June 30, 1953 D. E. WOBBE 2,643,627

METHOD OF PRODUCING CUSHION IN SEAMS OF CONTAINERS

Filed Dec. 28, 1950 2 Sheets-Sheet 1

Fig. 1

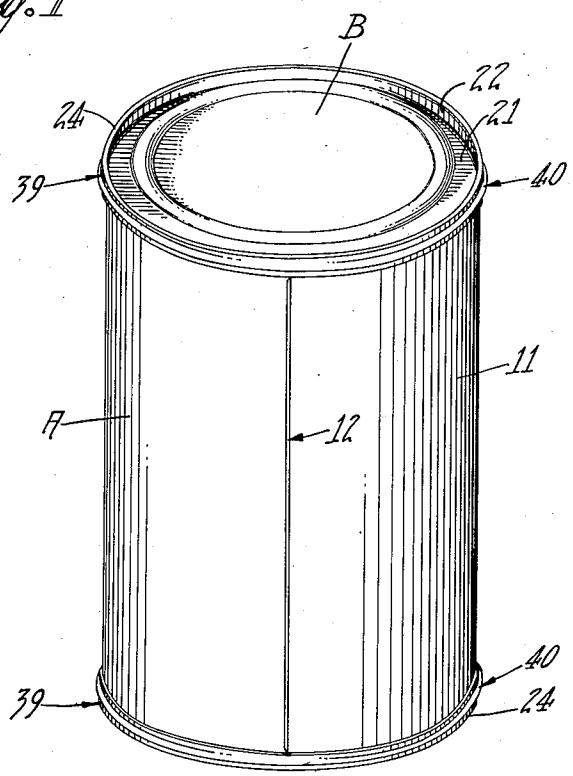


Fig. 3

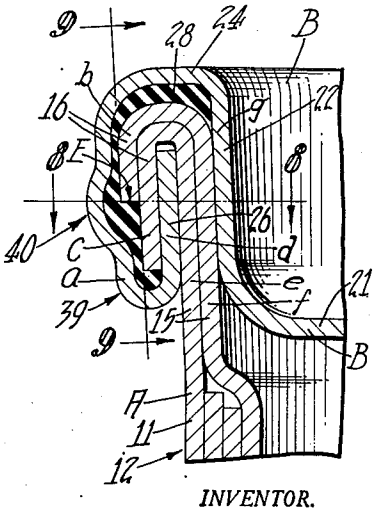
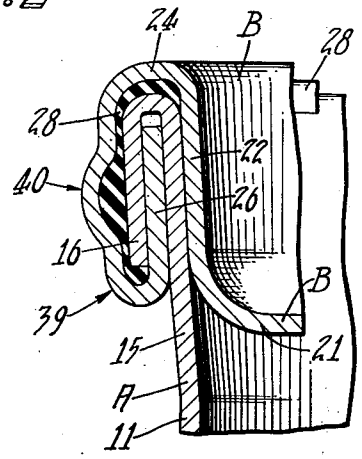


