United States Patent

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[54] **LOCKING DEVICE FOR EGG CARTONS**
8 Claims, 5 Drawing Figs.

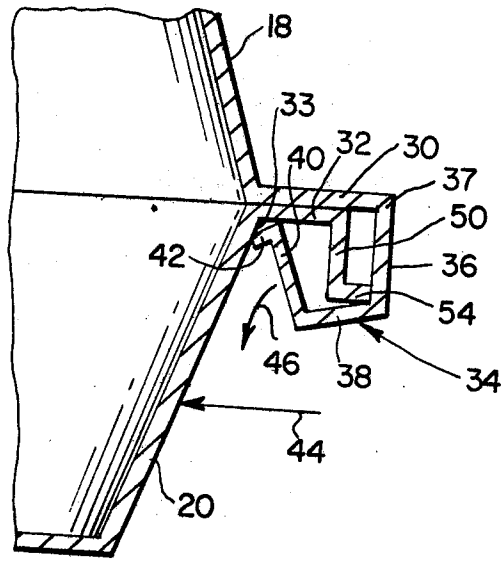
[52] **U.S. Cl.** **229/44,** 229/2.5, 229/45
[51] **Int. Cl.** **B65d 85/32,** B65d 1/24
[50] **Field of Search** 220/31SR; 229/2.5, 29M, 44, 45

[56] **References Cited**
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ABSTRACT: A locking device for an egg carton having an integrally hinged tray and cover. The locking device includes a U-shaped and longitudinally extending bar having a first leg hinged to the front of a protruding lip on the bottom of the cover's front wall and extending downwardly in front of the tray when the bar is in locked position; a bottom leg extending rearwardly from the bottom of the first leg; and a second leg extending upwardly from the inner edge of the bottom leg. The carton is locked shut by pivoting the bar under a protruding lip on the top of the tray's front wall and wedging the free longitudinal edge of the bar's second leg into the angular channel between the tray's front wall and its protruding lip.



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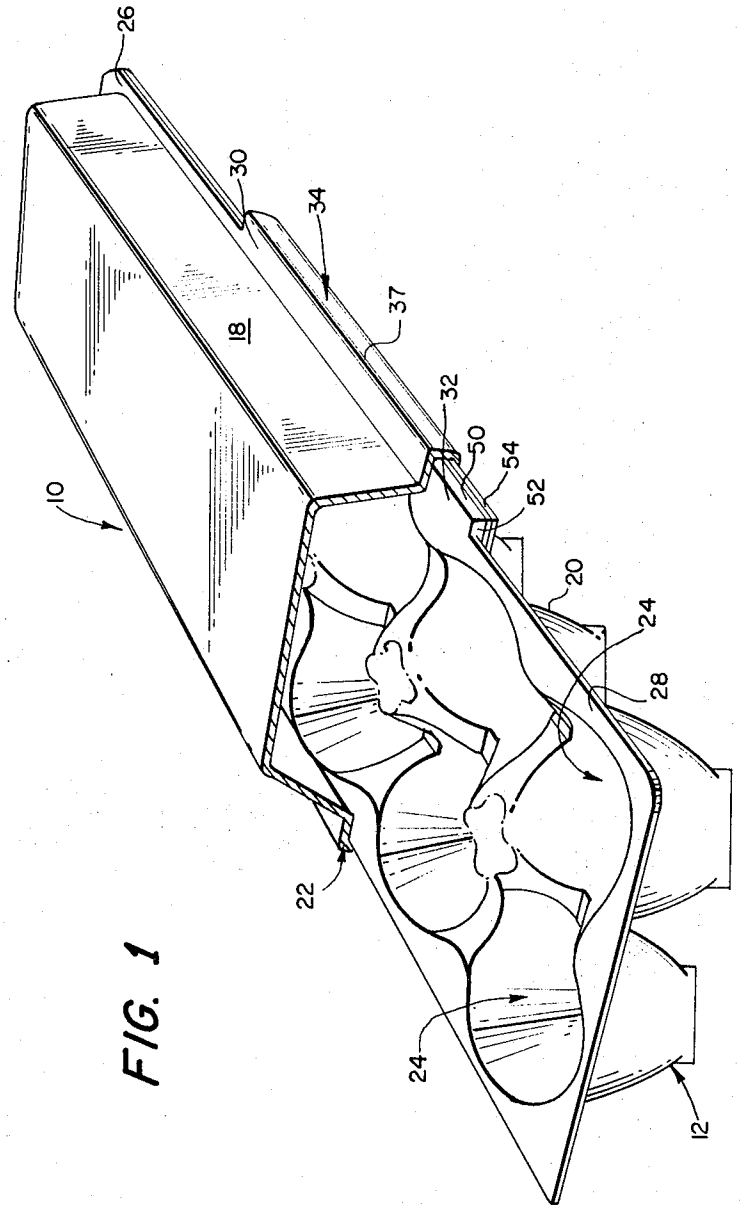


