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a part interest

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[54] **PACKAGING**
12 Claims, 18 Drawing Figs.

[52] U.S. Cl. **229/43,**
229/51, 206/46, 99/192

[51] Int. Cl. **B65d 5/64,**
B65d 43/00

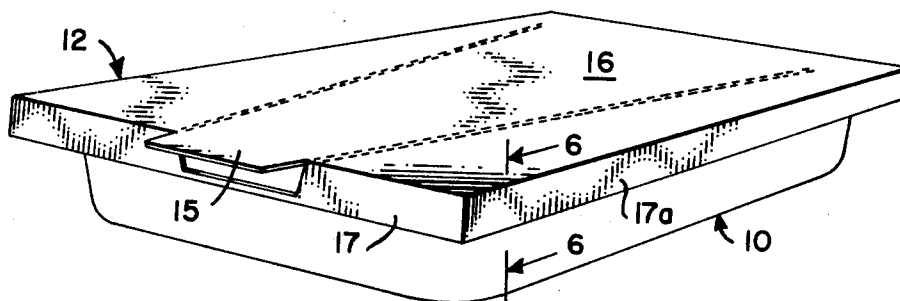
[50] Field of Search..... 229/43, 51,
37, 48; 206/46 (F); 99/171, 192; 220/97

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ABSTRACT: The carton and package provides for a new type of closure which may take several different forms, each of which incorporates a coated paperboard lid having a heat-sealable plastic coating such as polyethylene for example. Wherein a 180° bend is made to provide an outer edge of the lid which is heat-sealed together to provide strength to support a divergent flange or edge which is used in accomplishing a closing and/or sealing of the carton or package. In one form, this edge provides a snap-on operation for mechanically securing the lid on a tray by an interlocking relation between the horizontal flange on the top of the tray and the lid.

In another form of the invention, to provide the mechanical securing the edge of the lid is heat-sealed to the underside of the lip of the tray while the body of the paperboard lid is being heat-sealed on the top side of the lip of the tray. In both instances, an adhesive seal is used in addition to the heat seal which melts at temperatures below 212° F. and preferably at about 170°—180° F.



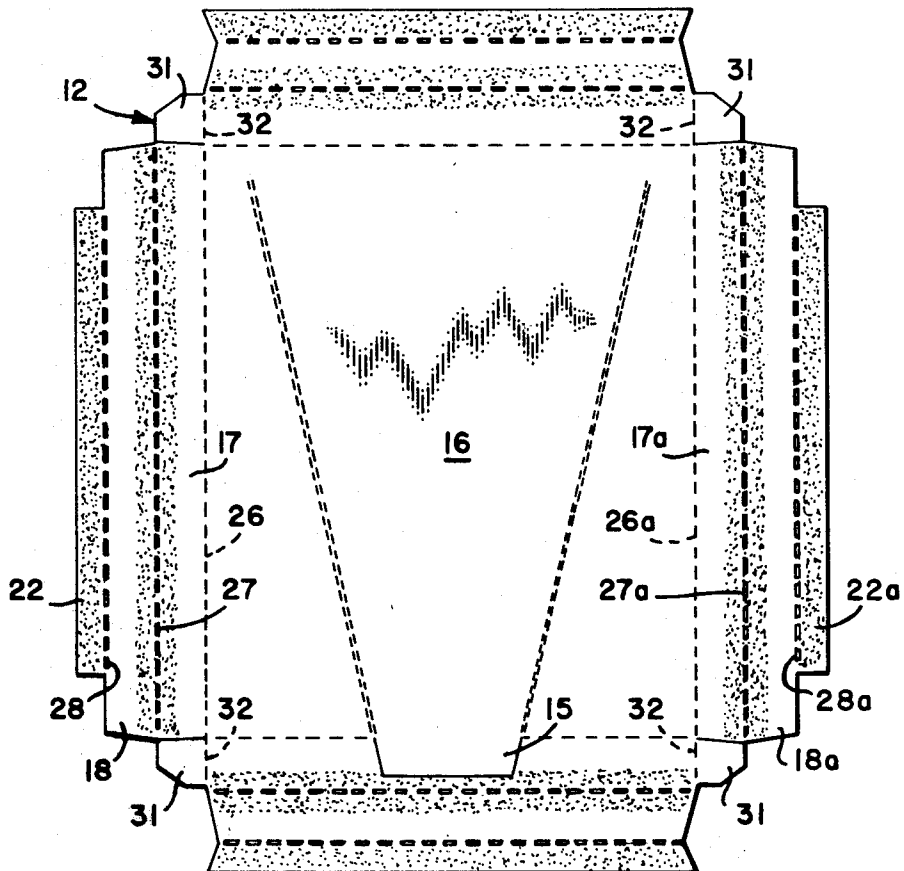
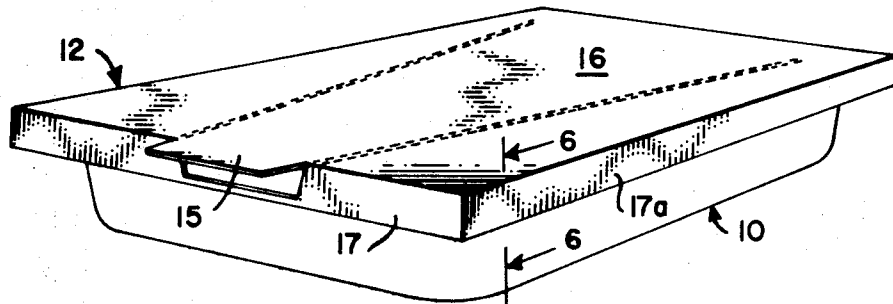


