

Jan. 5, 1943.

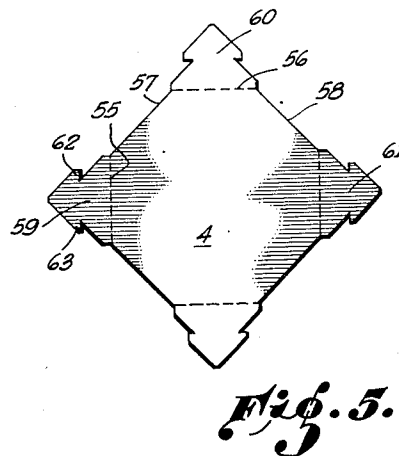
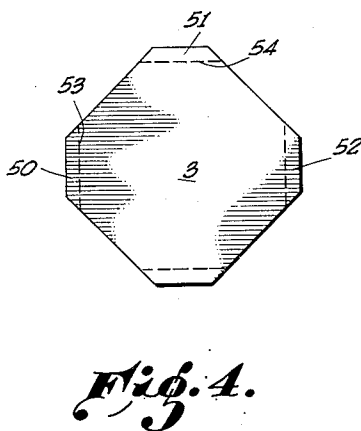
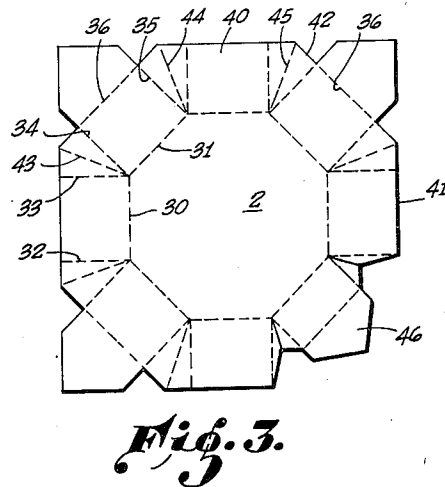
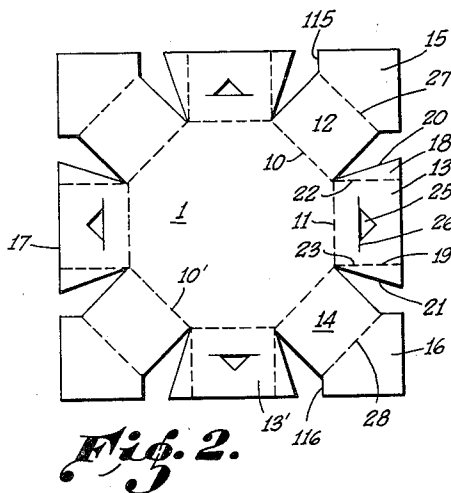
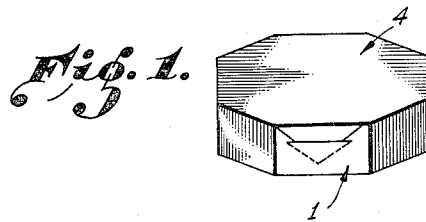
D. RAY

2,307,076

PACKAGING

Filed March 27, 1939

5 Sheets-Sheet 1



DON RAY
INVENTOR.

BY

C. J. McBeth
ATTORNEY.

Jan. 5, 1943.

D. RAY

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Fig. 6.

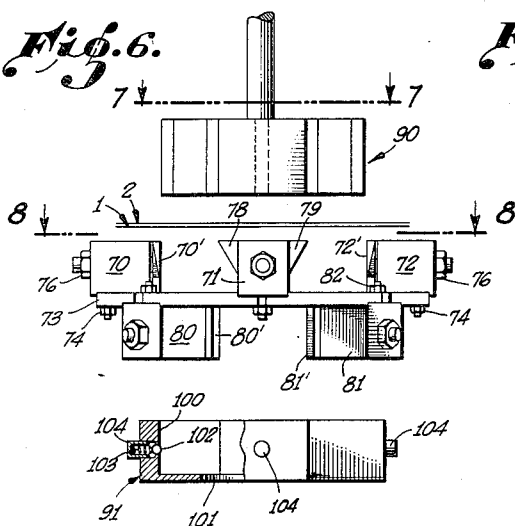


Fig. 7.

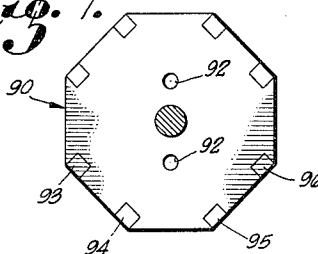


Fig. 8.