FIG. 1

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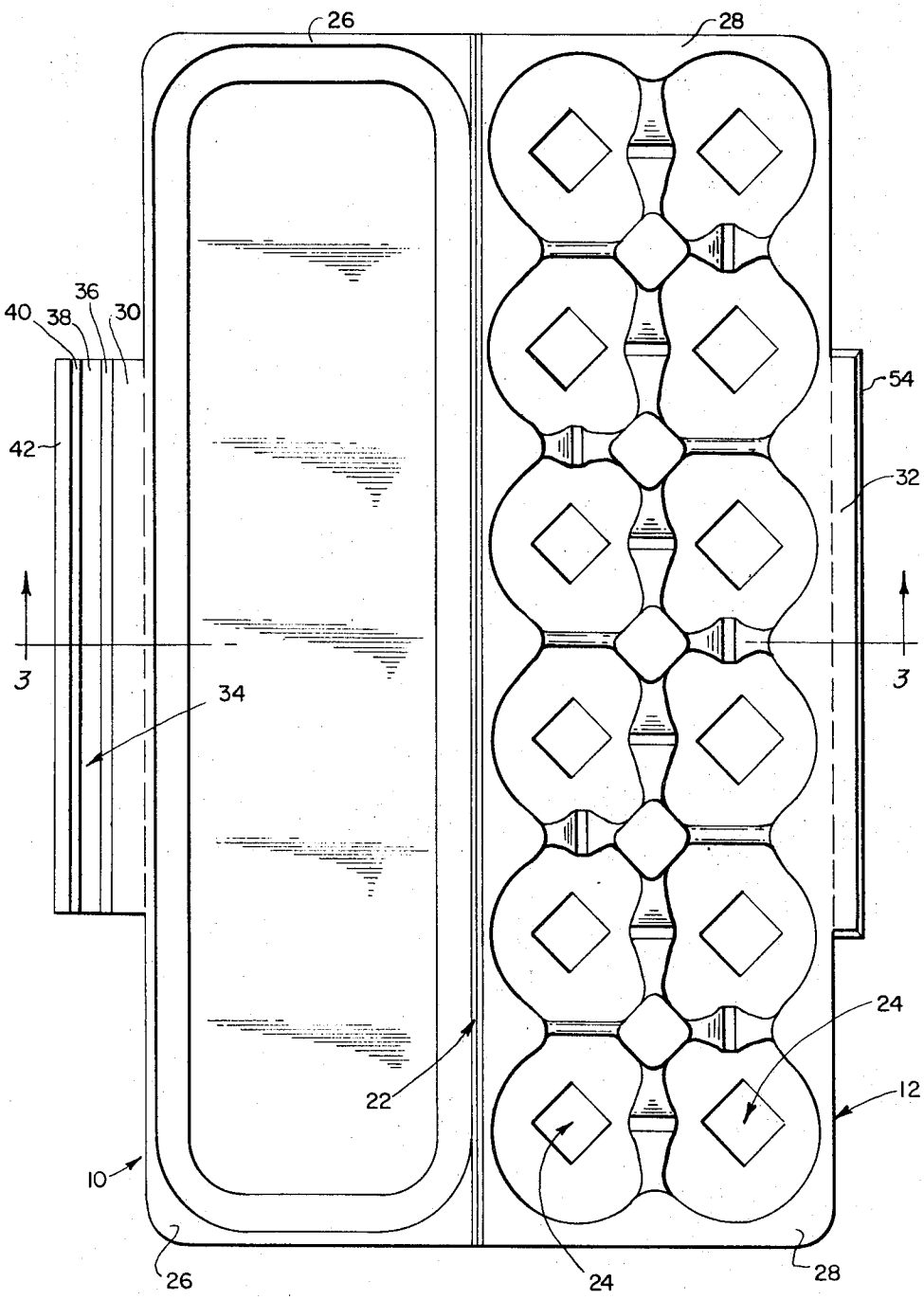


FIG. 2

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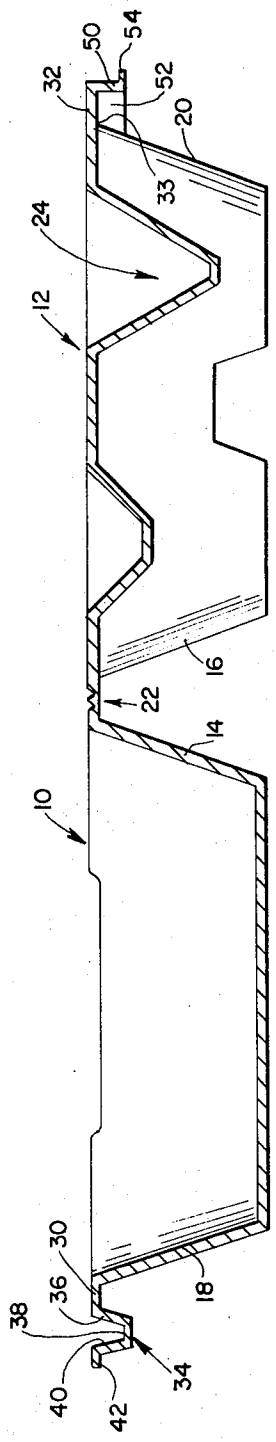


