

[54] **EGG CARTON**
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[51] **Int. Cl.²**..... **B65D 1/24; B65D 1/36**
[58] **Field of Search**..... **229/2.5, 29 M, 2.5 EC; 217/25.5, 26.5**

3,687,350 8/1972 Warburton..... 229/2.5

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[57] **ABSTRACT**

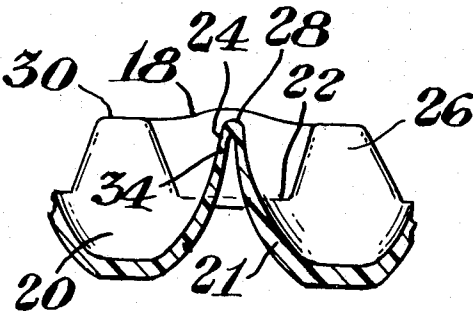
An egg carton structure, particularly designed to package extra large or jumbo grade size eggs and the like, having a bottom section with a plurality of downwardly disposed deep receiving pockets or cells and an interconnected closable cover and locking means.

The walls of adjacent cells extend upwardly to form resilient dividers or separators between the cells to prevent contact of eggs reposing in adjacent cells. Variable thicknesses of cell and divider walls, in conjunction with a combination of other unique elements, results in a structure which can be easily thermoformed into a serviceable carton and does not require extensive lateral or transverse ribs, walls or other means to provide lateral support between cells or general stiffness reinforcement of the egg carton as previously considered necessary.

8 Claims, 7 Drawing Figures

[56] **References Cited**

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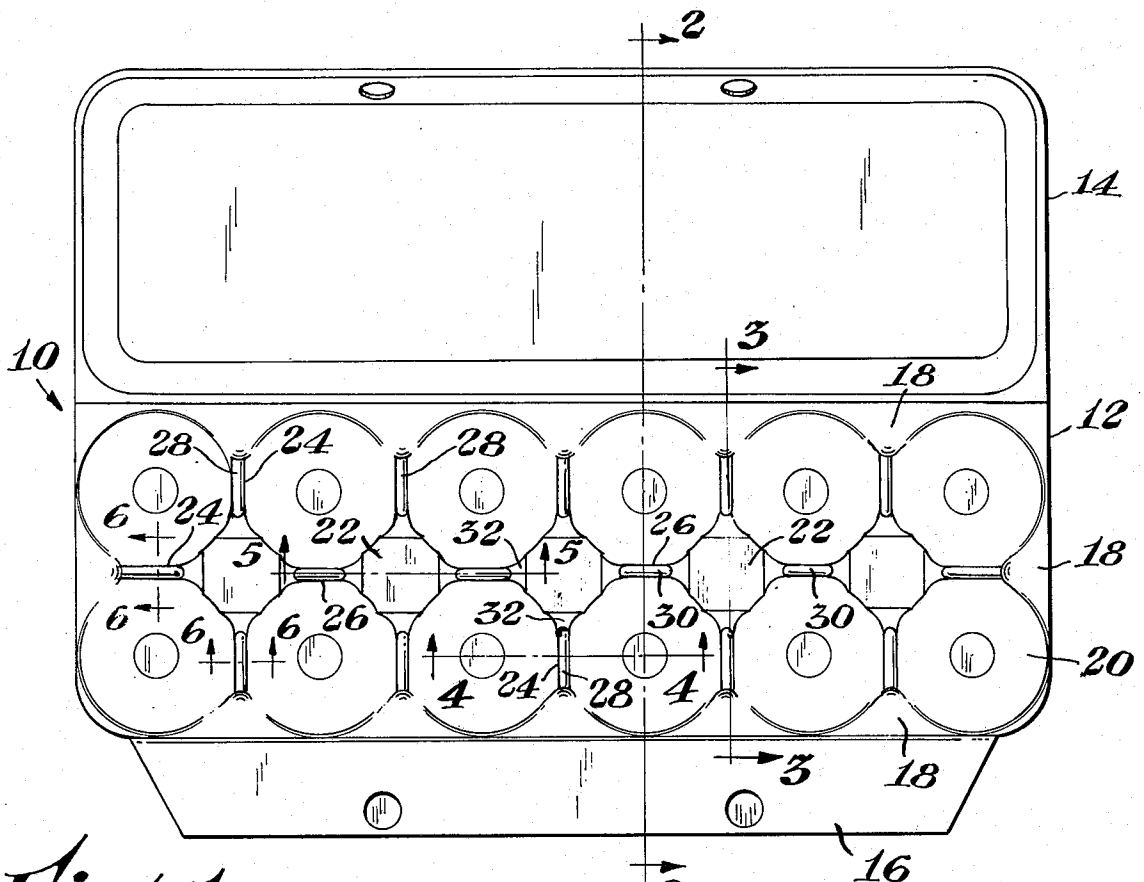


