

Feb. 15, 1966

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3,235,121

CONTAINER CLOSURE STRUCTURE

Filed Oct. 8, 1963

2 Sheets-Sheet 1

FIG. 1

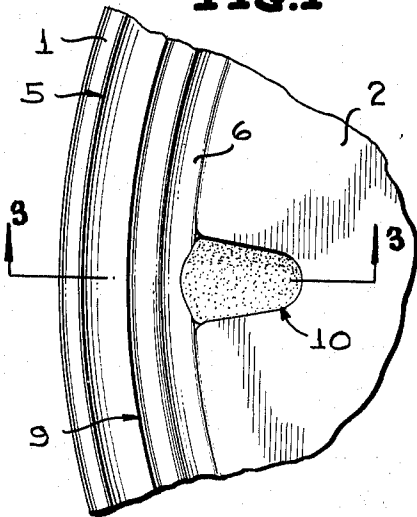


FIG. 2

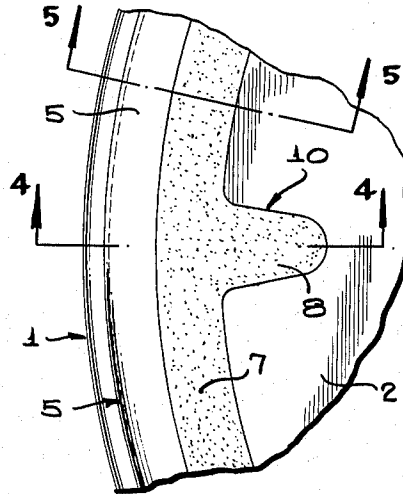


FIG. 3

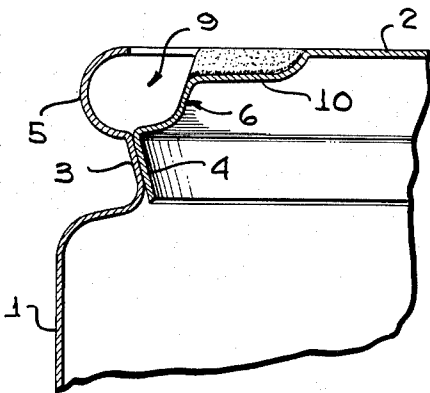


FIG. 4

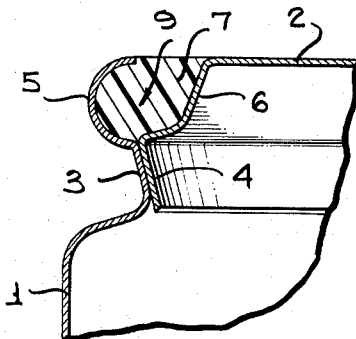
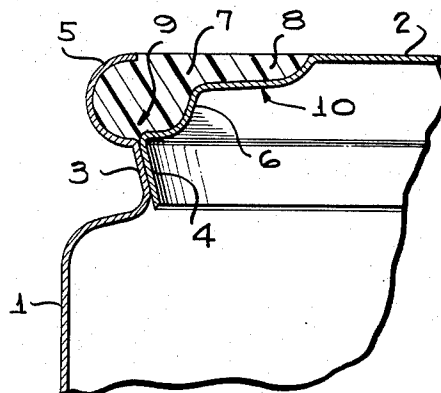


