Feb. 18, 1947. C. M. DE WOODY 2,415,871

CONTAINER FOR ASEPTIC FILLING AND DISPENSING OF STERILE LIQUIDS

Original Filed Dec. 7, 1944

Fig. 1

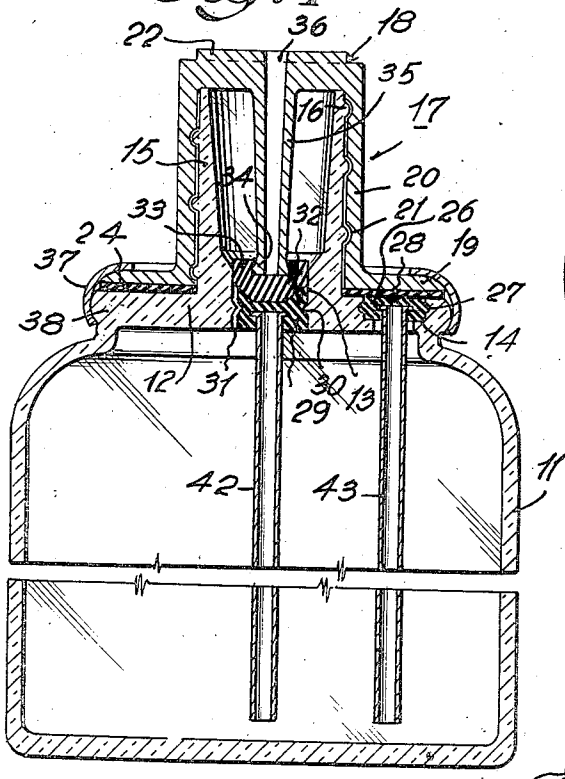


Fig. 3

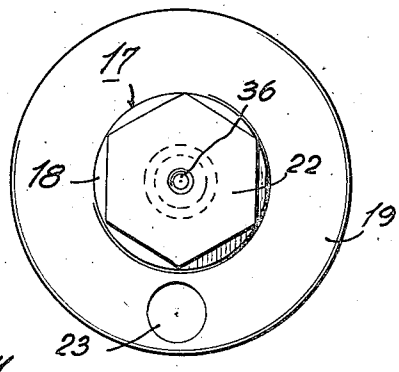


Fig. 5

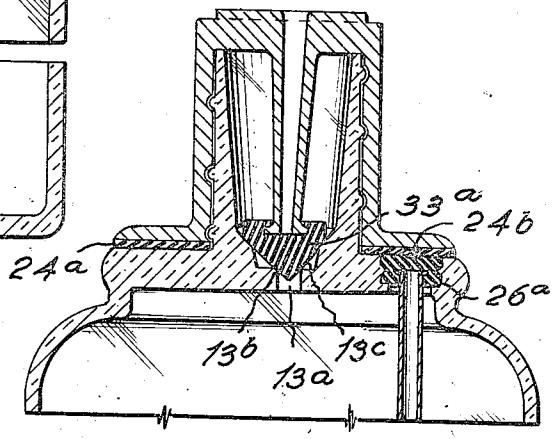


Fig. 2

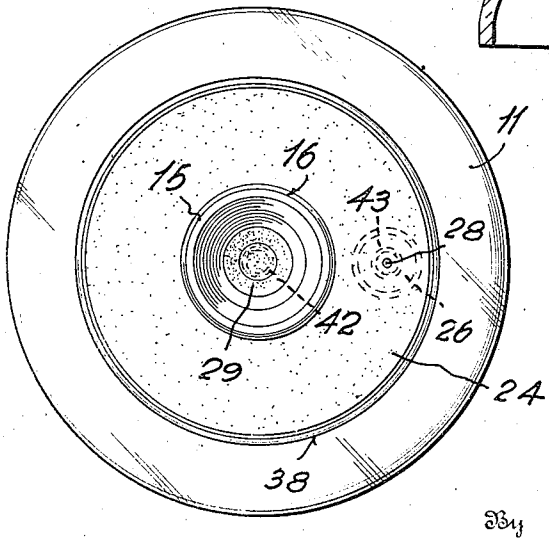
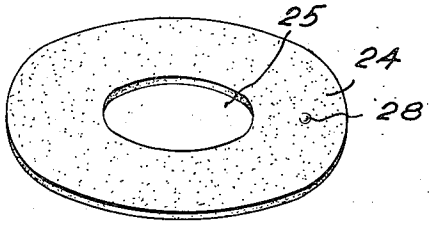


Fig. 4



Inventor
C. M. De Woody,

By Prevost & Prevost
Attorneys

Patented Feb. 18, 1947

2,415,871

UNITED STATES PATENT OFFICE

2,415,871

CONTAINER FOR ASEPTIC FILLING AND DISPENSING OF STERILE LIQUIDS

Charles M. De Woody, Vineland, N. J., assignor to Ace Glass Incorporated, Vineland, N. J., a corporation of New Jersey

Original application December 7, 1944, Serial No. 567,094. Divided and this application September 18, 1945, Serial No. 617,119

5 Claims. (Cl. 128—272)

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This invention relates to a container for aseptic filling and dispensing of sterile liquids, and the present application is a division of my parent application, Serial No. 567,094, filed December 7, 1944.

