

July 7, 1970

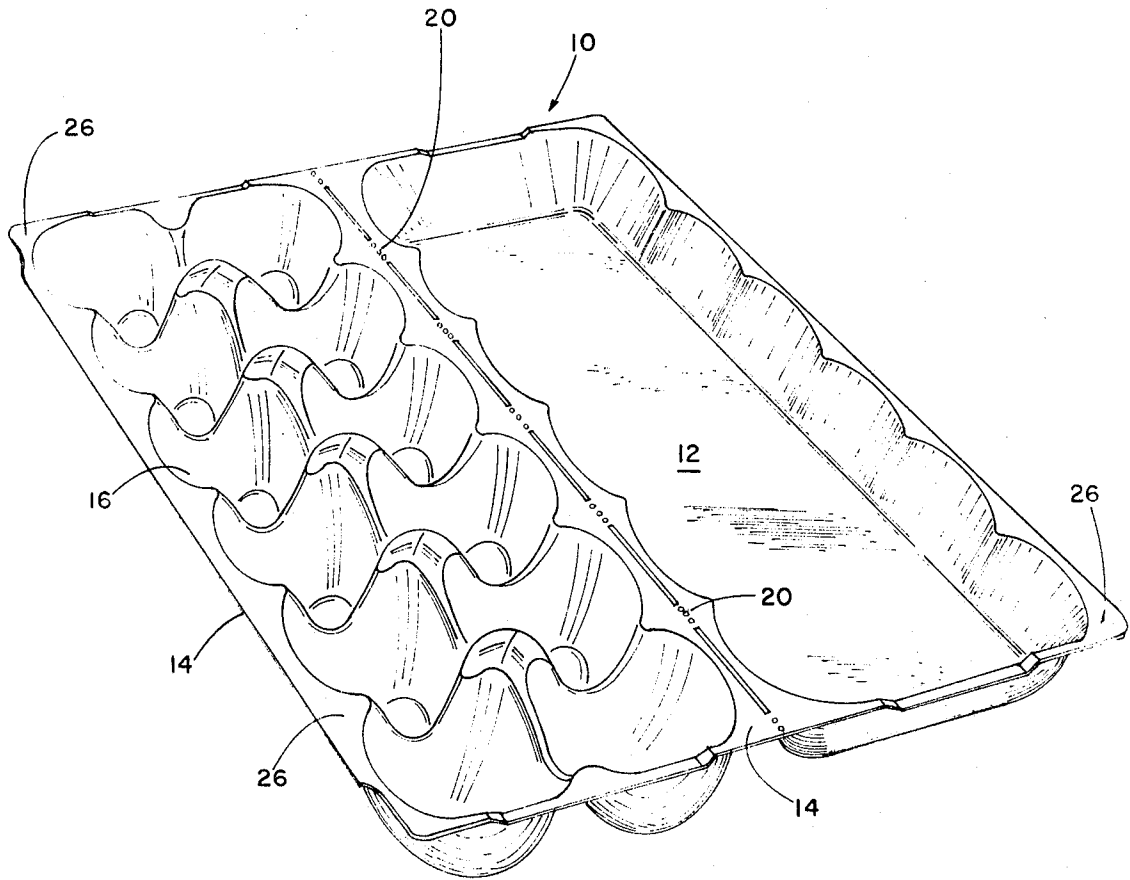
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3,519,189

