

July 31, 1951

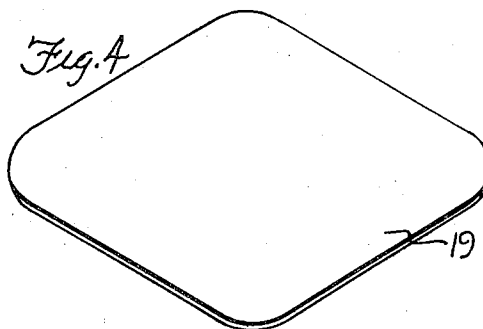
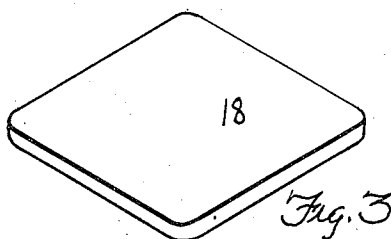
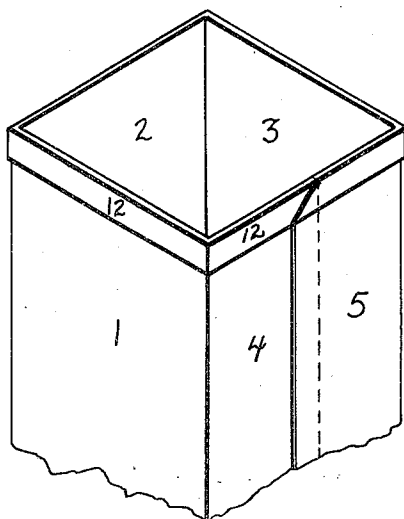
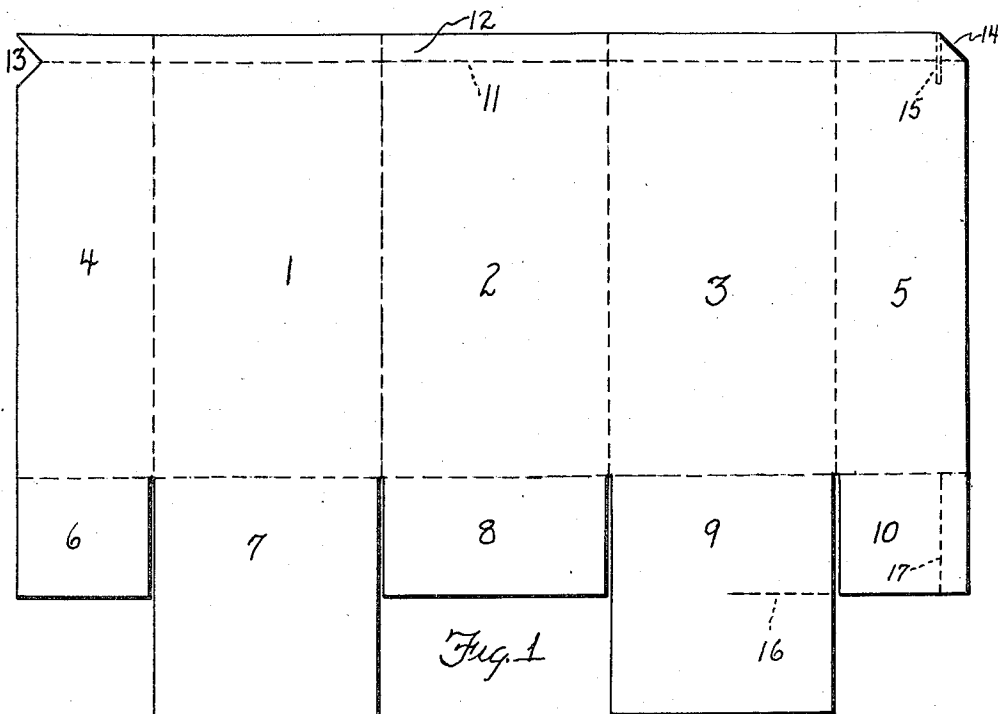
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2,562,579