Many types of closures have been used for containers of sterile liquids. However, those fluids which are not adaptable to heat sterilization present special problems. Containers for such materials or fluids must be sterilized before filling and maintained sterile. Strict aseptic manipulation must be observed throughout, particularly with those fluids which are intended for human consumption either by mouth or by injection.

Heretofore, containers for such purposes have been proposed and used to some extent but they have disadvantages. The primary object of the present invention is to provide a container adapted particularly for use with fluids which are not heat sterilizable, that is, fluids which would decompose, congeal, etc., under the influence of sterilizing heat, and one which eliminates the objectionable features of the devices heretofore proposed.

With the foregoing object outlined and with other objects in view which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawing and more particularly pointed out in the appended claims.

In the drawing:

Fig. 1 is a vertical sectional view of a container in accordance with the invention.

Fig. 2 is a top plan view with the cap removed.

Fig. 3 is a top plan view of the cap.

Fig. 4 is a perspective view of a washer or gasket employed in the construction shown in Fig. 1.

Fig. 5 is a vertical sectional view of the top portion of a container and illustrating another modification.

Referring to the embodiment illustrated in Figs. 1 to 4, inclusive, 11 designates the body of a container made of glass or any other suitable material, provided at its upper end with a top 12 having a center hole 13 and an off-center hole 14, the latter being preferably counter-bored. Rising from the top is a neck 15 having at the exterior thereof a coarse pitched screw thread 16.

17 designates a cap of plastics or other suitable material, having a top 18 at one end and an external flange 19 at the other. A substantially cylindrical portion 20 of the cap is provided with an internal screw thread 21 corresponding with the thread 16 and engaging the latter with a loose fit so that air can travel between the neck of the bottle and the cylindrical wall of the cap when the latter is elevated relatively to the container. The cap terminates in a hexagonal portion 22 to facilitate turning of the same, and the

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cap flange has an orifice 23 designed to register with the hole 14 when the cap is in a certain position relatively to the container.

24 designates a resilient washer of rubber or the like, having a central hole 25 for the reception of the neck of the bottle. A plug 26 fits in the hole 14 of the container. A tongue and groove joint 27 may be provided between the plug and the wall of the hole 14 for sealing purposes, and the washer has an indication or indentation 28 immediately above the center of the plug, serving as a guide for the insertion of a hypodermic needle or the like.

The hole 13 is closed substantially by a second plug 29 secured in position by a tongue and groove joint 30, and this plug has an air vent 31. The plug 29 is also preferably formed of rubber or the like and has a cavity 32 in the top thereof for the reception of a frustro-conical stopper 33 formed of resilient material, such as rubber, and grasping an annular flange 34 at the lower end of a tubularture 35 which depends from the top 18 of the cap and is provided with a tapered bore 36.

When the parts are in the positions shown in Fig. 1, an annular crown cap 37 may be employed to interlock the flange of the cap with an annular bead 38 at the top of the bottle.

Before filling the bottle, the screw cap 17 is loosely engaged on the neck of the bottle so that the stopper 33 does not contact the bottle above the plug 29, leaving the air vent 31 open. Similarly, there is no pressure upon the washer 24 so that slight pressure within the bottle will cause the plug or button 26 to rise to permit the escape of air from the container during filling. With the parts in loose engagement, the assembly is heat sterilized and is then ready for filling.

Filling is accomplished by means of a veinipuncture needle or other sterile device, inserted through stopper 33 and plug 29 via tubularture 35, sterile air escaping through 31 and also through 14 in the event that 26 is made loosely fitting. When the filling operation is terminated, the needle is withdrawn and the screw cap tightened, pressing together stopper 33 and plug 29 to seal off the air vent 31. Because of the resiliency and wedging action of 33 and 29, the needle perforations are satisfactorily sealed in tightening the screw cap. In the tightening operation, the hole 23 in the flange of the cap moves out of registration with the hole 14 and therefore the flange will bear upon the resilient washer to effectively seal the hole 14. Afterwards, as a precautionary measure, a crown cap 37, of conventional design with the center removed, may then be slipped over the cap flange 19 to prevent unscrewing of the cap.