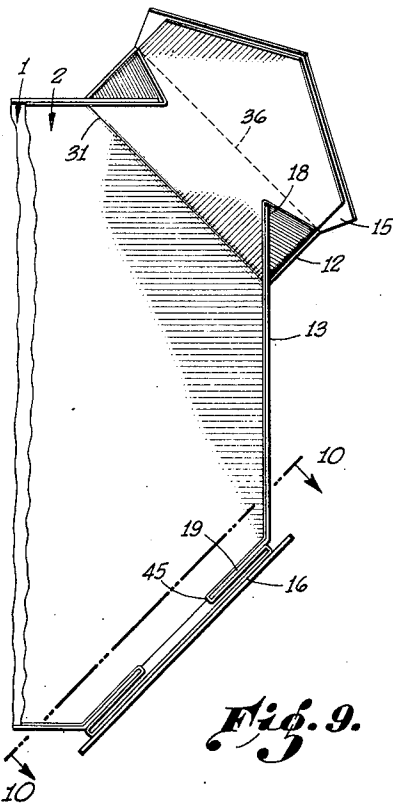
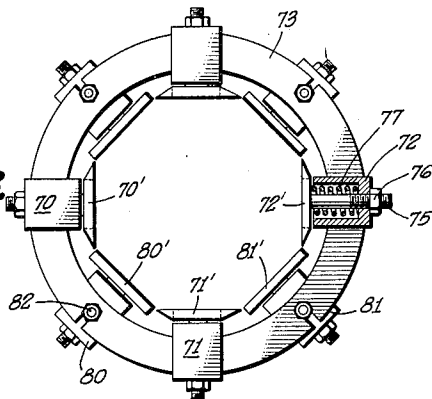
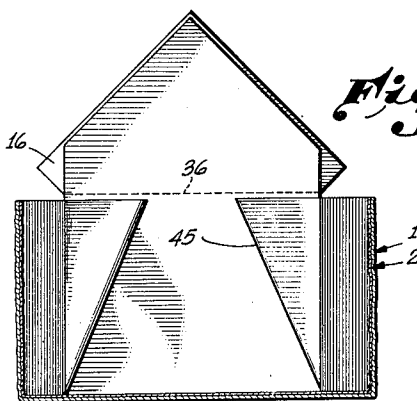


Fig. 9.

Fig. 10.



DON RAY

INVENTOR.

BY

C. J. Millette
ATTORNEY.

Jan. 5, 1943.

D. RAY

2,307,076

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Fig. 11.

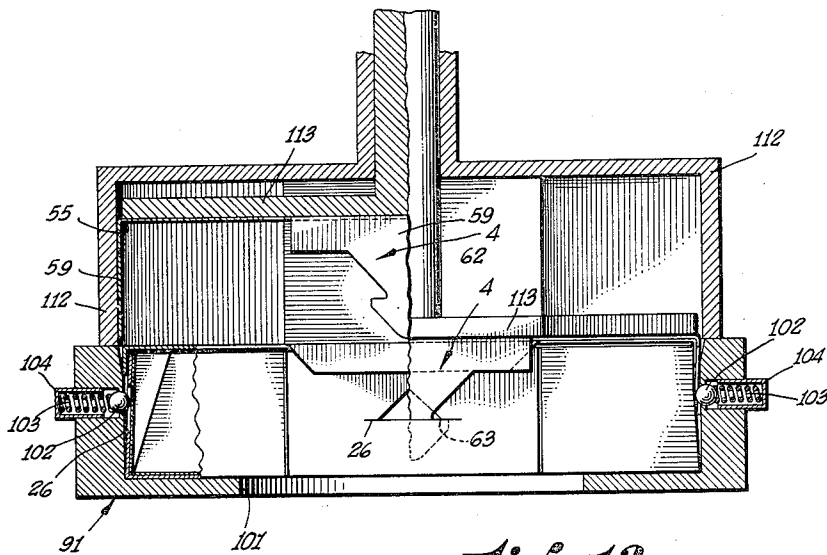
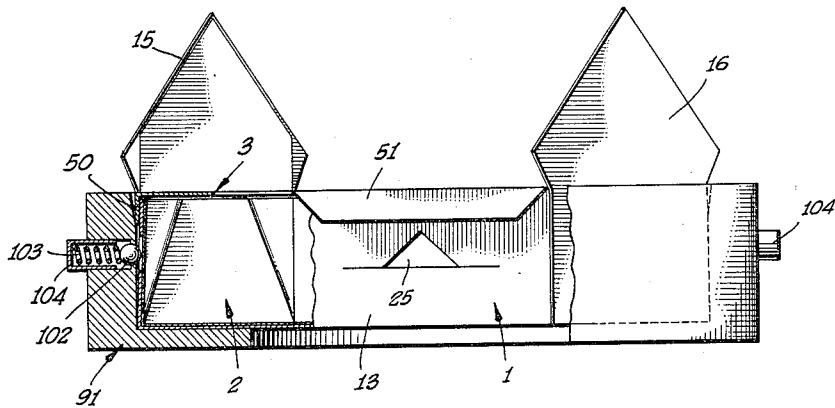


