

[54] **STERILIZABLE PACKAGE**

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[51] **Int. Cl.**..... **B65d 5/64**

[58] **Field of Search**..... **229/3.5 R, 3.5 MF, 14 BL,**
229/16 R, 16 A, 43

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[57] **ABSTRACT**

There is disclosed a sterilizable container for food-stuffs or the like and comprising a container bowl open at the top and having a circumferential upper edge which is connectable to a lid to form a tight closed unit. The container bowl comprises a cardboard base which is of a particular configuration and provided with crease lines and which is hermetically sealed between two layers of moisture impervious film; the edges of the film extending for a distance beyond the cardboard base so as to provide a portion to which the sealing lid is joined after the base is formed into its finished shape and the container is filled with suitable contents. Also disclosed is a method for fabricating the container, filling it and sealing it.

9 Claims, 8 Drawing Figures

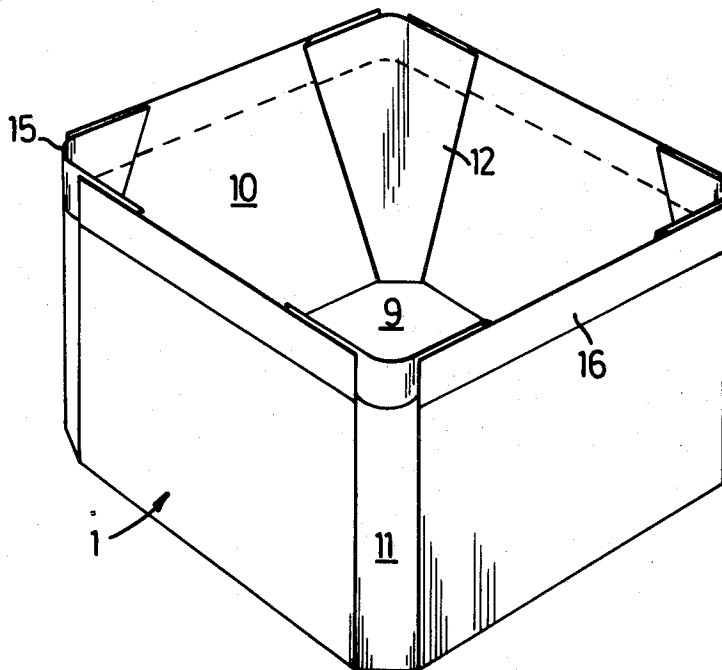


Fig. 1

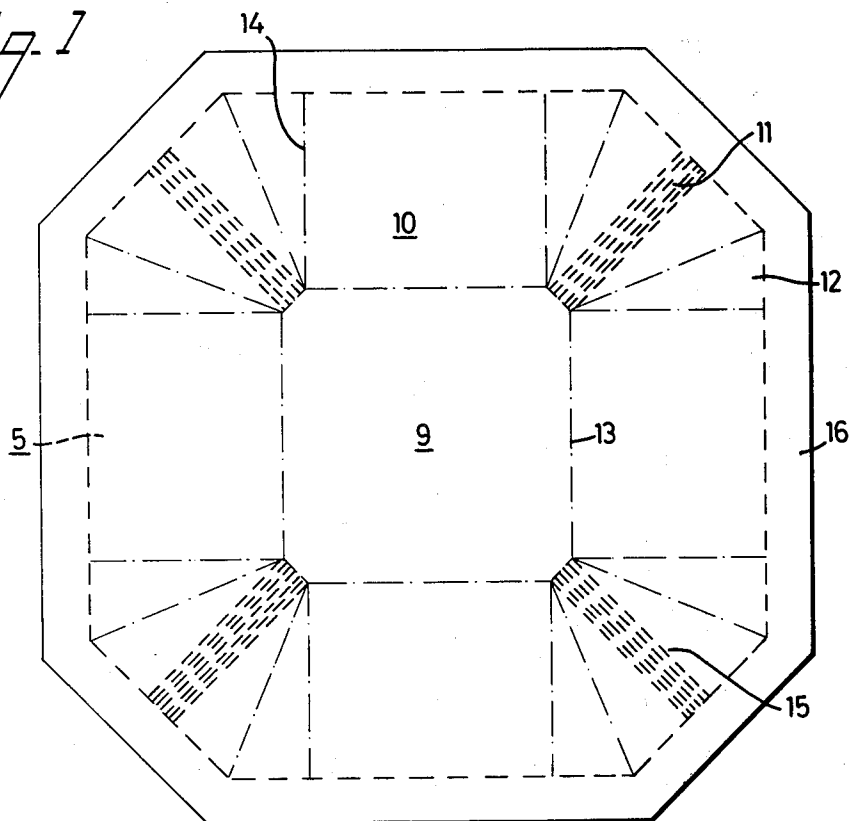


Fig. 2

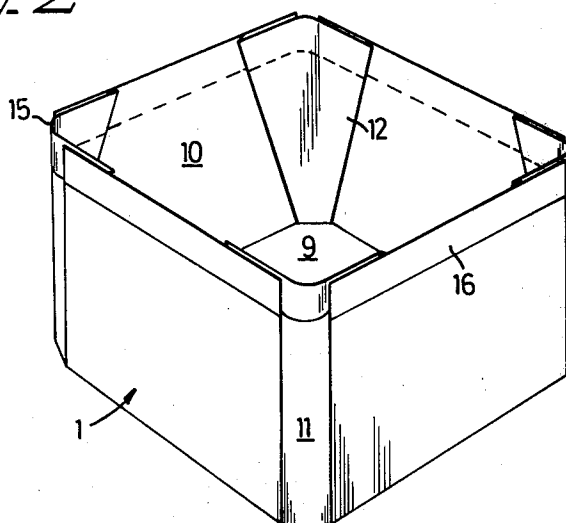


Fig. 3

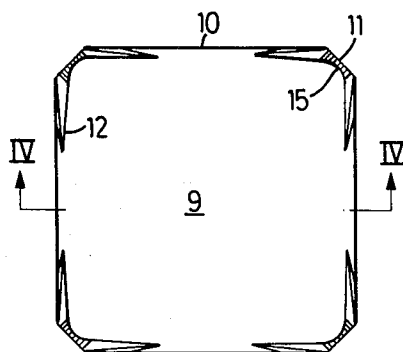


Fig. 4

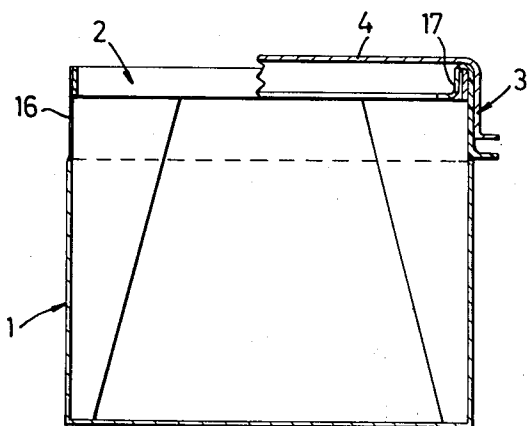


Fig. 5

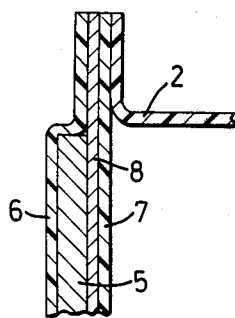


Fig. 6

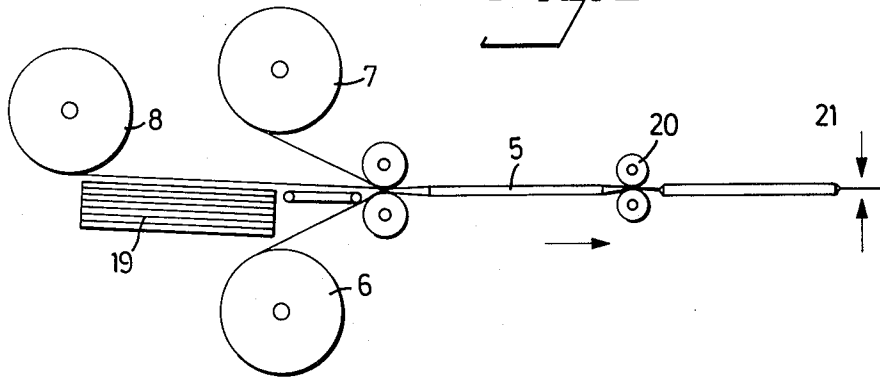


Fig. 7

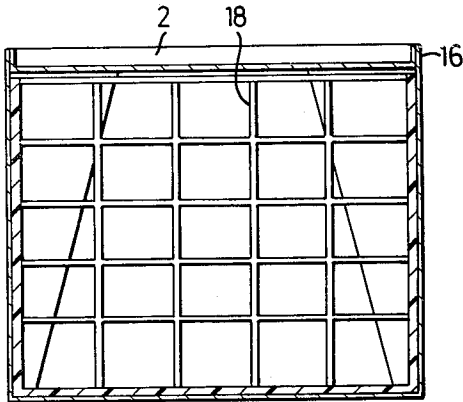
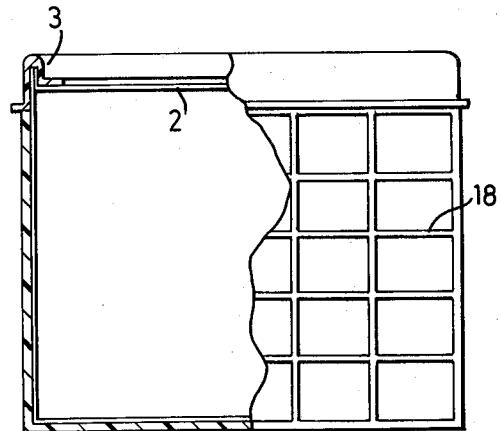


Fig. 8



STERILIZABLE PACKAGE

