United States Patent [19]

Bemiss

[11] **3,806,618**

[45]***Apr. 23, 1974**

[54] **METHOD OF HEATING A PACKAGE OF FOOD**

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[73] Assignee: **Robalex, Inc.,** San Francisco, Calif.

[*] Notice: The portion of the term of this patent subsequent to Feb. 13, 1990, has been disclaimed.

[22] Filed: **Aug. 1, 1972**

[21] Appl. No.: **276,928**

Related U.S. Application Data

[60] Continuation of Ser. No. 118,428, Feb. 21, 1971, Pat. No. 3,716,370, Division of Ser. No. 844,494, July 24, 1969, Pat. No. 3,580,478.

[52] **U.S. Cl.** **426/403,** 426/118

[51] **Int. Cl.** **B65b 29/08**

[58] **Field of Search** ..... 99/171 S, 171 C, 171 H, 99/171 R, 1; 229/DIG. 14

[56] **References Cited**

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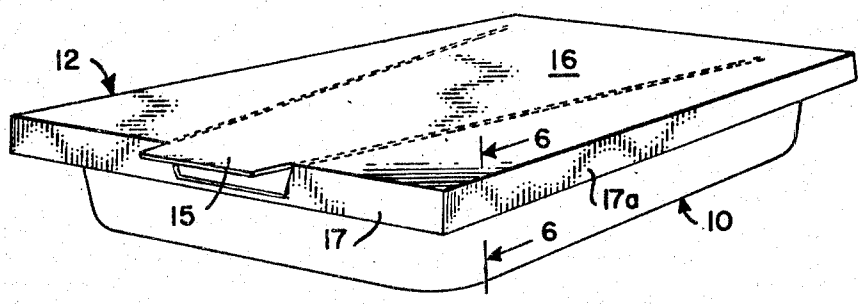
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Primary Examiner—Frank W. Lutter
Assistant Examiner—Steven L. Weinstein
Attorney, Agent, or Firm—J. M. Naylor; F. A. Neal; John K. Uilkema

[57] **ABSTRACT**

The method provides for heating a food package by boiling wherein between the lid and the tray a liquid-tight mechanical connection is provided, plus a gas-tight meltable seal. In heating under water the seal melts and allows the escape of steam from the interior while the mechanical connection maintains the interior free of indrawn water.