Fig. 12.

DON RAY
INVENTOR.

BY

C. J. Mitchell
ATTORNEY.

Jan. 5, 1943.

D. RAY

2,307,076

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Fig. 13.

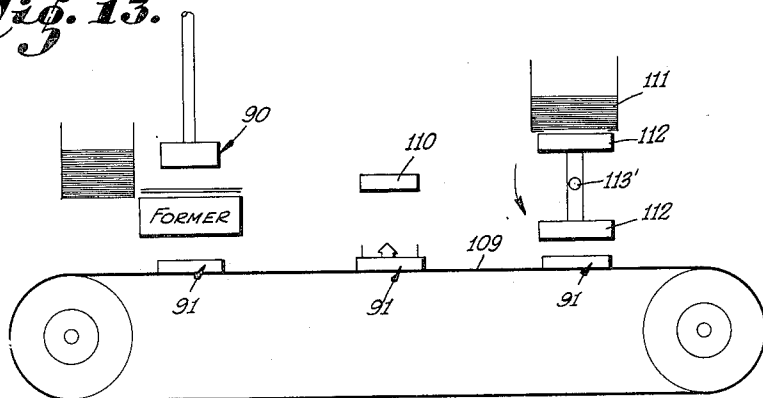


Fig. 16.

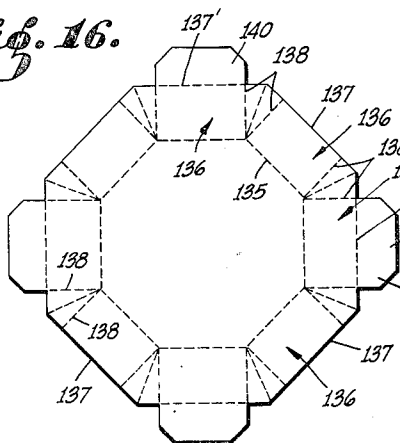


Fig. 14.

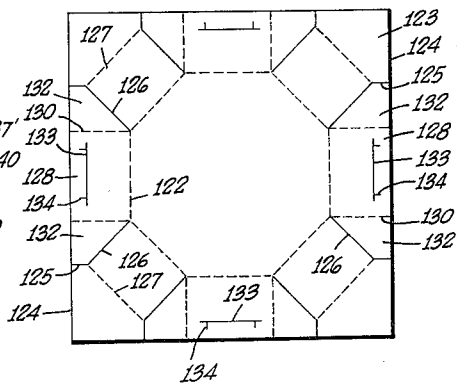


Fig. 17.

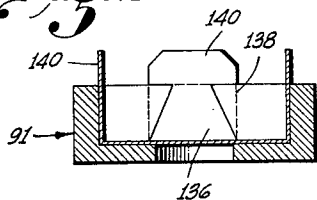
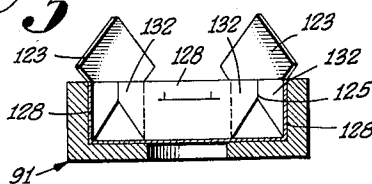


Fig. 15.



DON RAY
INVENTOR.

BY

C. J. Mitchell
ATTORNEY.

Jan. 5, 1943.