The present invention refers to a sterilizable container especially intended for food-stuffs and comprising a container bowl open at the top, which bowl is made of a liquid-tight material and which along the upper edge thereof is connected to a lid to form a tight, closed unit.

The invention is more particularly directed to such a container which is made of a base of cardboard or similar stiff material and a liquid and gas-tight lining of a thin and easily formable material. The invention also refers to a method of manufacturing such containers.

Containers of the above mentioned kind are previously known which are made of a container blank of cardboard or similar stiff material comprising a number of wall panels and bottom closure flaps and top closure flaps which are integral with the said wallpanels and which together form the bottom and the top, respectively, of the finished container. Generally, a lining of plastic or similar thin and easily formable tight material is attached to one or two of the walls of the outer container, whereupon the container is folded together, erected and closed at the bottom.

Such containers are disadvantageous in several respects. Due to the several joints both in the lining and the outer container extending along the side panels and the bottom and top of the container, it is difficult to get such a container completely tight. Further, since the lining is resting loosely against the outer container at least along two sides and the bottom and top, and since the lining under normal conditions cannot completely fill the interior of the outer container, the lining with its contents may move during transportation or handling of the container, and this sometimes leads to a rupture of the lining due to friction damage, whereby the lining begins to leak. Since, further, the lining can normally not be made to penetrate closely into the corners of the outer container, there will be some stretching in the lining when closing the bottom and top of the container, and the said stretching causes a thinning of the lining at such spots and there will be an increased risk of penetration of the lining with subsequent leakage.

In order to provide a container which is as tight as possible, it has been proposed that the container should be formed as an integral flat container blank having a central bottom and side pieces, corner panels and corner fold pieces integral with the said central bottom without being parted therefrom and a lining which is attached at points at least to the bottom. When raising the side pieces and the corner panels and folding in the corner fold pieces a completely tight container bowl without joints is obtained which may later be provided with a sealing lid. Also, with such prior art containers there is, however, a risk that the lining moves during transportation or handling which may cause rupture of the lining and subsequent leakage. Since, further, the outer container is made of cardboard, such a container is not very suited for sterilizing which is usually accomplished by means of super-heated steam, since the hygroscopic cardboard material will then absorb liquid and be damaged.