FIG. 2

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FIG. 3

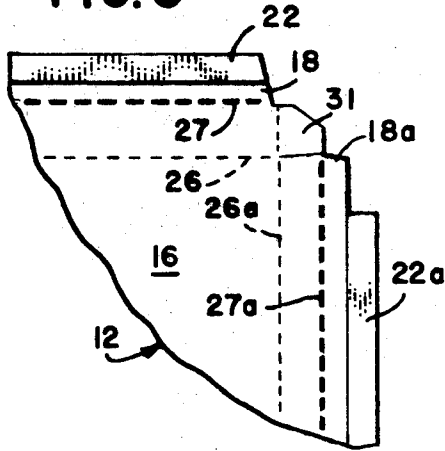


FIG. 4

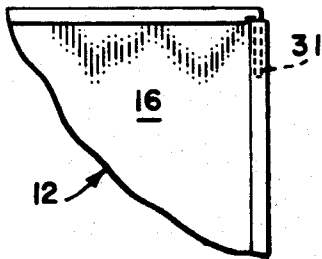
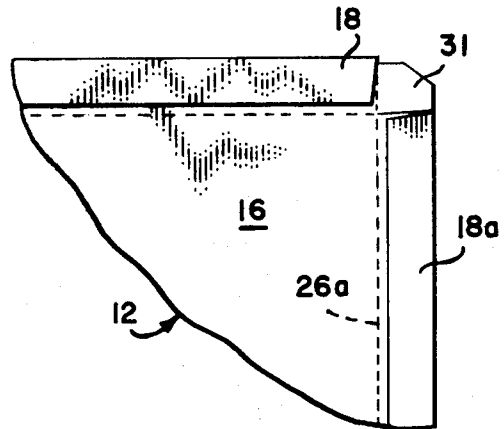