PROTECTIVE CONTAINER

Filed July 10, 1968

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

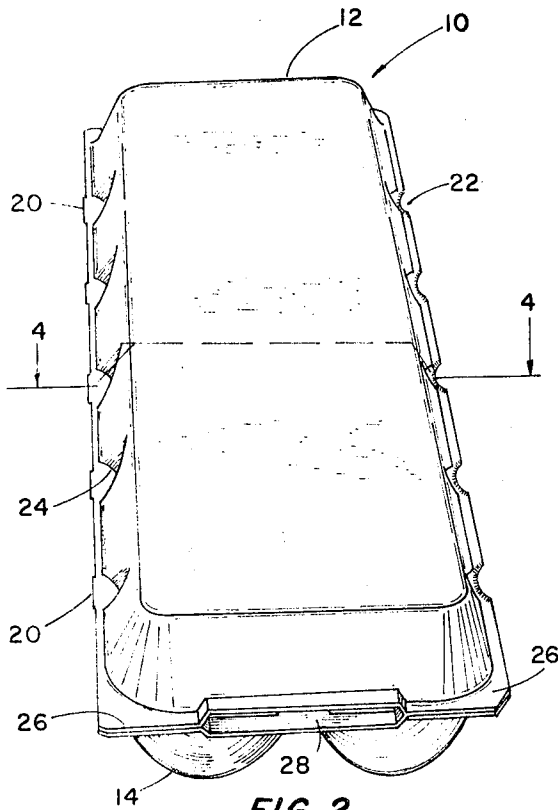


FIG. 2.

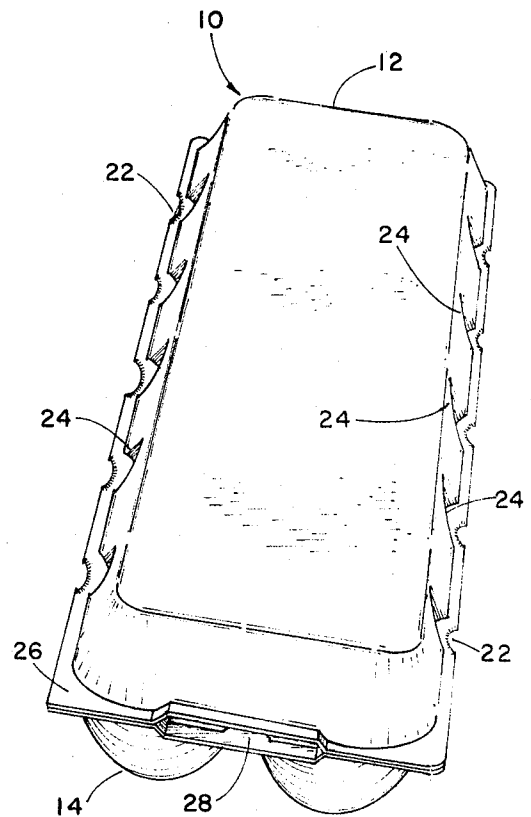


FIG. 3.

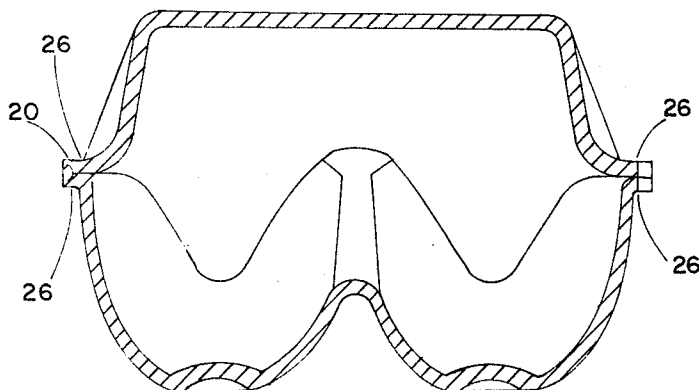


FIG. 4

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3 Sheets-Sheet 3

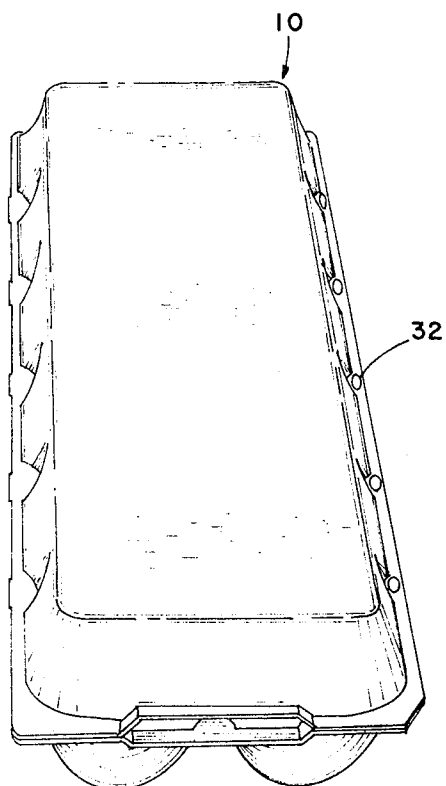


FIG. 8.