Fig. 1

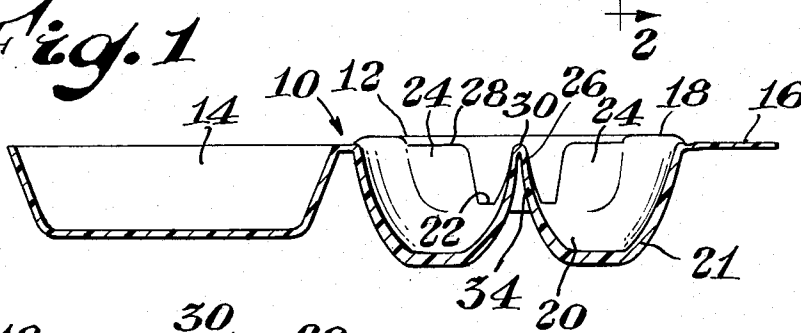


Fig. 2

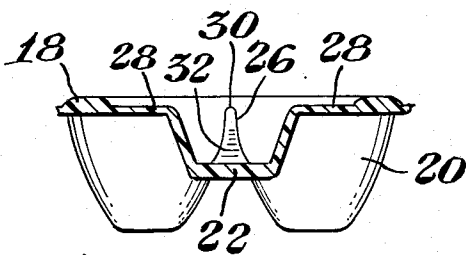


Fig. 3

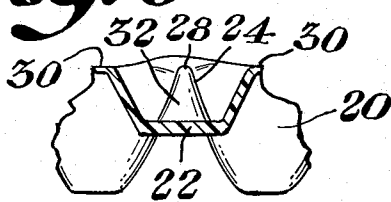


Fig. 5

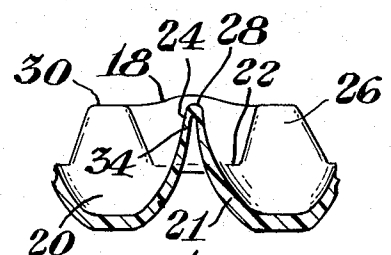


Fig. 4

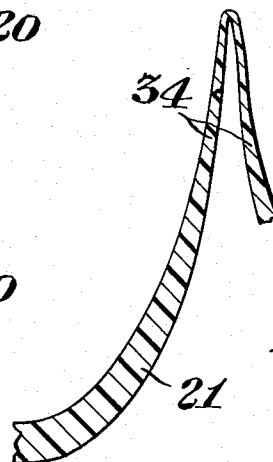


Fig. 6

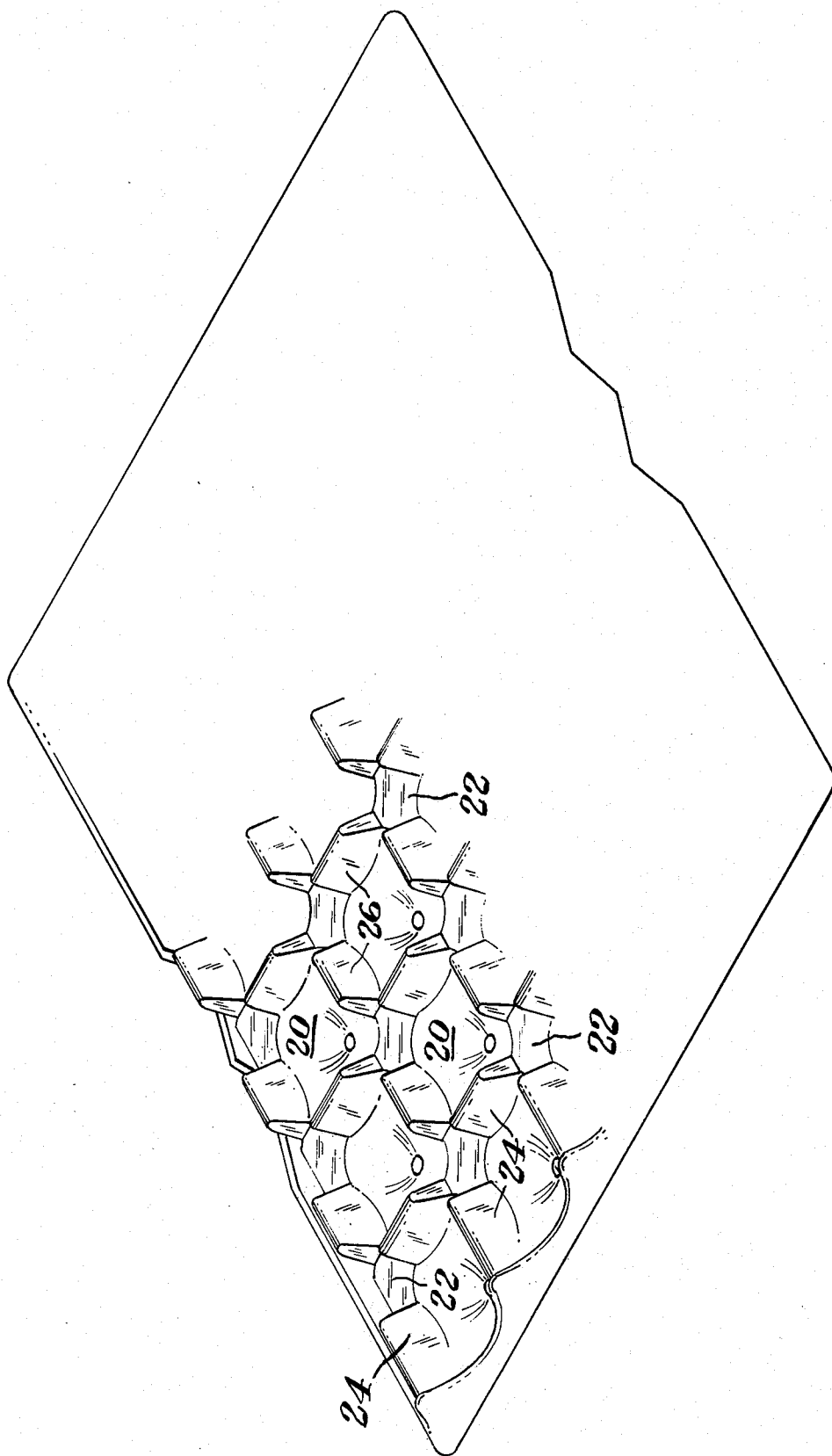


Fig. 7

EGG CARTON

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to improvements in cartons manufactured for packaging, shipping, storing and merchandising eggs or other fragile articles and, more particularly, to egg carton structures made from thermoplastic resinous materials such as foamed polystyrene and the like.

2. Description of the Prior Art

In general, eggs and like fragile articles are packed for shipment and merchandising in protective packages which usually have a dozen egg cells in two rows of six each for receiving the individual eggs. In the past, egg cartons were usually made from paperboard or a composition of molded wood pulp, but more recently egg cartons have been made of thermoplastic resinous materials such as foamed polystyrene. Wood pulp and thermoplastic foams generally provide materials of acceptable softness and resilience to protect fragile articles such as eggs, but the requisite carton strength and cell capacity have been achieved through the use of special structural design components.

Previously, a primary problem has been the incorporation of a soft resilient material into egg cartons which will also provide sufficient isolation and rigidity to prevent eggs from contacting each other and breaking during rough packaging, handling and shipping of the same. The problem of providing sufficient isolation and rigidity in egg cartons has resulted in a variety of designs including reinforcing ribs, and walls or other transverse stiffening means to overcome the economic disadvantage of using an excess of structural material. In addition, a variety of upwardly extending dividers or separators disposed between the egg receiving cells have been used to isolate one egg from another. Egg cartons illustrating the use of both transverse stiffening means and cell separators are found in U.S. Pats. Nos. 3,563,446 and 3,375,966, for example.

Although the use of known transverse stiffening means and separators have overcome many problems involving egg packaging, their use has created an additional problem. It has been found that it is difficult, if not impossible, to satisfactorily form foam plastic cartons with such features because of the deep draw of material required to form the transverse stiffening means and separators together. It is not practical to overcome this problem by using an excess of structural material because such makes the cartons more expensive to produce as compared to other egg carton designs.

SUMMARY

In general, the present invention provides an egg carton useful in packaging and handling of eggs or other fragile articles. The unitary structure of the egg carton is preferably formed from thermoplastic material such as polystyrene foam sheet. Although other materials such as molded pulp can be used to make the egg cartons, thermoplastic foam material is preferred because the egg carton designs overcomes a critical carton forming problem which makes such foam material more competitive with other structural materials.

