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W. H. ROBINSON

2,337,622

CONTAINER AND CLOSURE STRUCTURE

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Fig. 1.

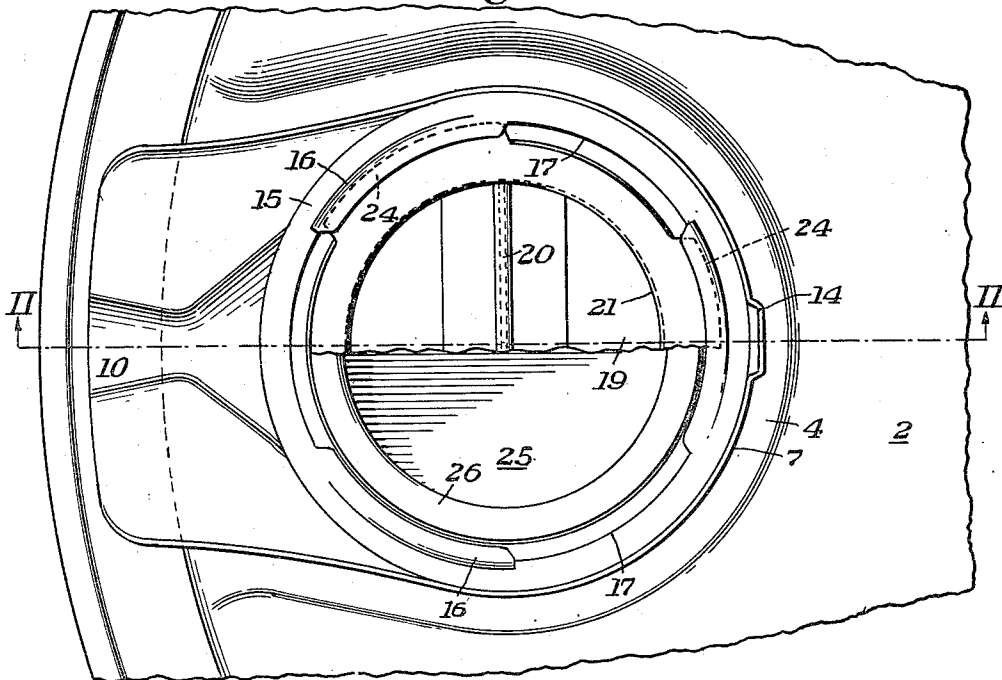


Fig. 2.

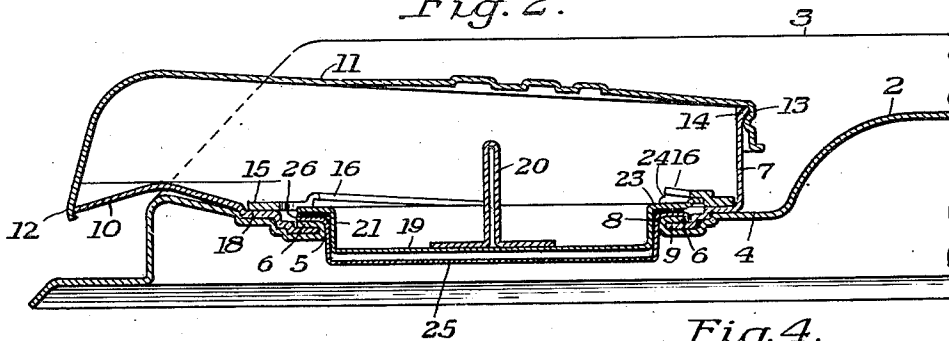


Fig. 3.

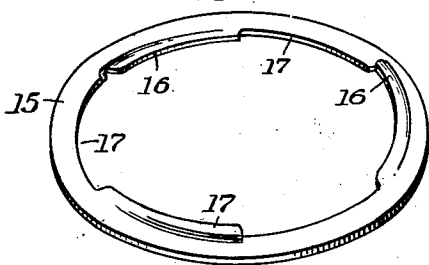
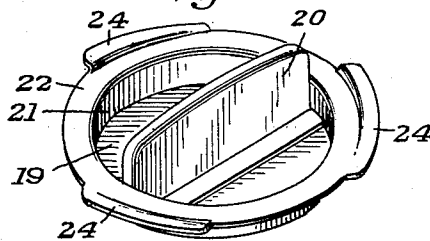


Fig. 4.



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UNITED STATES PATENT OFFICE

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CONTAINER AND CLOSURE STRUCTURE

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7 Claims. (Cl. 221-11)

This invention relates to containers and closure structures therefor. It relates more particularly to storage and shipping containers and especially such containers made out of sheet metal. In sheet metal containers of the type in question there is provided an opening through which the container is adapted to be filled and a closure for such opening. A spout is customarily applied to the container at the opening to guide the contents of the container when being poured out.