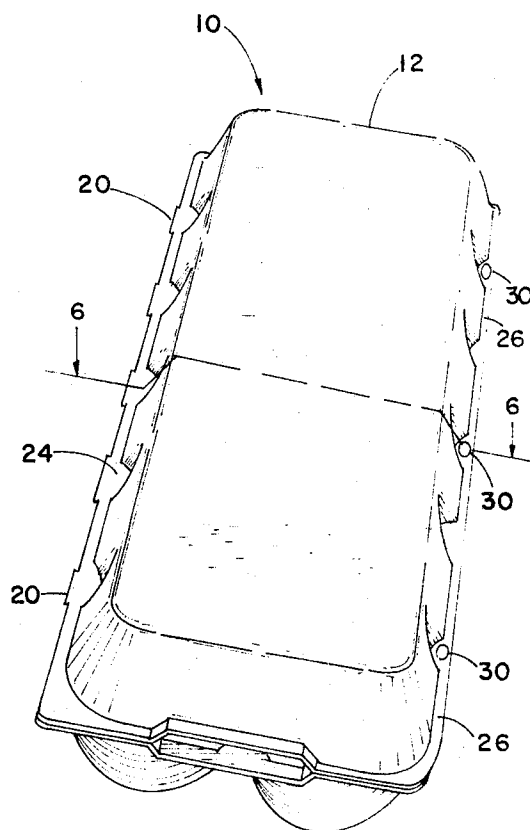


FIG. 5.

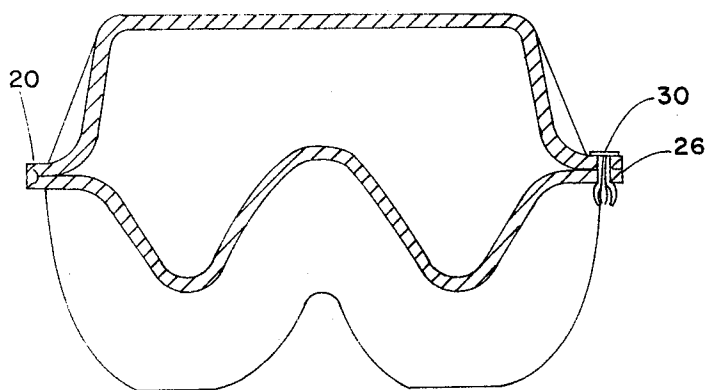


FIG. 6.

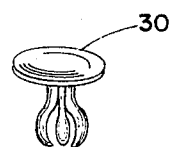


FIG. 7.

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3,519,189

PROTECTIVE CONTAINER

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Int. Cl. B65d 1/24, 85/32

U.S. Cl. 229—2.5

6 Claims

ABSTRACT OF THE DISCLOSURE

There is disclosed an egg carton made of a material such as foamed polystyrene in which at least one longitudinal edge, where the top and bottom of the carton come together, has spaced indentations and a heat sealed joining of the top and bottom portions at these indentations. In one embodiment, the second longitudinal edge where the top and bottom portions come together has relatively short spaced hinges so that when the carton is open, the top portion can either be refolded back or can be torn off, at option of the user. In addition, each of these hinges has a length sufficiently small so that they can readily be melted through and a heat seal effected. When a heat seal is effected at various spots along both longitudinal edges of the carton, the top of the carton can easily be torn off by the user.

This invention relates in general to a protective container and more particularly to an improved means for sealing together the top and bottom portions of an egg carton.

BACKGROUND OF THE INVENTION

Foamed polystyrene egg cartons have become a major component of the egg carton industry. Each carton is separately stamped from a sheet of foamed polystyrene and the stamping process is one wherein the bottom and top portions of the egg carton are stamped as a single unit with a longitudinal hinge permitting the top portion to be swung over on top of the bottom portion after the bottom portion has been filled with eggs. Typically, the bottom portion has a seven-eighths to one inch flap, into which flap latching means such as protrusions are formed during the thermo-forming process. Where the latching means are protrusions, they mate with openings in the side wall of the top portion so that the egg carton will be held closed.