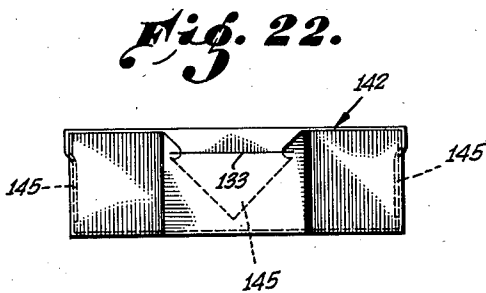
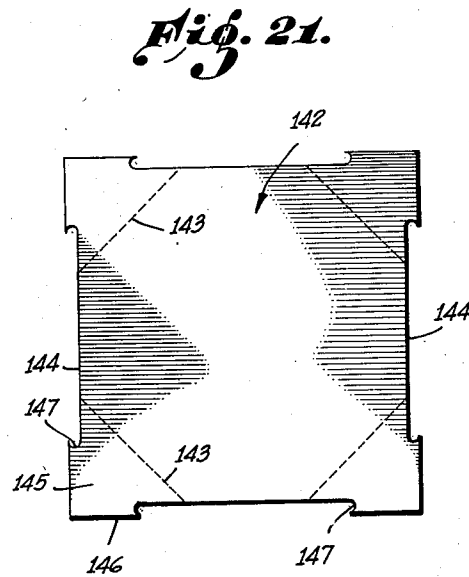
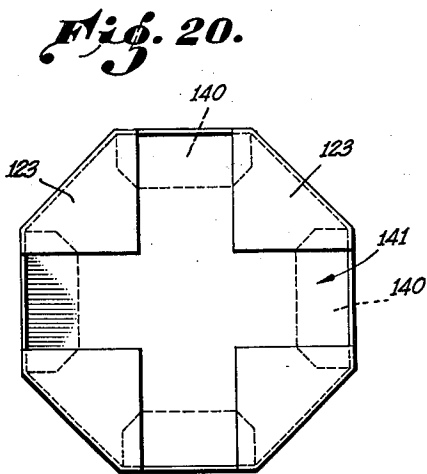
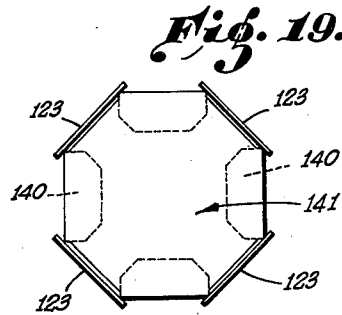
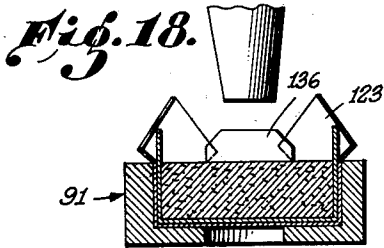
D. RAY

2,307,076

PACKAGING

Filed March 27, 1939

5 Sheets-Sheet 5



DON RAY
INVENTOR.

BY

C. A. Mickett
ATTORNEY.

UNITED STATES PATENT OFFICE

2,307,076

PACKAGING

Don Ray, Beverly Hills, Calif., assignor to Arden Farms Co., Los Angeles, Calif., a corporation of Delaware

Application March 27, 1939, Serial No. 264,376

2 Claims. (Cl. 93—3)

This invention relates to improvements in packaging machines, methods of packaging; and a container, package or box of novel contour and construction.

Generally stated, this invention pertains to means whereby various foodstuffs and other articles can be packaged in an economical, simple and readily available manner. One of the objects of the invention is to provide a method of operation whereby containers, boxes or packages can be formed, filled and sealed in a substantially continuous manner. Illustrative forms of boxes or containers will be described hereafter, such containers or boxes being characterized by their economy, ease of formation and stability of the resulting package.

In dispensing various products, it is desirable to provide a package with which the product may be thoroughly wrapped so as to preserve its flavor and to prevent it from contamination and deterioration. Various forms of cartons and boxes have been previously devised but such cartons or boxes are relatively expensive and are formed and filled in an awkward or difficult manner, not conducive to rapid, continuous or semi-continuous operations.

One of the objects of the present invention is to provide a box or container which is made from flat sheets of material but which can be folded so as to produce a stable product, the sheets having interlocking and stabilizing parts adapted to maintain the completed package in a sealed condition without the necessity of using extraneous sealing means.

Another object of the present invention is to provide a container which, though stable in its sealed form, may be readily opened so as to render the contents available.

A still further object is to provide a novel method of forming, filling and sealing containers.

Again, an object of the invention is to provide a machine whereby the methods herein disclosed may be carried out effectively.

These and various other objects, uses and advantages of the invention will become apparent to those skilled in the art from the following description of certain illustrative forms in which the inventions may be embodied.

In order to facilitate understanding, reference will be had to the appended drawings, in which:

Fig. 1 is a perspective view of an octagonal package made in accordance with this invention.

Fig. 2 is a plan view of a precut blank of a cover wrapper.

Fig. 3 is a plan view of an inner liner, one corner

thereof being lifted to show the method of folding.