In dispensing the sterile liquid within the container, the crown cap is removed and the screw cap loosened until the hole 23 in the cap flange

is centered above the plug 26. A sterile dispensing needle is then inserted at indentation 28 through the washer and plug 26. The unscrewing of the cap causes the stopper 33 to be lifted free of plug 29, and the constricted portion of the center neck of the container, thus removing the obstruction from vent 31, which now acts as an air inlet.

By virtue of the high resiliency of the parts 29 and 33, the holes punctured in them by the filling device remain closed so that the air which is admitted into the bottle must follow the less resistant path along the loosely fitting screw threads and so into the container.

Tubes 42, 43 are connected to either one or both of the plugs 29 and 26, as illustrated in Fig. 1. These tubes need not be straight as shown, but may be bent to reach any point in the interior of the bottle, and may be used either as vent or delivery tubes.

In the embodiment illustrated in Fig. 5, the hole 13*a* is counter-bored so as to provide an annular edge 13*b* designed to contact with the conical face 13*c* of the stopper 22*a*. With this construction the plug 29 is eliminated and a single plug or stopper serves the same purpose. Also in this embodiment the plug or button 26*a* is shown as a part separate from the washer 24*a* but serving the same purpose as the combined washer and button ensemble. In this construction the washer has a depending nipple 24*b* projecting into a cavity in the top of the button 26*a*.

While I have disclosed what I now consider to be some preferred embodiments of the invention in such manner that the same may be readily understood by those skilled in the art, I am aware that changes may be made in the details without departing from the spirit of the invention as expressed in the appended claims.

What I claim and desire to be secured by Letters Patent is:

1. A receptacle of the character described having a top provided with a central opening and an off-center opening, a neck extending upwardly from the top and provided with a screw thread, a cap having threaded engagement with said screw thread and provided with a base flange extending over said off-center opening, said flange having an opening designed to register with said off-center opening when the cap is in a predetermined position, a washer arranged between said flange and the top of the receptacle, a plug normally closing said off-center opening and adapted to be held in closed position by the washer and flange, a tubular member connected to the cap and extending into the bottle neck, a closure for the central opening including a stopper carried by said tubular member, and a vent or delivery tube secured to said closure and extending downwardly into the receptacle.

2. A receptacle of the character described having a top provided with a central opening and an off-center opening, a neck extending upwardly from the top and provided with a screw thread, a cap having threaded engagement with said screw thread and provided with a base flange extending over said off-center opening, said flange having an opening designed to register with said off-center opening when the cap is in a predetermined position, a washer arranged between said flange and the top of the receptacle, a plug normally closing said off-center opening and adapted to be held in closed position by the washer and flange, a tubular member connected to the cap and extending into the bottle neck, a closure for the central opening including a stopper carried by said tubular member, and a vent or delivery tube projecting downwardly from said plug into the receptacle.

3. A receptacle of the character described having a top provided with a central opening and an off-center opening, a neck extending upwardly from the top and provided with a screw thread, a cap having threaded engagement with said screw thread and provided with a base flange extending over said off-center opening, said flange having an opening designed to register with said off-center opening when the cap is in a predetermined position, a washer arranged between said flange and the top of the receptacle, a plug normally closing said off-center opening and adapted to be held in closed position by the washer and flange, a tubular member connected to the cap and extending into the bottle neck, the top of the receptacle having at least one annular edge at the central openings, and a stopper of puncturable material carried by the tubular member and provided with a substantially conical face adapted to cooperate with said edge to close the central opening.

4. A receptacle of the character described having a top provided with a central opening and an off-center opening, a neck extending upwardly from the top and provided with a screw thread, a cap having threaded engagement with said screw thread and provided with a base flange extending over said off-center opening, said flange having an opening designed to register with said off-center opening when the cap is in a predetermined position, a washer arranged between said flange and the top of the receptacle, a plug separate from said washer, normally closing said off-center opening and adapted to be held in closed position by the washer and flange, interlocking means between the washer and plug to prevent the washer from turning relatively to the plug, a tubular member connected to the cap and extending into the bottle neck, and a closure for the central opening including a stopper carried by said tubular member.

5. A receptacle of the character described having a top provided with a central opening and an off-center opening, a neck extending upwardly from the top and provided with a screw thread, a cap having threaded engagement with said screw thread and provided with a base flange extending over said off-center opening, said flange having an opening designed to register with said off-center opening when the cap is in a predetermined position, a washer member arranged between said flange and the top of the receptacle, a plug member separate from the washer member, normally closing said off-center opening and adapted to be held in closed position by the flange, one of said members having a cavity and the other having a nipple extending into the cavity, a tubular member connected to the cap and extending into the bottle, and a closure for the central opening including a stopper carried by said tubular member.

CHARLES M. DE WOODY.

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The following references are of record in the file of this patent:

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