

[54] **HEAT SEALED FOOD CONTAINER**

[76] Inventor: **Daniel Bernhardt**, c/o Q-P Inc., 406
N. Midland Ave., Saddle Brook,
N.J. 07662

[22] Filed: **July 13, 1971**

[21] Appl. No.: **162,035**

3,233,819 2/1966 Flaherty 229/43
3,398,876 8/1968 Ward 206/56 AA
2,880,859 4/1959 Tupper 229/43

Primary Examiner—George E. Lowrance

Assistant Examiner—Stephen Marcus

Attorney—Mark T. Basseches et al.

[52] U.S. Cl. **229/43**, 99/171 CT, 99/171 S,
206/46 F, 206/47 R, 206/56 AA, 220/97 C,
229/51 R

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

[58] Field of Search 206/46 F, 47 R, 56 AA,
206/56 AB, 65 K; 229/43, 44 R, 51 R, 51 TS;
99/171 CT, 171 TC, 171 C, 171 S; 220/97 C

[56] **References Cited**

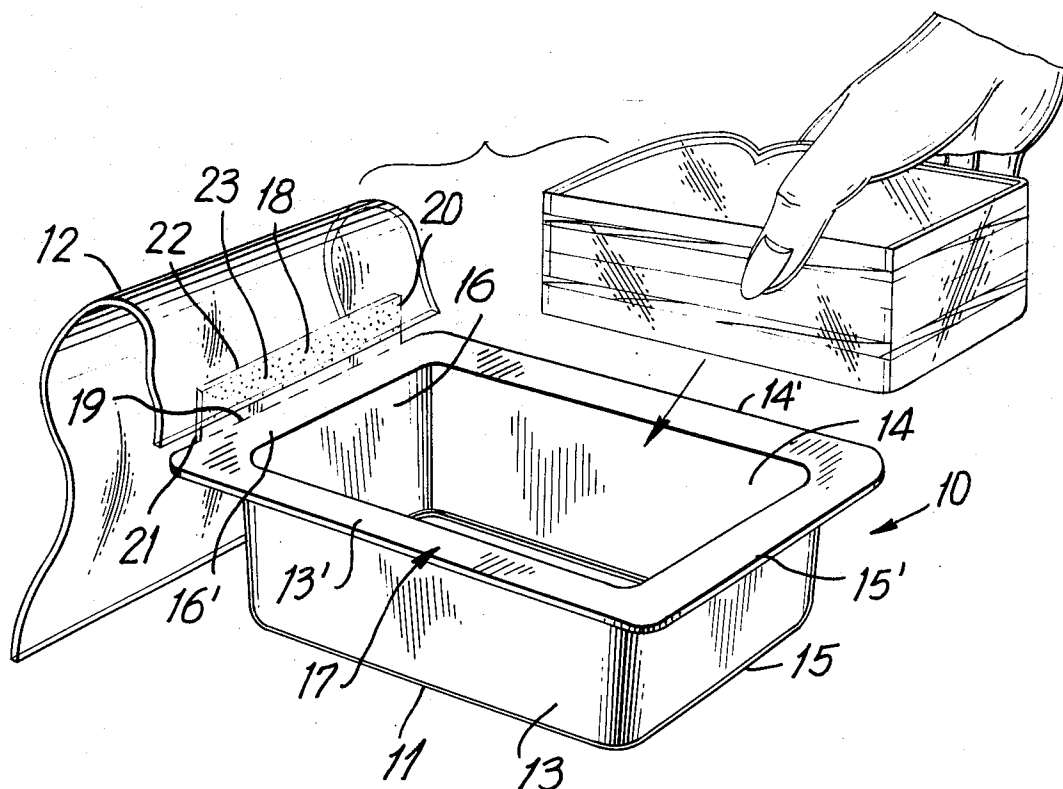
UNITED STATES PATENTS

3,371,848 3/1968 Ward et al. 206/56 AA
3,515,334 6/1970 Jacobson 206/46 F
3,465,873 9/1969 Munz 206/56 AB
1,892,756 1/1933 Van Horne 206/65 K
3,069,273 12/1962 Wayne 229/43 UX

[57] **ABSTRACT**

A heat sealable food container comprising a generally rigid plastic tray of substantial depth surrounded by a peripheral framing flange, all portions of said flange being disposed in a common plane. A flap member is integrally formed with one said portion of said flange, the flap being connected to said flange by a weakened hinge-tear line optionally defined by a series of partial or complete perforations or a thinned fold portion. A heat sealable transparent sheet is adhesively or heat sealingly connected to the upper surface of said flap, the sheet being of a size adapted to register with and form a cover for said flange.

