

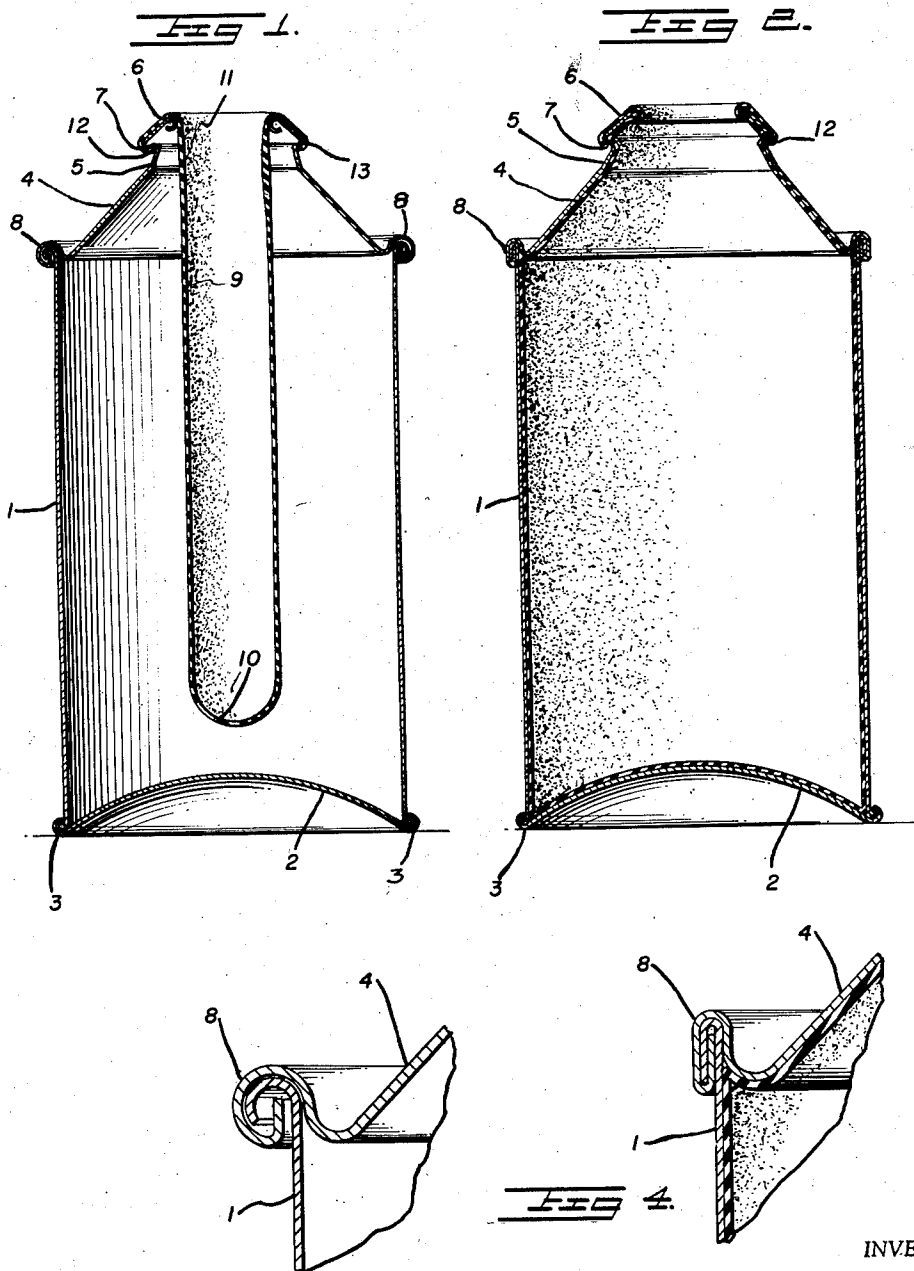
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METHOD OF APPLYING PREFORMED LINER TO A METAL CONTAINER

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METHOD OF APPLYING PREFORMED LINER TO A METAL CONTAINER

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4 Claims. (Cl. 113—120)

The invention relates to new and useful improvements in a method of applying a preformed liner to a metal container.