9 Claims, 18 Drawing Figures



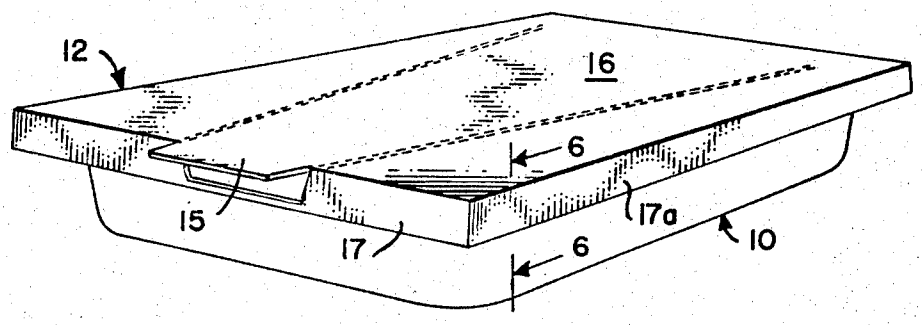

12
16
6
15
17
17a
6
10

FIG. 1

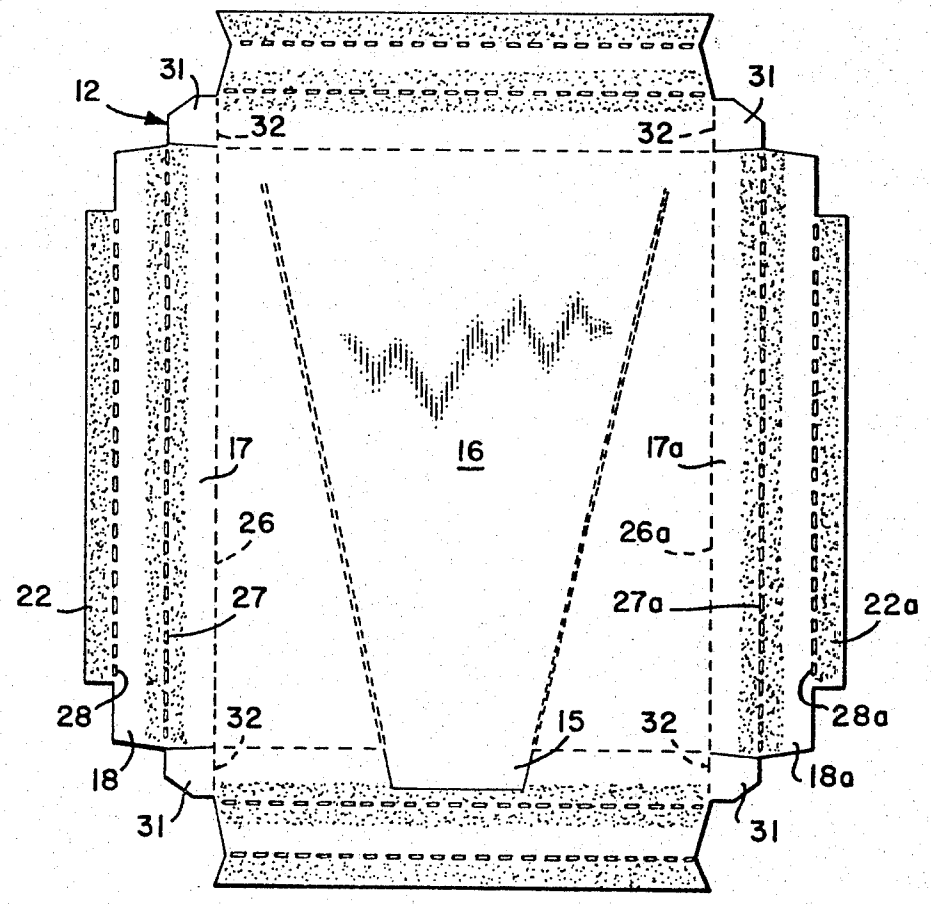

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18a
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31

FIG. 2

FIG. 3

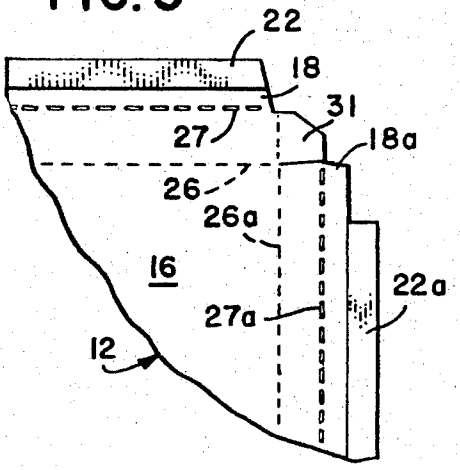
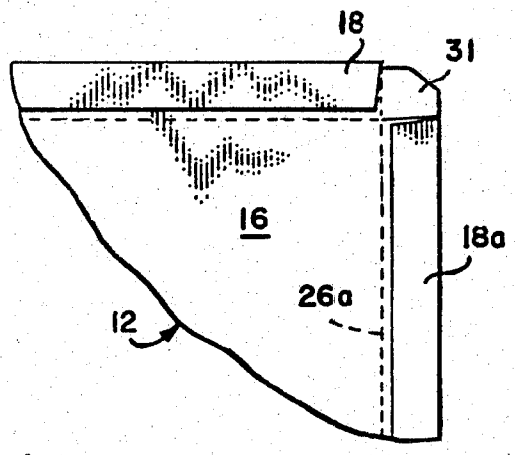