Consequently, containers of this kind have not previously been used for packing such products which ought to be sterilized. Instead, in such cases, containers or packages of thin stiff plastic material have usually been used. The latter packages are essentially more expen-

sive to manufacture and require more complicated and difficult to handle machines or equipment during manufacture, filling and sealing than is the case with the above-mentioned lined cardboard containers.

The present invention, therefore, concerns the problem of providing a lined cardboard container which is suited for packing of products which are to be sterilized and which container may be manufactured quickly and simply at a comparatively low cost by means of conventional machines.

The solution of this problem is, according to the invention, to provide a container blank comprising at least two liquid tight layers of a thin and easily formable material which between themselves enclose a stabilizing cardboard material, whereby the cardboard material and the two cover materials or foils are connected to form a solid unit, and in addition thereto the solution of the problem is that the combined container unit is formed as an unbroken unit including bottom and side pieces, corner panels and corner fold pieces which are integral with the bottom and which when raised form a completely tight container bowl, and further that the stabilizing cardboard material leaves a border free round the upper edge of the container, so that the said border part is composed only by the thin foils which may easily be connected to a lid piece so as to form a tight and closed container.

Further characteristics of the invention will be evident from the following detailed description in which reference will be made to the accompanying drawings.

In the drawings

FIG. 1 shows a plain blank for a container according to the invention.

FIG. 2 shows in a perspective view a raised container bowl made of the blank shown in FIG. 1.

FIG. 3 shows the container bowl of FIG. 2 from above.

FIG. 4 is a partial cross-section view of the container of FIG. 3 seen along line IV—IV.

FIG. 5 is a partial cross-section showing the structure of a container side and the lid associated therewith.

FIG. 6 is a diagrammatical showing of an apparatus for manufacturing blanks for the container.

FIGS. 7 and 8 are cross-sectional views showing alternative embodiments of the container according to FIGS. 1-4.

The container shown in the drawings generally comprises a container bowl 1, a lid seal foil 2 and an upper edge strengthening means 3. The container bowl may further be provided with a re-closable lid, which does not however form a part of the invention.

The container bowl is made of a plain blank without joints, and the blank is made of at least two thin and easily formable foils which between themselves hermetically enclose a stiffening means of cardboard. As is best evident from FIG. 5, a stiffening means 5 is thus enclosed between an outer foil 6 and an inner foil 7, which foils may be of the same or different kinds and consist of a thin and easily formable material like a plastic material. It is required that the said foils must be completely free of smell and taste so that the package can be used for food stuffs, aromatic compounds and the like, and in addition it is required that the said foils can stand the high temperatures at which the finished container is to be sterilized without being subjected to mechanical or chemical transformation. Normally the sterilizing process takes place at about 121°C, which

means that the foils must be heat resistant up to at least 130°C. For this purpose it has been found suitable to use ethylene materials which are heat resistant up to at least 130°C or polypropylene materials which are heat resistant up to at least 150°C. Other plastic materials may also be used.

There are very strong requirements of tightness in a container for sterilized products and, in order to prevent osmosis or other activity which may occur through the plastic material, a foil of an inert metal like an aluminum foil 8 is interposed between the cardboard stiffening means 5 and the inner plastic foil 7. Usually the inner foil 7 and the aluminum foil 8 are supplied as a combined laminate and are thereby considered and treated as one unit.

In FIG. 1 there is shown one embodiment of a blank for a container bowl which is formed as an integral unit and comprises a bottom 9 and four bowl sides 10 integral therewith, four corner panels 11 and, between the corner panels 11 and the bowl sides 10, corner fold pieces 12. The bowl sides 10 and the corner panels 11 are delimited from the bowl bottom 9 by creasing lines 13, and the corner panels 11 are in the same way delimited from the bowl sides 10 by creasing lines 14. At the bottom of the container the corner panels 11 form an angle of 45° with respect to the adjacent bottom sides but in order to provide a rounded form of the corner panels 11 at the upper edge of the container, the said panels are formed with several parallel creasing lines 15 which make it possible to obtain a round form as shown for instance in FIGS. 2 and 3. The outer form of the blank for the container bowl is such that the bowl in the erected state provides an even upper edge.

