

Nov. 9, 1943.

F. W. SAMPLE ET AL
CLOSURE DEVICE FOR CONTAINERS

2,333,822

Filed June 28, 1938

Fig. 1.

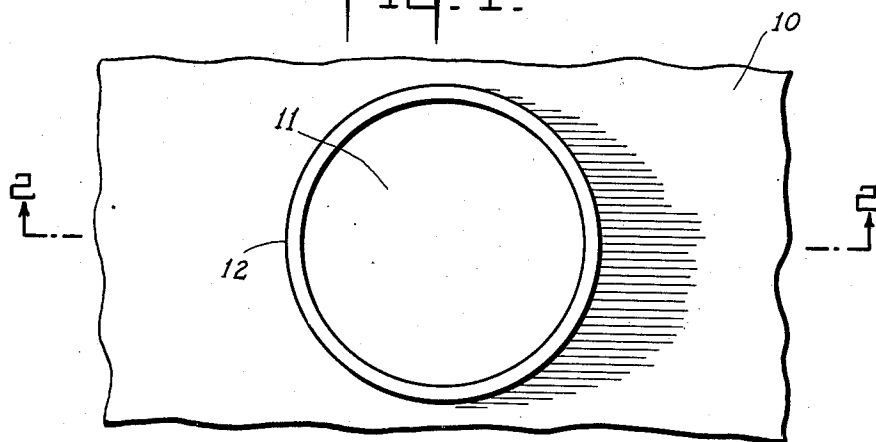


Fig. 2.

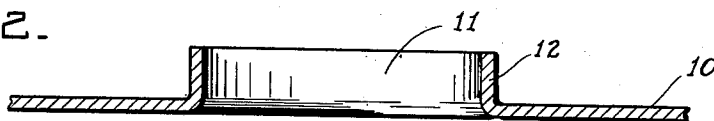


Fig. 3.

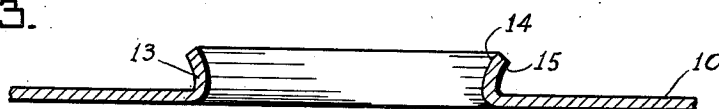


Fig. 4.

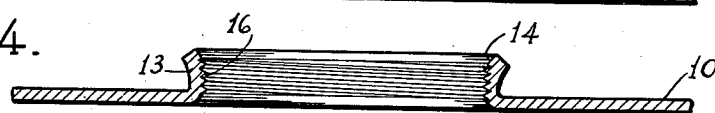


Fig. 5.

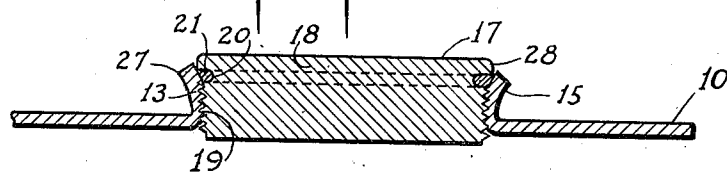
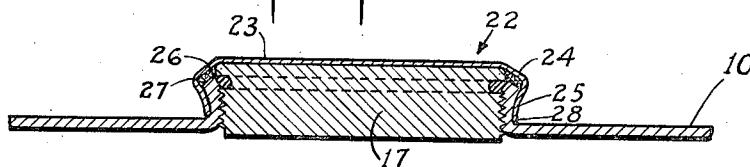


Fig. 6.



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CLOSURE DEVICE FOR CONTAINERS

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Application June 28, 1938; Serial No. 216,206

3 Claims. (Cl. 220—39)

This invention relates to container closure constructions and particularly to those in which the closure receiving part or flange is formed integrally with the container wall.

An object of the invention is to provide openings in heavy gauge containers with efficient closures having a minimum number of parts.

Another object of this invention is to provide an efficient and practical closure receiving part or flange from the stock of the walls of heavy gauge containers.

Another object is to provide a method for forming the same.

A further object of the invention is to form such closure receiving part or flange with efficient gasket and seal cap receiving surfaces.