FIG. 5

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FIG. 6

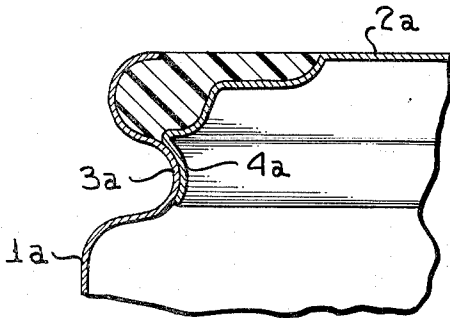


FIG. 7

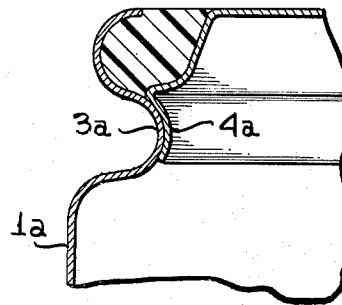


FIG. 8

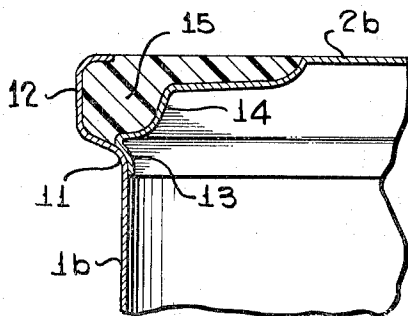


FIG. 10

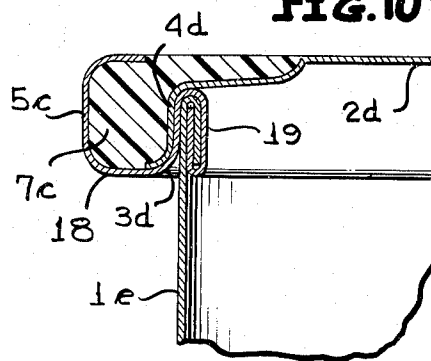
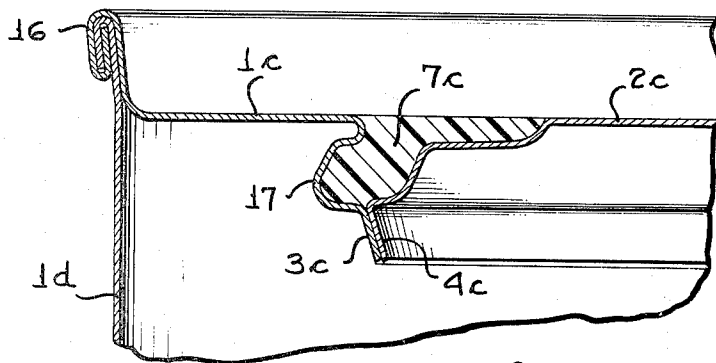


FIG. 9



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CONTAINER CLOSURE STRUCTURE

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Sch 32,309

8 Claims. (Cl. 220—47)

The present invention has for an object the provision of a novel can or container and a lid with a ring of rubber or resin disposed between the step-edge of the lid and the beaded edge of the can and which serves simultaneously to seal and attach the lid, which ring may be pulled out, if one wishes to open the can, by aid of a tongue, said pulling out occurring through an opening or slit which is narrow in relation to the cross section of the ring and located between the can and the lid.

Cans of this general type are known in the prior art, but they have not been entirely satisfactory because even in those cases in which a lid of metal would not be needed, it has been necessary to employ a metal lid, because in the process of attaching the lid the edge of the lid must be slightly flanged or beaded.

The present invention proposes to solve the problems and setbacks encountered in the mentioned known cans, and provide a novel arrangement of parts such that in the manufacture of the lids and of the can bodies one may use any kind of material, and the choice of such material simply is dictated by the intended contents of the cans, and furthermore the particular general shape of the can body will not affect in any way efficient closing of the can.

The mentioned problems attending manufacture and use of previously known cans have been solved by provision of novel can structure according to the invention including the sealing and attaching ring feature, the ring lying between a stiffening corrugation of the flanged edge of the can, which corrugation has approximately a C-shaped cross section, or between the lid ring which is connected to the can, and one step of the lid-edge which is curved in the direction opposite to the stiffening corrugation, which lid edge forms part of the press-in-lid or the inverted lid, an opening-slit or opening always being left in the height of the smooth portion of the lid in such manner that the greatest diameter of the lid edge is never greater than the diameter of the edge of the opening, and there are provided contacting surfaces at the edge of the opening and at the lid edge, which collaborate with each other for the purpose of centering and for the placing of said press-in-lid or inverted lid, which contacting surfaces have been prepared preferably by rolling, beading or corrugating.

The invention provides furthermore that this new type of can is equipped with a sealing and lid attaching ring which is applied in the liquid or plastic state, hardened after such application.