The cardboard material is substantially thicker than the foil 6, 7 and 8 and in order to avoid stretching in the foils or any creap leakages which may arise when a thick material is bent in sharp folds, the cardboard stiffening means 5 is smaller than the outer foil 6, the inner foil 7 and the aluminum foil 8, and is placed centrally between the said foils. In an erected container there is formed a thin upper edge 16 around the container, which edge is only composed of the three foils 6, 7 and 8. The total thickness of the said three foils is so small that the unit may be bent with sharp folds without the risk that creap leakages will arise at the said folds. Contributing to this is the fact that all the foils are easily bendable and have essentially better elasticity than is the case with the cardboard stiffening means 5.

The forming of the creasing in the blank to form the container bowl may take place only by shaping the cardboard stiffening means before this is joined in between the foils 6, 7 and 8, but the actual folding suitably takes place after the joining of the cardboard stiffening means between said foils.

Since the container is to be subjected to temperatures of about 120°C, it is of importance that the cardboard stiffening means 5 contain very little air and a very little amount of water, since otherwise air or steam bubbles may arise between the cardboard stiffening means and the foil. Usually the cardboard material has an amount of moisture of 50-60%, but for present purposes the amount of moisture should be as low as 4%. If considered necessary, the cardboard material may therefore be subjected to a drying process and perhaps also a pressing operation before being enclosed between the foils 6, 7 and 8.

The erection of the container bowl is accomplished by bending the bowl sides 10 upwards from the level of the bowl bottom 9 and at the same time folding the corner fold pieces 12 inwards and attaching the same to the inside of the adjacent bowl side 10. This is most clearly shown in FIG. 3. The attaching of the corner fold pieces 12 preferably is done by welding, whereby the plastic material of the corner fold pieces 12 melts together with the plastic material of the bowl sides 10. At the same time or immediately following the attaching of the corner fold pieces, the corresponding parts are welded together along the upper edge 16 and by this welding operation a completely tight joint is obtained between the corner fold pieces 12 and the bowl sides 10. At the same time, equalizing is obtained of the little difference in thickness which is present due to the triple foil composition which is present at the corners.

The enclosing of the cardboard stiffening means between the foils may be accomplished by glueing or welding in a lamination operation and it is thereby of importance that an intimate contact is obtained between the foils and cardboard stiffening means. Such an intimate contact assures that the inner foil which corresponds to the lining of a conventional container completely follows the cardboard stiffening means as far as into the corners, and thereby the risk of stretching and any ruptures of the foil in connection with the formation of the bowl is eliminated.

After the container bowl 1 has been erected as described above, it is filled with the product, whereupon the bowl is sealed with a lid seal foil 2 of a known type, which foil is welded against the inside of the upper edge 16 of the container bowl. The lid seal foil 2 suitably is a laminate of an aluminum foil and a plastic foil of the same type as the laminate 7, 8 at the inside of the container bowl. In order to increase the stability of the upper edge 16 formed by the foils 6, 7 and 8 and the lid seal foil 2, this edge 16 may be provided with an edge strengthening means 17 consisting of a frame having a groove which is open in the downward direction and in which the projecting edge 16 of the container bowl may be secured by glueing, welding or the like. Thanks to the lamination of the cardboard stiffening means 15 with the outer foil 6 and the inner foil 7 and aluminum foil 8, it is possible to completely utilize the stiffness of the said foils and it is possible to substantially reduce the thickness of the cardboard material compared with what has previously been possible. A container of this kind may, therefore, be made thin and light-weight but in spite of this very stable.