An object of the invention is to provide a method of removing the air from the space between the wall of a preformed liner inserted in the container and the wall of the container so that the liner may be expanded into and held in intimate contact with the wall of the container.

A further object of the invention is to provide a method of the above type wherein the air is removed through a loosely formed first operation double seam joining an end to the body wall of the container, after which the seam is tightly closed by the well known second operation seaming roll.

A still further object of the invention is to pressurize the interior of the liner to aid in removing the air surrounding the liner through the loosely formed double seam and for causing the intimate contact of the liner with the inner surface of the container.

Another object of the invention is to provide a method of the above type of attaching a preformed liner to the interior wall of the container wherein a coating of adhesive is applied in part or to the entire contacting surface between the liner and the wall of the container.

A still further object of the invention is to produce a container wherein a preformed liner makes intimate contact with the walls of the container.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention:

Figure 1 is a vertical sectional view through the container of the cone-top type showing a preformed liner inserted within the container and attached to the upper end of the neck portion of the container.

Figure 2 is a view similar to Figure 1 but showing the liner as expanded into intimate contact with the inner surface of the wall of the container.

Figure 3 is a sectional view through the top end first operation double seam for loosely connecting the container end to the container body.

Figure 4 is a view similar to Figure 3 showing the liner as expanded into contact with the wall of the container and the second operation applied to the seam for tightly closing the same.

The invention has to do with a method of providing a non-corrosive liner for a sheet metal container. In the drawings there is illustrated one form of container to which a liner has been applied. The container includes a body wall 1 having a lower end 2 secured thereto by a double seam 3. The top end of the container is cone-shaped as indicated at 4. The upper end of the cone-shaped portion 4 terminates in a neck portion 5 which is shaped so as to provide a sealing lip 6 and a retaining shoulder 7 to which a closure cap may be attached for sealing the container. This top end of the container is secured to the body wall 1 by a double seam 8. In

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forming a double seam the flange of the container end and the flange on the body wall are rolled by a first operation roll into a loosely formed seam and then the seam is sealed by rolling the loosely arranged parts into a tight seam by a second operation roll. This is the usual way of forming a double seam. In Figures 1 and 3 the seams are shown as loosely rolled sufficiently to hold the parts together but not to make a tight seam. The liner is made of neoprene or any suitable, stretchable material which is impervious and non-corrosive. The liner is first preformed so as to provide a cylindrical body portion 9 and the closed lower end portion 10. At the upper end of the preformed liner there is a thickened neck portion 11. The body of the preformed liner is inserted through the mouth of the container and the thickened neck portion is folded back outwardly over the lip of the container and beneath a shoulder 12 formed in the neck portion of the container. This outwardly folded portion of the liner extends beneath the shoulder as indicated at 13. After one or both of the ends of the container have been secured to the body wall by a loosely formed seam through which air may be drawn, then the container with the liner attached as shown in Figure 1 is placed in a chamber of a seaming machine, such for example as shown in the patent to G. L. Ardron No. 2,183,903, December 19, 1939.

After the container has been placed in the chamber of the seaming machine a vacuum is drawn on the chamber and this will draw air out of the space between the preformed liner and the body wall through the loosely formed double seam. The neck of the preformed liner is tightly sealed to the container and the drawing of the air from this space between the liner and the body wall will cause the liner to expand until it is brought into intimate contact with the wall of the container. Means is provided in the seaming machine so that atmospheric air may enter the interior of the preformed liner. In fact, if desired, this air may be under slight pressure to aid in the expanding of the preformed liner into intimate contact with the inner surface of the container throughout the entire area thereof. It is preferred that the top and bottom double seams be both loosely formed so as to insure intimate contact with the inner surface of the container.

Very good contact may be had between the liner and the body wall of the container by pressurizing the interior of the preformed liner. As the liner is expanded by the interior pressure thereon it will force the air in the space between the liner and the body wall out through the loosely formed double seam and allow the liner to make intimate contact with the body wall. This pressurizing of the interior of the preformed liner may be accomplished by introducing gas under pressure into the container after which the loosely formed double seam is closed so as to seal the space between the liner and the container wall, which insures that the liner will be retained in intimate contact with the body wall.