3 Claims, 9 Drawing Figures



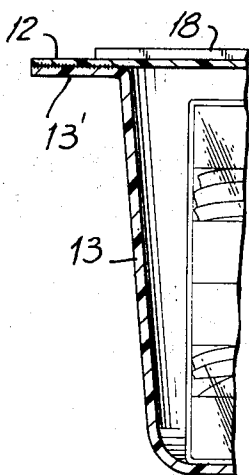
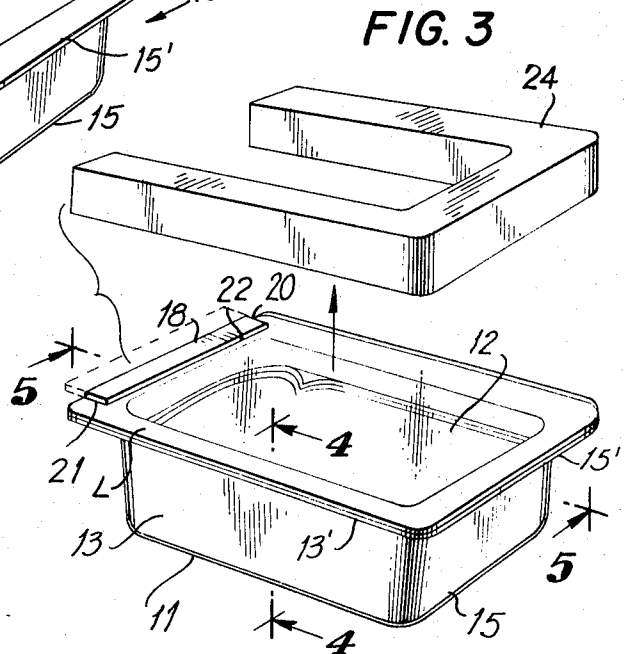
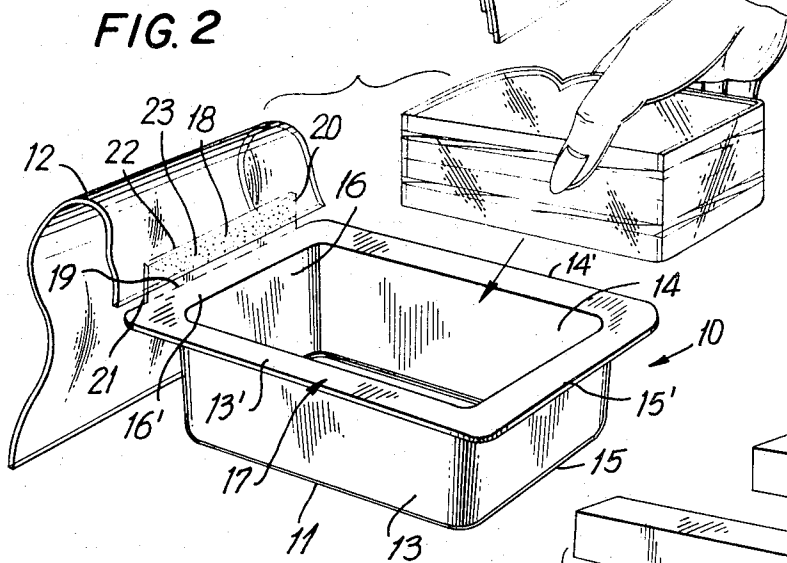
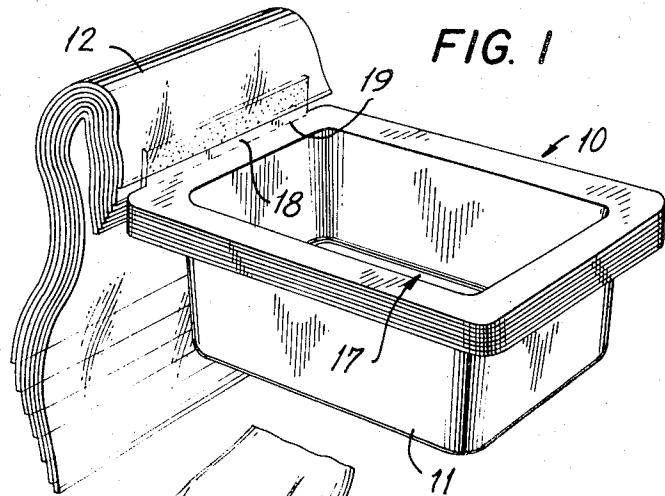


