United States Patent

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[54] **EGG CARTON**
6 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **229/44,** 229/2.5, 229/45
[51] **Int. Cl.** **B65d 5/66**
[50] **Field of Search** 229/2.5, 44, 45

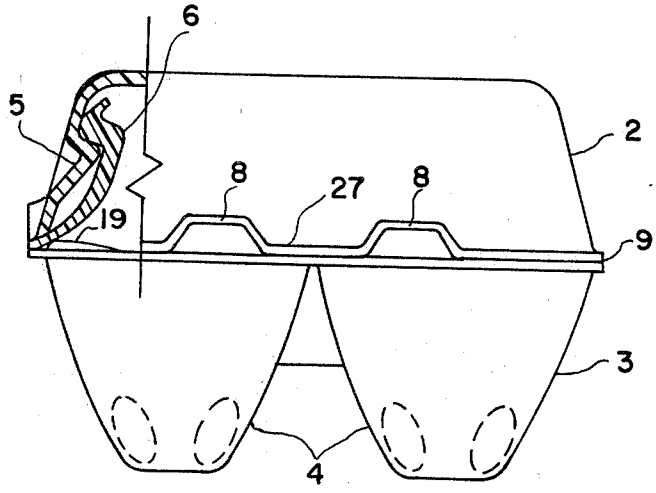
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ABSTRACT: A molded, one-piece egg carton having an egg-receiving tray, a lid hingedly attached to one side of the tray, a locking tab hingedly attached to the other side of the tray, and a locking bar on the interior surface of the front panel of the lid whereby when the locking tab is rotated and held so that the lid will close over it, the tab and bar cooperate to lock the lid to the tray.



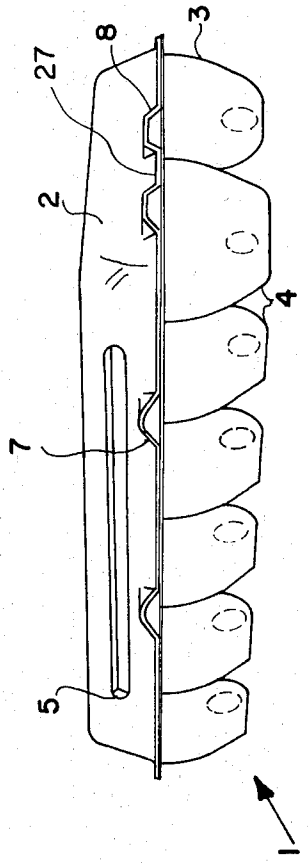


FIG. 1

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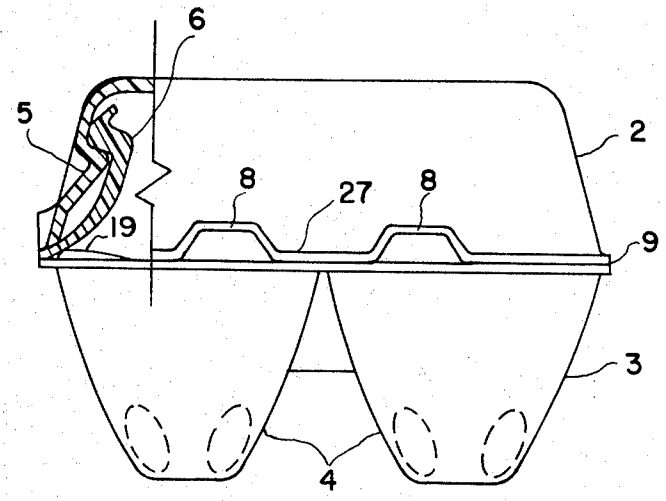