This particular design has the disadvantage that the carton may be readily opened in the store, the eggs handled, broken and stolen. It has a further disadvantage that the hold is not sufficiently positive to guarantee that the top portions will not pop open. Accordingly, it has been known to use the expedient of adding a lateral tape closure which has the disadvantage of being time consuming and unsightly. Because these egg cartons have to be sold for two to three cents a piece, the additional step of taping the edges adds a significant cost factor.

Accordingly, it is a major purpose of this invention to provide a means for closing the egg carton which will be a permanent closure, until the egg carton is opened by the ultimate consumer, and yet will not involve additional relatively expensive steps or material.

It is a related purpose of this invention to provide such a permanent closure as can readily be broken by the ultimate user without damage to the eggs.

One of the major elements in the cost of the egg carton is the cost of the sheets of foam polystyrene which are thermoformed into the ultimate egg carton by means of matching male and female dies. The cost of the egg carton and of the foamed polystyrene material is by no means

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negligible when compared with the cost of the dozen eggs which go into each carton. Accordingly, any savings in the amount of polystyrene material necessary will have a meaningful impact on the total cost of the end product.

Thus it is another major purpose of this invention to reduce the amount of foamed polystyrene material needed in forming the egg carton.

It is a more specific and related purpose of this invention to eliminate the need for the seven-eighths to one inch wide flap which is used to join the top and bottom portions of the carton. But, it is an important purpose of this invention to eliminate the need for this flap without requiring additional foamed polystyrene or other additional material which would simply replace the cost of the material saved.

BRIEF DESCRIPTION OF THE INVENTION

In brief, one embodiment of this invention involves a foamed polystyrene egg carton formed by the usual techniques of thermo-forming in which the top portion is formed hinged to the bottom portion. However, the hinges formed are relatively short in length, being approximately one-fourth inch in length, and are a plurality in number, spaced from one another along one of the longitudinal edges joining the top and bottom portions. Longitudinally, these hinges are preferably positioned between the pockets containing eggs so that a heat carrying member can be brought into contact with the hinges to cause the hinges to melt and form a heat seal at each of these points. The other longitudinal edge, wherein the top and bottom portions of the egg carton are joined, has a plurality of spaced heat seals. Each of these heat seals are preferably located between adjacent egg pockets where top and bottom portions of the container are recessed inwardly thereby facilitating placing a heat carrying member at the edges so as to seal the edges at the points desired.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and purposes of this invention will become apparent from the following detailed description and drawings, in which:

FIG. 1 is a perspective view of the carton of this invention in which the top and bottom portions are open and the interior of the egg carton is shown and the individual hinges that permit the top portion to be refolded on the bottom portion are shown along the edge joining the top and bottom portions;

FIG. 2 is a perspective view of the FIG. 1 carton, in which top and bottom portions are closed, showing the heat seal on one edge and hinge on the other;

FIG. 3 is a perspective view of the FIG. 1 carton with the top and bottom portions closed and sealed together, showing heat seals on both edges;

FIG. 4 is a cross sectional view along the plane 4—4 in FIG. 2 showing a seal on one edge and a hinge on the other in cross section;

FIG. 5 is a perspective view of an embodiment wherein a separate fastener is used to effect closure;

FIG. 6 is a cross section along the plane 6—6 of FIG. 5;

FIG. 7 is a perspective view of one of the fasteners that may be used in the FIG. 5 embodiment; and

FIG. 8 is a perspective view of an embodiment wherein spot heat seals are used to effect closure.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the drawings, FIGS. 1 through 4 views of the same egg carton 10, illustrating the egg

carton in both opened (FIG. 1) and closed, sealed (FIGS. 2 and 3) state.

As may be seen from the figures, the carton has a top portion 12 and a bottom portion 14. The bottom portion 14 has a series of shaped egg holding cells 16 of known design for holding each egg (no eggs are shown) individually so that the eggs do not rattle against one another. Various means may be provided, if desired, in the top cover to fit, secure or relegate each egg.