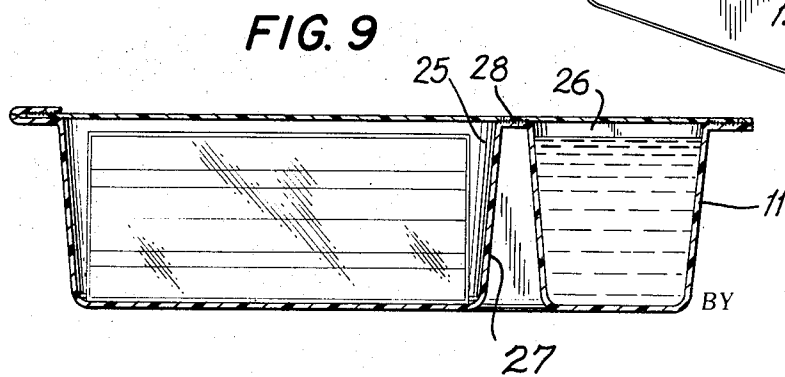
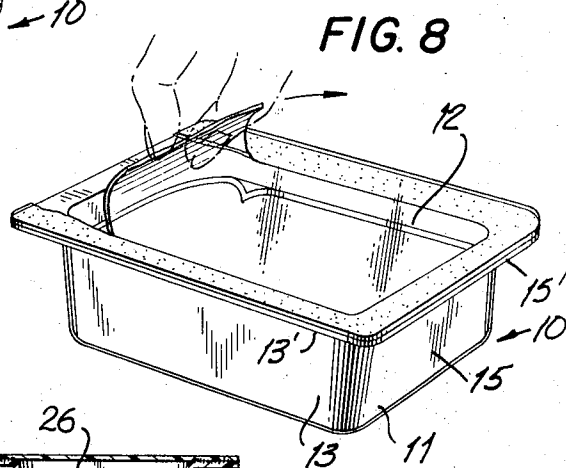
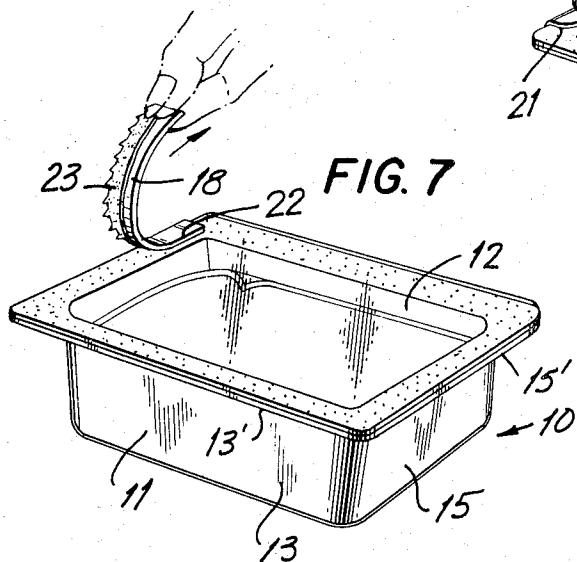
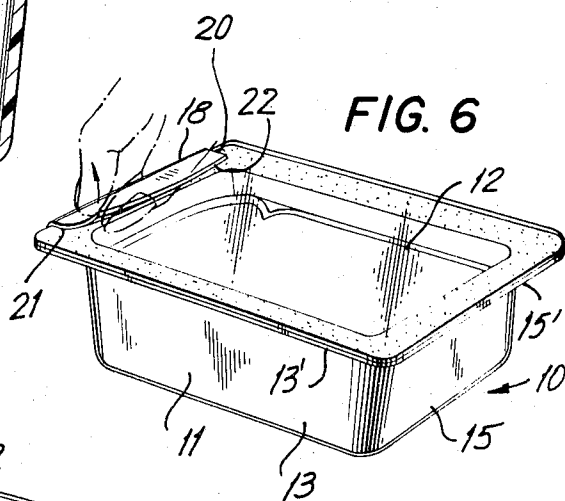
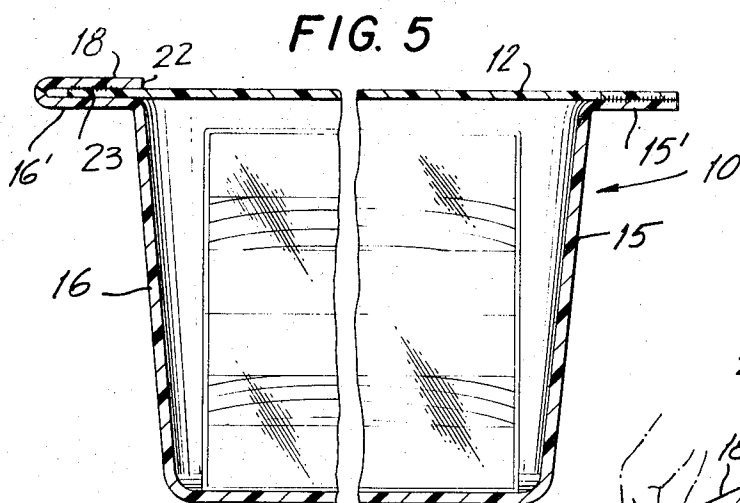
FIG. 4