By shaping this novel can in the manner stated not only are the setbacks of the previously known cans avoided, but there are provided new and novel cans having completely new properties. The new cans are filled just like the cans of prior art. Thereafter the lids, either of the press-in or inverted types are properly pressed into the can or are forcefully put into the proper inverted position, whereby the collaborating contacting surfaces at the edge of the opening of a given can and at the step-edge of the cooperating lid will assure that the lid reaches the desired position, by reason of the collaboration of said surfaces. In the final sealing, the material from which the sealing and attaching ring is formed, is applied in the liquid or plastic state into the

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interstitial space, which is formed, both at the pressed-in and the inverted lids, between the C-shaped corrugation at the edge of the opening of the cans and the portion of the step-edge of the lid which is curved in the opposite direction. The liquid or plastic mass is made to flow, or is pressed, into this interstitial space across the small opening slit which is located in the height of the smooth portion of the lid. Once the mass applied to the interstitial space has hardened, the cans are closed and sealed, and no other operational step in which a lid or any other part must undergo a deformation is necessary, and there is no occasion for the rings to come under any kind of mechanical stress or strain which might result in damage or destruction of the rings. This means that one operates under conditions which render almost impossible the provision of leaky cans, and furthermore provision is made for closing the cans at operational speeds previously unknown in the use of any cans of comparable type in the known art.

Once one of these new cans has been opened by pulling out the sealing ring, then by pressing the lid in again, or, respectively, by again pressing it on in the inverted position, one may create anew a practical sealing of the can. This is impossible in the use of any can presently known in the prior art, because in the case of such known cans once one has torn the zipper, the metal strip or the like, the lids can be placed upon them only loosely, and then there is always the risk that the lids will drop off at the slightest provocation. Thus, as far as the consumer is concerned, these new cans offer great advantages, in uses wherein the content of a can is to be removed portion by portion.

According to another feature of the invention the collaborating contacting surfaces at the edge of the opening of the can and at the step-edge of the lid may be constructed according to the principle of a snap-on closure. This construction of the new type of can will be especially advantageous when the can content is to be used in small portions, and when the can is to be opened and closed rather frequently.

Another feature of the invention resides in providing in the flat, smooth portion of the lid a recess for the formation and the accommodation of the tongue of the ring. By shaping the can in this manner the tongue of the ring is shaped properly when the lid sealing and attaching mass flows into this space wherein the ring is received and shaped. It is suitable when doing this to coat the tongue extension receiving recess in the flat portion of the lid with a repelling coating, such as talcum or the like, so as to avoid sticking of the tongue to the lid in such manner as to prevent the intended lifting of the tongue preparatory to unsealing and opening of the can.

The stated arrangement of the tongue of the ring also provides the advantage that the tongue will not protrude beyond the outer outlines of the can. Thus the can is protected during storage, transportation or the like, against damage and unintentional opening.

This new type of placing of the tongue leads furthermore to the advantage that the cans can be piled up just like ordinary cans, and that during such piling no special precautions against displacement of the tongues have to be undertaken.

According to another feature of the invention the lid is formed in two pieces, a center piece fitting within and sealed in and attached to a ring-like body according to the invention, said ring-like body, with the attached and sealed in center piece, being attached to or subject to attachment to the can body by conventional seaming or beading practices. The center piece and the surrounding ring-like body have cooperatively engaging supporting

wall surfaces, and are shaped to provide between them the recessing in which to receive the sealing mass which serves to seal the center piece within the ring-like body and to attach the center piece to the ring-like body before removal or stripping out of the mass. By thus practicing the invention it becomes possible to impart to the can or container any desired shape. It becomes possible to provide one lid unit from a center lid piece and the ring when one lets the sealing mass flow into the interstitial space, and once the mass has hardened, this composite lid unit can be connected to the body of the can just like a normal conventional lid. Therefore, installations and devices presently known in the art and conventionally used in closing containers by an act of flanging or beading, may be employed just as they were before, and the only change occurring is that one no longer employs the lids known to the prior art, but rather the herein disclosed new lid units.

The new type of construction of the cans according to the invention is not limited to cans formed of sheet metals, but may be used also in containers formed of other materials such as glass, ceramic masses, resins or the like in just the same way.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawing.

In the drawings:

FIGURE 1 is a fragmentary plan view illustrating one embodiment of the invention, the can and lid being shown assembled prior to sealing.

FIGURE 2 is a view similar to FIGURE 1 but showing the condition after the filling in of the lid sealing and attaching mass.

FIGURE 3 is a vertical cross section taken on the line 3—3 on FIGURE 1.