FIG. 2

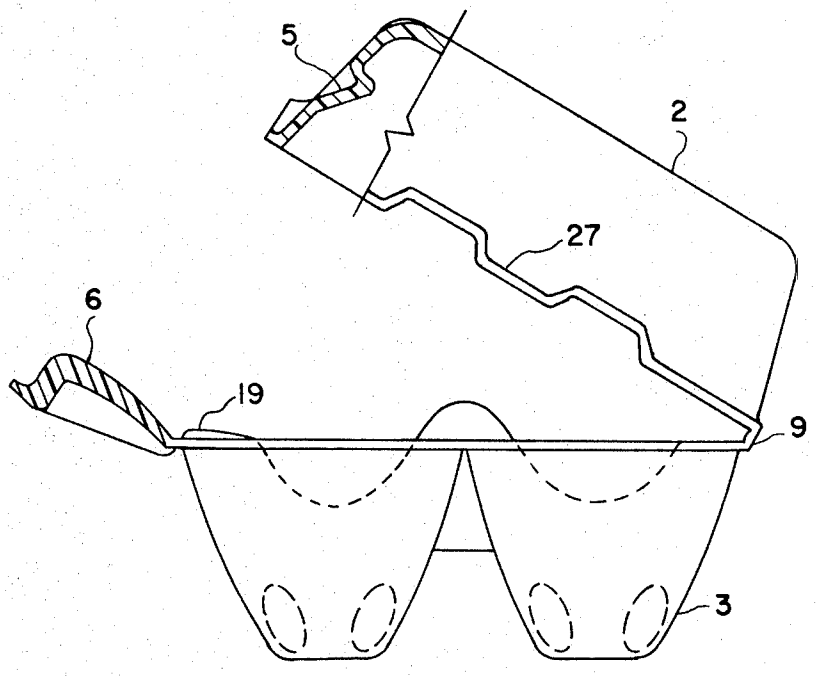


FIG. 3

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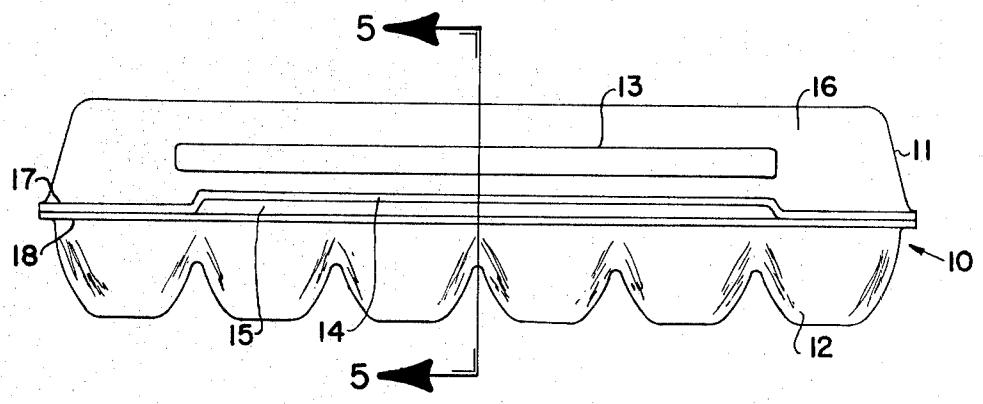