A still further object of the invention is to provide heavy gauge containers with closure receiving parts or flanges formed directly out of the container stock but yet possessing sufficient strength for safe operation during the life of the container besides having proper formations to receive closure plugs and seal caps whose construction and method of application assures that a tight closure will result.

Other objects of the invention will in part be obvious and will in part appear as this description progresses and by reference to the accompanying drawing.

Heretofore it has been thought necessary, in providing the openings in large metal containers or drums with efficient closing devices, to employ separate flanges or bushings for receiving closure plugs or bungs. These flanges are secured in place about the openings by pressing or welding the adjoining metals into a leak-proof joint. Such systems not only require that separate parts be provided, but also entail considerable expense in labor and machinery for the forming of such parts as well as in the securing of the same to the container walls. Efforts to eliminate this expense have heretofore been unavailing, it remaining for the instant invention to provide the solution to this problem.

With improvement in metals from which the type of heavy gauge containers in question are made, applicants have discovered a procedure by which efficient closures can be formed. The plug or bung receiving means is pressed right out of the stock of the container wall and is formed to accommodate a plug gasket as well as the skirt of a seal cap. Thus, not only is the plug properly received, but efficient seating for the plug gasket is provided, while additionally, the reception of a leak-proof and tamperproof seal

is provided for. This makes for a closure having all the attributes of what is now considered as good practice in the industry. Moreover, the resultant closure has all the strength necessary for efficient safe operation throughout the life of the container.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawing in which:

Fig. 1 is a plan view of a section of a container wall having an opening therein showing such opening defined by a neck or flange in the first stage of formation of the same.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing the neck or flange as upset in accordance with the next step in the process of forming the same.

Fig. 4 is a view similar to Fig. 3 showing the neck or flange after the same has been internally threaded.

Fig. 5 is a view similar to Fig. 4 showing a closure plug seated in position in the neck or flange.

And Fig. 6 is a view similar to Fig. 5 showing the manner in which the closure is sealed by means of a seal cap.

Throughout the several views of the drawing a portion of the wall of a container is generally indicated by the reference character 10. This may be a portion from the head or body sheet of a metallic container of relatively heavy gauge, but the invention is not to be considered as limited to the field of metallic drums, since it also finds application in the electrical field, for instance, in such constructions as transformer shells. In fact the closure of this invention would be most serviceable in wooden containers where a plate similar to that shown at 10 could readily be secured to or in the wood adjacent an opening therein.

In the first stage of forming the metal of the container wall into an effective part of a closure combination, a hole is punched therein, as shown at 11 in Fig. 2, following which the stock surrounding such hole is drawn or flanged to form a neck 12 surrounding opening 14. This neck, as shown, extends upwardly at substantially a 90° angle to the surface of wall 10 and has a thickness the same as that of said wall. The next operation to be performed on the neck, the results of which are shown in Fig. 3, is a combination of flaring and upsetting. If the stock is of sufficiently good quality, the force of the upsetting axially of the neck will produce there-

in a thickening whence a slightly shorter and thicker neck results, as shown at 13. This thickening, however, though desirable, is not necessary.

The upsetting action is effectively controlled due to the use of suitable dies so that an outward component is introduced. This flares the neck outwardly from its mouth to a point approximately midway of the same. Thus, a surface 14 is formed inside the neck around the mouth thereof for properly engaging and seating a plug gasket, while on the outside of the neck an inwardly inclined surface 15 results which is effective for the proper reception of a seal cap skirt as will appear more fully hereinafter.

Following the formation of the neck, as shown in Fig. 3, the interior of the same is threaded as shown at 16 in Fig. 4. In this regard, it is to be noted that the threading commences at the bottom of gasket seat 14 and thus is largely formed in the portion of neck 13 which is substantially devoid of any flare. In the event that the neck be thickened—which is contemplated where the material acted upon provides opportunity for the same—the wall back of the threads will be little, if any, thinner than the original stock 10. Even though no thickening takes place, however, sufficient stock will remain in back of the threads to provide an entirely safe and satisfactory seat for the closure elements employed.