The business of supplying containers of the type in question is highly competitive and a commercially successful container must be of sufficiently simple construction that it can be made at low enough cost to meet stiff price competition. Also the container must be structurally strong and particularly the closure for the opening through which the container is filled and emptied must effectively seal such opening under all conditions to which the container may reasonably be subjected in use. Heretofore it has been the aim of manufacturers to compromise between low cost and tight sealing with the result that structures of more complexity than desired have been employed in an attempt to insure a tight seal, yet a tight seal has not always been thus obtained in practice. Also, difficulty has been experienced due to the projection inwardly of the container of a neck surrounding the opening and which has in many cases been considered necessary from the structural standpoint to insure satisfactory sealing. This inwardly projecting neck is highly disadvantageous when the container is being filled with liquid, for when the level of liquid in the container rises above the lower extremity of the neck air is imprisoned between the surface of the liquid and the container top which vents out through the filling opening in irregular gushes, resulting in spattering of the liquid over the outside of the container and on anything else which may be adjacent the container. Also the inwardly projecting neck has materially interfered with smooth pouring out of the contents of the container, interrupting the flow and making difficult or impossible the controlled pouring out of the contents in a smooth compact stream. Attempts to do away with the inwardly projecting neck have met with difficulty from the standpoint of obtaining adequate strength and a sufficiently tight seal.

I have devised a container and closure structure which is extremely simple and cheap to manufacture, yet which provides for adequate strength and an eminently satisfactory and tight

seal. I preferably do away entirely with any inwardly projecting neck so that when the container is being filled it may be filled right up to the rim of the filling opening without danger of spattering due to air venting. This makes it possible to save substantially on the amount of metal going into the container, as the height of the container may be reduced by an amount approximating the height of the inwardly projecting neck which has heretofore customarily been employed. In my copending application Serial No. 377,965, filed of even date herewith, I have disclosed and claimed a container and closure structure accomplishing results similar to those accomplished by the present invention and while the structure of my said copending application is slightly simpler and cheaper than that of the present invention the structure herein disclosed and claimed has certain advantages which will be hereinafter pointed out.

I provide for sealing the container opening against the material of the container about the opening and I preferably maintain the closure in place by means disposed toward the outside of the container from the opening. I prefer to deform the material of the container at the edge of the opening to form a reinforcement and to seal against such reinforcement. I preferably provide a retaining member disposed about the opening with which the closure cooperates to be held in place. The closure preferably has a generally radially extending flange and means at the edge of the flange for engaging the retaining member. In a preferred form of structure the retaining member is in the form of a ring and is welded to the container outside the opening and has spaced cams with which spaced lugs at the periphery of the closure flange are adapted to engage. The cams or the lugs or both are inclined to provide for wedging engagement upon turning of the closure after insertion. When the closure is inserted the lugs pass between the cams of the retaining member, so the closure is held in place by a bayonet joint. A spout may be provided which may be held or clinched to the container by the material of the container at the opening and when such a spout is provided the retaining device is preferably disposed therewithin.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment thereof proceeds.

In the accompanying drawing I have shown

a present preferred embodiment of the invention, in which

Figure 1 is a fragmentary top plan view of a storage and shipping container with the dust cap for the spout removed and with the closure plug partly cut away;

Figure 2 is a central vertical cross-sectional view through the structure shown in Figure 1 and taken on the line II—II of that figure but with the dust cap for the spout applied;

Figure 3 is a perspective view of a cam ring forming part of the structure shown in Figures 1 and 2; and

Figure 4 is a perspective view of the closure plug.

Referring now more particularly to the drawing, there is shown a sheet metal container designated generally by reference numeral 2. The portion of the container shown is the top thereof adjacent the rim. The container as a whole may be of standard construction comprising, for example, a cylindrical body having a permanently attached bottom and a top which for purposes of the present invention may also be considered as permanently attached. In a preferred form the top may comprise what is generally known in the art as a lug cover or it may be permanently seamed to the body. Whatever the precise container structure, the container is adapted and intended to be filled through the pouring opening.

The top of the container rises to a maximum height indicated by reference numeral 3 and has adjacent the rim at one point a depressed portion 4, as well known in the art. At such depressed portion 4 the container is provided with a filling and pouring opening designated by reference numeral 5. The material of the container is outwardly and reversely turned about the opening 5 as shown at 6. A sheet metal spout 7 is provided, which spout has an opening designated by reference numeral 8 concentric with the opening 5. The metal of the spout at 9 about the spout opening 8 lies between the portions 4 and 6 of the metal of the container and is thereby clinched and held in place. The spout has a lip 10 which overhangs the container wall and a dust cap 11 may be applied over the spout. In applying the dust cap the nose 12 of the cap is hooked over the lip of the spout and the heel 13 of the cap is snapped over the rearward edge 14 of the spout.

Fastened within the spout and disposed toward the outside of the container from the opening 5 is a retaining device 15 in the form of a metal ring with inwardly projecting ears or cams 16 formed on the inner edge of the ring. The ears or cams 16 are equidistantly spaced on the ring 15, spaces 17 being provided therebetween for the reception of lugs on the closure plug when the closure plug is applied, as will presently be explained. The ring 15 as shown is of sheet metal and is welded to an annular surface portion 18 of the spout 7. If the spout is not used the ring may be welded directly to the metal of the container which lies beneath the portion 18 of the metal of the spout as shown in Figure 2.