Fig. 2



INVENTOR.
DELBERT E. WOBBE
BY Charles H. Esch
Ivan L. Thornburgh
ATTORNEYS

June 30, 1953 D. E. WOBBE 2,643,627

METHOD OF PRODUCING CUSHION IN SEAMS OF CONTAINERS

Filed Dec. 28, 1950 2 Sheets-Sheet 2

Fig. 4

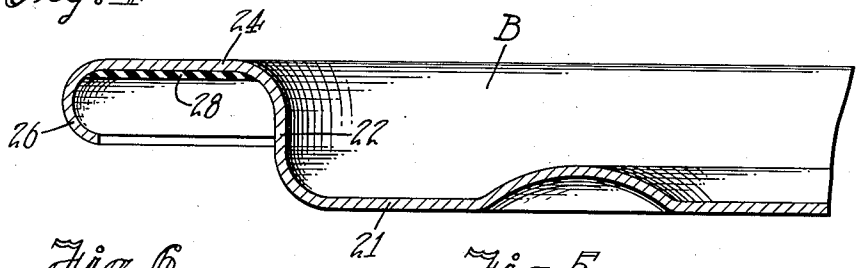


Fig. 6

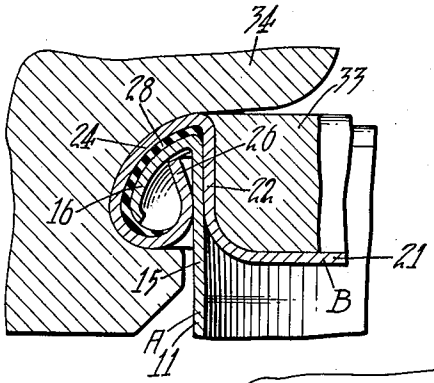


Fig. 5

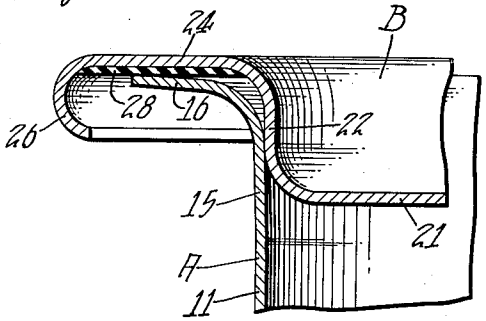


Fig. 8

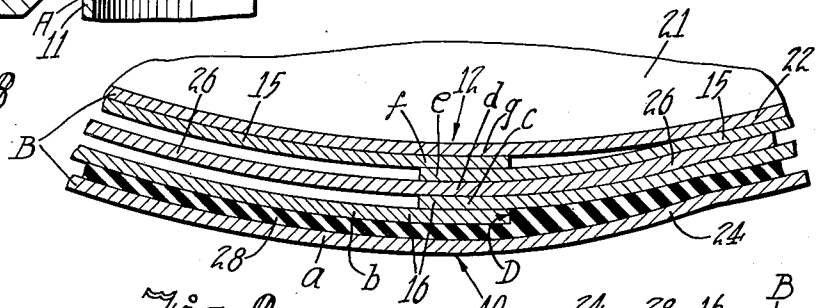


Fig. 9

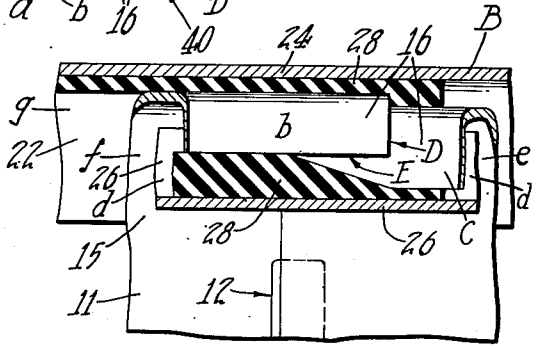
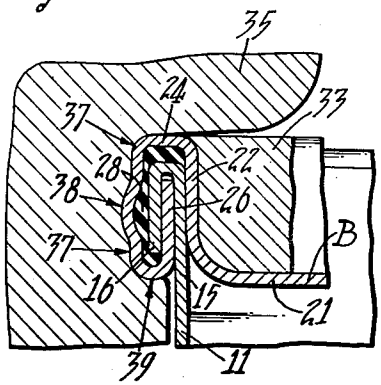


Fig. 7



INVENTOR.
DELBERT E. WOBBE
BY Charles H. Sine
Ivan D. Thornburgh
ATTORNEYS

Patented June 30, 1953

2,643,627

UNITED STATES PATENT OFFICE

2,643,627

METHOD OF PRODUCING CUSHION IN SEAMS OF CONTAINERS

Delbert E. Wobbe, Maywood, Ill., assignor to American Can Company, New York, N. Y., a corporation of New Jersey

Application December 28, 1950, Serial No. 203,075

2 Claims. (Cl. 113—120)

1

The present invention relates to a method of hermetically sealing containers or cans with end members or covers secured in place by end seams and has particular reference to providing in the end seams an extra thick hermetic cushion to insure against leakage of air or other fluids through the seam under severe handling of the container.

In the closing of sheet metal cans with end members by the interfolding of respective flange parts on the cans and on the end members to produce a uniting hermetic seam of the well known double seam type, a resilient gasket, usually a rubbery composition, is interposed between the flanges to render the seam hermetic. The interfolding of these flange parts usually is effected by seaming rollers which exert considerable pressure against the flange parts to bend them inwardly one within the other in a plurality of interlocked layers to produce the resulting end seam.

During the seam forming operation some of the gasket material occasionally is squeezed out from between the layers of the seam and thus metal-to-metal contact of the layers occurs in spots around the seam, particularly where the side seam of the container body with extra layers of metal is interfolded into the end seam. The result is that when these containers are subjected to severe use during shipment and other handling, passageways or interstices are sometimes formed in the seam as a result of this use and hence sometimes the seams leak air or other fluids through these interstices. This leakage is especially objectionable when the interior of the cans are to be vacuumized or gassed.