FIG. 4



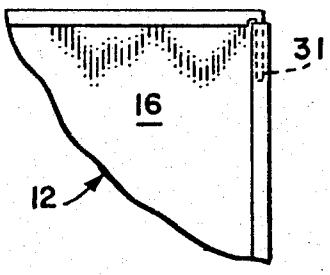


FIG. 5

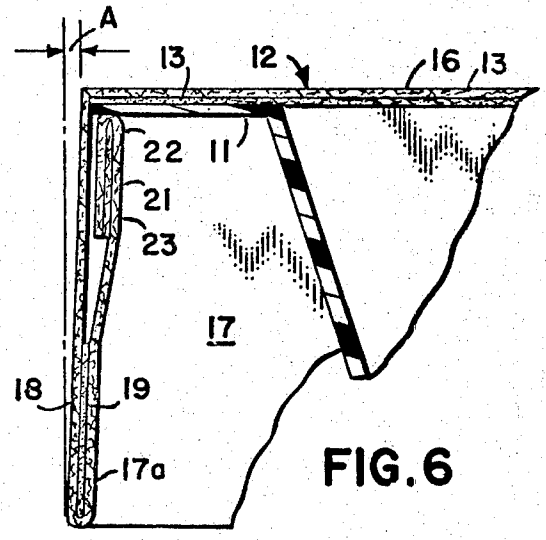


FIG. 6

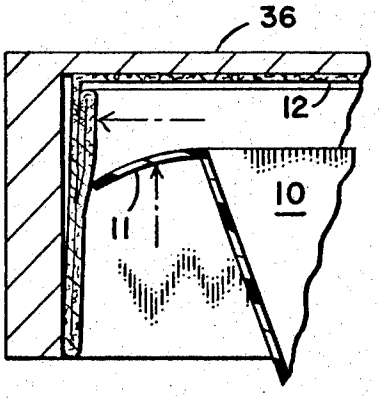


FIG. 7

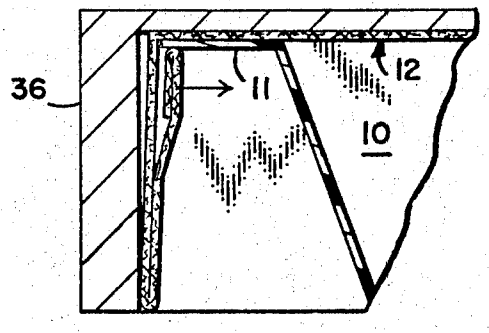