INVENTOR.
DANIEL BERNHARDT

BY

Mark Sauer

ATTORNEY



INVENTOR.
DANIEL BERNHARDT

BY *Mark Sasseches*

ATTORNEY

HEAT SEALED FOOD CONTAINER

The device is used by filling the same with food, folding the flap 180° so that the cover overlies the flange, and forming a continuous heat seal connection between the sheet and the flange or frame in the area exterior of the side marginal edges of the flap.

The device may be opened conveniently by tearing the weakened hinge line. Access to the tear line may preferably be had by reaching beneath the flap, which is preferably unconnected to the cover sheet except at a narrow line between the longitudinal edge of the flap and the hinge line, and forcing the hand rearwardly to rupture the connection between the hinge flap and the frame, thus to provide access beneath the cover sheet in the area previously covered by the flap.

Where it is desired to form two or more separate compartments, separator ridges terminating in upwardly directed lands in coplanar alignment with the frame may be formed in the trays, the cover sheets being heat sealingly connected to the lands.

A multiplicity of the food packages may be shipped and stored in stacked condition, with the cover sheets folded back in position to receive food portions.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention is in the field of heat sealable packages, and more particularly food packages.

2. The Prior Art

In the past, efforts have been made to provide food packages which will be inexpensive to manufacture, easy to fill, and which are susceptible of facile sealing. The packages when sealed should protect the contents thereof but nonetheless be susceptible of opening without the use of knives or like implements which may not be readily available.

Heretofore packages intended for this purpose have been deficient in one or more of the aspects noted above, i.e. sealing has been inefficient; application of covers time-consuming; and reopening of the covers has required undue effort or the use of implements on the part of the user.

SUMMARY OF THE INVENTION

The invention may be summarized as directed to a food tray which is formed of a heat sealable plastic material, preferably polystyrene foam, but alternatively of polyvinyl chloride, oriented polystyrene or equivalent heat sealable plastic materials, or cardboard materials which have been coated to render the same heat sealable.

The units, which are of substantial depth, are shaped to be mutually nestable and incorporate a peripheral, coplanar flange portion surrounding the mouth of the tray. A flap is integrally formed with one of the flange portions, the flanges preferably together defining a rectangular configuration.