Fig. 4 is a plan view of a top lining.

Fig. 5 is a plan view of a top cover sheet.

Fig. 6 is a side elevation, diagrammatic in form, of a machine for forming the container or package.

Fig. 7 is a horizontal section taken along the plane VII—VII of Fig. 6.

Fig. 8 is a plan view taken along the plane VIII—VIII of Fig. 6.

Fig. 9 is an enlarged plan view of a portion of a package showing the manner in which it is formed.

Fig. 10 is a vertical section taken along the plane X—X of Fig. 9.

Fig. 11 is a side elevation, partly broken away, of a mold in which the container is formed.

Fig. 12 is a side view, partly in section, showing two positions assumed during the sealing of the container.

Fig. 13 is a diagrammatic side view of a forming, filling and sealing machine.

Fig. 14 is a plan view of a modified form of cover wrapper.

Fig. 15 is a vertical section of a forming mold containing the cover wrapper of Fig. 14.

Fig. 16 is a plan view of a modified liner.

Fig. 17 is a vertical section showing the position assumed by the liner in a forming mold.

Fig. 18 is a vertical section showing the position assumed by the liner and wrapper in the mold during filling.

Fig. 19 is a plan view showing the position of the container elements after the top liner is placed thereon.

Fig. 20 is a plan view showing the position after the stabilizing tangs are bent in.

Fig. 21 is a plan view of a top cover sheet.

Fig. 22 is a side elevation of a completed container using the elements of Figs. 14, 16 and 21.

Various products may be handled by the means and methods of this invention such as, for example, butter, shortening, oleomargarine, ice cream, cheese, candy and various confections, dried or glazed fruit, salads, gelatins, etc., and the size and proportions of the container can vary somewhat with the bulkiness of the material which is being packaged for distribution. In the illustrative forms described hereafter and shown in the drawings, particular reference is made to a package which has been found particularly effective for use in distributing ice cream, cheese and the like.

By referring to Figs. 1 to 5, it will be noted

that the container itself may be made from four elements, namely, a cover wrapper 1, a liner 2, a top liner 3 and a top cover 4. It is to be noted, also, that each of these elements is cut from a substantially flat and square sheet of suitable material so that there is very little waste of material and the largest possible number of wrappers, liners, etc., can be cut from a continuous sheet of material.

The cover wrapper 1 and the top cover 4 may be made from a heavier grade of paper, this paper being suitably lithographed or printed on its exterior and if desired coated with paraffin or other wax, a resinous thermoplastic or thermosetting material, etc. Water-resistant or waterproof coatings are desirable whenever the contents are of a character which may mold or which are semi-liquid or require placement of the container in refrigerators during storage. The inner liner 2 and the top liner 3 may be made of material lighter in weight; Pliofilm, which is a rubber-containing thermosetting product having waterproof characteristics, or any other suitable parchmentized, oil-treated, waxed or even untreated material can be used.

The cover wrapper 1 is substantially square, in flat form, and has a central field delineated by the score marks 10, 11, etc. This central field as shown is octagonal. Surrounding this octagonal field are side portions including the portions 12, 13, 14, etc. The corner portions 12, 14, and the like are provided with enlarged stabilizing tangs 15, 16, and the like. The members 13, 13' have short wings 18, 19 extending therefrom, the edges of said wings, such as the edges 20 and 21, being directed toward the score lines defining the octagonal field.

The score lines 10, 11 and the like which define the field are of equal length and the members 12, 13, 14 and the like are therefore of equal width with the exception that the side members 13 and 13' have the wings 18 and 19 which extend from the parallel score lines 23, 23.

The side members 13 are also provided with a cutout portion 25 approximately triangular in form, the base of such triangular cutout portion being directed toward the field. The cut 26 extends from the base line of the triangular portion 25 toward the wings of the member 13.

Attention is also called to the fact that indentations or score lines 27, 28 and the like are formed in the stabilizing corner tangs, the fold indentations being parallel to the score lines 10 which delimit the field.

When a liner is used such as is shown in Fig. 3, such liner is also provided with an octagonal field defined by means of score lines 30, 31, etc. The field thus defined is preferably just a little smaller than the field of the cover wrapper 1. Perpendicular to these score lines 30 and 31 are other fold lines, such as 32, 33, 34, 35 and the like, defining side portions. A score line 36 also parallels the line 31 at a distance equivalent to the height of the final side wall of the container.