FIG. 8

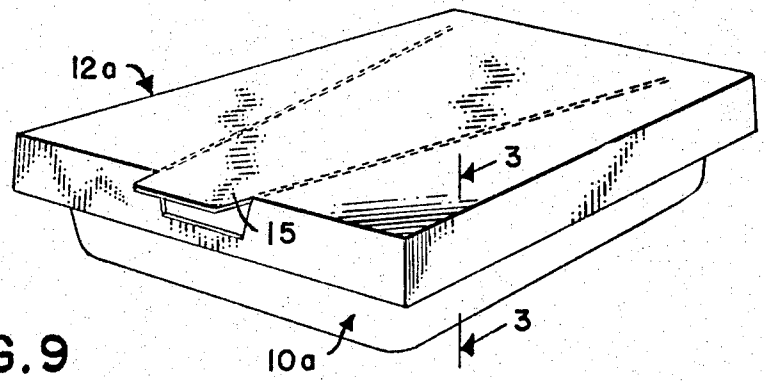


FIG. 9

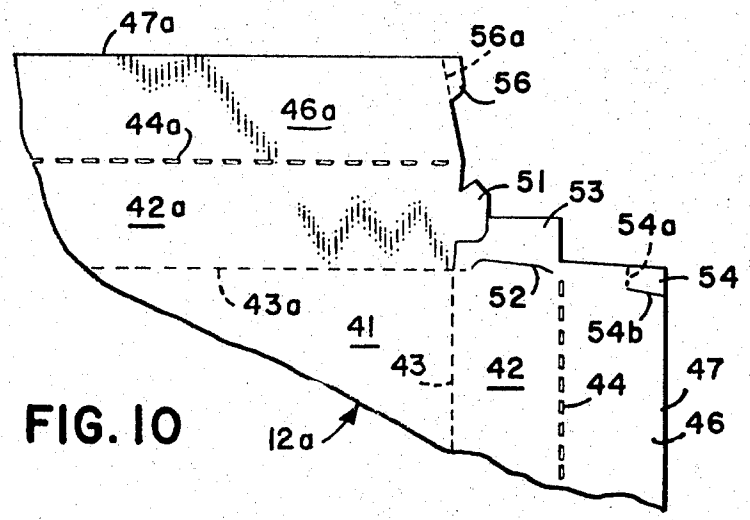


FIG. 10

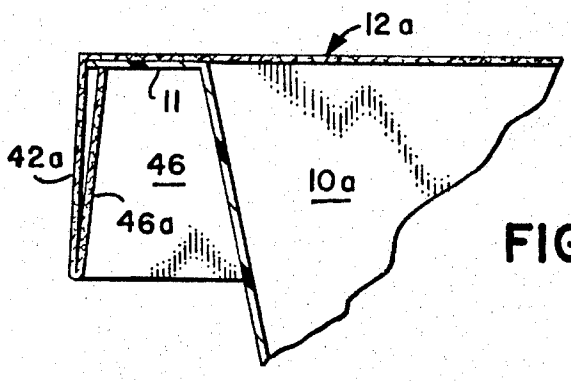
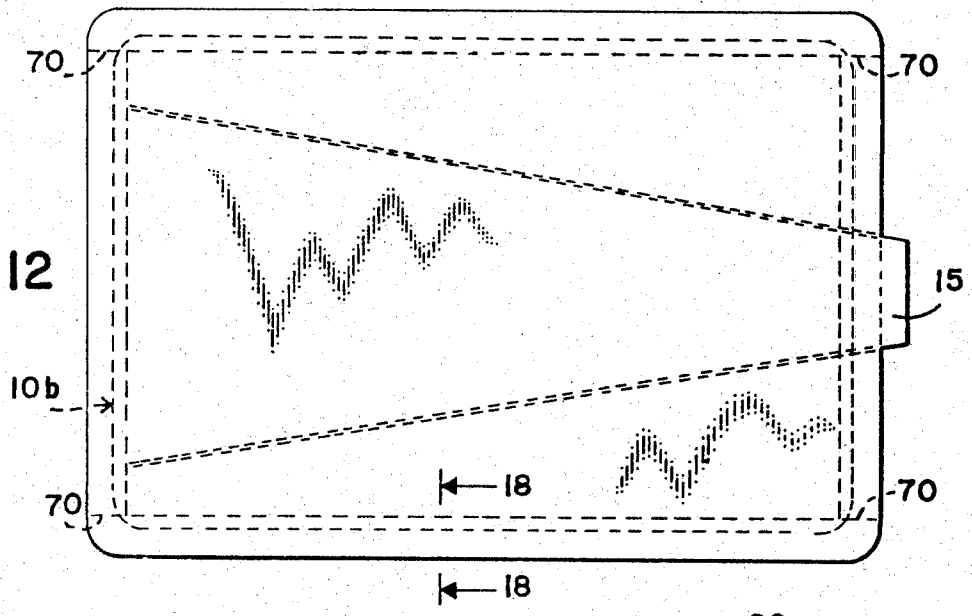


