Jan. 12, 1943. A. W. McCLARY 2,308,089

BUNG OPENING CONSTRUCTION

Filed April 5, 1941

Fig. 1.

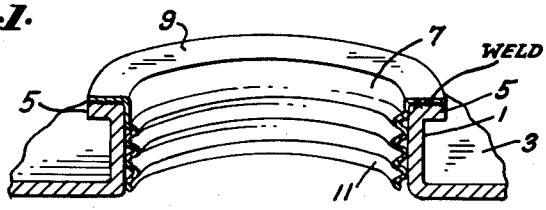


Fig. 2.

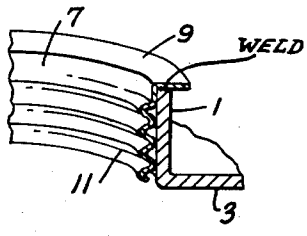


Fig. 3.

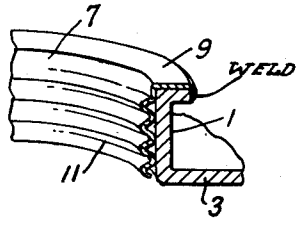


Fig. 4.

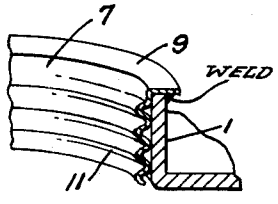


Fig. 5.

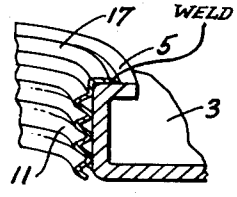


Fig. 6.

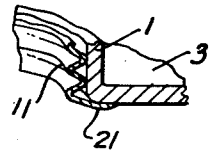
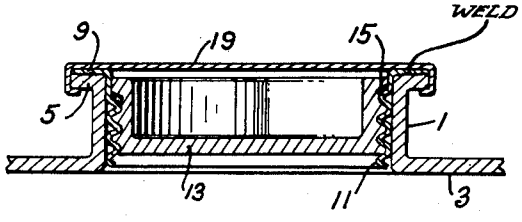


Fig. 7.



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BUNG OPENING CONSTRUCTION

Archie W. McClary, Oakland, Calif.

Application April 5, 1941, Serial No. 387,024

2 Claims. (Cl. 285—49)

My invention relates to metal drums and containers and more particularly to a bung opening construction for such drums and containers.

In the manufacture of metal drums and containers, particularly those designed to carry highly volatile and explosive liquids such as gasoline, naphtha and the like, it is quite essential that the container be absolutely leak proof and vapor proof and remain so in spite of the heavy abuse to which these containers may be exposed during handling. One possible source of trouble is the bung opening construction of such a container, and it, like the rest of the container must be leak proof and vapor proof, otherwise a distinct fire hazard is created. A bung opening formed by crimping the container sheet material about a bung ring or flange with a sealing gasket between, while relatively cheap, seldom retains its leak proof and vapor proof characteristics over an extended period of time, due to deterioration of the gasket and loosening of the seam in response to stresses and strains transmitted thereto during use. Although welding offers one solution to obtaining a leak proof and vapor proof seam, the many attempts to fabricate a bung opening structure through the use of welding have not, to my knowledge, resulted in a construction capable of economical manufacture, for these invariably required relatively heavy cast or forged fittings with an interior cut thread for receiving the bung closure. Nor have any of them, in so far as I am aware, been adaptable to the application of a cap seal.

Among the objects of my invention are—

(1) To provide in a metal drum or container, a novel and improved bung opening construction which is absolutely leak proof and vapor proof around the seams and will remain so in spite of the normal stresses and strains to which the same may be exposed during use.

(2) To provide a novel and improved bung opening construction capable of economical fabrication.

(3) To provide a novel and improved bung opening construction incorporating a bung sleeve which in my construction may be of exceptionally light gauge material.

(4) To provide a novel and improved bung opening construction including a bung sleeve, and wherein a neck formed from the container sheet material is relied upon to reinforce and brace the aforementioned sleeve.

(5) To provide a novel and improved bung opening construction involving a bung sleeve which is capable of being formed preferably of light gauge material independently of the drum proper and which can subsequently be assembled to the container in a strong leak-proof and vapor-proof assembly.

(6) To provide a novel and improved bung opening construction which readily lends itself to the use of economical welding methods in the fabrication thereof.

(7) To provide a novel and improved bung opening construction adapted to the use of standard welding apparatus in the fabrication thereof.

(8) To provide a novel and improved bung opening construction in the form of a welded assembly which is adapted for the application of a cap seal.