The edges 40 and 41 of the liner 2 are connected by means of the score line 36 so as to define a large octagonal field, the score line 36 being continued by a cut edge 42. Fold lines or score lines are also provided at 43, 44, 45, etc., these being directed to the points of intersection of the fold lines 30 and 31. The corner tang 46 is shown in a partially raised position so as to emphasize and disclose the manner in which the liner is folded along the various score lines during formation of a container.

The top liner 3, shown in Fig. 4, may be substantially square as shown and be provided with tab portions 50, 51, 52, which come into existence when the top liner 3 is folded along the score lines 53, 54 and the like. The top cover, shown in Fig. 4, is substantially square but the corners thereof are marked with the indented or scored lines 55, 56, and the like, said score lines together with the edges 57 and 58 defining an octagonal field. The locking tangs 59, 60 and 61 may be provided with enlarged triangular heads having shoulder portions, such as 62 and 63. The total width of this locking tang at the shoulder portions should be substantially equivalent or very slightly smaller than the length of the cut line 26, exclusive of the base of the aperture 25 in the cover wrapper 1.

The elements described can be best combined to form a package by the use of a machine such as is shown in Figs. 6, 7 and 8. The cover wrapper 1, and if desired the liner 2, may be fed into the machine in superimposed relation immediately on top of a series of forming heads 70, 71, 72 and the like adjustably carried upon a stationary ring or frame 73. The various forming heads 70, 71, 72 are arranged with their axes at 90° to each other, the presser plates 70', 71' and 72' thus forming an incomplete square. Each of the forming heads may be adjustably mounted in the frame 73 and may be movable toward the center of such square along milled slots or guides in the frame 73, the heads being positionable by means of locking bolts such as 74. Each of the forming heads is provided with a presser plate which is mounted upon a stem 75 having an adjustment nut 76 and such plates are yieldably urged toward the center of the square by means of springs 77 (see Fig. 8). These presser plates are also provided with wings, such as the wings 78, 79, which are triangular in form, being broader and wider at the top and converging to a point at the bottom as best shown in Figs. 6 and 8. The total width of the presser plates at the top (including the wings) should be approximately the same as the length of the edges 17 of the cover wrapper whereas the base of the presser plates 72' should be approximately equivalent to the width of the material along the score line 11.

Immediately below the set of forming heads 70, 71, etc., is another series of forming heads 80, 81, and the like, these forming heads being also mounted for radial adjustment and being spaced from each other so as to work along lines bisecting the angles between adjacent upper forming heads. For example, the forming head 80 is positioned so as to operate along the line bisecting the line of movement of the upper forming heads 70 and 71. Adjustment means are indicated at 82. Each of the forming heads 80, 81 and the like is provided with a presser plate 80', 81' and the like mounted in a manner similar to that in which the upper forming plates are carried.

The faces of the various presser plates 70', 80', 71', etc., should form a well approximately octagonal in cross section and similar in size to the size of the field of the cover wrapper 1. An octagonal plunger 90 is provided, of a size slightly smaller than the octagonal field of the cover wrapper and provided with means for reciprocally moving the plunger through the well formed by the various presser heads into a mold 91. Vertical bores 92 may be provided in the plunger 90 to provide means for releasing air. When the cover wrapper is made of a material capable of

adhering or cohering to the liner or to itself in the presence of heat, the plunger 90 may be provided with heating elements 93, 94, 95, 96 and the like set into the vertical faces of said plunger for the purpose of supplying heat to desired areas of the cover wrapper and liner as such cover wrapper and/or liner is bent and folded by the downward movement of the plunger 90 through the series of forming heads and into the mold 91.

The mold 91 is provided with an octagonal cavity 100 and an opening 101 in the bottom thereof. This mold is adapted to receive the cover wrapper and every other side of such octagonal mold is provided with means for securing the folded container within the mold while the plunger is withdrawn from the mold. Such means, for example, may comprise the spring-actuated pins or balls 102, such pins or balls being yieldably urged slightly into the octagonal cavity of the mold by means of a spring 103 contained in a cap 104. The pins or balls 102 constituting the illustrated locking means are adapted to engage with the cutout portions 25 of the cover wrapper 1 (shown in Fig. 2). It will thus be evident that in operation the cover wrapper 1 is placed in position on the upper series of forming heads 70, 71, etc., and the downward movement of the plunger 90 carries the cover wrapper through the assembly of forming heads and into the mold 91, the cover wrapper being suitably folded and if desired cemented at its overlapping edges by the action of heat on the coating material of such wrapper.

