neck. Cap 7 has a port or passageway 10 which is also frustro-conically shaped but is of greater taper than that of said plug and thus does not follow the contour of plug 4, so that the plug only comes into contact with the walls of the port in "closed" position at its upper end 8. Sealing rings 3 and 11 may be provided to seal off the contents completely if required.

Instead of a full external thread on the neck and a full internal thread on the cap a few turns at the top and at the bottom may be sufficient. Then the cap after only a slight turn can slide opening up the container till the bottom thread acts as stop when engaging the top turns of the neck. The sealing ring 11 may then be arranged in between the two threads. Alternatively, the top turns on the neck may be replaced by a small flange followed by a groove into which a sealing ring may be slipped while the upper thread of the cap may be replaced by a smooth part of a suitable diameter. Then the resilient sealing ring will act as stop when loosening the cap.

Cap 7 is preferably made with a rim not in line with the top of the cap so as not to come in contact with the contents of the container when discharged through the opening in the top of the cap.

Figure 3 shows arcuate slots 5 in annular groove 12 of container 1 with plug 4 on top of its neck.

Figure 4 is a sectional view through a container 13 with an ordinary neck 14 which has screwed thereon a separate neck part 15 with apertures 16 and plug 17 corresponding to the neck 2 as shown in Figures 1, 2 and 3, while cap 7 remains substantially unaltered.

In the embodiments of the invention described above, the liquid or paste will be sealed off in the container not through the plug within the port in the cap but by means of the annular face inside the cap covering the apertures 5 or 16 in the "closed" position. The plug does not contribute to an effective sealing of the contents as this would involve such accuracy in manufacturing the closure that mass production would be impossible. Furthermore, the difference in the angles of inclination of the side faces of the plug and the port in the cap results in an annular cavity between the port and the plug of substantially triangular cross-section. Tests have shown that a very small lift of the cap is sufficient to ensure an adequate discharge even of tacky pastes owing to the nozzle-like action of this cross-section.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A closure engageable with the neck of a container from which flowable substance in the form of a liquid, semi-liquid, paste and the like is to be dispensed comprising a transverse wall terminating in a plug and positioned to cover one end of the neck of the container, a cap having a top wall and engageable with said neck, a passageway extending through said top wall from the inner surface to the outer surface thereof and being substantially coaxial with said plug, sealing means seated at the inner surface of said top wall, said transverse wall being provided with at least one aperture communicating with the interior of said container, and an annular groove provided in the top surface of said transverse wall, said annular groove being in communication with said aperture and being closable solely by said sealing means of said cap in predetermined engagement position of said cap on said neck.

2. A closure according to claim 1, including a separate neck part seatable across the end of the neck proper of said container, said transverse wall forming a portion of said separate neck part and being positioned intermediate said neck proper and the cap of said container, when in engagement with the latter.

3. A closure according to claim 1, wherein both said passageway and said plug are conical in shape, said passageway being of greater taper than that of said plug.

WALTER R. J. JACOBSOHN.

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