FIGURE 4 is a view similar to FIGURE 3 but showing the sealed container of FIGURE 2, the section being taken on the line 4—4 on FIGURE 2.

FIGURE 5 is a vertical cross section taken on the line 5—5 on FIGURE 2.

FIGURES 6 and 7 are views similar to FIGURES 4 and 5 but showing a modified form of the invention wherein the cooperating supporting surfaces on the lid and can are shaped to provide a closure of the snap-on type.

FIGURE 8 is a view similar to FIGURE 6 and showing another modification of the invention wherein the can body is offset outwardly at its open mouth so as to provide a shoulder on which the lid can rest and also recessing in which to receive the lid sealing and attaching mass.

FIGURE 9 is a fragmentary vertical cross section showing another embodiment of the invention wherein the lid is a composite structure made up of a central closure portion and a surrounding lid-ring, the lid-ring and the central closure portion having cooperating, mutually engageable supporting surfaces and also cooperating recessing wherein to receive the mass of material which attaches the central closure portion to the lid ring and seals the same therein.

FIGURE 10 is a view similar to FIGURE 6 and showing still another modification of the invention embodying a lid-ring and a lid of inverted type sealed within and attached to the lid-ring.

FIGURES 1 through 5 show a can body 1 and a lid 2. Instead of flanging or beading usually provided in cans of prior art, for attaching a lid, the upper end of the herein disclosed can body is equipped with a corrugated indent or reinforcing wall 3 which protrudes into the can and is tapered downwardly and inwardly as shown. The reinforcing wall forms inside the can a contacting or centering surface for the cooperating correspondingly tapered counter surface 4 of the lid 2, which surface 4 is

located at the stepped edge or peripheral extremity of the lid. Above the corrugated reinforcing wall 3 the body of the can runs out into a corrugation or bead 5, which protrudes towards the outside, or in other words opens inward, and is C-shaped in radial cross section. When the lid 2 is pressed into the closing position shown in FIGURES 3 and 4, then opposite the corrugation 5 will be located a step 6 of opposite curvature, at the periphery of the step of the lid. The corrugation 5 and the step 6 circumscribe a hollow space for the accommodation of a lid sealing and attaching ring 7 which includes a radially inwardly projecting tongue 8, so that one may grasp the tongue and pull out the ring 7 across the opening slit 9 between the opening edge of the can and the lid. The tongue 8 is located in a deep recess 10 formed in the flat portion of the lid, and this recess, just as the hollow space, serve together as a mold, so to speak, for the formation of the ring 7 and the tongue 8, whenever the material from which the ring is formed is filled-in in the liquid or the plastic state. The edge of the opening of the can is dimensioned so that one may remove the lid without any trouble once the ring 7 has been pulled out of or stripped from the hollow space in which it was molded and served as a sealing and attaching means.

By reason of the shaping of the C-shaped reinforcement 5 and the step 6 a ring 7 is formed as soon as the liquid or plastic mass flows into the hollow receiving space, which ring is more or less annular. This ring will retain the lid strongly in its position and will simultaneously form a tight seal upon the can.

In FIGURES 6 and 7 there is shown a can which is distinguished over the one shown in FIGURES 1 to 5 in that it not only can be closed and opened repeatedly, but this repeated opening and closing can be accomplished with a snap action. In order to bring this about the corrugated reinforcement 3^a at the body of the can 1^a and the lid step 4^a at the edge of the lid 2^a are shaped in a curved manner, so that they cooperate with each other in the manner of a snap closure.

The embodiment of the novel can shown in FIGURE 8, excels by reason of its extreme simplicity. The corrugated reinforcing which in the previously described cans protrudes towards the inside and forms the contacting surface for the centering of the lid, is replaced by the shoulder 11, which is created by reshaping the reinforcing 12 which protrudes towards the outside. This reinforcing starts right from the body 1^b of the can and forms one upper portion of the can body which has a widened diameter. The lid 2^b is shaped at 13 to rest on the shoulder 11 and is stepped at 14 to cooperate with the enlargement 12 in providing a molding chamber in which to receive the sealing and attaching ring 15.

