

[54] EGG CARTON

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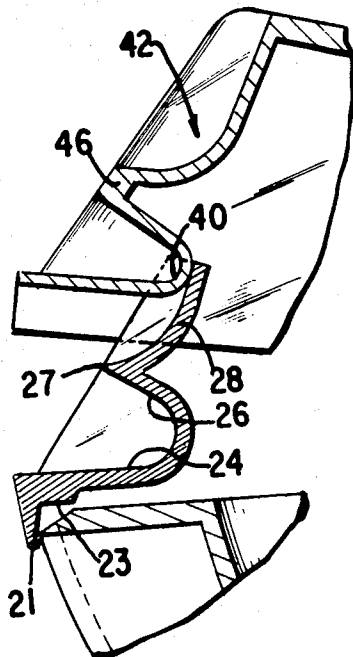
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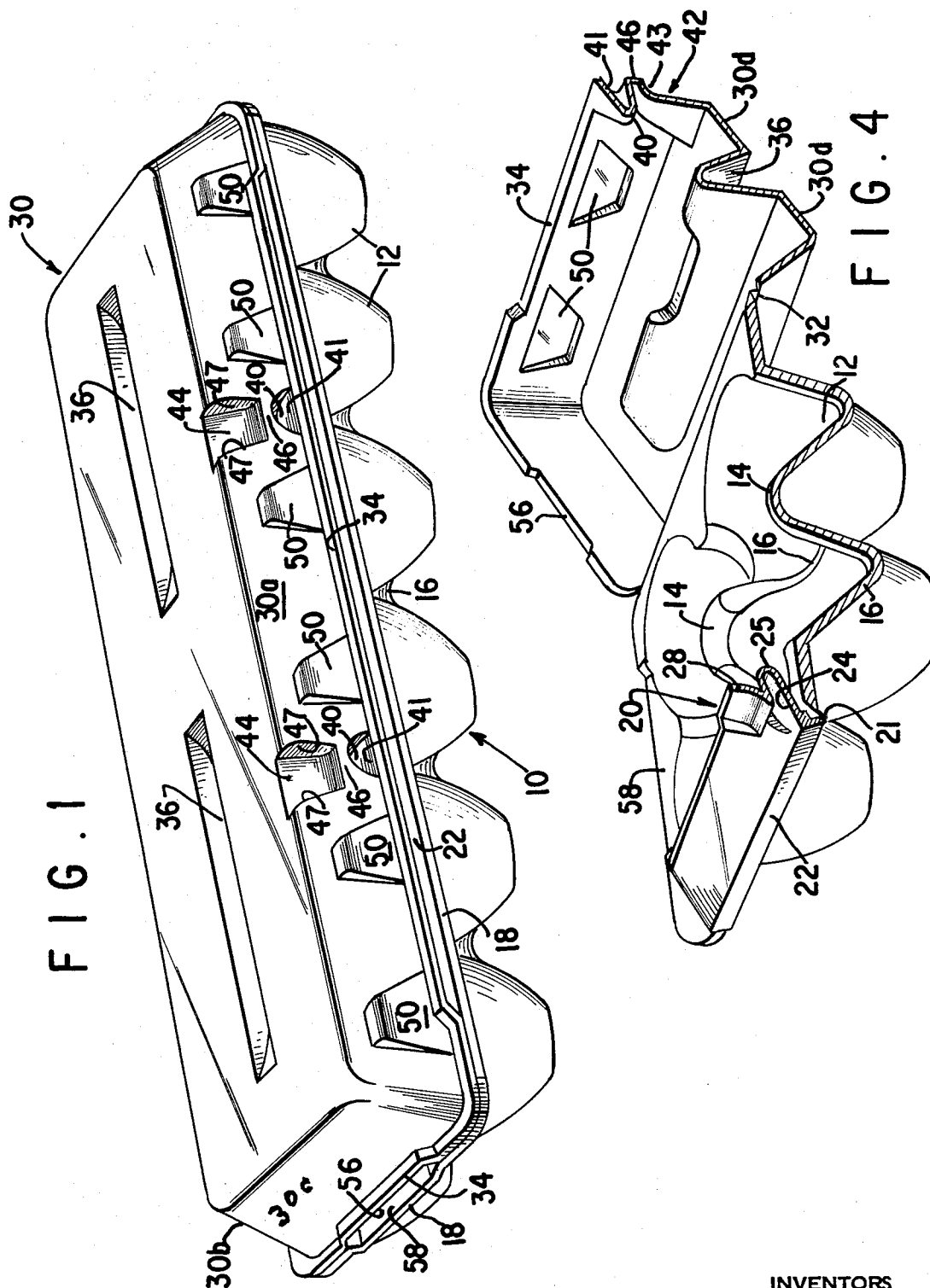
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ABSTRACT