In the embodiment shown, there are five separate, spaced from one another, hinges 20 joining the top portion 12 and bottom portion 14 of the egg carton 10. For two reasons, the length of each hinge 20 is preferably small, in the order of magnitude of one-quarter of an inch.

First, the relatively small in length hinge 20 makes it much easier for the ultimate consumer to readily tear off the top portion 12 when opening the egg carton. The bottom portion may be used to store the eggs and permit easy access. As far as this feature is concerned, the fact that the hinges 20 are provided gives the ultimate consumer the option of tearing off the top portion 12 or continuing to retain the top portion and employing the hinges 20 to refold the top portion back on top of the bottom portion 14.

A second reason for having the hinges 20 relatively short in length is to make it a relatively simple step to place a heating implement on the hinges, after packing eggs in the carton 10 and after folding the top portion 12 over the bottom portion 14, so as to effect a heat seal at each hinge 20 position. When such is done, the hinges are destroyed because they are melted away and replaced by a heat seal along the edge between the top and bottom portions of the egg carton. In the embodiment where the manufacturer thereby replaces the hinge 20 with the heat seal, the ultimate consumer has to destroy the seal in order to gain access to the eggs.

FIG. 3 best shows the plurality of edge seals 22 which, when foamed polystyrene is employed, are formed by the simple application of local heat. These edge seals 22 are formed along at least one of the longitudinal lines joining the top portion 12 and bottom portion 14 of the carton. In one form of the invention, the second edge may have the hinges shown in FIGS. 1 and 2 or, alternatively, may have a second row of edge seals 22 as shown in FIG. 3.

As may be seen from FIGS. 2 and 3, the top portion 12 is formed with indentations 24 along its outer surface adjacent to the area where the edge seals 22 are formed. These indentations 24 permit a heat carrying tool to be brought into contact with the edges of the rim 26 of the carton to form the heat seal while avoiding contact with the rest of the surface of the top portion. Such contact with the top portion 12 is undesirable since it would melt and distort the shape of the top portion and produce both unsightly and unpredictable results. For the same reason, the edge seals 22 are preferably located between the cells 16 in the bottom portion 14. When so located, the natural indentations between cells 16 afford protection from the heat carrying tool which effects the edge seals 22.

In forming the edge seals 22, the top portion 12 is folded over the bottom portion 14 in the normal fashion. Heat carrying rods are brought into contact with the rim 26 along the edges of the carton where it is desired to form the edge seals 22. At the same time, the flanged out rim portions 26 of the top 12 and of the bottom 14 are held in contact against one another when the heat carrying member is applied. This assures that the portion of the rims 26 which are to form the edge seals 22 will fuse with one another and not be separated by a gap.

It should be noted in connection with the above described embodiment that the combination of edge seals 22 and hinges 20 provides an egg carton (see FIG. 2) which is permanently sealed until the ultimate consumer

opens it and which affords the ultimate consumer the option of either retaining or discarding the top portion 12.

In addition, the egg carton illustrated in FIG. 1, with one row of hinges, provides a "universal" intermediate product which can be used by the egg processor to provide either one of two types of egg cartons for the ultimate consumer. The first type of egg carton is, as just described, one with the hinges 20 along one longitudinal edge and the edge seals 22 along the other longitudinal edge. The second type of egg carton is one with edge seals 22 along both longitudinal edges, the hinges having been melted and replaced by edge seals.

Furthermore, this edge seal technique completely eliminates the need for a closing flap and thus saves on material. In addition, by eliminating the need for a latching means to effect closure, this invention simplifies the manufacture of the egg carton. For example, in one of the presently used types of cartons, holes must be punched in the top portion to mate with the knobs in the flap hinges to the bottom portion. This invention eliminates the need to punch such holes.

It should also be noted that achieving the objects of this invention by the technique described enables continued use of egg cartons having the over all shape and configuration required by presently employed egg carton filling and handling machinery. Thus the advantages of this invention are achieved with the further advantage of being able to use presently installed equipment. All that will be required in the way of additional equipment is relatively minor peripheral equipment such as to apply the heat to the edges of the closed carton in order to form the edge seals 22.