FIG. 5

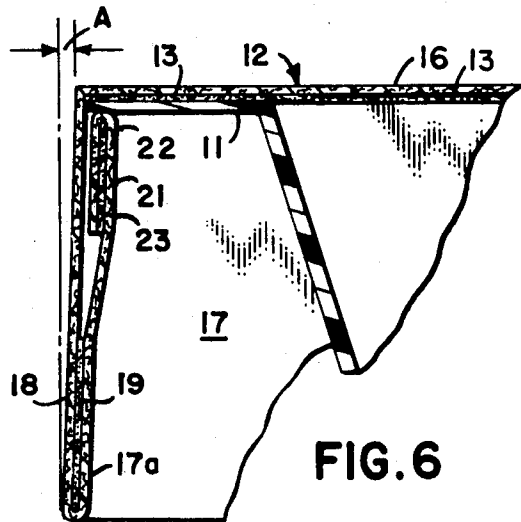


FIG. 6

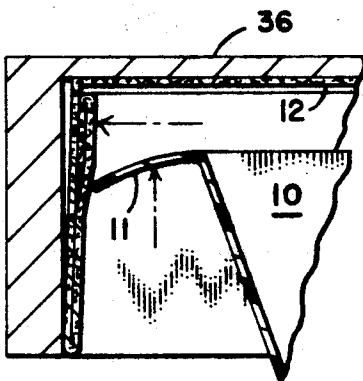


FIG. 7

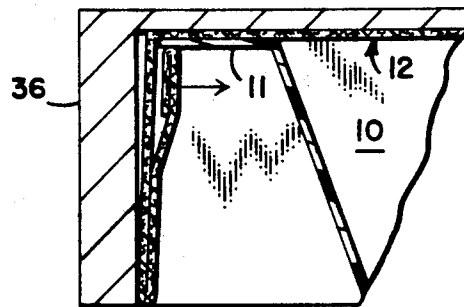
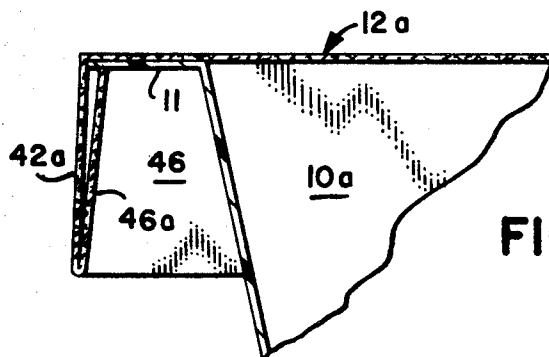
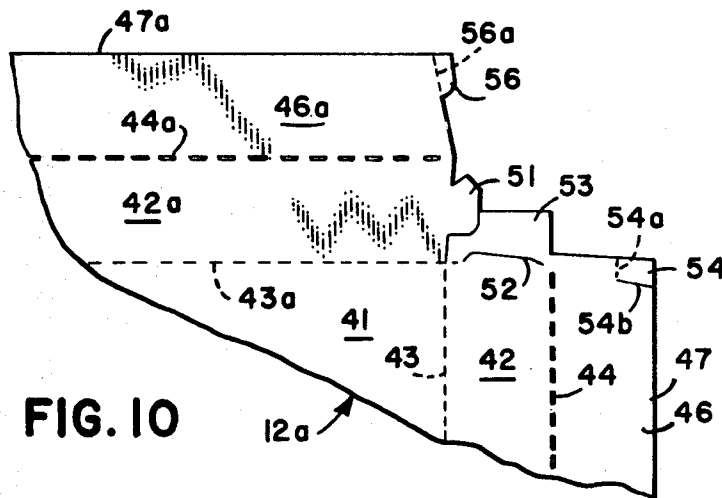
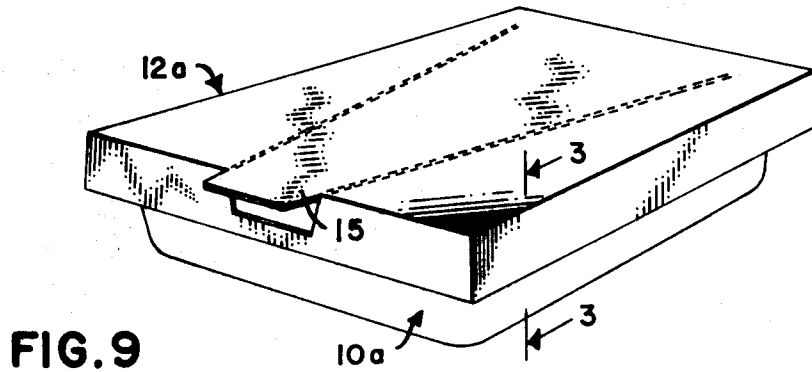