The side pieces 13 and 13' are first bent inwardly by the forming heads 70 and 71 and the corner tangs 12 and 14 are then bent inwardly along the score lines 10 by the forming heads 80 and 81, this movement also causing the wings 18 and 19 to be bent inwardly, such wings being then covered by edge portions of the sides 12 and 14. In the event a liner 2 is formed at the same time, then the liner and the cover wrapper become interlocked as best shown in Figs. 9 and 10. Since the liner 2 is impermeable not only throughout the bottom field but also throughout the side portions, a substantially water-tight container may be made. In Fig. 9 the wing 19 is shown bent whereas the wing 18 has not as yet been bent by the upward movement of the corner tangs along the crease lines 10 and 31. The folded edge 45 of the liner is clearly shown in Fig. 10.

Fig. 11 shows the partially formed container including the cover sheet and liner within the mold 91. The molds 91 are then advanced in any suitable manner as, for example, by means of a conveyor, to a filling head generally indicated at 110 (Fig. 13) where such containers are filled while still in such molds 91. The conveyor 109 then moves the mold and its filled container to a sealing station, at which time a top liner may be applied and the top cover applied. Fig. 11 shows the top liner 3 applied to the filled container, the tabs 50 and 51 being folded down so as to cover the sides 13. The upstanding stabilizing tangs 15 and 16 are then folded down and a suitable sealing device applies the top cover 4.

As shown in Fig. 13, a stack of these top covers 4, indicated at 111, is fed into a sealing mold 112, said sealing mold being capable of rotation about a horizontal shaft 113' so that it can convey the top cover 4 into position immediately above the mold 91.

By referring to Fig. 12 it will be seen that the sealing mold 112 is hollow and contains a movable piston 113. The top cover 4 has been bent along its crease lines 55, 56, etc., so as to cause the locking tangs 59, 60, etc., to lie in vertical planes at right angles to each other. Downward movement of the piston 113 forces the locking tangs around the container in the mold 91, such locking tangs entering the slot 26 until the shoulders 62 and 63 of such locking tangs extend below the line of the cut 26. The plunger 113 is then removed and the sealing mold 112 is retracted, leaving a completely filled and sealed container within the mold 91. The conveyor 109 then carries the mold to a discharge mechanism, not shown, whereby the filled and sealed containers are removed by the application of pressure to the bottom of the container through the port 101 in the bottom of the mold 91. In actual operation, from 15 to 25 containers of this character can be formed, filled with ice cream and sealed per minute.

The shoulders 115 and 116 of the locking tangs 15 and 16 cooperate with the top cover 4 and particularly with the inner surfaces of such top cover formed by bending the locking tanks along the crease lines 55 and 56 and thereby produce a finished container which is not readily deformable.

A modified form of cover wrapper, liner and top cover is shown in Figs. 14 to 22. The top cover sheet is indicated in Fig. 14 and it will be seen that it includes a center field, also octagonal in shape, delineated upon a flat square piece of material by the score marks 122. Corner tangs 123 are formed as a part of the cover wrapper and occur at the corners of the square blank. These tanks are defined by marginal edges 124 which delineate the blank and terminate in shoulders 125 disposed at right angles thereto, these shoulders extending inwardly toward each other until they intersect the cut edges 126 which emanate from and are at right angles to the score marks 122. Paralleling the score marks 122 and extending between the shoulders 125 are score marks 127.

The side folds 128 have an outer marginal edge in line with the edges 124 of the corner tangs. Score lines 130 are formed in these side members 128, thereby forming end flaps or wings 132. Cut into each of the rectangular center sections of the side folds 128 is a slit 133 parallel to the outer marginal edge and having small right angle slots 134 near the ends thereof. These slots are adapted to receive the locking tangs of the top of the container.

When the cover wrapper shown in Fig. 14 is folded into a forming mold, such as the mold 91 (see Fig. 15), the corner tangs 123 extend upwardly whereas the wings 132 of adjacent side flaps 128 practically come in contact with each other.

Fig. 16 shows a modified form of liner provided with score lines 135 defining a central field of octagonal shape. This field is bounded by a marginal portion of uniform width whereby a larger octagonally shaped sheet is defined. This marginal portion comprises a plurality of rectangular fields 136 bounded on their inner sides by the score marks 135 and on their outer sides by an edge 137. Parallel score lines 138 at right angles to the score lines 135 form the rectangular side portions which eventually constitute sides of the container. Alternate fields 136 are provided with tangs 140, these tangs extending be-

yond score line 137'. Score lines or indentations 139 connect the approximate points of intersection of the edges 137 and 137' with the score lines 135.