METHOD OF APPLYING END CLOSURES TO CONTAINERS

Filed Aug. 29, 1944

3 Sheets-Sheet 1



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METHOD OF APPLYING END CLOSURES TO CONTAINERS

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3 Sheets-Sheet 2

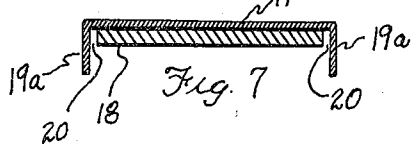
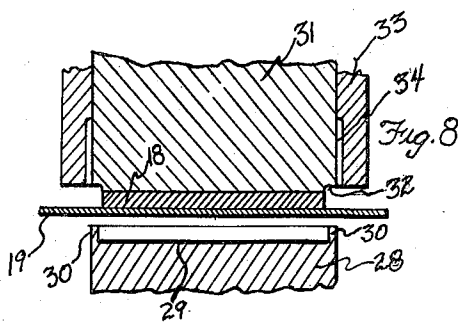
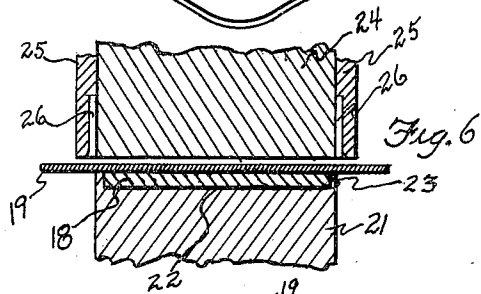
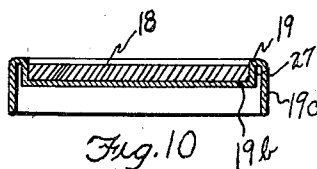
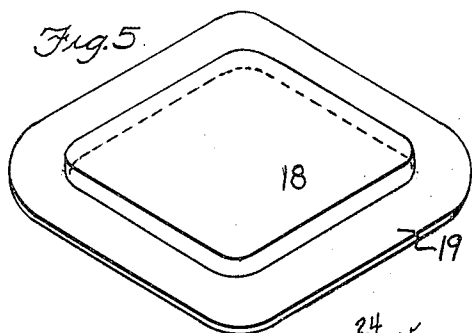


Fig. 9

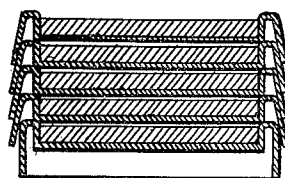
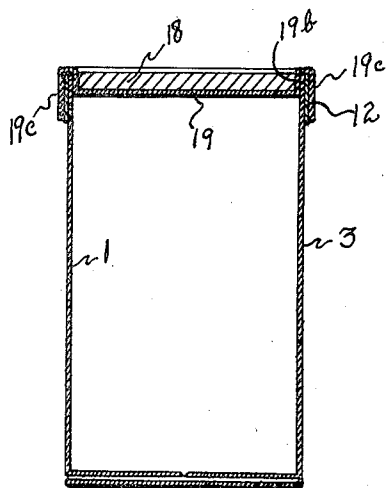
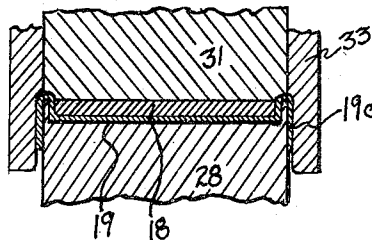