FIG. 4

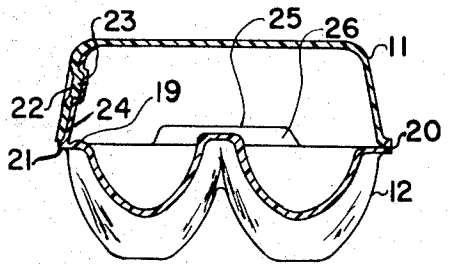


FIG. 5

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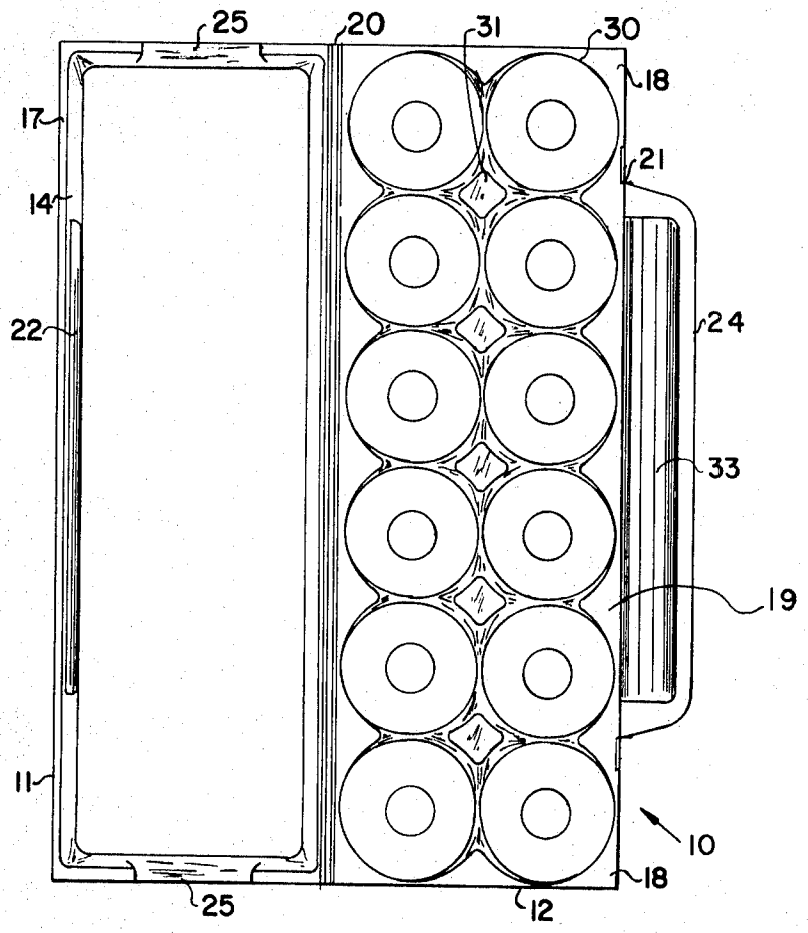


FIG. 6

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EGG CARTON

The present invention relates to egg cartons. In particular, the present invention relates to one-piece egg cartons which may be molded from cellulose pulp material or from expanded thermoplastic foam material.

In the prior art, a major problem has been to produce a carton which has adequate detail and at the same time can be readily stripped from the forming mold. In the mechanism which latches the tray portion securely to the lid portion of a carton the reproduction of detail is critical. In one prior art design apertures are provided in the front panel of the carton lid and locking lugs attached to the tray portion of the carton extend through the aperture thus locking the lid to the tray. However, this lid can cause fabricating problems where the apertures are cut away from the lid. One problem is that in the cutting of the apertures the resulting scrap chips can possibly cause clogging of the fabricating apparatus. Even where clogging does not occur, the scrap chips are a nuisance which must be disposed of thus incurring added expense in the fabricating operation. Accordingly, it is one object of the present invention to provide an improved latch arrangement which can be fabricated without the cutting operation and its scrap disposal problem.

Another object of the present invention is to make an egg carton which is readily strippable from its forming mold.

A further object of the present invention is to provide an egg carton which has a neat, attractive, appearance.

A still further object of the present invention is to provide an egg carton which has a positive lock between the tray and lid, and, at the same time, is easy to open.

These and other objects are achieved by the present invention which is a one-piece egg carton having an egg-receiving tray with front and rear sides and a lid with front and rear panels. The lid is hingedly attached to the rear side of the tray. A locking tab is hinged to the front side of the tray; and, an elongated locking bar is provided on the interior surface of the front panel of the lid. The locking bar is so disposed as to cooperate with the locking tab when the tab is rotated and held interior of the lid as it is closed. A positive lock is thus provided by the cooperating or mating surfaces of the tab and bar. A preferred molding material is expanded thermoplastic foam such as can be produced using polystyrene. However, any moldable material may be used such as paper or cellulosic pulp or unexpanded plastic material.