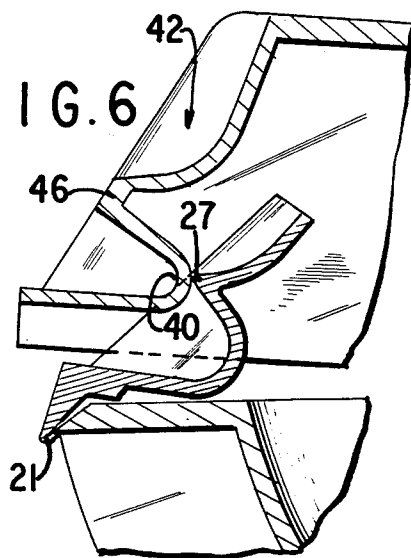
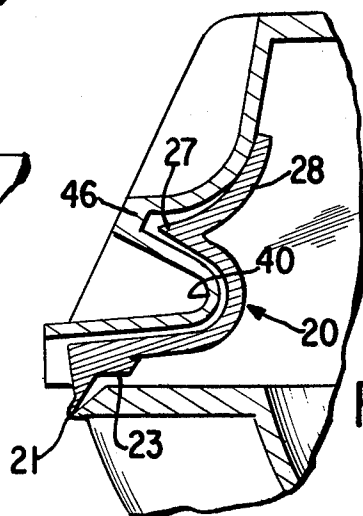
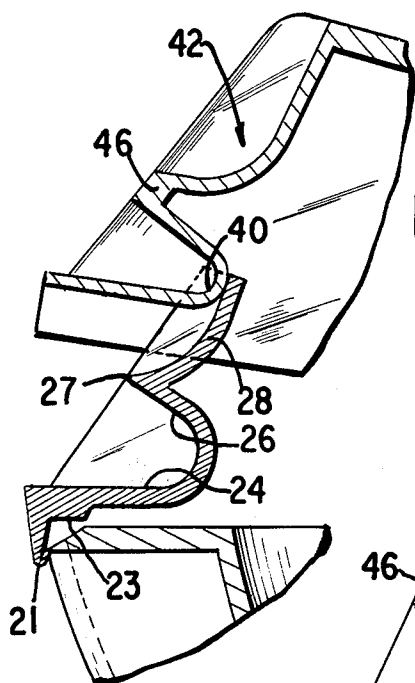
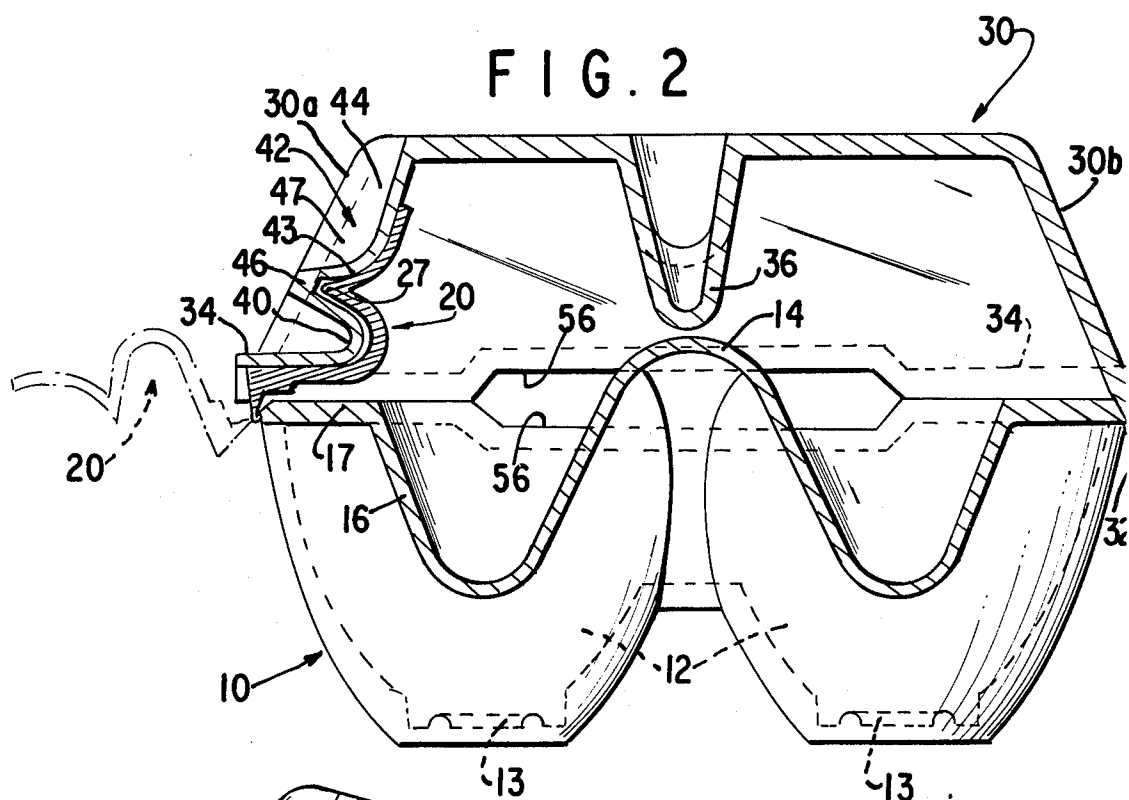
An egg carton having a latching arrangement which includes inwardly projecting lugs on the front panel of the carton cover which extend into corresponding lug receiving recesses on the latching flap attached to the carton tray, said flap having indented vertical channels above the top wall of said lug receiving recesses permitting the lugs to pass within said channels and to slide over the top rim of the lug receiving recesses into locking position with said recesses, said front panel also having indented vertical channels above each lug for receiving the lug of another carton in open nesting relationship.