In Fig. 5 is shown the manner in which the screw plug 17 is employed for closing the opening defined by neck or flange 13. A head 18, slightly larger than the diameter of the threaded portion 19, is provided on the plug. Beneath such head, between the same and the screw threads, is formed an undercut recess 20 for receiving a gasket 21. These parts are so related with respect to gasket seat 14 that the maximum effectiveness of gasket 21 is obtained, all as set forth in U. S. Patent No. 1,982,145 to John W. Shera. Hence, further discussion on this point is thought to be unnecessary.

In Fig. 6, the closure of Fig. 5 is shown as encompassed by a seal cap, generally shown at 22. This seal cap has a crown portion 23 for covering the head of plug 17, a brim portion 24 and a skirt portion 25. A gasket 26 received in the chamber defined by brim 24, the upper surface 27 of neck 13 and the side wall 28 of plug head 18, is carried by seal cap 22 and, on the crimping in place of seal cap 22, operates to seal the line between plug 17 and neck 13 against any possibility of leakage. This gasket may be adhesively secured to the inside of brim 24 or be held in place in any other desired manner. Compression and effective seating of the gasket 26 is accomplished by the drawing action transmitted by skirt 25 as the latter is axially crimped and thereby forced to slide downward on incline 15. This action is generally similar to that described in U. S. Patent No. 1,887,435 to F. W. Sample, but differs from the same to the extent indicated by the difference in structures involved. In this instance the use of a slightly larger gasket and the incline of brim 24 render the force necessary for providing an effective seal somewhat less than that required in employing the construction disclosed in U. S. Patent No. 1,887,435.

While gasket 26 gives insurance against any possibility of leakage even should gasket 21 be in any way rendered ineffective, the seal also provides insurance against tampering. This insurance resides in the fact that the bottom edge

28 of skirt 25 approaches so close to the upper surface of wall 10 that no room exists for the insertion of a tool by means of which one would be enabled to remove cap 22 without mutilating it. Should one wish, however, to remove seal 22 in an authorized manner thereby destroying the same, such can readily be accomplished due to the presence of score lines of the type indicated in U. S. Patent No. 1,982,145.

Although the neck has merely been illustrated as flared outwardly at its mouth to provide gasket surface 14 and an inclined cap skirt receiving surface 15, the possibility of other formations is readily apparent. For instance, the mouth of neck 12 could be upset to form a rounded thickened portion in the nature of a bead, or such a bead could be formed in alternate manner by exerting an outward bending and rounding action on the mouth of collar 12. Lastly a right-angled outward flare might be provided at the mouth of the neck to accommodate a plug with a flat gasket and to retain a seal cap whose skirt would be crimped in under the outwardly flared portion.

It is thought that the foregoing description adequately describes the construction as well as the method of formation of the closure of the invention. However, it is to be understood that such description is merely illustrative and is not to be interpreted in any way in a limiting sense.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In structure of the character described, a container wall having an opening therein, an up-standing neck surrounding said opening formed integrally with the stock of the container wall and said neck being thickened by compression throughout its length to allow for the formation of threads therein without substantially reducing the resultant thickness of the neck below the thickness of the container wall stock and flared outwardly for a substantial distance from its mouth to provide on the outside thereof an inwardly inclined surface for reception and retention of a seal cap skirt.

2. In structure of the character described, a container wall having an opening therein, an up-standing neck surrounding said opening formed integrally with the stock of the container wall and said neck being thickened by compression throughout its length to allow for the formation of threads therein, without substantially reducing the resultant thickness of the neck below the thickness of the container wall stock, and flared outwardly for a substantial distance from its mouth to provide on the outside thereof an inwardly inclined surface and on the inside thereof an outwardly inclined gasket seating surface.

3. In structure of the character described, a container wall having an opening therein, an up-standing neck surrounding said opening formed integrally with the stock of the container wall, said neck being thickened by compression throughout its length and flared outwardly for a substantial distance from its mouth to provide on the outside thereof an inwardly inclined surface for reception and retention of a seal cap skirt and said neck being threaded internally throughout a substantial portion of its length, and the stock of said neck, back of said threads, being substantially as thick as the original thickness of the container wall.

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