In the present invention, it has been found that a variable thickness of cell and separator walls, in conjunction with other unique elements or features, results in

a structure which does not require extensive lateral or transverse ribs and walls or other means to provide satisfactory lateral support between cells or general stiffness reinforcement of egg cartons as previously considered necessary. A functional egg carton having satisfactory overall strength is produced by maintaining a relatively thick cross section in the cell, cover and peripheral walls, and a relatively thin cross section in large flexible separators between the cells. By eliminating the need for extensive transverse stiffening means, a thermoplastic foam egg carton can be formed by vacuum forming, matched mold or other known techniques without resorting to excessive structural material to prevent tearing or other failure of such foam material due to excessive drawing of the foam material during the forming operation.

The present invention comprehends an egg carton comprising a bottom section having a plurality of downwardly directed deep egg receiving pockets or cells. If the pockets or cells are disposed in adjacent rows, the cell walls of four adjacent cells, two adjacent cells located in each of two adjacent rows, converge and interconnect into an intermediate horizontal transverse wall which is generally centrally and symmetrically located with respect to said cells.

In accordance with the invention, adjacent egg cells, in any arrangement of cells or pockets, whether in rows or not, are separated by at least one large flexible thin walled separator or divider. The separators are upwardly directed extensions of the cell walls of the adjacent cells. The separators are large and sufficiently thin walled to prevent contact and provide flexibility and resilience between eggs in adjacent cells. A closable cover and means to maintain said cover closed are interconnected with the bottom section. The type of cover and locking means which can be used is illustrated by U.S. Pat. No. 3,326,443, for example.

Particular novel features of the invention described above reside in cells, peripheral walls and a closable cover and locking means with a relatively thick cross section sufficient to provide satisfactory structural strength and large, thin-walled flexible separators which prevent contact and provide resilience and flexibility between eggs of varying dimensions in adjacent cells. If the above features of the present invention are used in combination, an egg carton formed from thermoplastic foam sheet which does not have or need extensive transverse stiffening elements, or necessitate deep drawing in its formation can be made that will be competitive with egg cartons made from other competitive egg carton materials. Accordingly, this invention has among its objects the provision of an egg carton useful for packaging, handling, storage and shipment of eggs or other fragile articles. Another object of the present invention is to provide an egg carton which is particularly useful in packaging of extra large or jumbo sized eggs. A further object of the present invention is to provide an egg carton formed from a thermoplastic foam sheet, such as polystyrene foam sheet, which does not have extensive transverse stiffening element as previously considered necessary.

BRIEF DESCRIPTION OF THE DRAWINGS

Additional objects and advantages of the present invention are even more apparent when taken in conjunction with the accompanying drawings in which like characters of reference designate corresponding mate-

rial and parts throughout the several views thereof, in which:

FIG. 1 is a plan view of an egg carton embodying the features of the invention;

FIG. 2 is a vertical section taken along reference line 2—2 of FIG. 1;

FIG. 3 is a partial vertical section taken along reference line 3—3 of FIG. 1;

FIG. 4 is a partial vertical section taken along reference line 4—4 of FIG. 1;

FIG. 5 is a partial vertical section taken along reference line 5—5 of FIG. 1;

FIG. 6 is a magnified partial vertical section taken along reference lines 6—6 of FIG. 1, illustrating the thin and flexible walls of the side and center separators; and

FIG. 7 is a fragmentary isometric view of an egg filler flat embodying the features of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following description illustrates the manner in which the principles of the invention are applied but are not to be construed as limiting the scope of the invention.

More specifically, it will be understood that the egg carton of this embodiment is formed from a sheet of thermoplastic polystyrene foam and is generally mass produced on a thermoforming machine from a foam sheet. As an example, such sheet can have a thickness of from about 50 to 200 mils. The egg carton produced can weigh, depending on its particular size and shape, from about 10 to 25 grams, preferably from 15 to 20 grams, and can vary from being no thicker than about 5 to 25 mils in cross sectional wall thickness for the relatively thin separators and from about 30 to 120 mils cross sectional wall thickness for the relatively thicker cells, peripheral walls, and closable cover and locking means.

