Oct. 13, 1959 P. H. GALLAY 2,908,418

CLOSURE DEVICE AND PROCESS FOR THE MANUFACTURE THEREOF

Filed May 28, 1956

Fig. 1.

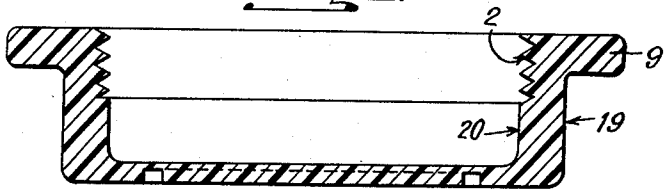


Fig. 2.

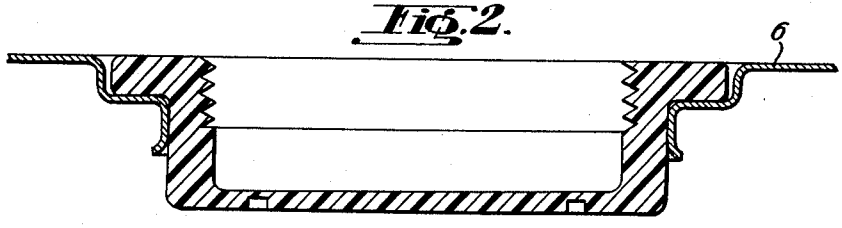


Fig. 3.



Fig. 4.

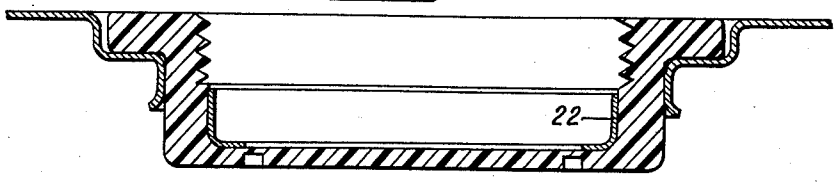


Fig. 5.

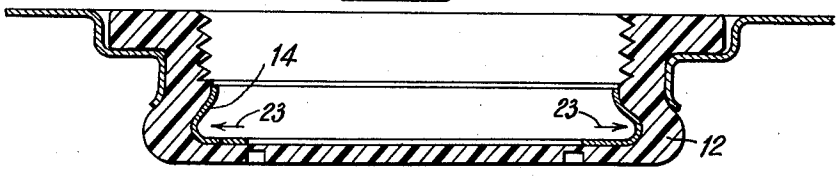
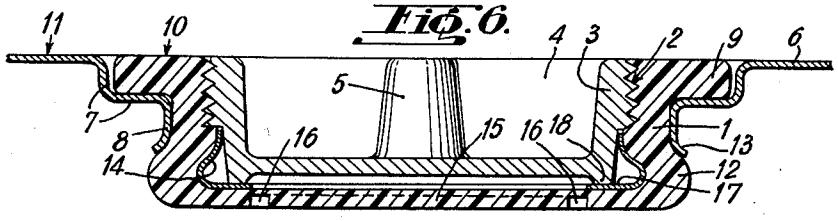


Fig. 6.



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CLOSURE DEVICE AND PROCESS FOR THE MANUFACTURE THEREOF

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Application May 28, 1956, Serial No. 587,843

2 Claims. (Cl. 220—27)

The object of this invention is a closure device, characterized by a body made of plastic material, provided internally with a thread enabling a bung to be screwed into it, said body being inserted into an opening provided in the wall of a metallic container and having for its tight joint with the container a moulded collar forming one end of the plastic body and an expanded circular bulge located at the other end of the body, said bulge squeezing between itself and the said collar an annular part of the wall of the container.

The invention also comprises a process for the manufacture of such a closure device. This process is characterized in that a body of a plastic material is moulded, said body having a generally cylindrical shape and at one of its ends a collar, said body having further in its inner part a thread extending from said end over a part of its height and following this thread a smooth cylindrical part, in that a metallic sleeve is placed in said body within said cylindrical part and in that after having inserted the body with the sleeve into an opening of the container, said sleeve is expanded in order to form by a deformation of the adjacent part of the body a circular bulge, said bulge squeezing tightly between itself and the said collar an annular part of the container and maintaining its form thanks to the deformation of the sleeve.

The attached drawing shows, as an example, one of the possible embodiments of closure devices according to the invention and is also an example of one of the possible uses to be made of the manufacturing process embodied by the invention. The various figures shown are sections.

Figs. 1, 2, 3, 4, 5 refer to various stages of the above manufacturing process.

Fig. 6 shows the manufactured closure device secured to the container's wall.

The closure device shown on Fig. 6 embodies a plastic body 1, internally provided with a thread 2 so as to take an externally threaded bung 3, provided with a ring-shaped hollow 4, wherein lugs—one of which is shown as 5—protrude, thus enabling the bung to be screwed in or out of the closure device, by hand, or with a suitable tool. 6 is part of the container's wall, with an opening shaped to take the plastic body 1.

Wall 6 is provided with a suitable, ring-shaped depression 7, followed, further inside, by a cylindrical part 8. At one end of the plastic body 1, a moulded, external, ring-shaped collar 9 rests upon the bottom of the annular depression 7. Thus, face 10 of body 1 lies flush with the external face 11 of the container's wall 6. At its other end, body 1 shows an external, circular bulge 12, obtained by expansion, as described below, squeezing between itself and the collar 9, the cylindrical part 8 of the container's wall 6. More precisely, bulge 12 presses against the lower, bell-mouthed part 13 of the cylindrical part 8, while collar 9 presses upon part 7. This results in a tight securing of the closure device in the container's wall.