(9) To provide a novel and improved bung opening construction having a threaded interior, wherein the threaded portion may be formed as an element independently of the drum proper and preferably of a very light gauge material, whereby the thread may be conveniently rolled into the element prior to assembling the same to the drum.

(10) To provide a novel and improved bung opening construction so designed as to enable replacement or repair without mutilating any of the drum structure.

Additional objects of my invention will be brought out in the following description of the same taken in conjunction with the accompanying drawing wherein—

Figure 1 is a perspective view in section of one embodiment of my invention,

Figures 2, 3, 4 and 5 are fragmentary perspective views in section, depicting additional embodiments of my invention,

Figure 6 is a fragmentary view in section, illustrating a feature applicable to each of the embodiments of Figures 1 through 5,

Figure 7 is a perspective view in section, showing the manner of applying a closure and cap seal to my improved bung opening construction.

In its broadest aspects, by invention contemplates the forming of an integral neck around a bung opening in a container, from the sheet material of which the container is fabricated. This neck is retained as such without threading or slotting the same in any manner to receive a closure. In lieu thereof, threads or other closure securing means are preferably rolled or pressed into a separate sleeve of preferably thin material adapted to fit into the neck and be secured thereto, such as by welding the sleeve to the neck around its outer end, or in some equivalent manner. While the neck portion may or may not be flanged at its outer end, the sleeve, in each

case will preferably be formed with a flange, enabling the sleeve to be properly supported in and by the neck in preparation for the welding operation. The resulting assembly will have a flange which extends beyond the outer cylindrical wall of the neck to constitute an overhanging lip, thus providing for the crimping thereon of a cap seal, following the closure of the bung opening with the customary bung threaded or otherwise adapted for securing the same in the sleeve.

For a more detailed disclosure of the invention and the advantages arising therefrom, reference will be made to the accompanying drawing.

Each of the various embodiments provides for a neck 1 drawn from the sheet material 3 from which the drum or container is formed, and accordingly, the neck may be located in any part of the finished container. At its outer edge, the neck in the embodiment of Figure 1 is formed with a peripheral outwardly directed lateral flange 5.

Fitted within the neck is a sleeve 7 of preferably thin sheet metal having a peripheral outwardly directed flange 9 at its outer end, and in contact with the flange 5. This sleeve is formed independently of the drum, and during its formation, threads 11 are preferably rolled therein of the proper pitch for receiving a standard bung plug or closure 13 and associated gasket 15, shown in assembled relationship in Figure 7.

In assembling the sleeve, it is inserted until the sleeve flange 9 engages the neck flange 5, whereupon, the sleeve will be supported in proper position to be affixed permanently to the drum, and this is readily realized through welding of the sleeve 7 to the neck 1 at their adjacent outer ends, preferably leaving the adjacent cylindrical surface portions of the sleeve and neck free of each other except for such frictional contact as may exist between them. The sleeve 7 may either snugly fit within the neck 1 or its diameter may be such as to leave one spaced from the other. The structure of Figure 1 lends itself quite readily to welding by the method of resistance welding, inasmuch as one contact may conveniently be held against the under surface of the neck flange 5 while the other would contact along the upper surface of the sleeve flange 9.

The embodiment of Figure 2 differs from that of Figure 1 in the fact that the neck 1 is not flanged at its outer end. The sleeve 7, however, can be made identical to that of Figure 1 and accordingly when assembled, the flange 9 will extend beyond the outer cylindrical surface of the neck to form an overhanging lip. Resistance welding may be employed as in Figure 1 to join the sleeve to the neck in a vapor-proof and leak-proof seal along the periphery of the end of the neck. In this case, one contact electrode will be held against the lower surface of the sheet 3, while the other contact will be held in contact with the upper surface of the sleeve flange 9.

In Figures 3, 4, and 5, I have illustrated assemblies corresponding to those of Figures 1 and 2 in a general way, showing, however, the application of metallic welding in the sealing of the sleeve to the neck. Thus in Figure 3, the contacting flanges 5 and 9 are joined along their edges only, and in the assembly of Figure 4, the weld is applied beneath the sleeve flange 9 along the line of contact between this flange and the outer cylindrical surface of the neck. In the embodiment of Figure 5, the sleeve is provided with but a narrow flange 17 which only partially covers the neck flange 5. This not only simplifies the welding operation but further adds to the economy of manufacture, since the narrow flange can readily be formed during the rolling of the thread, thereby eliminating the separate flanging operation required in the forming of the flange 9 of the previous embodiments.

Of considerable importance in connection with the above described assemblies, is the general overall economy which can be realized in the fabrication of the same, in addition to the many advantageous features inherently existing therein.