The flap is separated from the flange by a weakened fold or perforation line which also forms a convenient hinge. The uppermost surface of the flap is connected to a transparent cover sheet of a size to overlie the flange, the cover sheet being connected to the flap by a line of heat seal or adhesive paralleling the perforation line and extending the entire length of the flap, the adhesive being separated both from the hinge line and the parallel longitudinal edge of the flap. The length of the flap is preferably such that the side marginal edges

thereof, when the flap is folded 180°, overlap the flange portions of the side adjacent the flap containing flange.

In practice, a continuous heat seal is effected between the transparent cover sheet and the flanges in the area extending from one side marginal edge of the flap, around the entirety of the frame, and to the other side marginal edge of the flap, thus forming a completely sealed connection, to eliminate or at least to minimize the ingress of air to the interior of the sealed package.

It will be observed that the seal will be defined by a direct connection between the flange and sheet in the areas outside the flap, and between the flap and sheet in the areas in registry with the flap. The heat sealing connection will hold the sheet sandwiched between the flap and flange in the area in registry with the flap.

Opening of the flap is facilitated by reaching underneath the flap, breaking the readily ruptured connection between the flap and the sheet, tearing the weakened line between the flap and the flange, reaching under the sheet in the area under the flap and pulling the sheet upwardly, thus to expose the contents of the tray.

Optionally, where separate tray compartments are desired, a transverse wall may be formed within the tray, the wall terminating in an upwardly facing land disposed in a plane common with the plane of the flange. In this construction, a heat seal between the cover sheet and the land may be effected, thereby dividing the tray into two or more mutually noncommunicating compartments. It will be evident that the tray may be serially opened, first to expose one compartment while leaving the other intact.

It is accordingly an object of the invention to provide an improved food package device which may be shipped in nested bulk arrangement, filled, and readily, rapidly and effectively closed by a heat sealing step.

It is a further object of the invention to provide a device of the class described wherein separate compartments may be defined in a single heat sealing step.

It is a still further object of the invention to provide a device of the class described wherein the package may be readily opened without the use of tools in the nature of knives, etc.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, reference is made to the accompanying drawings, forming a part hereof, in which:

FIG. 1 is a perspective view of a group of nested food packages in accordance with the invention;

FIG. 2 is a perspective view of a food package in the process of being filled;

FIG. 3 is a filled, closed food package shown in conjunction with a sealing mechanism, which latter is diagrammatically represented;

FIG. 4 is a magnified section taken on the line 4—4 of FIG. 3;

FIG. 5 is a magnified section taken on the line 5—5 of FIG. 3;

FIGS. 6, 7 and 8 are perspective views illustrating the sequence of operations involved in opening a package;

FIG. 9 is a vertical sectional view of an embodiment of the invention.

In accordance with the invention there is disclosed a food package 10 consisting generally of two parts, namely, a food tray 11, and a covering sheet 12 preferably formed of transparent plastic material, such as cel-

lophane, which material has been coated to render the same susceptible of heat sealing.

The tray 11 is preferably formed of a foamed polystyrene which is relatively rigid and at the same time capable of having a heat seal connection effected thereto. Although polystyrene foam is a preferred material by reason of its heat insulating properties, alternate plastic materials having the desired properties of heat sealability and relative rigidity, such as polyvinyl chloride and oriented polystyrene, are readily adaptable for use as the tray component.

While the shape of the tray in horizontal section may be varied in accordance with the articles to be packaged, a rectangular shape is preferable and has been illustrated.

The tray component 11 includes side walls 13, 14 and end walls 15, 16, the upper terminal edges of each of the walls being defined by flange portions 13', 14', 15', 16'. The flange portions together define a continuous rim or frame, the upper flange surfaces of the portions being disposed in coplanar alignment. It will thus be seen that a frame or mouth 17 of substantial transverse extent and of continuous construction surrounds the entirety of the tray.

The end wall 16' incorporates a continuation or flap member 18, which flap member is enabled to hinge without rupture by a weakened line of partial or complete perforations 19. It will be appreciated that the line 19 may be formed by a combination of perforations or by a heat compression operation which thins the connection between the flap 18 and the flange 16' so as to weaken but hingedly secure the two components. It will therefore be understood that the term "perforation" as used herein and in the claims is to be interpreted as incorporating a weakening, with or without apertures, to permit a hinging as well as a severing, for purposes to be hereinafter set forth.