The opening 5 is adapted to be closed and sealed by a closure 19, which, as shown, is preferably in the nature of a hollow sheet metal plug with a grip portion 20 disposed centrally thereof and welded thereto. The closure or plug 19 has a body portion 21 adapted to project slightly inwardly of the container through the opening 5 and an annular outwardly extending flange por-

tion 22 adapted to overlap the reinforced portion of the container surrounding the opening 5 as shown. A gasket 23 is interposed between the reinforced portion of the container surrounding the opening and the under surface of the flange 22. Formed at the periphery of the flange 22 and extending substantially radially outwardly therefrom is a plurality of extensions or lugs 24 which, like the ears or cams 16 of the ring 15, are equidistantly spaced. Each of the lugs 24 is, as shown in Figure 4, inclined slightly to the plane of the flange 22 and the cams 16 are preferably also correspondingly inclined so that when the plug is inserted or dropped into place the lugs 24 will pass through the spaces 17, after which, upon turning of the plug in the clockwise direction viewing Figure 1, the lugs 24 will engage beneath the respective cams 16 to tightly wedge and hold the plug in sealing position. The seal is effected through the gasket 23 by the under surface of the flange 22.

If desired the container may be initially sealed by a sealing member 25 in the shape of a light gauge sheet metal cup having a radial flange 26 at its edge and which may be pressed into the opening 5 after the container is filled and before the plug 19 is applied. The sealing member 25 preferably fits the opening 5 tightly and is forced into such opening frictionally so that it cannot be removed without being damaged or ruptured, thus leaving an indication that the container has been opened.

The structure above described is exceptionally strong and durable. While the spout 7 may be omitted it is desirably employed, first, because it enhances the utility of the container and, second, because it further strengthens and stiffens the material of the container about the opening. There is no neck of the container extending inwardly from the opening and the container may be filled clear up to the level of the opening 5. The small amount of the contents which may be displaced when the sealing member 25 and plug 19 are inserted will cause no difficulty. Doing away with the inwardly projecting neck also provides for more easily controlled pouring. The contents of the container flow out in a smooth unimpeded stream, which is not the case when an inwardly projecting neck is employed. The simplicity and low cost of the container will be appreciated. Thus I combine into one a very simple and cheap container which has exceptionally strong structural characteristics and which obviates disadvantages heretofore inherent in similar structures by reason of an inwardly extending neck at the opening interfering with complete filling of the container and with proper pouring out of the contents thereof. I am enabled to materially reduce the overall height of my container, which means a very important saving in material when it is borne in mind that these containers are made by quantity production methods.

The structure herein disclosed has an advantage over that of my copending application Serial No. 377,965, in that the means for holding the plug in place is disposed outwardly of the sealing point. Thus the holding means is not subject to the action of the contents of the container when the plug is in place which in certain instances might render the same difficultly operable.

While I have shown and described a present preferred embodiment of the invention it is to be distinctly understood that the invention is not

limited thereto but may be otherwise variously embodied within the scope of the following claims.

I claim:

1. A container having an opening therein, the material of the container being deformed to provide a reinforcement about the opening, a closure for the opening having a portion adapted to seal against the reinforcement and means disposed relatively to said portion in a direction outwardly normal to the axis of the opening for holding the closure in place.

2. A container comprising an assembly including a body having an opening therein and a spout clinched to the container body at the opening, a closure for the opening lying when in operative position generally within the spout and means connected with the assembly and lying outside the opening for holding the closure in place.

3. A container comprising an assembly including a body having an opening therein and a spout at the opening, portions of the material of the container body and spout being interfitted to form a reinforced rim about the opening, the spout flaring immediately generally radially outwardly away from said rim, a closure for the opening sealing on said reinforced rim and means connected with the assembly and lying outside said rim for holding the closure in place.

4. A container having an opening in its top through which it is adapted to be filled, the material of the top surrounding said opening having its under surface extending generally laterally away from said opening and said material being reversely turned to provide a reinforced portion about said opening, a closure for said opening having a sealing portion cooperating with said reinforced portion to seal said opening

and means connected with the container and lying outside said reinforced portion for holding the closure in place.

5. A container having an opening in its top through which it is adapted to be filled, the material of the top surrounding said opening having its under surface extending generally laterally away from said opening and said material being reversely turned to provide a reinforced portion about said opening, a closure for said opening having a sealing portion cooperating with said reinforced portion to seal said opening and bayonet joint means connected with the container and lying outside said reinforced portion for holding the closure in place.

6. A container having an opening in its top through which it is adapted to be filled, the material of the top surrounding said opening having its under surface extending generally laterally away from said opening and said material being reversely turned to provide a reinforced portion about said opening, a closure for said opening having a sealing portion cooperating with said reinforced portion to seal said opening and means including a retaining ring connected with the container and lying outside said reinforced portion for holding the closure in place.

7. A container comprising an assembly including a body having an opening and a spout at the opening to guide contents of the container being poured out through the opening, a closure for the opening, a ring of material separate from the material of the body connected with the assembly and disposed within the spout and lying generally in a plane perpendicular to the axis of the opening and means on said ring and said closure for holding the closure in place.

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