FIG. 8

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FIG. 12

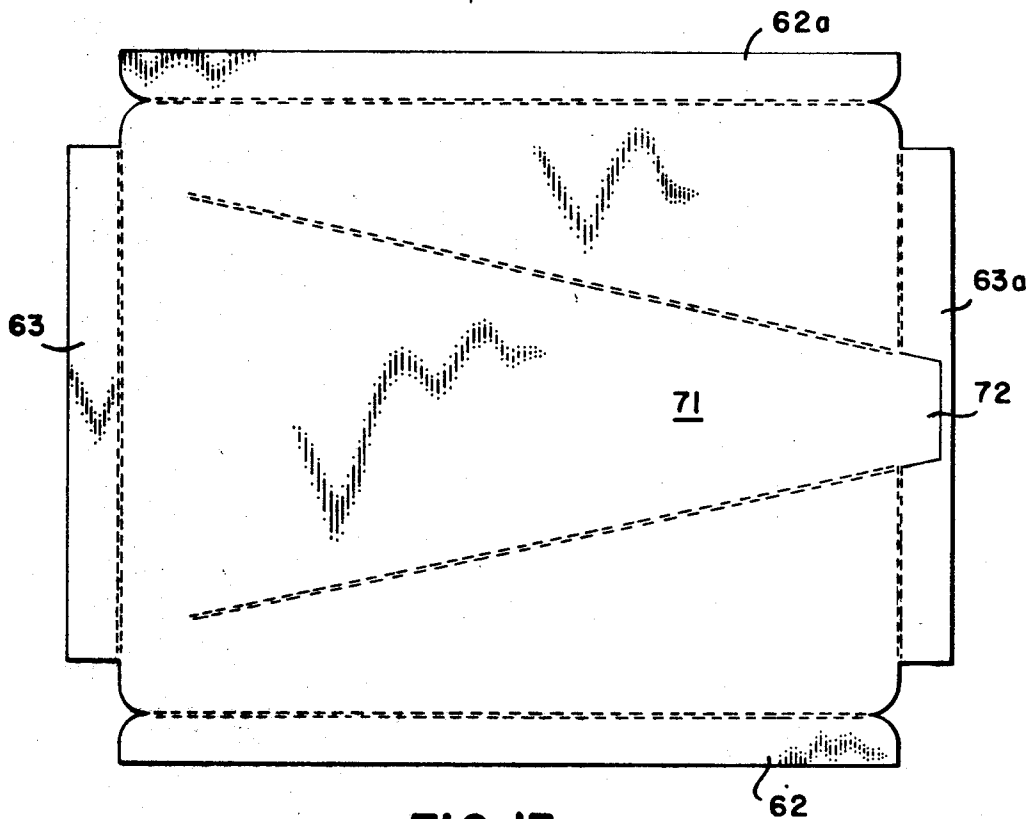
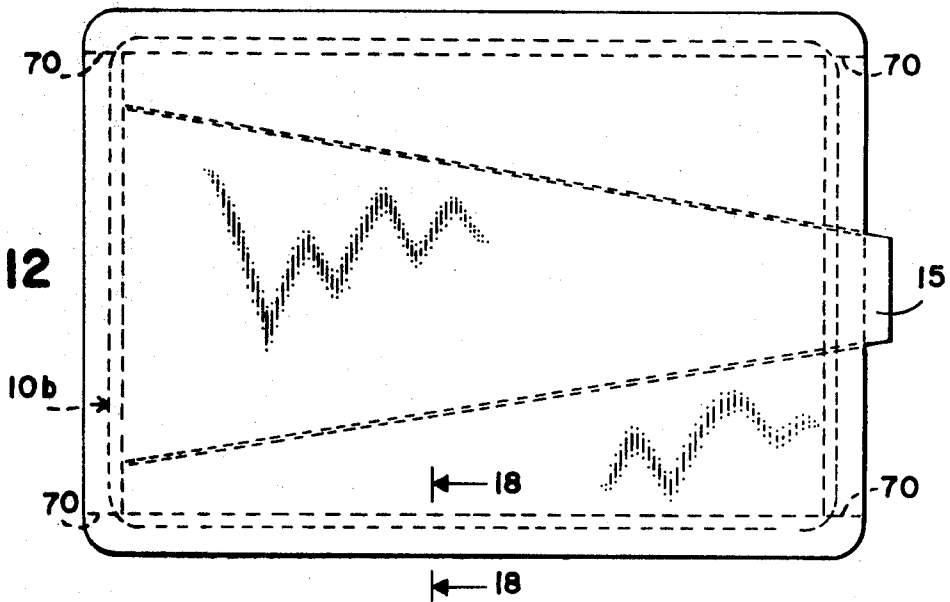