The present invention contemplates the provision of a method of sealing containers or cans with end members in such a manner as to overcome the above mentioned difficulties.

An object of the invention is the provision of a method of sealing a container or can with an end member by an interfolding of flange portions of the can and the end member to provide a uniting end seam of a plurality of layers of flange material wherein a localized recess is formed in the seam between its two outer layers of flange material and is filled with a resilient gasket material for providing an extra thick cushion in the seam to insure against leakage of air through the seam under severe handling of the container.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying

2

drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a perspective view of a container embodying the instant invention and having end members applied in accordance with the method steps of the invention;

Fig. 2 is an enlarged fragmentary sectional view of a portion of the upper end of the container shown in Fig. 1, the view being taken through the end seam substantially along any radial line other than that passing through the side seam of the container;

Fig. 3 is a view similar to Fig. 2 and showing the construction of the end seam at the side seam of the container;

Fig. 4 is an enlarged fragmentary sectional view of an end member used in closing the container shown in Fig. 1;

Fig. 5 is an enlarged fragmentary sectional view of the end member applied to a container as an incident to sealing the container;

Figs. 6 and 7 are enlarged fragmentary sectional views of the assembled end member and container and portions of tools for effecting the interfolding of the container and end member flanges to produce a unitary end seam, the two views showing different stages in the forming of the seam; and

Figs. 8 and 9 are sectional views taken substantially along the lines 8—8, and 9—9 in Fig. 3, Fig. 9 being shown on a reduced scale.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate method steps of closing and sealing a conventional sheet metal container or can A with a sheet metal end member B, the invention being equally well adapted to bottomless can bodies as well as bottomed bodies, either filled or unfilled, and to bottom end members as well as to covers or top end members.

The can A includes a tubular body 11. The drawings show this body as being preferably made from a flat blank bent into tubular shape and having its longitudinal edge portions joined together in the usual lock and lap side seam 12 (Figs. 1 and 3) since in this type of can body, because of the extra layers of metal in the side seam and because a pair of angularly disposed steps D, E (Fig. 9) occur in the lap portion of the seam, it is sometimes difficult to obtain a hermetic seal between the end members and the body at the side seam. At the ends of the body, marginal edge portions 15 are flared outwardly and are provided with an outwardly projecting

flange 16 (see Fig. 5) for securing the end members B to the body. This flange 16 includes the lapped portions of the end seam and the steps D, E, which are the result of the terminal edges of these overlapped portions (see Fig. 9).

The end members B preferably are formed with a countersunk panel 21 (Figs. 4 and 5) which merges into an upright or substantially vertical surrounding wall section 22. This wall section 22 is also outwardly flared to closely engage the corresponding outwardly flared portion 15 of the can body when the end member is applied to the can. At its outer edge the upright wall section 22 merges into an annular substantially horizontal flange 24 which surrounds the wall section 22. The end member flange 24 terminates in an inwardly curved or curled edge 26. This flange 24 carries a resilient gasket 28 which may be a solid annular ring or as shown in the drawings may be a rubber or the like compound applied in a fluid condition and dried to a solid resilient condition in the conventional manner well known in the can making art.

In accordance with the method steps of the instant invention, which includes the application of the gasket 28 to the end member B, an end member B is applied to an open ended flanged can or can body A as shown in Fig. 5 with the gasket 28 interposed between the flange 24 of the end member and the flange 16 of the can or body A. In this position of the end member, its countersunk panel 21 fits into the mouth or open end of the body 11 and its upright wall section 22 engages tightly against the inner surface of the flared wall portion 15 of the body.

While the end member B is in this position on the can, it is permanently united thereto by an interfolding or interlocking of the end member flange 24 and the can body flange 16. This is brought about preferably in two stages, namely a first operation and a second operation, by a conventional chuck 33 (Figs. 6 and 7) and a pair of seaming rollers 34, 35. The chuck 33 fits down into the countersink of the end member B and engages the countersunk panel 21 and the upright wall section 22 to back-up and support these end member parts during the seaming operations. The seaming rollers 34, 35 engage the outer periphery of the end member flange 24 and exert a pressure inwardly against it to effect the flange interfolding operation.

The seaming roller 34 preferably is a conventional first operation seaming roller and engages the flange 24 first. As the roller 34 moves in toward the can in the conventional manner, it bends the flange 24 and its curled edge 26, inwardly under the body flange 16 also bending the latter until the end member flange parts and the body flange are partially and loosely interfolded in the manner shown in Fig. 6.