FIG. 11

FIG. 12



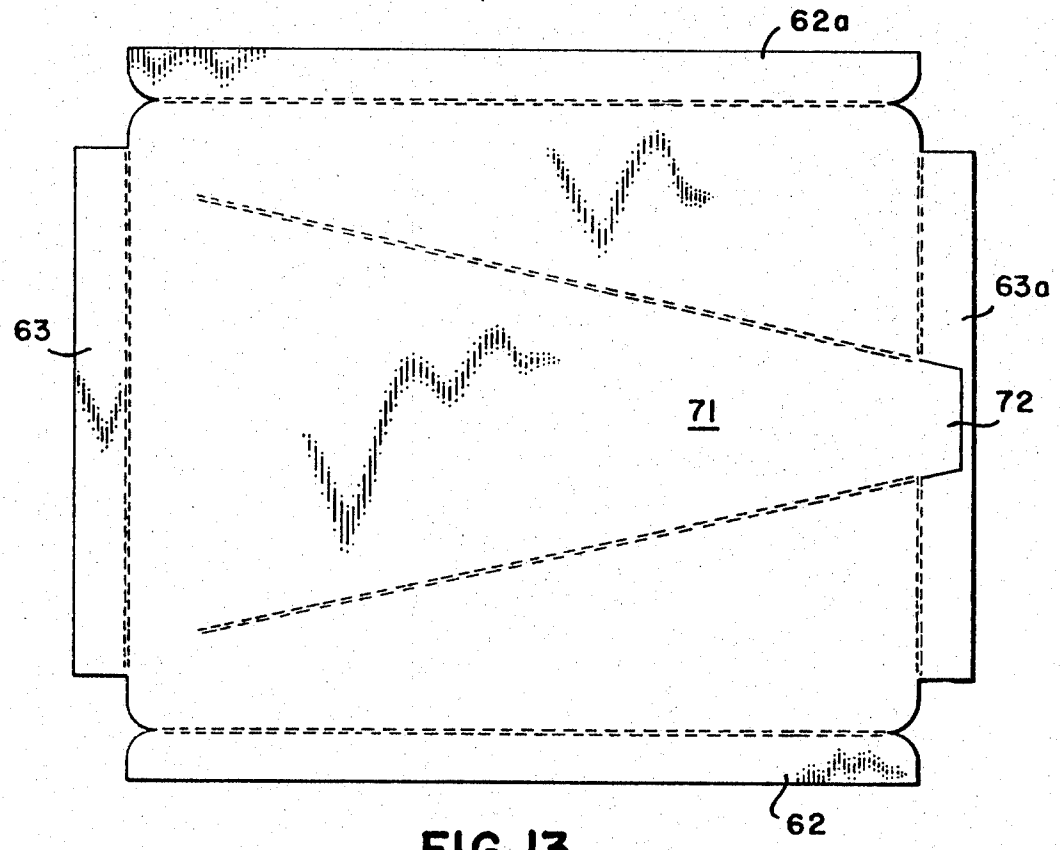


FIG. 13

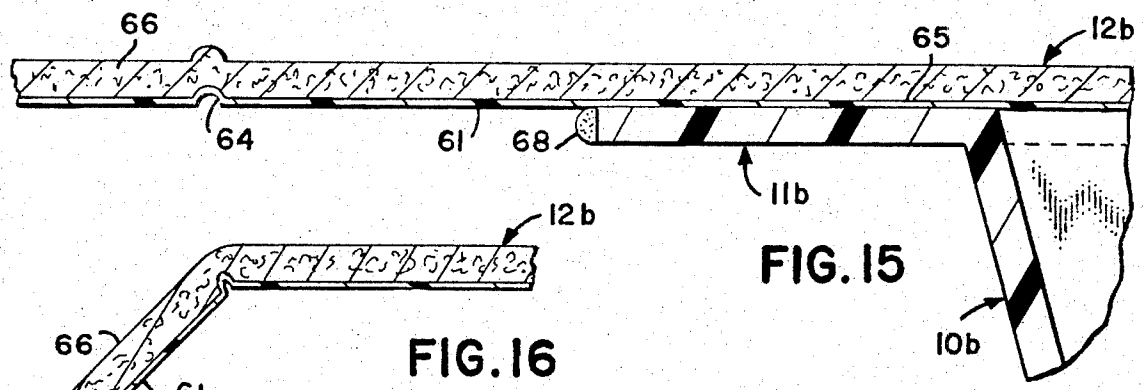


FIG. 15

FIG. 16

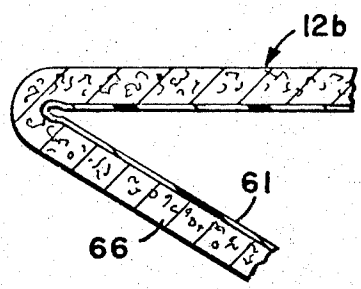
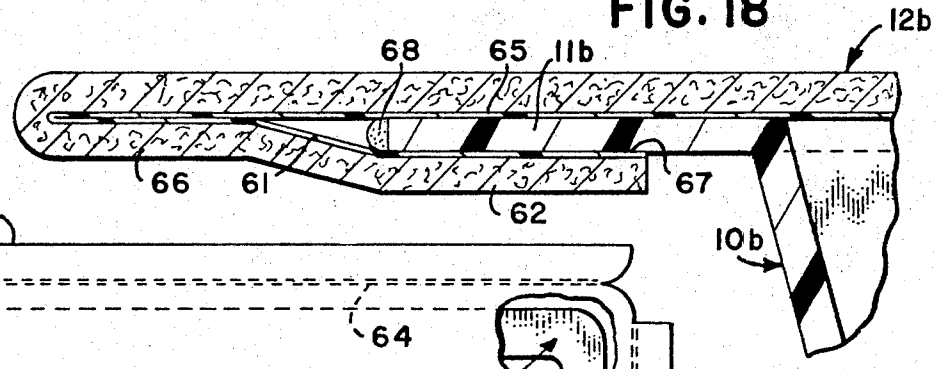