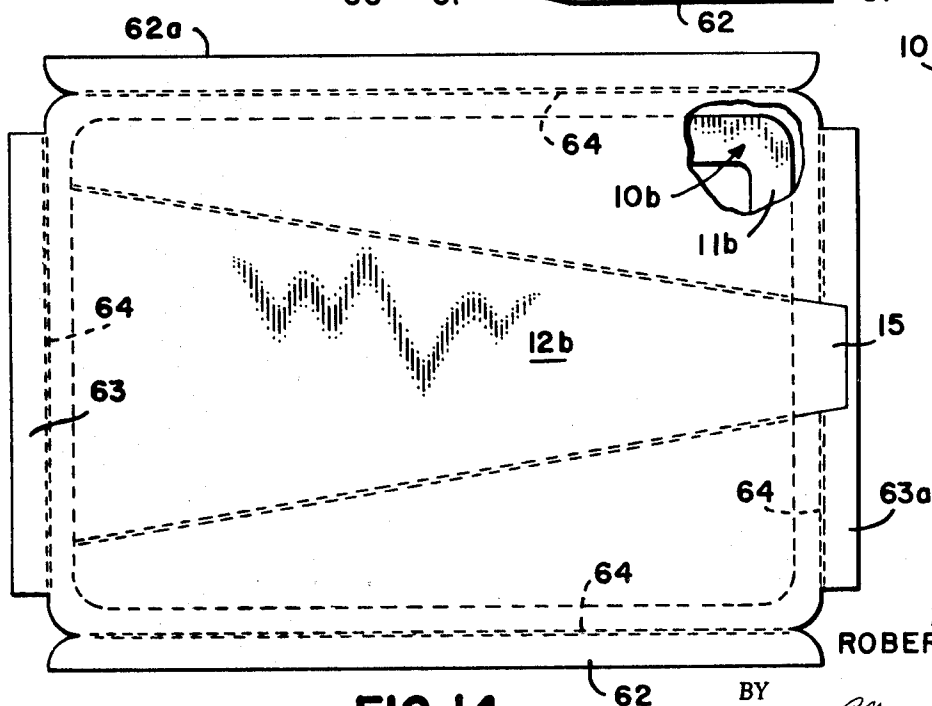
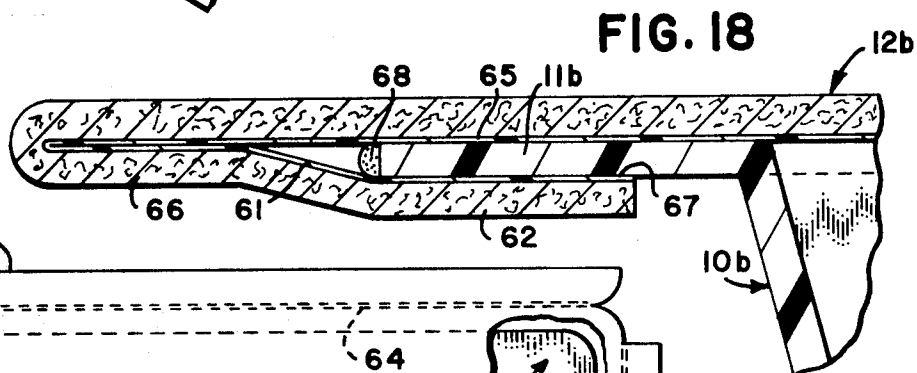
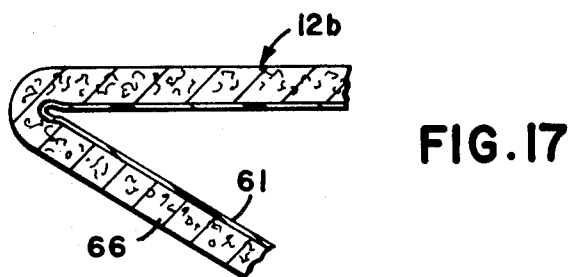
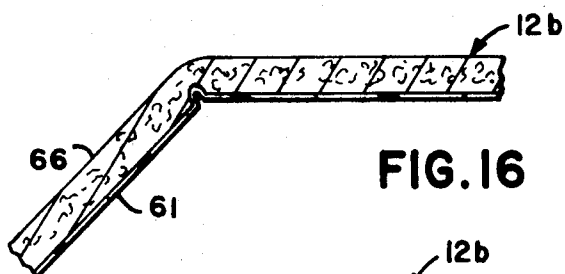
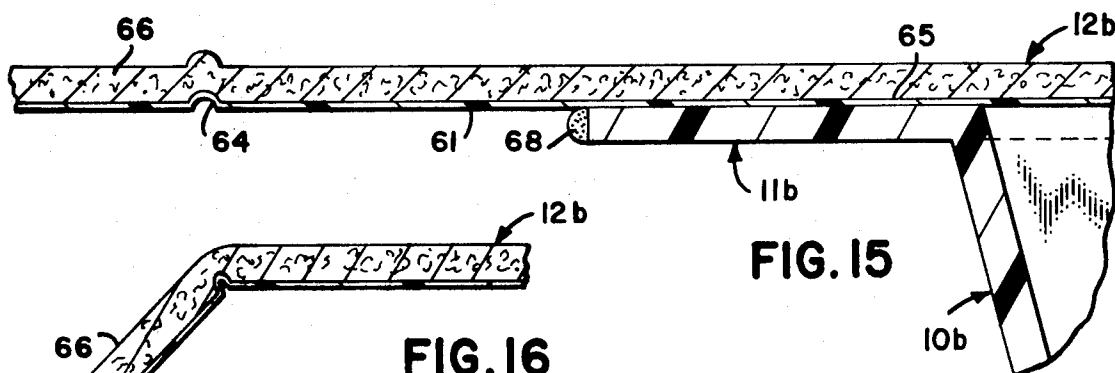
FIG. 13

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PACKAGING

The present invention relates to cartons, to packages, and methods of making packages from cartons, and is concerned more particularly with the provision of a carton or package of a traylike body and a lid for a tray or other receptacle having horizontal flange means at its open end to which the lid is applied. The lid is held in place by a mechanical connection, and if desired, a caulk or hot melt seal is employed.

It is the general object of the invention to provide an improved carton or package for various food products to be sold, for example, frozen food products wherein the sealing or closing of a plastic tray or container by a paperboard lid having a plastic coating capable of heat sealing to the tray and employing at the outer edge of the lid a portion of double thickness formed by 180° bend of plastic heat-sealed together to provide a support for a projecting edge which is used in the securing of the lid to the tray.

It is another general object of the invention to provide a tray having a lid attached thereto and sealed in such a manner that a boilable package is provided.

It is another general object of the invention to provide an improved carton or package for various products to be sold, for example products which package has a snap-on lid which can be easily and simply applied to a traylike container or package.

Still another object of the invention is to provide a snap-on lid of a character referred to above which provides a sealed carton or package which incorporates a low temperature melting caulk or glue or other adhesive material.

Still another object of the invention is to provide packages of the character referred to above which are adaptable readily to automatic closing operations.