5 Claims, 7 Drawing Figures



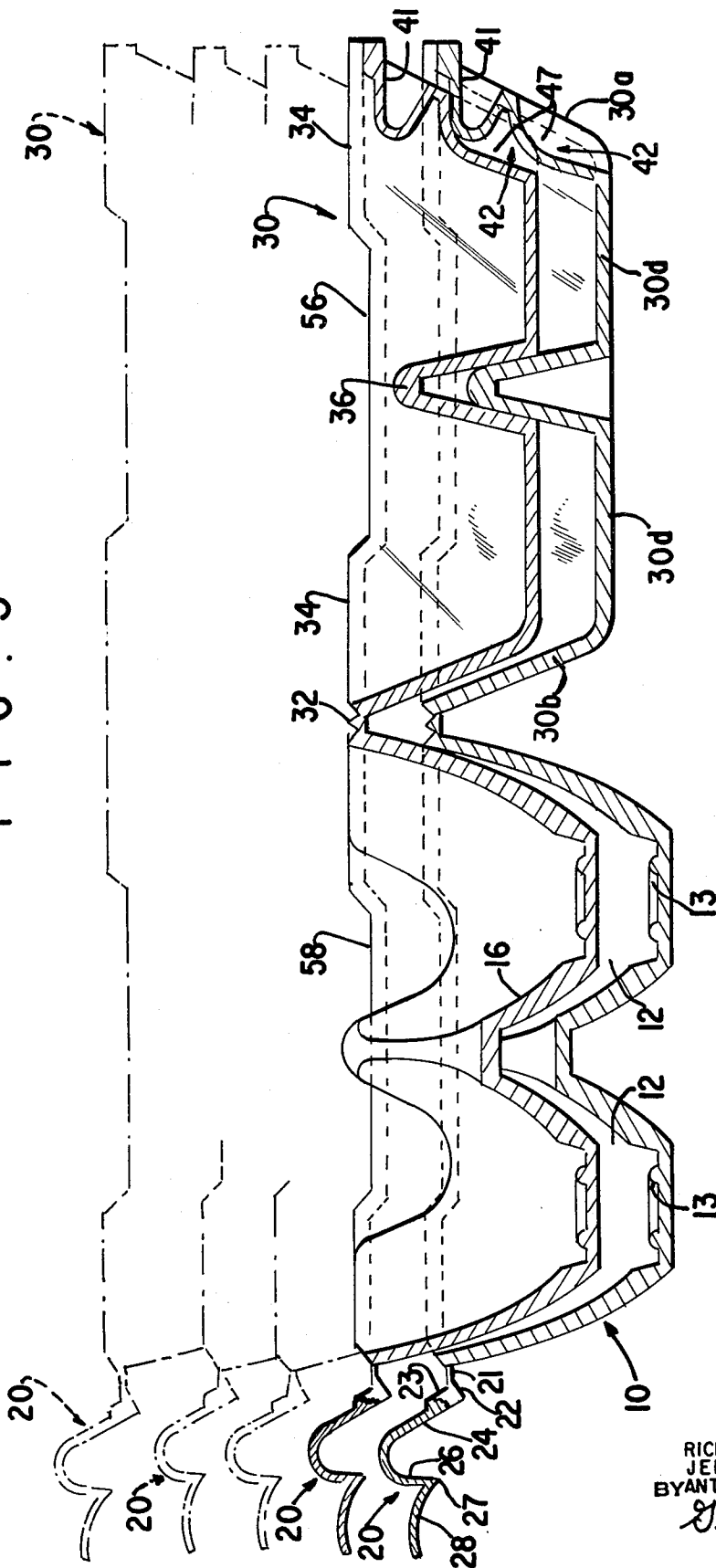


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FIG. 3



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EGG CARTON

This invention relates to egg carton construction and more particularly to a novel egg carton which has an improved latching and sealing arrangement and which also can be stacked prior to filling in open condition occupying a minimum of wasted space.

Egg carton of the molded pulp or foamed plastic material are well-known in the art. Typical of such egg cartons are those disclosed in Reifers U.S. Pat. No. 2,888,183 and J. W. Boyd et al. U.S. Pat. No. 3,184,133. These cartons include a tray having a number of cells for holding a like number of eggs, a cover hinged to the backside of the tray so that it may be swung to a closed position overlaying the tray, and a latching flap attached to the front panel of the tray portion. A latching arrangement is formed by cooperating members on the latching flap and the front wall of the cover member which include one or more projections on the latching flap and corresponding openings in the cover front panel.

The cartons of the Reifers and Boyd patents have various disadvantages. Thus, the latching arrangement utilizes members which protrude from the latching flap through holes in the cover front panel. Therefore, a possibility exists that the latching flap can be disengaged accidentally by pushing in on the protruding members extending through the front panel. Further, the holes can provide areas of structural weakness in the carton. Additionally, these holes are usually incorporated in a manufacturing operation separate from the forming or molding operation. Due to inherent inaccuracies in aligning the holes with these lugs, the holes must be enlarged to accommodate these inaccuracies resulting in a less tight latching. In this invention the recess is molded along with the lugs avoiding these inaccuracies.

The subject invention provides an improved egg carton and latching arrangement which overcomes disadvantages of the prior art cartons discussed above. In accordance with this invention, the egg carton is formed by the usual cellular tray which has a latching flap attached to the front thereof. A cover is hinged to the rear edge of the cellular tray. The latching flap is formed with a number of latch accepting molded recesses and a corresponding number of inwardly extending lugs or posts are formed on the inner face of the cover front panel. The flap has a molded depression above the latching recesses which extends to the top of the flap. To securely close the carton it is only necessary to move the cover down over the latching flap, past or within the depressed or channel areas above the rim of the recess and past said rim until the lugs on the cover extend into the recesses on the latching flap. The latching flap has a natural tendency to move outwardly, toward the cover front panel. Thus, a secure engagement is produced between the lugs on the cover front panel and the lug receiving recesses in the latching flap.