The flap 18 includes side marginal edges 20, 21 and longitudinal edge 22. As best seen from an inspection of FIG. 3, for instance, the side edges 20, 21 preferably extend sufficiently far in a lateral direction so as slightly but not completely to overlap the flange portions 13' and 14'.

The transparent top sheet member 12 is connected to the flap 18 preferably by a narrow heat seal band or line of adhesive 23, which band or line is disposed between the longitudinal edge 22 of the flap and the perforation, score or weakened line 19.

In use, a food article is deposited into the tray portion through the mouth or frame 17, the flap 18 and its associated cover sheet 12 being folded back, as shown in FIGS. 1 and 2. The flap is thereafter folded over 180° so as to sandwich the adhesively connected portion of the sheet 12 between the flap 18 and the flange portion 16', the parts being then disposed substantially in the position shown in FIG. 3. As previously noted, the side marginal edges 21, 22 extend far enough outwardly partly but not completely to overlap the side flanges 13', 14'.

In FIG. 3 there is diagrammatically shown a heat seal forming element 24 of generally U-shaped conformation. It will be understood that the under surface of the U-shaped seal is provided with a heater apparatus for effecting a heating of the sheet along a continuous seal line or area L. The seal line or area L extends from a position just adjacent the side marginal edge 21 of the flap 18 and continuously and uninterruptedly around

the frame 17 overlying the flanges 13', 15', 14', the line L terminating in intimate adjacency to the other side marginal edge 22 of the flap. It will be appreciated that during the actual formation of the heat seal, the tray may be mounted within a jig or like apparatus which supports the latter by the marginal frame, which jig or apparatus may or may not actively contribute to the heating effects employed to form the seal. Since apparatus to effect heat sealing is well known and since the same, per se, forms no part of the present invention, a detailed discussion thereof would be surplusage.

It is important to note, as will be more clearly pointed out hereinafter, the position of the seal which is formed since the same materially aids in the defining of an impervious package.

It will be recognized that a complete seal between the cover sheet 12 and the flanges defining the mouth is effected in all areas except in the area of the sheet which is engaged by the flap 18. However, in this area the seal is defined by the adhesive strip, line or band 23 which extends across the entire length of the flap. Since the heat seal between the sheet and the flanges in the areas immediately adjacent the marginal edges 20, 21 of the flap prevent any compromise in this area, it will be observed that a total sealing effect is obtained.

Reopening of the container, as illustrated in FIGS. 6, 7 and 8, is facilitated by the ability of the user to reach beneath the marginal edge 22 of the flap 18, sever the relatively light adhesive connection between the sheet 12 and the flap 18, thereby providing access for reaching beneath the cover sheet and the flange 16', as shown in FIG. 8. Once access to this area is obtained, the cover sheet may be torn away, exposing the contents.

It is an important feature of the invention that the heat seal or adhesive line or band 23, in the completed condition of the package, provides only a limited strength connection between the cover sheet 12 and the flap 18. It will be observed that after the heat seal line L has been formed, any stressing of the connection provided by the band 23 is impossible since the downwardly constrained flap shields and holds the sheet portions in registry with the flap in their desired position. Thus, by reason of the described construction, it is possible for a relatively weak adhesive line to be employed at 23, enabling the user readily to compromise the seal in this area, and raise away the flap when it is desired to open the package.

The facility with which the package of the present invention may be opened should be contrasted with the difficulty encountered in connection with packages heretofore known wherein opening was required to be effected by puncturing the top sheet in an area in registry with the contents, and then manually reaching through the punctured portion and ripping away the sheet.

In an alternate construction heretofore known, a tab or extension of the top sheet was permitted to extend beyond the side marginal edges of the flanges, opening of the packet being effected by pulling upwardly on the extended flap of the cover sheet. Such devices, however, have been found unreliable since the success of the operation requires the pulling forces exerted on the flap to be sufficient to separate the main connection line between the flap and the cover sheet. Since the heat seal connection is often very strong and not readily ruptured, it is not common for the flap to tear

away from the main sheet, requiring the user to puncture the cover sheet, as previously described, in order to gain access to the contents of the package.