The seaming roller 35 is a second operation or finishing roller and it is provided with a seaming profile or groove 37 (Fig. 7) which is formed with an annular intermediate recess or deeper grooved portion 38. This second operation seaming roller 35 is moved laterally into engagement with the end member flange 24 after the first seaming operation, i. e. after the flange 24 has been partially bent as explained above to produce the loosely interfolded first operation seam as shown in Fig. 6.

As the second operation seaming roller 35 moves in against the first operation seam it presses the partially interfolded flange parts 16, 24, 26 into a finished double seam 39 as best shown in Figs. 2, 3 and 7 with the gasket 28 disposed between the two outer layers 16, 24 of the seam. During this finished seaming operation the profile face 37 of the roller 35 on either side of the intermediate recess 38, exerts considerable pressure laterally against the partially reformed flange 24 and tightly compresses the flange 24, the body flange 16, the end member curl 26, the flared portion 15 of the body 11, and the end member upright wall section 22, against the chuck 33 in order to force these seam sections into close fitting substantial parallelism and to thereby produce a strong interlocked hermetic and leakproof end seam. Seven layers of metal *a, b, c, d, e, f* and *g* are thus locked together at the side seam region of the end seam with the gasket 28 between layers *a* and *b*.

While the above mentioned seam parts 24, 16, 26, 15 and 22 are being forced together to produce the edge portions of the finished seam 39, a portion of the resilient gasket 28 interposed between the two outer layers 24, 16 of the seam, is squeezed inwardly and is compressed in and completely fills the intermediate portion of the seam. This gasket compressing action forces the intermediate portion of the outermost layer, *a*, of the seam into the intermediate recess 38 of the roller 35 and thereby produces a localized annular bulge 40 in the finished seam 39. The intermediate recess 38 in the second operation seaming roller 35 is so located as to form the bulge 40 in the seam 39 at a place directly opposite or in alignment with the step E (Figs. 3 and 9) in the lap section of the seam so that the reformed gasket 28 is thicker along an annular region including the step E.

In this manner an extra thick layer of the resilient gasket material is built up under pressure in the space between the two outer layers of the seam along the step E and across the step D and provides a resilient hermetic seal and cushion which immediately spreads into and closes any interstices formed in the seam as a result of undue pressure on the seam or severe handling of the container after sealing. At the side seam 12 of the body, as shown in Figs. 3, 8 and 9, the extra thick cushion of the gasket material effectively seals the stepped edge which is the result of the overlapping side seam edge portions which are incorporated in the end seam 39, and thus prevents a cutting through of the gasket and leakage of air or other fluid through the seam at this point.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the steps of the method described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the method hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A method of hermetically sealing double seams formed between flanges of metal container bodies and metal covers where the bodies have side seams terminating in lapped sections producing angularly disposed projecting steps in the body flange layers of the double seam adjacent the radially outer layer of the cover flange, said method comprising application of a resilient gasket between said body and cover flanges, interfolding said flanges into a loose double seam with the gasket confined between the two radially outer

layers thereof, and radially compressing said loose seam above and below said angularly disposed steps leaving the intermediate portion of said radially outer layer less compressed, thus bulging said outer layer outwardly and producing a substantial recess inwardly of said outer layer between said compressed sections, said compressing action simultaneously forcing portions of the resilient gasket into said recess to build up an extra thickness of the gasket material and pressing it against said angularly disposed steps to hermetically seal any interstices at said steps.

2. A method of hermetically sealing a metal cover having a peripheral flange to a metal container body having a cooperating flange and having a lap side seam section with angularly disposed projecting steps, said method comprising interposing a resilient gasket between said body and cover flanges, interfolding said flanges to produce a double seam having a plurality of layers of the flange material including a radially outermost layer of the cover flange material and an adjacent inner layer of the body flange material with its included angularly disposed projecting steps, said resilient gasket being confined and interposed between said outermost layer and said adjacent angularly disposed steps, and simultaneously with said interfolding operation compressing said outermost layer above and below said steps and compressing to a lesser degree said intermediate portion of said outermost layer thereby bulging outwardly the intermediate portion of said radially outermost layer to produce a substantially wide recess opposite said angularly disposed steps and to crowd said gasket into said recess to fill said recess and the interstices created by said steps to insure against leakage of air through said double seam under severe handling of the container.

DELBERT E. WOBBE.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,623,808	O'Brien	Apr. 5, 1927
2,163,619	Murch	June 27, 1939
2,467,182	Beattie	Apr. 12, 1949