

Sept. 26, 1961

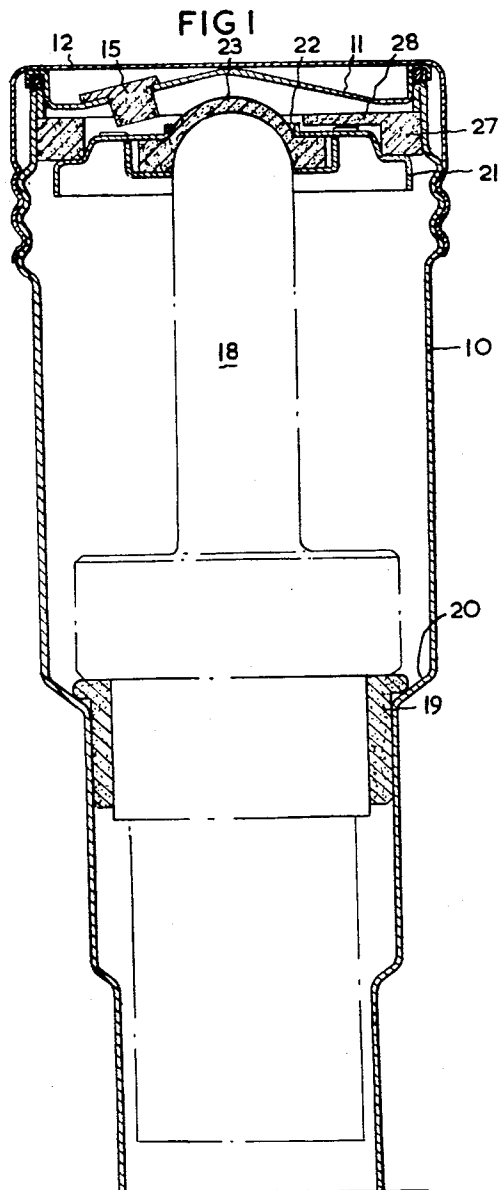
C. E. ADDIS

3,001,639

LOCATING DEVICE FOR ARTICLES IN A CONTAINER

Filed Dec. 12, 1956

3 Sheets-Sheet 1



Inventor  
Charles E. Addis  
By Ralph B. Stewart  
attorney

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C. E. ADDIS

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3 Sheets-Sheet 2

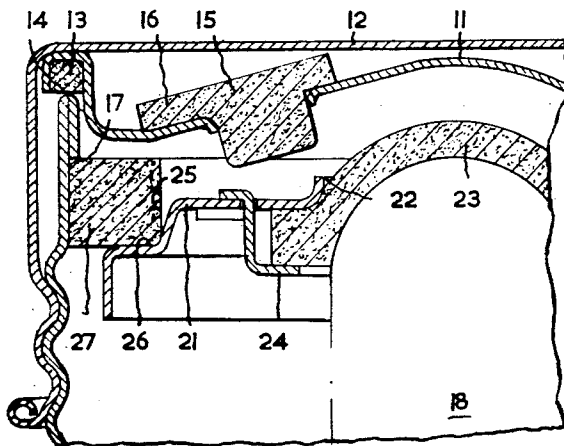


FIG 2

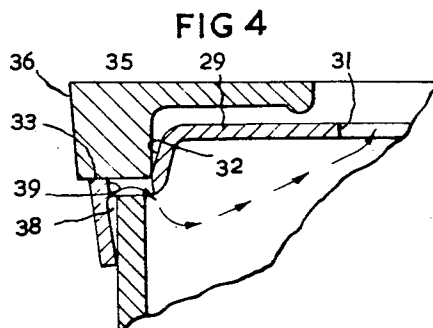


FIG 4

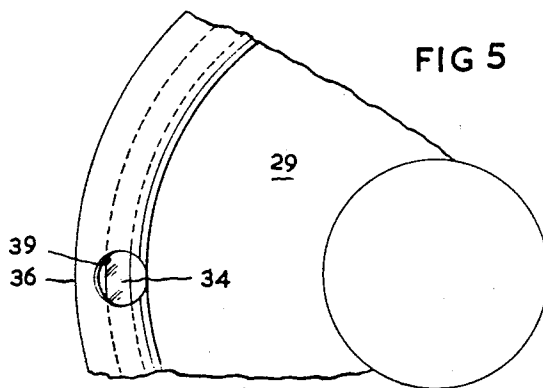


FIG 5

Inventor  
Charles E. Addis  
By Ralph B. Stewart  
Attorney

Sept. 26, 1961

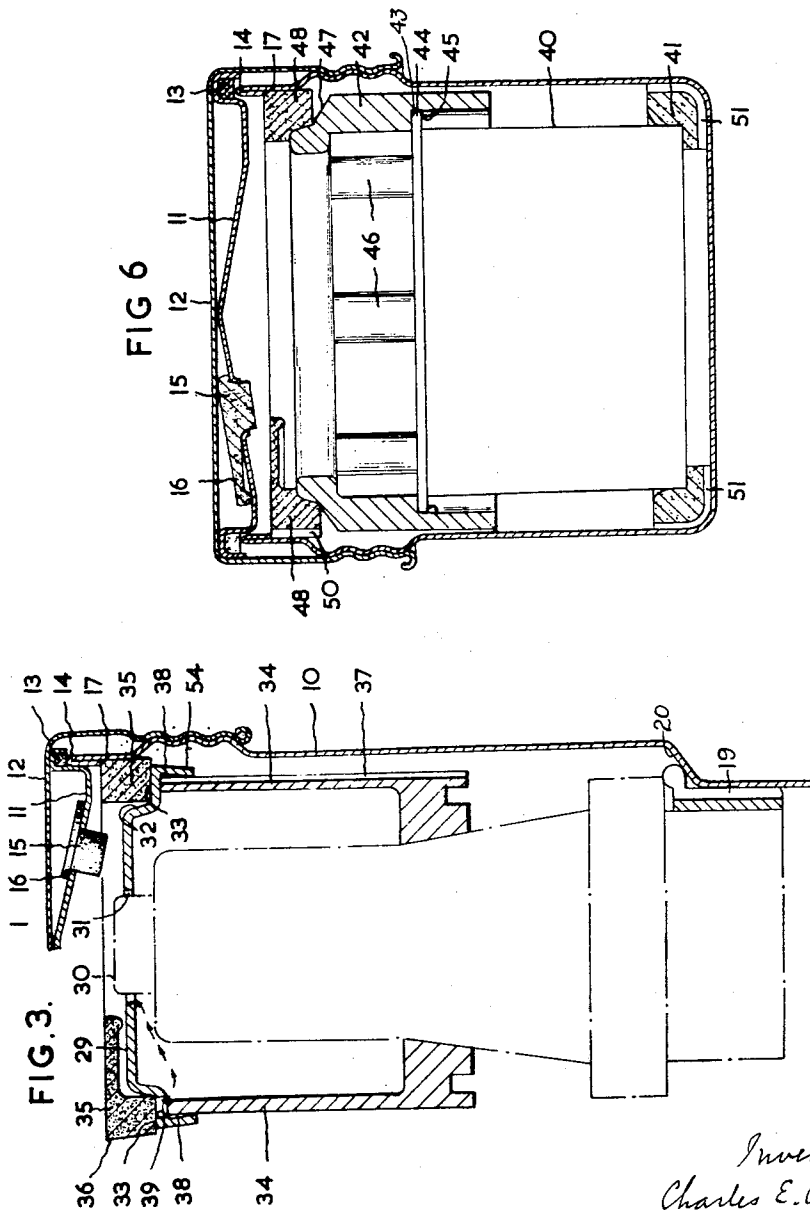
C. E. ADDIS

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LOCATING DEVICE FOR ARTICLES IN A CONTAINER

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3 Sheets-Sheet 3



Inventor  
Charles E. Addis  
By Ralph B. Stewart  
attorney

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## LOCATING DEVICE FOR ARTICLES IN A CONTAINER

Charles Edmund Addis, Birmingham, England, assignor to Bulpitt and Sons Limited, Birmingham, England, a British company

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4 Claims. (Cl. 206-46)

This invention relates to the location of articles in a container. In the packaging of delicate or fragile articles it is often necessary to locate the article positively in the container but at the same time support it resiliently.

The invention consists in providing in a container locating means comprising a relatively stiff locating member having a bearing portion to engage an article to be supported and a first seating provided with a resilient peripheral ring which engages the locating member and is adapted to engage a second seating provided in or on the wall of the container, the arrangement being such that upon axial compression of the ring, for insertion and retention in the second seating, the ring is expanded laterally, both radially inwards to grip the locating member and radially outwards against the wall of the container.

The invention further consists in means for locating an article in a container, having a mouth provided with a closure, comprising inner means for resiliently supporting the article out of contact with the container wall opposite the mouth and outer locating means including a rigid locating member having a bearing portion to engage an article to be supported and a resilient ring of substantially rectangular or quadrilateral cross-section of which the inward edge of the bore of the ring engages a seating on the locating member and the diagonally opposite peripheral edge is engageable with an inwardly directed shoulder or recess inside the mouth by exerting inward axial pressure upon the ring, the arrangement being such that the article is resiliently located axially between the inner and outer locating means and the end of the article near the mouth of the container is resiliently located radially by the outer locating means.