The assembly relies for its strength upon the neck portion formed integral with the container. Since this portion is not threaded or otherwise deformed to receive the closure, its original strength is maintained, and in the case of Figures 1 and 3, the flange 5 serves to reinforce and thereby strengthen the neck portion. Inasmuch as the flanging of the neck adds somewhat to the cost, it is preferably omitted except in such cases where added strength is desired.

The fact that the threads 11 are not formed in the neck itself, but are applied to a sleeve 7 adapted to fit into the neck, not only simplifies the manufacture materially, but enables considerable economy in the selection of material and the thickness thereof, from which the sleeve is fabricated. It will be apparent from the various embodiments described, that the sleeve is completely formed independently of the container, and being but a small element, it can be very conveniently handled in performing the various operations thereon. The same may be formed from tube stock or sheet material and the gauge may vary between wide limits, and is not limited to the thickness of the container material as is the case where no sleeve is utilized to carry the threads but the threads are formed directly in the neck 1. Consequently, inasmuch as the neck offers the necessary rigidity for the bung opening structure and functions as a protective wall, the sleeve, although not limited as to thickness, is preferably formed from light gauge material, and in this connection, not only enables the realization of additional economy arising out of the selection of thin gauge material, but light gauge material is more readily rolled to provide a V thread for the reception of the customary bung having a cut thread.

Assembling of the sleeve 7 is facilitated by the flange 9 of Figures 1 through 4 and the corresponding but narrower flange 17 of Figure 5, which rests upon the end of the neck, preparatory to welding in any of the various ways described. The flange 9 serves the additional purpose of providing an anchoring lip for the securing of a cap seal 19 or the like as by crimping, to preclude unauthorized tampering with the contents of the container, after the same has been prepared for shipment. In the embodiment of Figure 5, the neck flange 5 serves this purpose.

Should abuse in the handling of drums during shipment, result in the development of a crack in the sleeve 7, it will be noted that the vapor-proof character of the construction is not affected in the least, for the weld seal will still preclude loss of vapor between the sleeve and the neck just as efficiently as before. In fact, the development of a crack in the sleeve will not materially affect the conditions originally existing prior to such damage.

Applicable to each of the embodiments of my invention, is the feature illustrated in Figure 6.

In accordance with this disclosure, the lower edge 21 of the sleeve may be rolled into close-fitting engagement with the lower edge of the neck 1. This offers the advantage of reducing probability of strains and stresses on the weld, and in addition, assures complete drainage of all sediment in the pouring of the contents from the drum.

Although I have disclosed the sleeve in each of the embodiments as being welded to the neck at the outer extremity thereof, it is conceivably possible to weld the two along the lower edge of the sleeve, to seal the assembly against leakage of liquid or vapor between the sleeve and neck. In this event, the welding at the outer end of the neck could be eliminated if desired.

My improved assembly avoids all necessity for crimping in the assembling thereof, in that it is so designed as to adapt it to the use of standard welding apparatus, all of which is of primary consideration, if economy is to be realized in the fabrication of an assembly of the character disclosed by me.

Another factor of considerable importance, is the comparative ease and economy with which one may repair or replace damaged structure in my improved assembly. The sleeve, for example, may readily be removed by grinding the flange 9 or 17 down to the weld, and a new sleeve inserted and welded. In lieu of grinding down the flange, the sleeve might be freed by grinding through at the bend of the flange, leaving the flange remaining as part of the neck structure. Where the lower edge of the sleeve is rolled as described, this will present no problem to removal of the sleeve, in view of the relative thinness of material capable of use in my improved assembly. In any event, it is pointed out, that the neck or any part of the drum proper is left undisturbed, the entire procedure being narrowed down to practically a grinding operation in the removal of the old sleeve and a welding operation in the assembling of a new sleeve.

While I have disclosed my invention in detail, it is possible to modify the same without departing from the principles embodied therein. The neck, for example, may also be formed independently of the drum sheet material and then welded into place. From an economic viewpoint, I prefer to form the neck directly from the drum material, though in both cases the neck will be integral with the drum. I accordingly do not desire to be limited in my protection to the aforementioned details of construction, except as may be necessitated by the prior art and the appended claims.

I claim:

1. A bung opening construction for a container comprising an outwardly extending neck integral with the container, a bung receiving sleeve telescopically assembled within said neck and having an end flange welded to an outer surface of the end of said neck to the exclusion of the inner cylindrical surface thereof and extending laterally beyond the outer cylindrical surface of said neck.

2. A bung opening construction for a container comprising an outwardly extending neck integral with the container; a bung receiving sleeve of thinner gauge material than said neck, telescopically assembled within said neck and having an end flange welded to an outer surface of the end of said neck to the exclusion of the inner cylindrical surface thereof and extending laterally beyond the outer cylindrical surface of said neck.

ARCHIE W. McCLARY.