FIG. 17

FIG. 18



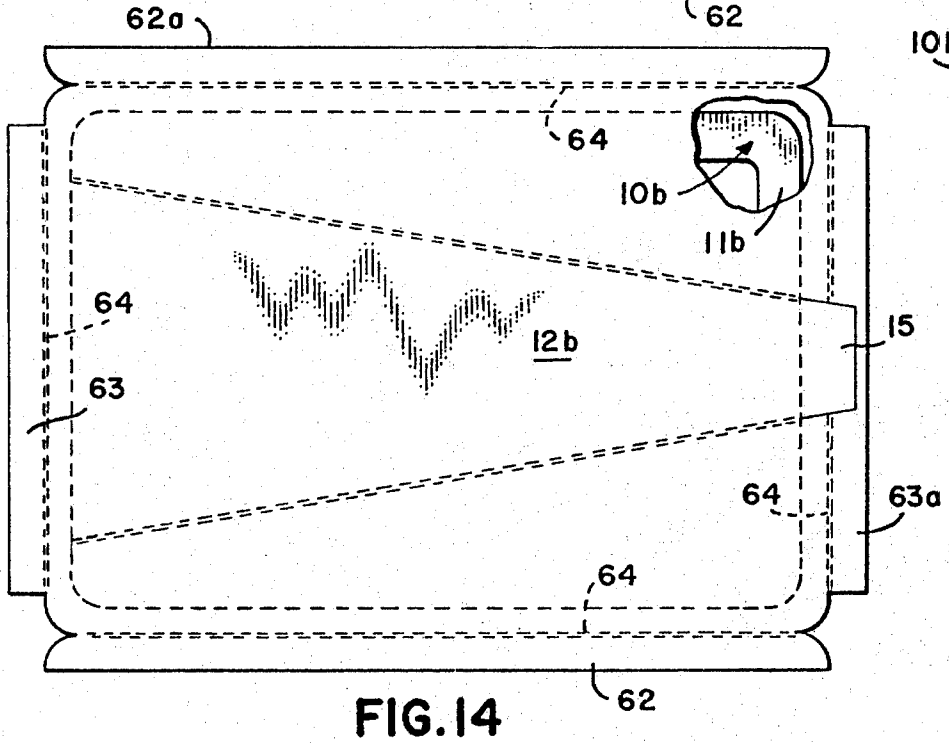


FIG. 14

METHOD OF HEATING A PACKAGE OF FOOD

DESCRIPTION OF THE INVENTION

This is a continuation application of application Ser. No. 118,428, filed Feb. 21, 1971, entitled PACKAGING, now U.S. Pat. No. 3,716,370, which in turn is a divisional application of application Ser. No. 844,494, filed July 24, 1969, entitled PACKAGING, and issued under U.S. Pat. No. 3,580,478.

The present invention relates to methods of making packages from cartons, and is concerned more particularly with the provision of a carton or package of a tray-like 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 a general object of the invention to provide an improved method of heating a plastic package by boiling wherein provision is made for escape of any steam generated from the boiling of the contents of the package.

Another object of the invention is to provide a method of heating food in a carton which incorporates heating a package by boiling in water which package incorporates a seal preventing the entry of water into the package.

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**, and **5** illustrate manufacturing operations performed in converting the lid blank shown in FIG. **2** to a box-like 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**;

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; and

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** be 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, Okla. under their Formula No. PPDX–122, as disclosed in the copending application of BEMISS and DONALD, Ser. No. 41,921, filed June 1, 1970 now U.S. Pat. No. 3,716,180 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 sealied 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 side walls **17** and **17***a*, each of which is bent back upon itself through 180° to provide a bottom portion **18** which is heat sealed at shaded areas **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 spring-like 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 side walls **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 **26***a* to side wall portions **17** and **17***a*. The side wall portions **17** and **17***a* are connected at the outer edge by pairs of perforated hinge lines **27** and **27***a* to respective side flaps **18** and **18***a*. The pairs of side flaps **18** and **18***a* are connected by respective pairs of fully perforated hinge lines **28** and **28***a* to respective flap extensions **22** and **22***a*.