Pressurizing of the interior of the preformed liner may also be accomplished by filling same with a liquid or semi-liquid product under pressure. The container may be sealed by applying a cap thereto for retaining pressure on the product. This filled container does not need to have the loose double seam closed because the pressure on the inside of the liner of the capped can keeps the liner in intimate contact with the body wall.

While the invention is principally directed to a method of applying a preformed liner to a metal container, the method also produces a novel article, that is, a container having a preformed liner sealed to the open neck end of the container and forced into intimate contact with the wall of the container by excluding the air from the space between the liner and the body wall through

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a loosely formed double seam and then completing the double seam by a second operation thereon. This sealing of the exit from the space with the air excluded therefrom will cause the liner to be retained in intimate contact with the body wall. This excluding of the air from the space through the loose double seam may be accomplished by drawing a vacuum on the space or by pressurizing the interior surface of the liner and forcing the air from the space out through the loose double seam.

It is obvious that minor changes in the method disclosed and the article produced thereby may be made without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. The method of lining a container having top and bottom ends secured to the body wall by double seaming wherein the top end has a neck portion terminating in an opening comprising securing one of the ends to the body portion by a loose first operation double seam, inserting a preformed liner of stretchable material into the container through said neck opening, attaching and sealing the open end of the preformed liner to said neck portion, removing the air from between the liner and the interior of the container through the loosely formed double seam so that the liner may be expanded into intimate contact with the interior surface of the container and closing the loosely formed double seam to provide an air-tight seal therein immediately upon the removal of the air from the space between the liner and the wall of the container for permanently holding the liner in contact with the wall of the container.

2. The method of lining a container having top and bottom ends secured to the body wall by double seaming wherein the top end has a neck portion terminating in an opening comprising securing one of the ends of the body portion by a loose first operation double seam, inserting a preformed liner of stretchable material into the container through said neck opening, attaching and sealing the open end of the preformed liner to said neck portion, connecting the space between the preformed liner and the wall of the container through the loosely formed double seam with a source of vacuum for withdrawing the air from said space and expanding said liner into intimate contact with the interior surface of the wall of the container, and closing the loosely formed double seam to provide an air-tight seal therein while the space between the liner and the wall of the container is con-

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nected to the source for withdrawing the air thereby to maintain the vacuum necessary to hold the liner against the interior surface of the wall of the container.

3. The method of lining a container having top and bottom ends secured to the body wall by double seaming wherein the top end has a neck portion terminating in an opening comprising securing one of the ends to the body portion by a loose first operation double seam, inserting a preformed liner of stretchable material into the container through said neck opening, attaching and sealing the open end of the preformed liner to said neck portion, pressurizing the interior of the preformed liner for expanding the liner and forcing the air out of the space between the liner and the body wall through the loosely formed double seam and the liner into intimate contact with the body wall and closing the loosely formed double seam to provide an air-tight seal therein while the liner is held in contact with the inner surface of the body wall.

4. The method of lining a container having top and bottom ends secured to the body wall by double seaming wherein the top end has a neck portion terminating in an opening comprising securing one of the ends to the body portion by a loose first operation double seam, inserting a preformed liner of stretchable material into the container through said opening, attaching and sealing the open end of the preformed liner to said neck portion, admitting a liquid or a semi-liquid under pressure to the interior of the preformed liner for expanding the liner and forcing the air out of the space between the liner and the body wall through the loosely formed double seam and the liner into intimate contact with the body wall, applying a closure to the loose double seam to provide an air-tight seal thereat.

References Cited in the file of this patent

UNITED STATES PATENTS

1,452,039	Gravell	Apr. 17, 1923
2,065,293	Scudder	Dec. 22, 1936
2,124,823	Kronquest	July 26, 1938
2,321,408	Mills	June 8, 1943
2,321,836	Marzo	June 15, 1943

FOREIGN PATENTS

430,256	Great Britain	June 17, 1935
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