Thus it can be seen that the various seemingly conflicting purposes of this invention to achieve a permanent edge seal without requiring additional egg carton material (and, indeed, while saving on egg carton material) and yet enabling the continued use of presently employed egg carton handling and loading machinery are all achieved. The particular technique of this invention is simple but therein lies its value in that it achieves a number of purposes without increasing the cost of an item which must be kept relatively low in cost in order for it to be a feasible packaging device for eggs.

FIGS. 5 through 7 illustrate a further embodiment wherein the basic FIG. 1 embodiment is sealed by means of separate fasteners 30. These fasteners 30, which may be made of either metal or plastic, provide the option for a user of a readily reclosable carton 10. As may be seen in FIG. 5, the hinges 20 are left in place, without being heat sealed away, so that the top 12 can be readily opened and closed when the fasteners 30 are removed. The fasteners 30 extend through the rim 26 at the positions where the indentations 24 are located. Because the design of this carton 10 includes the indentations 24, enough space is provided along the rim 26, at the indentations 24, so that fasteners, such as the fasteners 30, may be employed. In this fashion, a removable fastener is provided and the user can, after removing the fasteners 30, open and close the container 10. However, the design makes it possible to achieve this function without requiring additional closure flaps or extended rim 26 areas. Thus the FIG. 5 embodiment meets a major objective of this invention, which is to save on the cost of material required for the carton 10 involved.

FIG. 8 illustrates a further embodiment wherein spot heat seals 32 are used to effect closure. Because this carton design includes the indentations 24, there is space at the indentations to spot heat seal without melting or distorting other portions of the carton. Thus the FIG. 8 embodiment, like the FIG. 5 embodiment, meets a major objective of this invention, which is to eliminate the need for additional material to form flaps to provide a closure.

Although various embodiments of this invention have been described in detail, it should be obvious that certain

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aspects of the embodiments described may be varied without departing from the scope of this invention.

For example, the invention has been described in an egg container embodiment. Yet the container design could be made for light bulbs, Christmas tree ornaments, fruits or the like.

The invention has been described in connection with a specific embodiment including foamed polystyrene since such material has been found useful in the practice of this invention. However, it should be understood that other material, which can be similarly formed into cartons and in particular materials which can be thermoformed, may be employed. Thus, other foamed plastic materials could be employed to provide the embodiments illustrated in the various figures.

What is claimed is:

1. In a carton having a top portion and a bottom portion, said bottom portion having a plurality of cells for retaining articles therein and indentations in a pair of opposite outer walls corresponding to the spaces between adjacent cells, and said top portion having corresponding indentations in at least one of a like pair of opposite outer walls, whereby with said carton in closed position, the indentations on said top and bottom portions are in registry, the improvement comprising,

a plurality of spaced hinge means integrally joining said top and bottom portions along the associated edges of a first pair of corresponding outer walls thereof, each of said hinge means being positioned adjacent the indentations in said first pair of outer walls,

and means along the edges of a second pair of corresponding outer walls of said top and bottom portions opposite said first named pair adapted to receive fastening means to retain said carton portions

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in closed position, said fastening receiving means being positioned adjacent a pair of aligned indentations in said second pair of outer walls.

2. The carton of claim 1 wherein said top and bottom portions and said hinge means are integrally formed of a foamed plastic material.

3. The carton of claim 1 wherein each of said top and bottom portions include flange portions forming the bases of the indentations in the outer walls thereof with the corresponding flange portions of each pair of aligned indentations coming into contact upon closure of the carton to provide said fastening receiving means.

4. The carton of claim 3 wherein said fastening means comprises a spot heat seal joining said contacting flange means of at least one pair of said indentations.

5. The carton of claim 3 wherein said fastening means comprises a separate mechanical fastener joining said contacting flange means of at least one pair of said indentations.

6. The carton of claim 3 wherein each of said hinge means is of relatively short length to permit ready separation of said top and bottom portions.

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U.S. Cl. X.R.

229—44, 45