In FIGURE 9 a can is shown which is equipped with a composite lid including a lid-ring 1^c, which serves to accommodate an insertion lid or center piece 2^c. The lid ring 1^c is attached to the body 1^d of the can by aid of a double hammered down edge, known in the prior art as a double seam. This embodiment is suitable in large diameter cans or with oval or polygonal cross sections. The lid ring 1^c carries at the side which faces the lid 2^c a reinforcing corrugation 17 which has a cross section approximately like the letter "C," and serves to accommodate the ring 7^c and one also notices there a contacting surface 3^c which will collaborate with the correspondingly shaped supporting or counter-surface 4^c at the step-edge of the lid 2^c. The shape of these two contacting surfaces may be as shown in FIGURE 3 or as in FIGURE 6, depending upon the intended purposes.

In FIGURE 10 is shown still another embodiment of the invention wherein the can is equipped with a lid-ring 18 for the accommodation of an inverted lid 2^d. This lid-ring 18, just like the lid-ring 1^c, is attached at the beaded edge of the body 1^e of the can by aid of a double hammered down edge or double seam 19. The C-shaped

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reinforcing 5^c in this embodiment is located outwardly of the body of the can. The collaborating contacting surfaces 3^a and 4^a are provided in this case at the suitable opposing portion of the lid ring and the stepped edge of the lid 2^a as shown and provision is made for receiving the sealing and attaching ring at 7^c.

It will be apparent from the foregoing, and by reference to the drawings that the lid and body of the container structure have portions mutually engageable as at 3, 4 in FIGURES 1, 3, 4 and 5, 3^a, 4^a in FIGURES 6 and 7, 11, 13 as in FIGURE 8, 3^c, 4^c as in FIGURE 9, and as at 3^d, 4^d in FIGURE 10 to support the lid in body closing position. These will be recognized as optional taper-flare portions or "snap in" reclosure providing portions.

The lid and body have annularly opposing recess portions such as 5, 6 of FIGURES 1, 3, 4 and 5 and like portions of FIGURES 6 and 7, 12, 14 of FIGURE 8 and within the portions 17 and 5^c of FIGURES 9 and 10, respectively, between which to provide the annular channel wherein the sealing ring 7, 15 or 7^c is molded and retained as a lid attaching key. It will be noted that the sealing ring engages over and seals the slit provided by cooperative engagement of the previously mentioned mutually engageable lid and body portions.

The sealing and keying ring is formed of rubbery material which is deformable to an extent for permitting a pulling out of the ring, in a single piece and through the restricted outlet opening upwardly out of the channel, the channel and the key holding restriction being provided by the cooperative shaping of the beforementioned annularly opposing recessing of the container body and lid. It is to be understood that in the sealing of the container closure there are three steps: Initially, to position the lid in and on its supporting means, thereby to close the container and provide the sealing and attaching ring receiving channel. The second step is to fill the channel or groove with the rubber or resin in the form of a liquid mass, or in other words to "flow in" the ring mass. Then the ring mass is caused to harden or set to its final shape retaining but deformable consistency, sealing the slit between the cooperatively engaging body and lid support portions and forming the desired lid attaching key within the receiving channel. In order to overcome any objectionable tendency for the ring to adhere in the channel or its extension into the lid recess 10, talc or any other resist may be employed, the same being applied wherever any sticking tendency may be most objectionable, as in the lid recess.

While examples of preferred and modified embodiments of the invention are disclosed herein, it is to be understood that changes and modifications of the disclosed embodiments may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A container structure comprising a body and a lid, said lid being stepped and said body having a reinforcing corrugation which is generally "C" shaped in cross section and opposed to the lid step to provide therewith a receiving channel, said lid fitting within the body at the juncture of the "C" shaped corrugation by way of cooperating taper-flare portions on the lid and body to form a support for the lid and defining an annular slit, a ring of rubbery material molded in the channel and sealing over the slit, and the upper extremity of the corrugation overlying the ring to hold it in place as a slit sealing and lid attaching key.

2. A container structure comprising a body and a lid, said lid being stepped and said body having a reinforcing corrugation which is generally "C" shaped in cross section and opposed to the lid step to provide therewith a receiving channel, said "C" shaped corrugation merging with a reversed corrugation which is generally "C" shaped in cross-section, said reversed corrugation forming a

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shoulder for receiving said lid, said lid step being curved as to mate with said reversed corrugation, said lid fitting within the body in the form of a "snap in" reclosure at the juncture of the reversed corrugation to form a support for the lid and defining an annular slit, a ring of rubbery material molded in the channel and sealing over the slit, and the upper extremity of the reinforcing corrugation overlying the ring to hold it in place as a slit sealing and lid attaching key.