In addition to the aforesaid latching arrangement, the subject invention also incorporates a unique stacking feature which decreases the stacking density of the cartons, which would otherwise be relatively large due to the presence of the latching lugs. In accordance with the invention, there is provided a depressed vertical channel above each locking lug into which the lugs of another carton can be nested when the cartons are in the empty and open stacked or nested position. Thus, the open, empty cartons can be stacked with a relatively low density.

A wide variety of materials may be employed in the fabrication of the carton structure of the present invention. A preferred material has been found to be thermoplastic foam such as, for example, foam polystyrene, although other polymers such as polyethylene, polypropylene, polyvinyl chloride and the like are also useful. A single preferred embodiment of the present invention is presented, for purposes of illustration, in the attached drawings showing an egg carton as embodied herein produced by match molding from a sheet of polystyrene foam. Thus, apart from the various edges of the carton, each lug, projection or depression on one side of the foamed polystyrene sheet has a corresponding opposite shape

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on the other side thereof. Variations in thicknesses in various parts of the carton can be produced by the spacing between the adjacent mold surfaces.

It is therefore an object of the present invention to provide a novel egg carton with a latching arrangement wherein inwardly extending lugs on the front panel of the top cover protrude into molded recesses or indentations of the latching flap.

Another object is to provide an egg carton which can be stacked in the open position, in which the latching lugs of the carton fit within mating depressions above such lugs of another carton.

A further object is to provide an egg carton utilizing a latching arrangement with inwardly extending lugs on the front panel of a cover projecting into non-apertured recesses in a latching flap. Optionally, the cover can also be provided with a strengthening rib extending between the front and rear panels to prevent the front panel from spreading.

Other objects and advantages of the present invention will become more apparent upon reference to the following specification and annexed drawings, wherein identical numerals refer to identical parts and in which:

FIG. 1 is front view of the egg carton of the subject invention in closed condition;

FIG. 2 is a transverse cross section of the carton of FIG. 1 taken through the vertical plane at the center of the locking lug;

FIG. 3 is a vertical cross section as in FIG. 2 but with at least two cartons in open nesting relationship to each other;

FIG. 4 is a partial perspective view of the carton in open position which particularly illustrates the latching mechanism;

FIG. 5 is a fragmentary vertical cut away view of the latching arrangement as the locking lug on the cover is guided toward the latching flap recess while closing the carton;

FIG. 6 is similar to FIG. 5 but the latching lug has been pushed downwardly over the rim of the latch receiving recess prior to locking; and

FIG. 7 is similar to FIG. 5 but at the completion of the locking operation with the lug seated in the locking flap recess.

Referring now to the drawings wherein the identical numerals refer to identical parts, the carton has a lower tray 10 formed with a number of individual, generally concave cells 12, there being one cell 12 for each egg. The bottom of each cell is shown as being flat with a raised circle 13. In the most common configuration, which is shown in the drawings, there are two rows of six cells 12 to hold a dozen eggs. Of course, other cell arrays, such as three by four, can be used. A quad of adjacent cells are joined by a generally convex projection or post 14, as can be best seen in FIG. 2, which are the terminal points of cell divider wall 16. The projections 14 are hollow on the bottom side of the tray so that another projection 14 can fit within the hollow portion when the cartons are in open stacked condition (see FIG. 3). Walls 16 extend both parallel and transversely to the longitudinal axis of the tray 10. The projections 14 extend above the cell walls and also above a peripheral rim 18 which is formed around the two ends of the tray outwardly of a platform 17 (see FIG. 2). Extending upwardly from the front edge of the tray is a hinge 21 to a latching flap 20. The latching flap 20 is bent upwardly from the tray in the closed condition so that it has a natural tendency to swing outwardly with respect to the central cell area of tray 10 when upward biasing force is released.

The hinge 21 is connected directly to a riser 22 which permits the bottom wall 24 of the lug receiving recess 25 of the flap 20 to be swung above the hinge area and on to the top or outer edges of platform 17. A thickened portion 23 on the rear side of the riser 22 forms an abutment against platform 17 to prevent the flap from extending unduly inwardly. Above the riser 22 and abutment 23 there is a molded inward lug receiving recess 25 formed in the shape of a thimble having a shortened upper wall. Thus, the lower wall 24 of the recess extends further outwardly than the top wall 26 thereof. The top wall

26 of the recess terminates in a ridge 27 which is the outer top wall of the recess 25. An inward vertical channel 28 is molded above the outer edge of ridge 27. The channel 28 (see FIGS. 4 and 5) extends to the top end of the latching or locking flap and has a width which is at least as great as the width of the lug receiving recess in order to permit the cover lugs to be guided thereby in the locking position. The channel 28 permits the cover lugs 40 to move downwardly within the channel and thus acts as a guide way directing lug 40 over rim 27 and into recess 25.