Embodiments of the invention in sealed metal containers in which articles are to be stored in a partial vacuum or at sub-atmospheric pressure will now be described, by way of example, with reference to the accompanying drawings in which:

FIGURE 1 is a sectional elevation of one form of sealed metal container with locating means according to the invention.

FIGURE 2 is an enlarged fragmentary view of part of FIGURE 1.

FIGURE 3 is an incomplete sectional elevation of another sealed metal container with modified locating means.

FIGURES 4 and 5 are an enlarged fragmentary elevation and plan respectively of part of the container shown in FIGURE 3.

FIGURE 6 is a sectional elevation of yet another sealed metal container with further modified locating means.

In all the illustrated embodiments the sealed metal containers comprise a seamless cylindrical body 10 made as a deep drawing in sheet metal or impact extrusion, an inner lid 11 and an outer protective cover 12 screwed on to a thread in the body 10. The inner lid 11 has a sealing ring 13 to make air-tight engagement with a rim 14 around the mouth of the body 10 and a rubber bung 15 closing an aperture through the inner lid 11 and provided with a tongue 16 to enable the bung to be pulled out easily in order to break the vacuum and enable the inner lid 11 to be removed. The rim 14 is formed by a head or

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inturned portion forming an internal shoulder or recess 17.

In the container of FIGURES 1 and 2 an article 18 to be stored is supported by a rubber grommet 19 resting on a shoulder 20 formed at an intermediate point in the wall of the body 10. The end of the article 18 extending towards the mouth of the container is of reduced diameter. A substantially rigid sheet-metal disc-shaped locating member 21 has a central opening 22 to receive the upper end of the article 18. In the central opening 22 is secured a resilient element 23 of rubber or like material which may be shaped to suit the end of the article 18 or may be a thin disc which is deformable to the end shape of the article on packing the article in the container. Alternatively a cushioning ring surrounding the projecting end may be used. The resilient element 23 is secured to the locating member 21 by a sheet-metal retaining cup 24. The central portion of the locating member 21 around the opening 22 is raised to form a radially directed chamfered shoulder 25 with a surrounding peripheral flange 26.

When an article such as 18 has been put in the container the locating member is placed with the resilient element 23 in contact with the projecting end part of the article and a resilient ring 27 made of rubber is placed on the peripheral flange 26. In its free state the resilient ring 27 may be substantially rectangular but is preferably quadrilateral in cross-section with its outer surface slightly tapering. It readily enters the mouth of the container with its smaller end face inwards and fits easily on the locating member with the inner edge of its bore against the seating formed by the shoulder 25 and with its inner face against the flange 26.

The resilient ring is then pressed axially into the container until the outer peripheral edge has been forced past the internal shoulder or recess 17 which then retains the ring in compressed condition in which its cross-section is substantially rectangular. Diagonally opposed corners in the cross-section of the ring are urged against the locating member 21 and the inturned shoulder or recess 17. The ring 27 is thus caused to grip the locating member 21 and walls of the body 10 so spacing the peripheral edge of the locating member from the container walls. In urging the ring into position the resilient element 23 is stretched over the projecting end of the article which is thereby gripped. The article is therefore supported resiliently against axial movement by being clamped between the locating member 21 and the rubber grommet 19 which spaces the article away from the container wall opposite the mouth. The end of the article having the projecting portion is supported resiliently against lateral movement by the locating member 21 and the resilient ring 27.

To remove the resilient ring 27 a lug 28 may be formed on its inner and upper edge which when pulled radially inwards distorts the ring and releases it from the outer seating.

In the embodiment of FIGURES 3, 4 and 5 the locating means comprises a sheet-metal locating member 29 having, if necessary, to provide clearance for an article 30 to be stored in the container, a central opening 31. The locating member 29 has a shoulder 32 and surrounding peripheral flange 33 similar to the shoulder 25 and flange 26 of the preceding embodiment. The locating member 29 has a peripheral flange 34 which is directed axially but is slightly inclined towards the axis.

The portion of the locating means which bears on the article 30 is a tubular collar 34 of plastic, polythene for example, which is a push-in fit in the locating member 29 and is shaped at the inner end to seat on the article 30. The article 30 is supported by a rubber grommet 19 resting on a shoulder 20 as in the preceding embodiment.

A resilient retaining ring 35 like the retaining ring 27 of the preceding embodiment and fitted in a similar manner has in the free state a slightly tapering external surface as shown on the left-hand side of FIGURE 3 and in FIGURE 4, forming an acute edge 36 to engage the shoulder 17.