When such inner liner is formed in a forming mold, it assumes the position shown in Fig. 17. When the liner and cover wrapper are simultaneously folded, the various darts assume the position shown in Fig. 18 and the container thus formed can be filled.

Fig. 19 is a plan view of such container after the tangs 140 have been bent inwardly and then covered by a top liner 141 similar to the liner shown in Fig. 4.

Fig. 20 shows the position assumed by the stabilizing tangs 123 after they have been bent in so as to cover the top liner 141.

Fig. 21 is a plan view of the top cover 142 and it is to be noted that said top cover is substantially square but has its corners marked with diagonally directed score lines 143, these score lines, together with the edges 144, delineating an octagonal field. The corner locking tangs 145 thus formed have marginal edges 146 disposed substantially at right angles and locking shoulders 147. The total width of these locking tangs between the shoulders should not exceed the length of the cut line 133 formed in the side flaps 128 of the cover wrapper.

This top cover 142 is applied in a manner similar to that previously described and the completed package is shown in Fig. 22. It is to be noted that the shoulders 147 of the locking tangs 145 cooperate with the edge formed by the cut line 133 so as to lock the top cover 142 in position.

It will thus be seen that the package here disclosed is formed by the use of inexpensive flat sheets of suitable material which do not require the use of expensive machinery or preforming dies but make it possible for a package to be made and assembled progressively with a minimum amount of waste. The method herein disclosed permits the filling and sealing of a large number of containers per unit of time and requires but a limited number of filling molds. Obviously the containers can also be assembled and filled by hand, if desired. In the event the inner or outer surfaces of the outer wrapper are coated with thermoplastic or thermosetting compositions, then there is no necessity of employing locking tangs on the top cover and simply tabs insertable into slots cut in the side flaps of the bottom wrapper are sufficient since the application of heat to the overlapped areas of the bottom wrapper will cause the bottom wrapper to maintain its position due to the action of the thermosetting coating. Similar interlocking of parts may be attained by the use of Pliofilm or other suitable material for the inner liner.

The automatic continuous form of machine comprises a forming station and means for conveying the filled molds past a filling station and a sealing station. The packages can be removed from the molds either manually or automatically. Obviously, the various motions, such as the downward motion of the plunger, the forward intermittent motion of the conveyor and the inter-

mittent motion of the sealing mechanism, are suitably mechanically interlocked and correlated. Such correlation comes within the skill of the engineering arts and need not be described in detail herein. All changes, modifications and adaptations coming within the scope of the appended claims are embraced thereby. For instance, although the description given hereinabove has specifically referred to ice cream, and the use of a liner folded into and interlocked with the cover wrapper has been referred to, the container and methods of this invention can be used with advantage in enclosing preformed and prewrapped objects. For example, glazed or dried fruits may be molded into polygonal form, wrapped with a liner or a sheet of Cellophane, and the preformed and prewrapped contents then inserted into a container consisting only of the cover wrapper, which cover wrapper is then sealed by the application of a top cover. Cheese in precut, preformed and prewrapped condition can also be introduced into these containers. Many other adaptations will occur to those skilled in the art.

I claim:

1. A method of forming and filling containers which comprises: folding a superimposed liner sheet and a cover wrapper sheet simultaneously and in contact to form the bottom and sides of a container; applying heat to limited areas of said folded liner and cover wrapper to bond the same together; forcing said container comprising said folded liner and cover wrapper into a mold, filling said container while in said mold, attaching a top cover onto said filled container while in said mold, and then removing said filled and covered container from said mold.

2. A method of forming and filling containers continuously, which containers are characterized as comprising a relatively stiff blank cut and scored to form a container of polygonal shape with upturned side walls adapted to overlap each other along contiguous edges when folded, a liner having a configuration to conform to the inner surface of the formed container when the blank is folded, and a cover adapted to interlock with the blank to close the container, which method consists in disposing a liner blank upon the container blank and then simultaneously folding the sides of the liner blank and the container blank to form side walls for the container with the contiguous edges of the container blank in overlapped relation to each other, and the liner conforming to the inner surface of the folded blank and folded around contiguous overlapping edges of the side wall portions of the container blank, said operations taking place simultaneously while forcing said container and liner into a mold in a folding zone, then moving said container and mold to a filling zone, then filling said container with the product to be dispensed while in said mold and thereafter applying the cover element to the container and disposing it in interlocked relation to the sides of the container, whereby the product will be covered and the container will be closed.

DON RAY.