Fig. 11

Fig. 12

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3 Sheets-Sheet 3

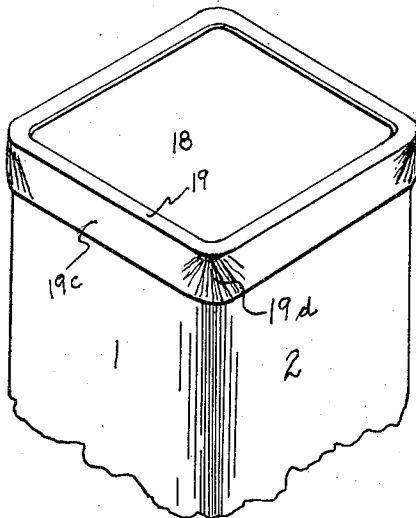


Fig. 13

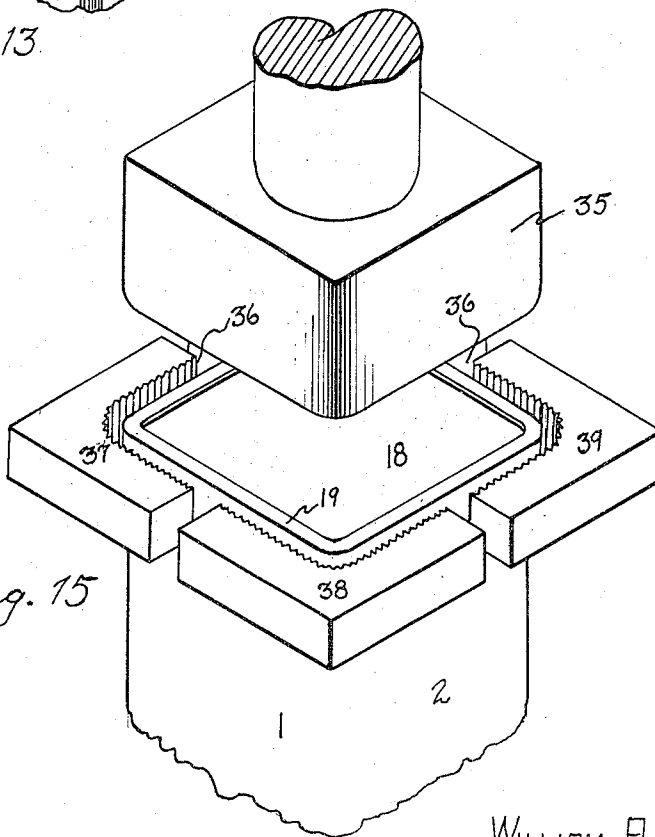
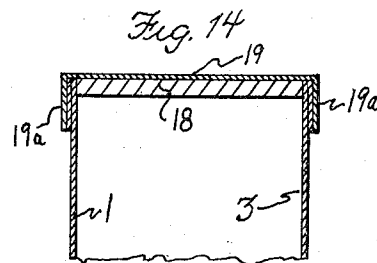


Fig. 15

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2,562,579

METHOD OF APPLYING END CLOSURES TO CONTAINERS

William A. Ringler, Wayne, Pa., assignor to The Gardner Board and Carton Co., a corporation of Ohio

Application August 29, 1944, Serial No. 551,693

2 Claims. (Cl. 93—55.1)

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My invention relates to the provision of liquid-tight containers and to means for their hermetic closure.

In copending applications entitled sealed containers for liquids, Serial No. 536,566, filed May 20, 1944, now abandoned, and containers for solid and liquid products, Serial No. 540,641, filed June 16, 1944, now abandoned, I have described containers comprising essentially a tubular body with means for closure at one end, which tubular body when erected is liquidtight or can be made so, as by dipping into a bath of sealing substance, and a cap style closure adapted to be placed in position in the open end of the body and brought into hermetic relationship therewith.

The principal object of the present invention is the provision of improvements in structures of this general type.

It is an object of my invention to provide a closure structure which is simpler and more positive to use, and in which the effecting of a seal is accomplished more easily and with greater dependability.

Specifically it is an object of my invention to provide a container and closure structure in which the operation of sealing does not entail either the folding of flaps or the crimping of sheet material into radically new forms. Hence, I avoid the dangers to the seal arising from the resilience of the sheet material and the tendency for parts to spring away from each other or to fail of adhesion.

It is an object of my invention to provide closure members capable of accepting and retaining sealing substance in a better fashion and more advantageously placed as well as in larger quantities at the places where the seal is to be effected.

These advantages are obtained while retaining sufficient strength and rigidity in the closure to protect the seal and to permit the use of relatively weak thermoplastic adhesives such as paraffin.

Such objects of my invention and others which will be set forth hereinafter or will be apparent to one skilled in the art upon reading these specifications I accomplish by that construction and arrangement of parts and in that procedure of which I shall now describe certain exemplary embodiments. Reference is made to the drawings wherein:

Figure 1 is a plan view of a blank from which the body of my container may be made.

Figure 2 is a partial perspective of the body in erected form.

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Figure 3 is a perspective view of a filler or rigidifying element for use in a closure.

Figure 4 is a perspective view of a second member of the cap or closure, namely a sheet of paper, boxboard or the like.

Figure 5 shows in perspective the filler adhered to the sheet and ready for a forming operation.

Figure 6 shows in cross section pressure means used in a crimping operation.

Figure 7 is a cross-sectional showing of one type of cap or closure member formed in accordance with my invention.

Figure 8 shows in cross section pressure means used in producing another type of closure member.