The tray so produced by the present invention is readily strippable from a mold and the latching mechanism has sufficient detail as to provide a positive lock which may be easily opened. The advantages of the present invention may be more fully appreciated by reference to the following detailed description and drawings in which:

FIG. 1 is a perspective view of a closed egg carton which is one embodiment of the present invention;

FIG. 2 is an end view of the embodiment shown in FIG. 1 with a partial section taken through the front portion of the lid to show the cooperating locking bar and locking tab;

FIG. 3 is the same view as FIG. 2 except that the lid is opened and is rotated away from the locking tab;

FIG. 4 is the front view of an egg carton which is another embodiment of the present invention;

FIG. 5 is a section view taken along line 5–5 of FIG. 4; and

FIG. 6 is a top view of the embodiment shown in FIG. 4 with the lid and locking flap rotated so that the egg carton is fully opened.

Referring now to FIG. 1, egg carton 1 is shown having a lid 2 and a tray 3 which is composed of egg-receiving cells 4. These cells are arranged in a 2 × 6 array but the subject invention is not limited to this specific array. For example, the subject invention is applicable to a 4 × 3 array, a 2 × 3 array, or any array which may be regularly arranged whether it be more or less than an even dozen.

In FIGS. 2 and 3 an end view of the carton of FIG. 1 is shown. FIG. 2 shows the lid closed and locked into position and FIG. 3 shows the lid open. Lid 2 is attached to tray 3 through hinge 9 and may be rotated about the hinge to open or close the carton. Hinge 9 runs the entire length of the carton and is on the opposite side of the carton from locking flap or tab 6. The tab 6 is hingedly attached to tray 3 and may be rotated until it is in a position as shown in FIG. 2. When tab 6 is in this position lid 2 may be closed and locking tab 6 will engage the locking bar 5 thus positively locking the lid to the tray. Raised boss 19 located along the front margin 18 at the position shown in FIGS. 2 and 3 will cause locking tab 6 to have a tendency to rotate and return to its original position because of the interference between the boss 19 and tab 6. The resilience and flexibility of the molded material aids this tendency. The tendency to rotate to original position will cause a secure lock between tab 6 and locking bar 5. Locking bar 5 is formed from an indentation in the front panel of the lid 2 as may be seen in FIG. 1. However, other elongated projections along the interior surface of the front panel of lid 2 could be provided as a shoulder on which locking tab 6 can be locked and still be within the scope of the present invention. However, forming locking bar 6 by making an indentation in the front panel of the lid is the preferred embodiment. In FIG. 1, opening boss ports 7 are shown and these serve as finger grips so that a person desiring to open the egg carton may insert a finger or thumb in the boss port 7 and urge the front panel of the lid outward so as to pull it away from locking bar 6. Thus, the front panel of the lid 2 should not be made so rigid that it cannot be moved away from locking tab 6 under finger pressure. Cartons made from paper pulp and expanded thermoplastic foam have the required flexibility.

The carton lid 2 is also provided with indentations which serve as air vents 8 at either end of the carton 1. A land 27 is provided between the two vents to keep the lid sidewall from deflecting when cartons are being stacked one on top of another.

In FIG. 4 a second embodiment 10 of the egg carton of the present invention is shown. This embodiment comprises lid 11, an egg-receiving tray 12, the undercut locking indentation or locking bar 13, indentation 14 and opening 15 for a finger grip or opening boss, front top panel 16, lid front margin 17 and tray front margin 18.

FIG. 5 is a section view taken along lines 5–5 of FIG. 4. In FIG. 5 hinge 20 is shown which connects lid 11 to tray 12 and about which lid 11 can rotate in the opening and closing of the carton 10. Hinge 21 connects locking flap or tab 24 to the tray 12 and it is about hinge 21 that the tab 24 rotates into position as shown in FIG. 5 so that the concave indentation 23 on its surface will engage the convex projection 22 or locking bar thus locking the carton. The locking bar 22 is a convex projection on the interior surface of the front panel 16 of the lid 11. The projection 22 is a result of the indentation 13 on the exterior surface of the front panel 16 of lid 11. Also in FIG. 5 can be seen air vent 26 which is provided by indentation 25 in the lid 11. This vent corresponds to the air vents 8 which can be seen in FIGS. 1 and 2 of the first described embodiment.