A cover 30 is hinged at 32 to the rear top portion of the tray 10. The hinge can be of any suitable, conventional construction. The cover 30 has respective front, rear and side panels 30a, 30b and 30c which surround and depend downwardly from a top wall 30d. The panels 30a, 30b and 30c taper outwardly slightly from top panel 30d so that the covers of the carton can be stacked. A peripheral lip 34 is formed around the front 30a and the two side panels 30c.

Longitudinal reinforcing ribs 36 are formed in the top wall 30d and extend between the cover side panels 30c. The ribs 36 extend downwardly from the top panel 30d and are shown as being of generally "V" shape with two outwardly angled side walls and a joining bottom wall. As seen in FIG. 2, the ribs 36 are depressed areas of the cover top panel 30d which are formed during the molding operation. The construction provides substantial rigidity and a safety factor against downward pressure in the closed carton condition since the ribs abut against the posts 14.

A plurality of hollow inwardly projecting latching lugs 40 are formed inwardly of the front peripheral lip 34. It is preferred that at least two such lugs 40 be provided to assure adequate latching.

A plurality of lug-stacking vertical channels or depressions 42 are also formed on the front panel 30a of each carton above each lug 40. The size and shape of each lug-stacking depression 42 is such that a lug 40 of another carton can nest therein as shown in FIG. 3. This permits stacking, as is described below. The depressions are shown as being generally in the shape of a step having their side walls 47 extending inwardly toward the interior of the cover, with a tread 43 and a riser 44.

The latching lug 40 and the stacking depressions 42 are in substantially the same vertical plane. The bottom wall 41 of the lug, in the locked or closed condition, mates over the top of the bottom wall 24 of the lug receiving recess. The bottom wall 41 merges into margin 34 and forms an area for finger engagement to lift the cover outwardly and upwardly in order to open the carton. Each lug 40 has a top outer rim 46 which is in substantially the same plane or slightly inwardly thereof of the planar portions of the front cover. The top of rim 46 extends upwardly and inwardly to form the lug stacking depression 42 as described hereinabove. The inside of front cover 30a has a space between lug 40 and tread 43 for receiving the ridge 27 above lug receiving recess 25.

The latching flap 20 has a height above the tray rim 18 which is preferably slightly less than that of the cover front panel 30a.

As can be seen particularly in FIG. 2 cut out portions 56 of the cover and 58 of the tray define slots therebetween ensuring ventilation of the carton.

To seal the carton after it has been filled with eggs, the latching flap 20 is swung up to the position shown in FIG. 5 if it is not already in that position. The cover 30 is pressed downwardly and lugs 40 are guided within and downwardly of channels 28 until the latching lugs 40 pass over ridges 27 and into the lug receiving recesses 25 of the latching flap. As can be seen in FIGS. 5 and 6, abutment 23 and even the underside of wall 24 are pressed against platform 17 as lug 40 passes over rim 27. As can be seen in FIG. 7, flap 20 has a tendency to move outwardly so that recess 25 maintains mating contact with lug 40. To open the cover both an upward and an outward force is applied to cover front panel 30a.

It should be noted that the locking lugs 40 extend inwardly from panel 30a and are not exposed as in the carton of the aforesaid Reifers and Boyd patents. Therefore, there is little or no likelihood of the cover being accidentally disengaged from the recess 25 by someone pushing inwardly on the latching lugs, as could occur in the prior art structures.