In an alternative embodiment of the invention the cardboard stiffening means 5 may be substituted for by a basket 18 or the like made of a plastic material which provides the necessary stiffening of the foil material, and the said basket may, as shown in FIG. 7, be applied within the bowl consisting only of a foil material or having a cardboard stiffening means or, as shown in FIG. 8, be applied outside the container bowl prior to or after the filling and the sealing thereof.

The container according to the invention is manufactured in the following way. A blank for a container bowl is manufactured as diagrammatically shown in FIG. 6. From a pile 19 of cardboard stiffeners the cardboard stiffeners 5 are successively fed between a web of outer foil 6 on one side and a web of aluminum foil 8 and an inner foil 7 on the other side. Before this, if considered necessary, the amount of moisture in the

cardboard material is reduced in a drying operation. After the cardboard stiffeners 5 have been fed between the foil webs, they are preferably pressed between hot rollers whereby a welding takes place of the foils along the edge 16 so that the cardboard material is hermetically enclosed between the said foils. Not until this is done are the different blanks cut to separate container bowl blanks which are presented to a station at which they are creased and erected, at which the corner fold pieces 12 are secured, the upper edge is welded and the bowl is filled and sealed by means of the lid seal foil as described above. In this condition the filled and sealed container is sterilized by being subjected to a suitable sterilization temperature which in a particular case was 121°C. Such sterilizing generally takes place by means of super-heated steam in a steam autoclave, and it is important for this purpose that the foils 6, 7 and 8 completely prevent penetration of moisture to the hygroscopic cardboard material 5, since the package would otherwise be ruined by swelling of the cardboard material. It is important that the cardboard material have the above-mentioned low moisture and air content so that no steam or air bubbles penetrate between the cardboard material and the foils. In order to effectively prevent such penetration it may be suitable to separately weld the upper edge 16 of the bowl after the cardboard material has been laminated with the foil.

After the steam sterilization the container may be provided with an edge strengthening means 17 and a re-closable lid 4.

The above described container in accordance with the invention may in many cases replace conventional preserve-tins, may be manufactured at a lower cost and in a simpler manner by means of available machines, and may, therefore, form a complement for other packing methods for sterilized products. The container may also be given any suitable form and may be made pliable. The finished laminated blanks for the container bowls, which may be supplied to the place of filling and sealing the container, take up very little space thanks to their flat or plane form. It is to be understood that the above specification is only of an exemplifying nature and that all kinds of modifications may be presented within the scope of the appended claims.

I claim:

1. A sterilizable container comprising a container

bowl of a liquid-tight material which bowl is open at the top and which is connected along the upper edge thereof to a lid thereby forming a tight, closed unit, characterized in that said container bowl is formed by at least two thin foils which are intimately contacting a base of a stiff material disposed therebetween wherein said base extends a distance less than the distance to said upper edge of said container bowl, and wherein said foils are joined together along said upper edge and said lid is joined in sealed relationship with the non-strengthened upper part of said container bowl.

2. Container according to claim 1 wherein said base is hermetically enclosed between said two foils and the non-strengthened upper part of said container bowl is composed only by said foils welded together thereby forming a connected unit.

3. Container according to claim 2 wherein said base is laminated together with said foils thereby forming an integral unit with said foils.

4. Container according to claim 1 wherein said base is a basket which is placed within said container bowl which comprises said foils.

5. Container according to claim 1 wherein said base is a basket which is placed outside said container bowl which comprises said foils.

6. Container according to claim 1 wherein said container bowl is formed by a flat uninterrupted blank including a bottom and container sides which are integral with the said bottom and with corner panels and corner fold pieces to provide a container bowl without any joints.

7. Container according to claim 2 wherein the inner foil of said two foils is a laminate comprising an outer aluminum foil and an inner foil of a plastic material which is resistant to sterilizing temperatures.

8. Container according to claim 1 wherein said lid comprises a lid seal foil in the form of a laminate comprising an inner plastic foil and an outer aluminum foil, said lid seal foil being connected to and welded against the inside of said non-strengthened upper edge part of said container bowl.

9. Container according to claim 1 wherein said non-strengthened upper edge part of said container bowl is enclosed in a frame of a stiff material.

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