3. A container structure comprising a body and a lid, said lid being stepped and said body having a reinforcing corrugation which is generally "C" shaped in cross section and opposed to the lid step to provide therewith a receiving channel, said receiving channel being formed in part in a ring which is attached to the upper end extremity of the body and is offset outwardly from said body, said lid fitting within the body at the juncture of the "C" shaped corrugation to form a support for the lid and defining an annular slit, a ring of rubbery material molded in the channel and sealing over the slit, and the upper extremity of the corrugation overlying the ring to hold it in place as a slit sealing and lid attaching key.

4. A container structure comprising a body and a lid, said lid being stepped and said body having a reinforcing corrugation which is generally "C" shaped in cross section and opposed to the lid step to provide therewith a receiving channel, said lid fitting within the body at the juncture of the "C" shaped corrugation to form a support for the lid and defining an annular slit, a ring of rubbery material in the channel and sealing over the slit, and the upper extremity of the corrugation overlying the ring to hold it in place as a slit sealing and lid attaching key, wherein said sealing and keying ring being molded in the channel and the lid having a recess therein into which the molded ring extends to provide a pull tongue by which the ring can be pulled from the channel to unseal the container.

5. A container structure comprising a body and a lid, said lid being stepped and said body having a reinforcing corrugation which is generally "C" shaped in cross section and opposed to the lid step to provide therewith a receiving channel, said lid fitting within the body at the juncture of the "C" shaped corrugation to form a support for the lid and defining an annular slit, a ring of rubbery material in the channel and sealing over the slit, and the upper extremity of the corrugation overlying the ring to hold it in place as a slit sealing and lid attaching key, said sealing and keying ring being molded in the channel and the lid having a recess therein into which the molded ring extends to provide a pull tongue by which the ring can be pulled from the channel to unseal the container, and also including in the pull tongue receiving recess of the lid a resist effective to keep the tongue free in its receiving recess.

6. A container structure comprising a body and a lid, said lid being stepped and said body having a reinforcing corrugation which is generally "C" shaped in cross section and opposed to the lid step to provide therewith a receiving channel, said lid fitting within the body at the juncture of the "C" shaped corrugation by way of cooperating taper-flare portions on the lid and body to form a support for the lid and defining an annular slit, a ring of rubbery material molded in the channel and sealing over the slit, the upper extremity of the corrugation overlying the ring to hold it in place as a slit sealing and lid attaching key, and the upper extremities of the corrugation, the lid and the rubbery material lying in substantially the same plane and exhibiting a smooth surface for permitting stacking of successive containers.

7. A container structure comprising a body and a lid, said lid being stepped and said body having a reinforcing corrugation which is generally "C" shaped in cross section and opposed to the lid step to provide therewith a receiving channel, said "C" shaped corrugation merging with a reversed corrugation which is generally "C" shaped

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in cross-section, said reversed corrugation forming a shoulder for receiving said lid, said lid step being curved as to mate with said reversed corrugation, said lid fitting within the body in the form of a snap-in reclosure at the juncture of the reversed corrugation to form a support 5 for the lid and defining an annular slit, a ring of rubbery material molded in the channel and sealing over the slit, the upper extremity of the corrugation overlying the ring to hold it in place as a slit sealing and lid attaching key, and the upper extremities of the corrugation, the lid and 10 the rubbery material lying in substantially the same plane and exhibiting a smooth surface for permitting stacking of successive containers.

8. A container structure comprising a body and a lid, said lid being stepped and said body having a reinforcing corrugation which is generally "C" shaped in cross section and opposed to the lid step to provide therewith a receiving channel, said receiving channel being formed in part in a ring which is attached to the upper end extremity of the body, said lid fitting within the body at the juncture of the "C" shaped corrugation to form a support 15 for the lid and defining an annular slit, a ring of rubbery

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material molded in the channel and sealing over the slit, the upper extremity of the corrugation overlying the ring to hold it in place as a slit sealing and lid attaching key and the upper extremities of the corrugation, the lid and the rubbery material lying in substantially the same plane and exhibiting a smooth surface for permitting stacking of successive containers.

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