A further object of the invention is to provide a package which can be boiled and which provides in effect a one-way valve construction between the inside and the outside to allow the escape of steam from the inside and to prevent the ingress of water to the inside.

A further object of the invention is to provide a trap connection between the lid and the tray which can remain open if desired to allow vacuumizing and/or gassing of the inside with an inert gas when desired.

Other objects and advantages of the invention will be apparent from the following description of certain preferred embodiments thereof as illustrated in the accompanying drawings in which:

FIG. 1 is a perspective view of a closed package;

FIG. 2 is a plan view of a blank for the lid of a package;

FIGS. 3, 4, and 5 illustrate manufacturing operations performed in converting the lid blank shown in FIG. 2 to a boxlike shape lid as applied to the package;

FIG. 6 is a view of the lid with the flanges of the tray held by the trapping walls of the lid;

FIGS. 7 and 8 illustrate one way of effecting the assembly of the lid and the tray by placing the lid in a jig formed as a receptacle and forcing the lid over the tray;

FIGS. 9, 10 and 11 illustrate a modified form of the invention;

FIG. 9 is a perspective view similar to FIG. 1;

FIG. 10 is a fragmentary plan view of the blank for forming the lid shown in FIG. 9; and

FIG. 11 is a fragmentary sectional view through the assembled package, the lid being shown as applied to the tray with its trapping walls or elements engaged underneath the tray flange.

FIGS. 12 through 18 relate to a further modified form of the invention.

FIG. 12 is the plan view of a package or carton or tray closed with the lid according to the invention;

FIG. 13 is a plan view of the lid blank used in forming the package;

FIG. 14 is a plan view of the lid as applied to a tray ready for closing;

FIGS. 15 through 18 are enlarged detailed sectional views illustrating the sequence of the closing operations.

Referring to FIG. 1, the invention is illustrated in connection with a conventional tray 10 which may be of polyethylene, for example, and of a rigid or semirigid construction. This tray has a flange 11 (FIG. 6) extending around the four sides thereof and being adapted to be fastened in and trapped by a lid 12 which is of open boxtop construction.

Preferably, the lid 12 may be heat-sealed to the flanges 11 by means of a heat-sealing coating 13 as shown in FIG. 6, this coating being meltable at or below the temperature of boiling water and preferably below this temperature and being an "Alathon" petroleum and wax formula produced by the Continental Oil Company of Ponca City, Oklahoma under their Formula No. PPDx-122, as disclosed in the copending application of Bemiss & Donald, Ser. No. 41,921 filed June 1, 1970 for Self-Opening Packages. Also, the heat-sealing of the portions of the lid together and the lid to the flange may be accomplished where the lid is of paperboard for example, and is coated with a polyethylene coating so that the polyethylene tray and the polyethylene coating can be heat-sealed together in usual fashion. The package may be opened in either case by means of a tear strip 15.

Referring again to FIGS. 1 and 6, it is seen that the lid 12 has a top wall 16 surrounded by four sidewalls 17 and 17a, each of which is bent back upon itself through 180° to provide a bottom portion 18 which is heat-sealed at shaded area 19. The paperboard employed to make the lid may have a polyethylene coating thereon. The flange portion 18 which is bent through 180° has a springlike locking or trapping portion extending upwardly whose upper portion is formed at a double wall by the 180° folding of the outer edge portion 22, this being heat-sealed to the upper portion of the wall 21 at 23. It will be seen that the upper edge of the double wall 22 is spaced a little below the upper wall 16 of the lid to provide space for the flange 11, and that the sidewalls 17 are outwardly flared for an angle A of about 2° to 4° to provide an entrance opening for the flange and to permit passage of the flange past the double wall portion 22 into its trapping or locking position shown in FIG. 6.

The blank for the lid 12 as shown in FIG. 2 includes a central wall 16 which is connected by scored or perforated pairs of hinge lines 26 and 26a to sidewall portions 17 and 17a. The sidewall portions 17 and 17a are connected at the outer edge by pairs of perforated hinge lines 27 and 27a to respective side flaps 18 and 18a. The pairs side flaps 18 and 18a are connected by respective pairs of fully perforated hinge lines 28 and 28a to respective flap extensions 22 and 22a.

To enable closing of the corners of the lid, a pair of connecting flaps 31 (FIG. 2) are provided at each end of the wall portions or flap portions 17a as shown in FIG. 2, being separated by a cut line from the adjacent end portion of the wall or flap portion 17 and being hinged at 32 to the adjacent wall portion 17a. It will be noted in FIG. 2 that the flap extensions 22 and 22a are cut short so they will not interfere with the location of the connecting flap or tab 31 in the assembly of the lid.