In FIG. 9 there is disclosed an embodiment of the invention wherein the tray 11 is separated into discrete compartments 25, 26 by a transversely extending projection 27, terminating in an uppermost land portion 28. It will be appreciated in connection with this embodiment that the frame or mouth 17 is uninterrupted and the projection and land extends transversely inter-

iorly of the side walls of the package. In this embodiment the heat sealing element is so constructed and arranged as to effect a heat seal between the covering sheet 12 and the land 28 at the same time as the seal line L is effected. It will thus be observed that the compartment 26 is completely isolated from compartment 25 until the cover sheet has been removed.

Obviously, if additional compartments are desired, additional projections such as the projection 27 may be molded into the tray member, which projections may extend transversely or longitudinally or both, depending upon the desired number and location of compartments desired.

It will thus be observed that there is provided an improved heat sealable enclosure, and particularly a food enclosure, wherein a multiplicity of units may be nested for efficient shipping and compact storage. The enclosures may be sealed, after being filled, by very simple heat sealing apparatus or, for that matter, through the use of a sealer in the nature of a heater pencil, making the packages useful for small stores, delicatessen shops, or even for home use, wherein complex heat sealing equipment is impractical.

A particular feature of the invention is the ability to provide a tight, non-compromised seal, which may be readily opened when desired, by the expedient of securing the cover sheet to the foldable flap with a readily compromised adhesive area, which area is protected after heat sealing until it is desired to open the package.

The package of the invention is to be contrasted with heat sealed packages heretofore known wherein an exposed extension portion of the cover sheet is provided, to be used in opening the unit. Often, the seal in the prior art unit is prematurely compromised during handling since the projecting extension is readily accessible.

In the device of the present invention the cover portion which will be used to open the package is well protected, being accessible only after portions of the protector flap are raised.

Having thus described the invention and illustrated its use, what is claimed as new and is desired to be secured by Letters Patent is:

1. A food package comprising a tray member of rigid, heat sealable plastic, said tray including side walls, each

of said walls having a narrow surrounding flange portion, the upper surfaces of said flange portions being disposed in co-planar alignment, said flanges defining a continuous frame, a flap member integrally formed with one of said flanges between the ends thereof, the length of said flap being less than the length of said one of said flanges, said flap and flange being separated by a line of perforations defining a hinge, the side marginal edges of said flap, when the latter is bent 180° with respect to said one flange, being in overlapping relation to the side flanges adjacent said one flange, a transparent heat sealable cover sheet of a size adapted to register with said frame secured to the surface of said flap which is uppermost in the unhinged position along a continuous connection line interposed between said hinge line and the free end of said flap, said flap being bent 180° into registry with said one flange, and a continuous U-shaped, co-planar heat seal connection line formed between said cover sheet and said flange portions, said connection beginning adjacent one said side marginal edge of said flap and terminating adjacent the other said side marginal edge.

2. As a new article of manufacture, a package adapted to be filled with food and thereafter sealed by a continuous U-shaped heat seal formed in a single plane, said article comprising a tray member of rigid heat sealable plastic, said tray member including a rectangular mouth portion surrounded by two side flanges and two end flanges, said flanges together defining a continuous, outwardly extending rectangular frame, the uppermost surface of said frame being disposed in a common plane, an integral flap member extending outwardly from one of said end flanges, said flap member being hingedly connected to said end flange along a weakened fold line of connection located substantially in alignment with the outermost marginal edge of said end flange, said flap member being of lesser longitudinal extent than said end flange, the side marginal edges of said flap being aligned with a central portion of the side flanges surrounding said end flange, a transparent cover sheet of a size adapted to register with said frame, said cover sheet being adhesively secured to the upper surface of said flap along a narrow attachment line extending the length of said flap and interposed between said line of connection and the longitudinal free marginal edge of said flap, whereby when said flap is folded over into registry with said end flange, said container may be sealed by a continuous, planar, U-shaped heat seal connection between said cover sheet and said flanges, said seal beginning adjacent the side marginal edges of said flap and extending the length of said side and other end flanges.

3. A nested stack of packages in accordance with claim 2 wherein said flaps in said stack are disposed in registering relation with each other.

* * * * *