FIG. 6 shows the top view of the carton 10 as it is laid completely open. This is the way the carton would appear as it comes from a mold. Typically the carton would be formed from a single sheet of moldable material such as expanded thermoplastic foam; and, after heating, the sheet material would be forced into the female portion of the die by a vacuum, or a combination of a vacuum and a conforming male die. The present invention, however, is not limited to the specific method of forming as these are many and varied. What is important is that the egg carton of the present invention is of such a configuration that it may be readily stripped from the die; and, even the undercut on locking bar 22 is not great enough to cause any special carton removal problem.

In FIG. 6 the 2 × 6 array of the egg cells 30 is easily seen. As stated before, this could be a 4 × 3, 2 × 3, or some other compact array. Posts 31 separate the eggs and keep them from

striking one another. The size of the cells can readily be determined by anyone skilled in the art so that they can receive medium, large, or extra large eggs. The shock-absorbing effect which is particularly provided by expanded thermoplastic material gives additional protection to the eggs in the carton.

The egg carton and the embodiment of FIG. 1 would resemble the embodiment shown in FIG. 6 when laid open except for the location of the opening bosses and the air vents. As shown in FIG. 6, the reverse side 33 of the locking tab 24 projects outwardly or is convex, that is, it would be raised with respect to the plane of the drawing. When the carton is to be closed this locking flap or tab 24 is rotated somewhat greater than 90° about the hinge 21 and held while the lid 11 is closed thereover. The resistance to the rotation caused by bosses 19 makes tab 24 bear against projection or bar 22 thus locking the carton positively. When closed, the rim 17 of the lid rests against the margin 18 of the base thus providing a stable transfer of load from the lid to the base when the egg cartons are stacked.

The typical thickness of the carton walls when formed from cellulose pulp would be approximately 0.050 inches. When formed from expanded thermoplastic foam the carton material thicknesses will be in the range of 0.070 to 0.090 inches and the carton will weight in the range of 15 to 25 gms. However, it is to be understood that these thicknesses and weights are in no way limiting. Wall thickness throughout a carton will vary particularly in the egg cell region because of the deep drawing effect to form the individual cells. Also, the lid and rims may be thicker for load-carrying ability.

Having thus described my invention, it is to be understood that it is to be limited only by the scope of the following claims.

I claim:

1. In an egg carton having an egg-receiving tray with front and rear sides and a lid with front and rear panels, said lid being hingedly attached to the rear side of said tray, the improvement comprising:

a. an elongated locking tab hingedly to the front side of said tray, said tab having a single rectangularly shaped, indentation therein extending substantially the length of the tab; and

b. a single, straight elongated locking bar projecting from the interior surface of the front panel of said lid, for a major portion of the length thereof, said locking bar being so disposed as to cooperate with the single indentation in said locking tab when said tab is rotated to be interior of said lid as it is closed, said tab and said bar being substantially equally coextensive, the tendency of the tab to resist rotation holding said tab and bar in cooperating position thereby locking said carton lid and tray.

2. The egg carton of claim 1 wherein said locking bar is formed by an elongated indentation in the exterior surface of the front panel of said lid.

3. The egg carton of claim 1 wherein said lid is provided with at least one opening boss port to permit the egg carton to be easily opened with the fingers.

4. The egg carton of claim 1 wherein said egg carton is of molded, one-piece construction.

5. The egg carton of claim 4 wherein said egg carton is molded from expanded thermoplastic foam.

6. The egg carton of claim 4 wherein said egg carton is molded from a cellulose pulp material.