In the operation of assembling the lid, FIG. 3 illustrates the flap extensions 22, 22a folded over and heat-sealed to the outer edge of the flaps 18, 18a. After this operation is performed, as illustrated in FIG. 4, flaps 18 and 18a are folded 180° about the hinge lines 27 and 27a to the positions shown in FIGS. 4 so that a heat-sealing operation is performed at the outer portion of these sidewalls of the lid 12. Subsequently, these side flap portions are folded for 90° about the hinge lines 26 and 26a at the same time that the connecting tab 31 is inserted into and seats in the unheat-sealed portion. Tab 31 is inserted between the walls of the wall flap portion 17 and 18 and then a heat-sealing operation performed to secure the lid at its corners.

The parts are dimensioned as previously explained to provide a slight outward taper of the sides of the end 12.

Referring to FIGS. 6, 7 and 8, a boxlike jig 36 is provided of rectangular construction and four-sided walls into which the

lid 12 can be inserted for assembly, and then the tray 10 is pressed in inside of the lid, its flange 11 bending slightly as it passes by the locking or trapping members of the lid and then snapping into place, as seen in FIG. 8, the trapping members coming out under the horizontal flanges of the tray to hold it in place in the lid. This operation of course, is performed after the tray has had the objects to be carried such as frozen food, for example, placed therein.

Afterwards, the tray with the lid thereon would be passed through a suitable heat-sealing apparatus of the type disclosed in the patent to Bemiss and Hansen, U.S. Pat. No. 3,325,969. A hermetically sealed package is available for use in connection with a product contained therein. This would be a food product which is subject to being heated or boiled for serving. The tray is preferably of polyethylene plastic and the products therein can be boiled to the desired temperature, the boiling raising the plastic sealant 13 to a temperature above its melting point so that the heat seal is lost providing an effective one-way valve construction entirely around the lid and the tray so that steam or other vapors can escape while no water will be admitted.

The modification shown in FIGS. 9, 10 and 11 is similar to the modification previously described in many respects and the identical portions will not be repeated in the description. For example, this form employs a polyethylene tray 10a and a lid 12a. It also has the sidewalls or locking portions which are different in construction from that previously described, and the method of fastening the four side flanges or flaps of the lid together is also different. Referring to FIG. 10, for example, the lid 12a comprises a central wall 41, which has attached at its respective sides similar opposite sets of flaps as previously described and shown in FIG. 0. In this form, the flaps are of slightly different construction, the adjacent flap portion 42 being connected by fold line 43 to the center panel or wall 41 of the lid, and at the top panel 42a is connected by a perforated hinge line 43a. Secured to the outer edge of the flap portion 42 by fully perforated hinge line 44 is an outer or locking flap 46 at the side and 46a at the top. A conventional corner lock of the type manufactured by the Klik-Lok Corporation is provided for securing the ends of the respective flap portions 42 and 42a and 46 and 46a together and this construction providing a locking tab 51 at each end of the flap portions 42a, to correspond to a cutout 52 in the adjacent flap portion 42, the tab 51 being adapted to be inserted through the cutout 52 at each end of the flap portion 42 is adapted to be folded inside of the tab 51 which then will be folded and be tucked into the cut slot 52 simultaneously. The outer trapping portions 46 of the respective edges of the lid have respective tabs 54 which are cut at 54b from the adjacent wall portion of the wall 46 and has a hinge line 54a at its bottom. A tab 56 is formed at the end of the wall 46a and has a bend line 56a by which it is attached, this provides interlocking construction of these outer portions whereby the locking tab 56 can be bent about its hinge line 56a and inserted through the cut slot 54b adjacent to the locking tab 54.

With the construction shown in FIGS. 9, 10 and 11, after the lid has been formed, the trapping walls 46 and 46a have a central bulge where they are spaced from the adjacent flange walls 42 and 42a and provide a spring portion for snapping underneath the flange 11 of the adjacent side of the tray 10a as shown in FIG. 11. This modification of FIGS. 9, 10 and 11 does not require any heat-sealing in the manufacture of the lid.

Referring to FIGS. 12 through 18, a form of the invention is shown which is particularly adaptable to producing a boilable package. The tray 10b has the usual side flanges as 11b and has associated therewith a closure lid 12b. The lid 12b is of paperboard and has a plastic coating 61 thereon which may be of polyethylene, for example, to match the material from which the tray 10b is made, and to be heat-sealable thereto. The lid 12b has its edges respective side flaps 62 and 62a and 63 and 63a, all connected by a scored line 64 to respective pairs of side extensions to the center body portion of the lid

12a. The side flap portions as seen in FIGS. 15 through 18 can be bent back through 180° so that the sealing can be effected above the flange 11b at the U-shaped double wall portion 66, and also underneath the flange 11b at 67. The heat-sealed double wall portion 66 forms a support for the extension edge 67. Within the space formed by the bent over portions 62, there is provided a length of caulking or hot melt adhesive 68 which will melt below 212° F, say at 170°—180° so as to effectively seal the package against the escape of steam, particularly at the corners, where the side flap portions 62 and 63 would abut each other, but are not overlapped during the heat-sealing operation.