To ensure that the innermost part of the container is properly evacuated a positive air path is provided to it from the space immediately inside the inner lid 11 to which the evacuating connection is made. As part of this path the collar 34 has a groove 37 extending in an axial direction which opens into an annular space 38 formed between the outer end of the collar and the slightly inclined peripheral flange 54. In the flange 33 a hole 39 is pierced larger in diameter than the wall thickness of the collar 34. This hole 39 connects the annular space 38 to the interior of the collar 34 and through the central opening 31 or some other opening through the locating member 29 to the space inwards of the lid 11 even when the retaining ring 27 is in place.

The container shown in FIGURE 6 is intended to receive an article 40 of generally cylindrical shape and having an annular flange 44 near its outer end. The article rests on a rubber base ring 41 and the locating means comprises a collar 42 of plastic such as polythene having a recess 43 at its inner end to receive the flange 44 on which it is held with a snap-on engagement by small angularly spaced internal arcuate ribs 45. Axially extending angularly spaced internal ribs 46 on the collar 42 form shoulders inside the recess 43 to bear on the article 40. In this example a seating 47 is formed directly on the collar 42 to receive a resilient retaining ring 48 of similar shape in the free state to the ring 35 of the embodiment of FIGURES 3, 4 and 5. When the ring 48 is placed in position on the seating it rests upon the re-entrant seating 47 as in the previous embodiments but when the ring is forced axially inwards to engage the shoulder 17 the cross-section of the ring is disturbed so that the ring bears on an outer salient portion 49 in addition to bearing on the re-entrant seating 47.

A shallow groove 50 is formed axially in the outer edge of the retaining ring 48 and similar grooves 51 in the outer surface of the base ring 41 to ensure that the whole interior of the container is at the same subatmospheric pressure.

Although in the embodiments described substantially rectangular or quadrilateral section resilient rings have been used; in certain cases rings of elliptical, circular or other cross-section may be preferable.

The shoulder or recess forming a seating on the body for the resilient ring instead of being formed by an in-turned edge at the rim of the body may be formed in a variety of ways; for example by a recess in the wall of the container or by spaced lateral flanges or ledges in or on the walls of the container projecting radially inwards and straddling the flat faces of the ring or by one such flange or ledge, engaging a portion of the outer periphery of the ring diagonally or diametrically opposed in the cross-section of the ring to the portion engaging the seating on the locating member.

I claim:

1. In a container for supporting an article therein, a rigid tubular collar surrounding the article and having an inwardly extending shoulder to support said collar on the article, a rigid cover member extending across the collar adjacent the container opening and having a peripheral flange in engagement with the outer wall of the collar, at

least one axially extending groove in the outer wall of the collar, the cover member having at least one opening therein to provide a passageway from the groove to the interior space of the collar and a vent opening disposed substantially centrally thereof, the container having means forming a shoulder internally thereof spaced from the cover member, a resilient member seated on the cover member and having its periphery engageable with the inner wall of the container and axially compressed between the shoulder and the cover member.

2. A device in accordance with claim 1 in which the diameter of the cover member is greater than that of the collar and the peripheral flange of the cover is inclined inwardly to engage the collar.

3. In a container, means resiliently supporting an article therein spaced from the walls thereof against axial and lateral movement with respect to the container walls comprising a resilient supporting member located within the container distant from the container opening, out of contact with the container and engageable with the article to be supported, a rigid locating member located within the container adjacent the container opening and having an annular surface facing said opening, said annular surface having its marginal portion depressed to form a seat, an annular resilient member separate from said locating member in peripheral engagement with the inner wall of said container and positioned on said seat, a rigid annular shoulder member within the container between said locating member and the container opening, said shoulder member being concentric with and secured to the container wall and having an axially inwardly facing surface, said resilient member having been inserted between said seat and said inwardly facing surface by deformation of its cross-section whereby said resilient member is axially compressed between said inwardly facing surface and said seat.

4. In a container for supporting an article therein, a relatively rigid locating member located within the container and having an annular surface facing the container opening, means on said locating member engageable with the article to be supported and centering the article with respect to the locating member, said locating member being formed separately from the walls of said container, a rim, a rigid annular shoulder member within and adjacent the container opening and spaced from said annular surface formed by a re-entrant extension of said rim, said shoulder member being concentric with and secured to the container wall and having an axially inwardly facing surface, an annular resilient member separate from said locating member seated on said annular surface of the locating member and having its periphery engageable with the inner wall of said container, said resilient member having been inserted between said inwardly facing surface and said annular surface by deformation of its cross-section, whereby said resilient member is axially compressed between said inwardly facing surface and said annular surface.

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