Figure 9 shows the pressure means in final relationship in the crimping operation.

Figure 10 is a cross-sectional representation of said other type of closure member.

Figure 11 is a sectional view showing a plurality of said closures in nested relationship.

Figure 12 is a cross sectional view of a container closed by the closure of Figure 10.

Figure 13 is a partial perspective view of a container.

Figure 14 is a partial perspective view of a container closed by the closure of Figure 7.

Figure 15 is a diagrammatic perspective view showing means for effecting a seal.

Referring first to Figure 1, I have shown one form of body blank having walls 1, 2 and 3 in articulation, there being in this instance half walls 4 and 5 articulated to walls 1 and 2, the structure being one which may be tubed by folding on appropriate score lines and partially lapping and adhering the wall portions 4 and 5.

At the bottom of the blank I have in this instance shown a series of closure flaps 6, 7, 8, 9 and 10 forming what are known as seal end flaps for the effecting of a bottom closure. The form of the bottom closure is not a limitation upon my invention, and any suitable type of bottom closure may be employed. It is also within the scope of my invention to make the body in the form of a sleeve open at both ends and to employ on both ends the closure members hereinafter described. In order to provide an upper reinforced edge, a score line 11 is formed near the upper edge of the blank leaving a portion 12 of the walls to be turned over and pasted to the body walls. A notch may be cut in members 4 and 12 as at 13 and the opposite end of the member 12 may be beveled as at 14 for the purpose of providing a smooth upper edge for the body, as more fully described in my copending application Serial No.

536,566 referred to above. The board adjacent laps in the body may be provided with softening score lines 15, 16 and 17 are more fully described in my copending application.

The blank of Figure 1 may be formed of proofed or unproofed board and will be tubed as will be readily understood. The specific blank of Figure 1, having the seal end bottom flaps can be closed on the bottom by means of these flaps and then dipped bodily into a bath of proofing substance. There are many proofing substances, usually of thermoplastic character, which may be employed, and the nature of the proofing and sealing substance is not a limitation upon my invention. The nature of my closures is such, however, that relatively weak sealing and proofing substances may readily be employed. An example of such substances is paraffin wax.

The erected container is partially shown in Figure 2. For closing it, I provide a preformed cap-like structure consisting essentially of two parts. One part is a relatively heavy and stiff filler member designed to contribute rigidity to the top closure, and to support the body walls of the container during the exertion of pressure employed in sealing. The second member is a sheet of board or heavy paper capable of being crimped and formed as hereinafter described. In Figure 3 I have shown a filler member at 18 and in Figure 4 a sheet of board at 19. The filler is adhered to the sheet and positioned centrally thereof, as shown in Figure 5. Each piece may be proofed or treated with a sealing substance prior to their union and the union effected by means of the sealing substance, or the two members may be adhered together by any desired adhesive and the combination thereafter treated with the proofing or sealing substance as by spraying, dipping, or the like.

In one form of my closure the member 18 is cut or stamped to a size to fit snugly within the open end of the sleeve or body. The sheet 19 is then preformed about the filler 18 so as to provide downwardly extending lips, as shown at 19a in Figure 7, the lips being spaced from the filler to provide grooves 20 of a shape and width to accept relatively snugly the upper edges of the container body. The crimping may be done by pressure means including, as shown in Figure 6, a lower die member 21 having a recess 22 to accept the filler member 18, and having peripheral upstanding portions 23 about the recess to define the width and disposition of the groove 20. An upper pressure member 24 has a cross sectional shape and dimensions similar to the member 21 and is brought down from above to hold the closure members 18 and 19 in place. A sliding member 25, recessed as at 26 can now be brought down as will be readily understood to form the closure member into the shape shown in Figure 7 by bending down the lip portions 19a. It will be understood that at the corners of the closure structure a crimping action will take place.