Referring to FIG. 12, it will be seen that after heat-sealing of the lid, there are four "one-way valves" 70 where the ends of the flap extension or side flaps 63 and 63a abut the long edges of the side flaps 62 and 62a. There is no provision for overlapping during heat-sealing, but a watertight connection is provided at the lines 70. However steam under pressure generated during heating of the food product in the closed package will cause escape of steam at the four corners.

It will be noted that in each of the modifications of FIGS. 1, etc. and FIG. 12 a mechanical securing or mechanical closing of the package is provided, in the FIG. 1 modification by the trapping construction of the lid and the FIG. 12 modification by the heat seal and overlap of the lid around the flange. It will be seen that in addition to this mechanical connection or attachment that a positive watertight seal is provided by means of the special heat-sealing layer 13 as seen in FIG. 6 and by means of a bead of hot melt 68 (fig. 15).

Also, a tear strip 71 is provided, having a handle portion 72 formed from the flap portion 63a to enable ready opening of the package when it is required for use. These tear strips are conventional shape and construction and similar to the tear strips provided in the previous modifications.

The above type of package is adapted to be heat-sealed in the apparatus of the Bemiss and Hansen application identified above.

It will be appreciated that the carton lid and/or package of the invention disclosed and claimed herein will be capable of variation and modifications, and also the disclosed methods can be performed in a variety of ways.

I claim:

1. A snap-on lid for a package such as a tray or carton having an open end provided with horizontal flange means extending outwardly from said open end for purposes of receiving a closure or lid, said lid comprising a central wall portion coextensive with said open end and said flange means, said lid having a plurality of downwardly extending sidewalls at the edges of said central wall portion, certain of said sidewalls on said lid each having a first part extending downwardly away from said wall portion and an upwardly extending second part disposed inwardly of said first part with respect to said lid and being bent back on said first part to form a bend edge and terminating in spaced relation from said wall portion to provide a flange receiving and trapping space between the free edge of said second part and said wall portion, whereby when said lid is applied to a tray or carton the flange means will snap past the second wall part and be trapped thereby to hold the lid tightly engaged with the tray or carton.

2. A snap-on lid as recited in claim 1, in which said second part of said wall portion has a surface of heat-sealable character and has an outer edge part bent back through 180° on itself and heat-sealed to itself.

3. A snap-on lid as recited in claim 1, in which said first and second parts have surfaces of heat-sealable character and have a heat-sealed strip connection adjacent to said bent edge but terminating in spaced relation from said free edge thereof.

4. A snap-on lid as recited in claim 1, in which said sidewalls have a surface of heat-sealable character and have respective overlapping corner connections heat-sealed together.

5. A boilable package for food products which comprises a tray and a lid, a mechanical connection between the tray and the lid providing for a watertight sealed relation between the

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lid and the tray, said mechanical connection also having at least one location where it will pass gas under pressure such as steam from the boiling of the contents of the package, and a gastight connection between the tray and the lid comprising a coating of meltable or heat-softenable material applied to said location and having a melting point below 212° F.

6. A boilable package for food products which comprises a tray and a lid as recited in claim 5, in which said mechanical connection comprises interlocking elements.

7. A boilable package for food products which comprises a tray and a lid as recited in claim 5, in which said lid and said tray have abutting portions thereof adjacent the opening of the tray heat-sealed together.

8. A boilable package for food products which comprises a tray and a lid as recited in claim 5, in which said tray has a flange positioned about its open side, and said lid has a trapping connection to said flange.

9. A boilable package as recited in claim 8, in which said lid comprising a central wall portion coextensive with said lid comprising a central wall portion coextensive with said open end and said flange means, said lid having a plurality of downwardly extending sidewalls at the edges of said central wall portion, certain of said sidewalls on said lid each having a first part extending downwardly away from said wall portion

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and an upwardly extending second part disposed inwardly of said first part with respect to said lid and being bent back on said first part to form a bent edge and terminating in spaced relation from said wall portion to provide a flange-receiving and trapping space between the free edge of said second part and said wall portion, whereby when said lid is applied to a tray or carton the flange means will snap past the second wall part and be trapped thereby to hold the lid tightly engaged with the tray or carton.

10. A boilable package as recited in claim 9, in which said second part of said wall portion has a surface of heat-sealable character and has an outer edge part bent back through 180° upon itself and heat-sealed to itself.

11. A boilable package as recited in claim 9, in which said first and second parts have surfaces of heat-sealable character and have a heat-sealed strip connection adjacent to said bent edge but terminating in spaced relation from said free edge thereof.

12. A boilable package as recited in claim 9, in which said sidewalls have a surface of heat-sealable character and have respective overlapping corner connections heat-sealed together.

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