The egg carton to be presently described in detail is that of the type conventionally described as a 2 × 6 one dozen egg carton, i.e., holds 12 eggs in two adjacent rows of six each. However, the principles of the present invention can likewise be applied to other sizes of cartons and carton shapes, such as the 3 × 4 cartons also well known in the industry, or in larger filler flats, for example. Inasmuch as the cells and other cooperating portions of the egg carton are substantially uniform throughout the same, only one of each of the cooperating elements will be described in detail.

The egg carton is indicated generally at 10 in FIGS. 1 and 2, and comprises a unitary structure having a bottom section 12, a closable cover 14 and locking member 16. As previously noted, the structure of the closable cover 14 and locking member 16 are best illustrated in U.S. Pat. No. 3,326,443.

The bottom section 12 includes an outer peripheral wall 18 and a plurality of cells indicated generally at 20 produced in two rows of six each. The cell walls 21 of four adjacent cells 20, two adjacent cells located in each of the two adjacent rows, converge and interconnect with intermediate horizontal transverse walls 22. In addition, two adjacent cells 20, in the rows and across adjacent rows, are separated by flexible thin walled side and center separators indicated generally at 24 and 26, respectively. The side separators 24 and center separators 26 are formed by extension walls 34

of walls 21 of cells 20 and terminate at upper end walls 28 and 30, respectively. Side walls 32 interconnect the upper end walls 28 and 30 with transverse walls 22, and the outer part of upper end walls 28 merges with outer peripheral wall 18 to complete the formation of the side separators 24 and center separators 26.

As previously noted, a particularly novel feature of the present invention resides in varying the cross sectional wall thickness of the different elements in the egg carton 10. By having thick walled cross sections in cells 20, peripheral wall 18, cover 14 and locking member 16 to provide egg carton 10 with structural strength and by having thin walled cross sections in the side separators 24 and center separators 26 to provide resilience and flexibility between eggs positioned in cells 20, it is possible to eliminate unnecessary transverse reinforcement means which creates problems during forming of egg cartons from thermoplastic foam sheets. FIG. 6 is a fragmented magnified view illustrating this difference in relative thickness between the extension walls 34 of the side and center separators, 24 and 26, and walls 21 of cells 20.

Referring to FIG. 7, an egg filler flat 70 illustrating the features of the invention is shown. Like characters of reference of egg carton 10, FIGS. 1—6, designate corresponding parts in filler flat 70.

It is to be understood that the scope of this invention is not limited by the method of making the egg carton herein disclosed. It is also to be understood that the scope of this invention is not limited by the shape of the cells, number of cells or by the number of rows of cells herein disclosed. It is further to be understood that this invention may be equally applicable to egg cartons or other containers made from materials other than those specifically herein disclosed. Thus, while certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. In combination with a packaging structure designed to package eggs and the like, wherein the improvement comprises: a body section including a plurality of downwardly directed deep egg receiving pockets or cells, all adjacent cells or pockets separated by at least one flexible thin walled separator preventing substantial contact and providing resilience and flexibility between said eggs and the like to be positioned in said adjacent cells or pockets, said separators formed by upwardly directed extension walls from cell or pocket walls of said adjacent cells or pockets, said extension walls terminating in upper end walls, said cells or pockets having relatively thick cross-sections to provide structural strength in said structure and said separators having relatively thin cross-sections to prevent substantial contact and provide resilience and flexibility between said eggs and the like to be positioned in said adjacent cells or pockets.

2. The packaging structure of claim 1 wherein said structure is a carton including a closable cover and a means to maintain said cover closed, said cover and means to maintain said cover closed having relatively thick cross-sections to provide structural strength in said carton.

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3. The packaging structure of claim 1 wherein said structure is a filler flat adapted to be positioned one on top of the other in a container.

4. The packaging structure of claim 1 wherein said cells or pockets are disposed in adjacent rows and four adjacent cells or pockets formed by two adjacent cells or pockets located in each of two adjacent rows are interconnected with intermediate horizontal transverse walls which are centrally and symmetrically located with respect to said four adjacent cells or pockets, said transverse walls having relatively thick cross-sections to provide structural strength in said structure.

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5. The packaging structure of claim 4 wherein said extension walls of said separators have a thickness of from about 5 to 25 mils and said cells or pockets and horizontal transverse walls have a thickness of from about 30 to 120 mils.

6. The packaging structure of claim 4 wherein said structure is formed from molded pulp.

7. The packaging structure of claim 4 wherein said structure is formed from thermoplastic foam.

8. The packaging structure of claim 5 wherein said thermoplastic foam is polystyrene foam sheet.

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