Another form of closure is illustrated in Figure 10 where the filler member 18 is made smaller than the inside cross sectional dimensions of the container body by the thickness of the sheet 19. The sheet is formed upwardly about the filler member as at 19b so that the filler member lies in a recess or pocket in the sheet. Then peripheral portions of the sheet are brought downwardly to form the skirt 19c, there being a groove-like spacing 27 between the parts 19b and 19c to accept the upper edges of the container body. Such a closure may be formed in pressure mem-

bers such as those illustrated in Figures 8 and 9. A lower pressure member 28 is formed with a recess 29 and upstanding edges 30. The closure assembly of Figure 5 is placed in position, and an upper pressure member 31 forces the sheet and the filler down into the recess 29. The upper pressure member is relieved as at 32 to accommodate the board as it passes over the projections 30 of the lower pressure member. When the closure is thus partially formed a third sleeve-like pressure member 33 relieved as at 34 is brought downwardly to complete the formation of the closure. Again at the corners of the skirt portion the sheet 19 will be crimped. This is indicated at 19d in Figure 13.

A series of the nested closure members is illustrated in Figure 11. Figure 12 shows in cross section the closure member of Figure 10 in place on the upper end of a container body. It will be noted that the filler 18 and adjacent portions 19b of the closure sheet enter the open end of the container body while the skirt portion 19c laps the container body externally. The upper edges of the container body walls are recessed in a groove between portions 19b and 19c of the closure member. The filler 18 is of heavy board or other stiff and strong material and it will be noted that the upper end of the container body is very greatly rigidified.

The same action occurs with the closure member of Figure 7 as is indicated in Figure 14. Here the filler member 18 enters the open end of the container body directly while the closure sheet 19 extends across the end of the container body with the skirt portions 19a lapping the container walls exteriorly.

The stamping or forming of the closure members may be done after they have been treated with proofing substance or before, as may be desired. In the latter event, the closure may be put through a bath of paraffin or other thermoplastic coating, or sprayed or otherwise treated with it. If the closure member is first formed and then treated with the sealing substance, there is a tendency for the sealing substance to collect in grooves 20 or 27, and this is of advantage in the formation of dependable hermetic seals.

It will be understood that the sealing substance may be applied either to the container body or to the closure or both and that in any event, the sealing substance applied to one of the members will be of such character as to form a firm bond with the other of the members or with a sealing substance with which it has been coated. My closure members are placed in position on the open end of a container body, as indicated in Figure 12 or 14, and are pressed downwardly thereon and inwardly from the four corners. This is indicated in Figure 13 where the cap member 18, 19 is shown in position on the container body 1, 2. As shown diagrammatically in Figure 15, an overhead pressure member 35 may be brought downwardly to insure the setting of the upper edges of the container body in the groove of the closure member. Sidewise pressure members 36, 37, 38 and 39 are brought inwardly by suitable means to press the skirt portions of the closure member against the body walls of the container.

Where thermoplastic sealing substances are used, provision is made for fusing and re-hardening the sealing substance. This may be done in various ways. The cap or closure members may be warmed before being applied to the con-

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tainer body and the upper edges of the container body may likewise be warmed, if desired, although this is not usually necessary. The pressing members in this instance may be at room temperature or artificially cooled in order to set the thermoplastic adhesive. Or the pressure members may be warmed to fuse or soften the adhesive and then cooled while in pressure exerting position. It is also within the scope of my invention to employ warmed pressure members to soften the thermoplastic coatings, then move the closed container to another position where cooled pressure members operate to set the coating while holding the parts in tight conformation.

One function of the filler members is to rigidify the upper portion of the container during the exertion of pressure during sealing. Another function of the filler members is to prevent racking of the sealed container so as to protect seals made with relatively weak thermoplastics such as paraffin.

Modifications may be made in my invention without departing from the spirit of it. Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A process of forming an hermetically sealed polygonal paperboard container which comprises providing an open-ended polygonal tubular body of fibrous material having body walls in articulation, end portions of said body walls being of double thickness and presenting at one end folded coplanar edges, and a closure therefor comprising a relatively rigid polygonal filler and a sheet of fibrous material, said closure being in preformed condition and presenting a polygonal portion for entering the end of said container, a

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continuous groove from one side for accepting the upper edges of said container body walls, and a skirt portion for lapping the double thickness end portions of said container body walls on the exterior of said container body, positioning the closure on the container body with the interposition of a sealing adhesive, effecting a primary hermetic seal by exerting pressure peripherally on said closure member so as to seal the folded edge portions of said body walls against the base of said groove, and effecting a supplementary seal by pressing inwardly on the skirt portions of said closure, said inward pressure being resisted by said polygonal filler.

2. The process claimed in claim 1 in which said adhesive is paraffin.

WILLIAM A. RINGLER.

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