The internal thread 2 covers only part of the height of body 1, beginning at its end provided with the circular ring 9. The smooth cylindrical part of body 1, contiguous to the threaded part, is provided with a sleeve 14, located, as can be seen in Fig. 6, at the level of bulge 12, of which said sleeve has the shape, being in close contact, with the inside of that part of the plastic body.

Said closure device, when intact, has a bottom 15 which is part of body 1, as it is moulded of one piece with the said body. A circular groove 16 provides a weak spot in the bottom of part 15, enabling this bottom to yield easily under suitable pressure; thereupon, after removal of the threaded bung 3, access is gained to the container's inside. Sleeve 14 has an internal, flat, annular part 17, resting against the end of bung 15. The opening in part 17 is nearly of the same size as the external diameter of the groove 16.

The bung 3 shows, at one end, a raised shoulder 18 which, when the bung is screwed home, rests upon the flat, annular part 17 of the metallic sleeve 14.

The manufacture of the illustrated closure device would be as follows: Moulding of the plastic body, the section of which is shown by Fig. 1, which will, in the end, result in body 1 of Fig. 6. The main part 19 of the body is cylindrical in shape and provided, at one end, with an external, annular collar 9. Inside the body, a thread is moulded, extending upon part only of the cylinder's height, beginning at the end provided with the collar 9; a smooth cylindrical part 20 follows thereupon. The body shown in Fig. 1 is inserted into an opening in the metallic container's wall 6, corresponding exactly to the shape shown in Fig. 6. A metallic sleeve 21 (Fig. 3) is located, as shown in Fig. 4, at the bottom of body 1. Said sleeve is provided with an interior, annular part 17 and with a cylindrical part 22, the external diameter of which corresponds to the internal diameter of the cylindrical part 20 of Fig. 1. Thereupon, sleeve 21 is expanded externally, as indicated by arrows 23 of Fig. 5, thus forming, at the lower part of the plastic body 1, a circular bulge 12, as shown in Figs. 5 and 6. The expansion of the sleeve 14 to the shape shown in Fig. 6 is a permanent one. This expansion correspondingly shapes bulge 12 against the natural elasticity of the plastic body 1, which tends to regain its original shape. Part 8 of the shaped container's wall is thus pressed between collar 9 and bulge 12, firmly securing the closure device to the container. After screwing home bung 3, the closure device is ready for use. To gain access to the inside of the container, it is only necessary to unscrew the bung and to remove the center part 15 (Fig. 6).

If it is desired to remove the whole closure device, for instance, in order to insert a new device after refilling the container, it will suffice to cut through sleeve 14; thereupon, bulge 12 will recede back to its original form, as a consequence of its natural elasticity, and the whole closure device can easily be removed from the opening in wall 6. A new closure can then be inserted, as described above.

What I claim is:

1. The combination of a container wall having a circular aperture defined by a cylindrical wall depending from the container wall into the container, said cylindrical wall having a ledge therein the surface of which is substantially parallel to the container wall, and said cylindrical wall having a bell mouth on the inner end thereof, a closure device for said aperture comprising a plastic cylindrical member of a length greater than the length of said cylindrical wall, a collar projecting radially outwardly from one end of said cylindrical member, a disc integral with the other end of said cylindrical member,

said disc having a weakened portion for enabling part of the disc to be easily removed, the side of said plastic cylindrical member being threaded adjacent the end from which said collar projects, and a sleeve fitted into said plastic cylindrical member at the end having the disc integral therewith, the part of said sleeve closest to said disc being bulged out, and said sleeve having an inwardly extending flange on the end next to said disc, and a threaded bung threadable into said threaded end of said plastic cylindrical member and having a shoulder on the inner end thereof, said plastic cylindrical member being set in the aperture in the container wall with the flange thereon seated on said ledge and the inner end extending past said bell mouth, said sleeve in said inner end of said cylindrical member bulging out the plastic cylindrical member around the bell mouth to seat said flange against said ledge, and the flange on said sleeve against said disc, and said bung being threaded into said plastic cylindrical member with said shoulder against the flange on said sleeve.

2. The combination of a container wall having a circular aperture therein defined by a cylindrical wall depending from the container wall into the container, said cylindrical wall having a ledge therein the surface of which is substantially parallel to the container wall, and said cylindrical wall having a bell mouth on the inner end thereof, and a closure device for said aperture comprising a plastic cylindrical member of a length greater than the length of said cylindrical wall, a collar projecting

radially outwardly from one end of said cylindrical member, a disc integral with the other end of said cylindrical member, said disc having a weakened portion for enabling part of the disc to be easily removed, the side of said plastic cylindrical member being threaded adjacent the end from which said collar projects, and a sleeve fitted into said plastic cylindrical member at the end having the disc integral therewith, the part of said sleeve closest to said disc being bulged out, and said sleeve having an inwardly extending flange on the end next to said disc, said plastic cylindrical member being set in the aperture in the container wall with the flange thereon seated on said ledge and the inner end extending past said bell mouth, said sleeve in said inner end of said cylindrical member bulging out the plastic cylindrical member around the bell mouth to seat said flange against said ledge, and the flange on said sleeve against said disc.

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