FIG. 3 shows the stacking or nesting of the cartons. A cross-section is shown of cartons in the stack. While only a few cartons are shown, since this demonstrates the principles of the invention, it should be understood that a greater number of cartons can be stacked one within the other. Since the trays 10 of both types of cartons are identical, they stack with the posts 14 nesting inside of each other. The latching flap 20 of each carton fits within the flap of the next lower carton of the stack. The bottom carton in the stack of FIG. 3 shows a stacking lug 40 nesting within depression 42 of the carton above it. This nesting sequence of parts 40 and 42 is repeated for additional cartons added to the stack.

The use of the stacking depressions 42, which are complementary with the lugs 40, increases the stacking density of the cartons. It would take a considerably greater volume to stack the same number of cartons if the stacking arrangement of the subject invention was not utilized. This should be apparent when it is considered that the cover of each carton would be able to nest into the cover of the next lower carton only to a point where the front panel of the cover of the upper carton would be stopped by the inwardly projecting latching lugs on the cover of the next lower carton. By utilizing the subject invention the cover of the upper carton can move down further into the next outer carton on the stack since the latching lugs of the latter fit into the depressions of the former thereby permitting further downward movement of the upper carton than could previously be obtained.

What is claimed is:

1. A carton having a tray section, including upwardly disposed front, back and side walls, a cover section including a top and depending outwardly inclined front, rear and side walls, and a locking flap, the cover rear wall hinged to the tray rear wall, the locking flap hinged to the front wall to swing into and out of an inwardly and upwardly disposed operative position in which it latches with the rear face of the front cover wall when the top is in its carton closing position said carton, in the closed condition, characterized by the locking flap and front cover having cooperating locking areas, a vertical channel in the front cover above said locking areas, said vertical channel extending downwardly from the cover top, an inwardly directed lug below said channel on said cover front, said vertical channel dimensioned to nest a lug identical to said inwardly directed lug having a bottom wall extending outwardly of the carton cover and tray, said vertical channel and lug connected by a hollow outwardly directed generally "V" shaped ridge, said locking flap having a hollow recess adjacent the bottom thereof for receiving said lug, and an upper ridge mating with the hollow side of the front "V" shaped ridge and a depressed area thereabove mating with the cover front channel.

2. A carton of claim 1 wherein the tray has a platform thereabout inwardly of its upper edges and the bottom wall of the locking flap lug receiving recess is normally out of contact with said platform, the cover lug and upper ridge of the recess dimensions displacing said flap rearwardly and downwardly to make abutting contact with said platform when said lug slides over said ridge in opening said carton.

3. A carton having a tray section including front, rear and side walls and a plurality of article receiving pockets, a cover including a top and depending front, side and rear walls, with at least the front cover wall being outwardly inclined, and a locking flap, the top rear wall being hinged to the tray rear wall, the locking flap hinged to the tray front wall to swing into and out of an inwardly and upwardly disposed operative position in which it latches with the rear face of the front cover wall when the top is in its carton closing position, said carton characterized by the front cover wall having an inwardly

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disposed hollow locking lug adjacent the bottom end thereof and an indented vertical channel commencing adjacent the top of the lug and extending upwardly over the remaining portion of the front cover wall, said flap in the operative position having a hollow inwardly extending recess to receive the cover front lug and a channel thereabove which is wider than said front cover channel to guide said lug in the plane of said flap recess.

4. A carton of claim 3 wherein the locking flap hinge has an outwardly directed longitudinal depression, the top edge of said depression being above the tops of the cell walls adjacent thereto, said edge acting as an abutment in cooperation with said cell walls to limit the inward angle of said flap when in the operative position.

5. A plurality of open empty cartons in nesting relationship to each other, each of said cartons having: a base section including front, rear and side walls and a plurality of article

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receiving pockets; a cover including a top and depending outwardly inclined front, side and rear walls and a locking flap; the top rear wall being hinged to the base rear wall; the locking flap hinged to the base front wall to swing into and out of an inwardly and upwardly disposed operative position in which it latches with the rear face of the front cover wall when the top is in its carton closing position, said front cover wall having at least one inwardly disposed locking lug adjacent to the bottom thereof and an indented vertical channel thereabove, said flap having, in the operative position, an inwardly extending recess adjacent the bottom thereof to receive the cover front lug and a channel thereabove for close juxtaposed relationship, said cartons being in the open position nested with identical parts above each other, said front cover lug fitting in the front cover wall channel of the carton immediately above it.

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