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 **17***a* 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 **17***a*. It will be noted in FIG. **2** that the flap extensions **22** and **22***a* 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**, **22***a* folded over and heat sealed to the outer edge of the flaps **18**, **18***a*. After this operation is performed, as illustrated in FIG. **4**, flaps **18** and **18***a* are folded 180° about the hinge lines **27** and **27***a* to the positions shown in FIG. **4** so that a heat sealing operation is performed at the outer portion of these

side walls of the lid **12.** Subsequently, these side flap portions are folded for 90° about the hinge lines **26** and **26***a* at the same time that the connecting tab **31** is inserted into and seats in the un-heat 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 box-like 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 U.S. Pat. to Bemiss and Hansen, 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 **10***a* and a lid **12***a*. It also has the side walls 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 **12***a* comprises a central wall **41,** which has attached at its respective sides similar opposite sets of flaps as previously described and shown in FIG. **2.** 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 **42***a* is connected by a perforated hinge line **43***a*. 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 **46***a* 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 **42***a* and **46** and **46***a* together and this construction providing a locking tab **51** at each end of the flap portions **42***a*, to correspond to a cutout **52** in the adjacent flap portion **42,** the tab **51** being adapted to be inserted through the cutout **52** during erection operation. Similarly, the tab **53** beyond the cut **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 **54***b* from the adjacent wall portion of the wall **46** and has a hinge line **54***a* at its bottom. A tab **56** is formed at the end of the wall **46***a* and has a bend line **56***a* 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 **56***a* and inserted through the cut slot **54***b* 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 **46***a* have a central bulge where they are spaced from the adjacent flange walls **42** and **42***a* and provide a spring portion for snapping underneath the flange **11** of the adjacent side of the tray **10***a* as shown in FIG. **11.** This modification of FIGS. **9, 10** and **11** does not require any heat sealing in the manufacture at 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 **10***b* has the usual side flanges as **11***b* and has associated therewith a closure lid **12***b*. The lid **12***b* 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 **10***b* is made, and to be heat-sealable thereto. The lid **12***b* has at its edges respective side flaps **62** and **62***a* and **63** and and **63***a*, all connected by a scored line **64** to respective pairs of side extensions to the center body portion of the lid **12***b*. 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 **11***b* at **65,** at the U-shaped double wall portion **66,** and also underneath the flange **11***b* 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 vent the package to permit 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 **63***a* abut the long edges of the side flaps **62** and **62***a*. 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 water-tight 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 **63***a* 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 method of heating a package of food in boiling liquid which comprises providing a tray, placing moisture containing food in said tray, providing a lid for said tray, forming a mechanical interlocked connection between an overlapped portion of said lid about a periphery of said tray about substantially the entire peripheries thereof which is water-proof in character thereby forming a package, providing a meltable seal for said mechanical connection about substantially the entire mechanical connection which is of a gas-tight character, heating the package in said liquid to cause melting of the gas-tight seal between the tray and the lid while retaining the mechanical connection therebetween, and passing the steam from the contents of the package to the outside through an area contiguous a non-overlapped portion of the lid and the tray periphery while barring entry of liquid into the package.

2. The method as defined in claim **1** including the step of locating the meltable seal in an area bounded by said overlapped portion and a free terminal edge of said tray periphery.

3. The method as defined in claim **2** wherein said package includes at least a single corner and said non-overlapped portion is located thereat.

4. The method as defined in claim **2** wherein said lid periphery is a horizontal flange.

5. The method as defined in claim **2** wherein the meltable seal is further located in the area of said non-overlapped lid portion.

6. The method as defined in claim **5** wherein said lid periphery is a horizontal flange.

7. The method as defined in claim **5** wherein said package includes at least a single corner and said non-overlapped portion is located thereat.

8. The method as defined in claim **7** wherein said lid periphery is a horizontal flange.

9. The method as defined in claim **8** wherein said lid is coated with polymeric sealing material and said horizontal flange has against its opposite surfaces said polymeric sealing material of the lid.

* * * * *