FIG. 3

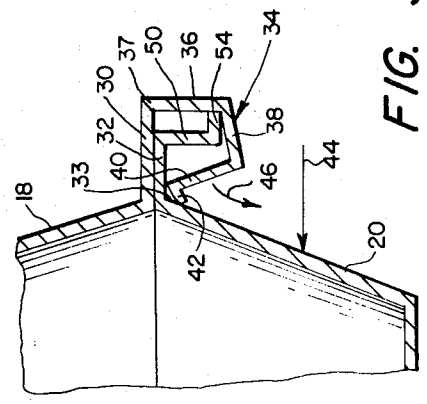


FIG. 5

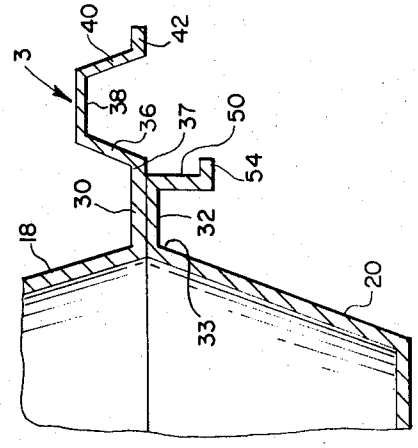


FIG. 4

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LOCKING DEVICE FOR EGG CARTONS

This invention relates to packaging cartons, and more particularly to a new and improved locking device for molded egg cartons.

The molded egg cartons contemplated for use with the locking device of this invention include a cover section or lid and a tray or bottom cellular section having a plurality of egg accommodating cells arranged in parallel rows. While the number of cells and rows may vary, the section preferably consists of a dozen cells arranged in two (2) parallel rows of six (6) cells each.

A wide variety of materials may be used in the manufacture of such carton structures. Molded paper pulp, pasteboard, plastic, and the like, for example, may be used. The preferred material, however, is thermoplastic foam, such as foam polystyrene, or other polymers, such as polyethylene, polypropylene, polyvinylchloride, or the like. For purposes of illustration, and as a preferred embodiment, the attached drawings show an egg carton having an integral locking device produced by vacuum molding or match molding techniques from a sheet of polystyrene foam.

In accordance with the present invention, a new and improved locking device is provided for such egg carton structures which comprises a U-shaped and longitudinally extending locking bar having a first leg hinged along its top longitudinal edge to the forward edge of a protruding lip on the bottom of the cover section's front wall and extending downwardly in front of the carton's tray when the bar is in locked position; a bottom leg extending rearwardly from the bottom longitudinal edge of the first leg; and a second leg extending upwardly from the inner longitudinal edge of the bottom leg.

After closing the cover over the tray, the carton is secured shut by pivoting the locking bar under a protruding lip on the top of the carton's tray and wedging the upper free longitudinal edge of the locking bar's second leg into the angular channel between the tray's front wall and its protruding lip.

The accompanying drawings which are incorporated in and constitute a part of this specification, illustrate an embodiment of the locking device of this invention and together with the description serve to explain the principles of the invention.

Of the drawings:

FIG. 1 is a perspective view, partially in section, of a closed egg carton embodying the locking device of this invention;

FIG. 2 is a plan view of the egg carton of FIG. 1 in an open position;

FIG. 3 is an enlarged sectional view taken along the line 3–3 of FIG. 2;

FIG. 4 is an enlarged fragmentary sectional view of the front of the carton of FIG. 1 with the locking device in unlocked position; and

FIG. 5 is a view similar to FIG. 4 but with the locking device in locked position.

Reference will now be made in detail to the present preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings.

The carton illustrated in the drawings and contemplated for use with the locking device of this invention is an egg carton having a cover section or lid **10** and a bottom section or tray **12**. As best shown in FIG. 3, the cover and bottom sections' rear walls **14** and **16**, respectively, and their front walls **18** and **20**, respectively, flare outwardly toward the open center faces of the carton's sections. An integral web **22** hingedly connects the cover and bottom sections' rearwalls **14** and **16** so that the cover can be rotated into closed superimposed relation with the bottom section. Bottom section **12** includes a plurality of egg accommodating cells **24** arranged in two (2) parallel rows of six (6) cells each.

As best shown in FIGS. **1** and **2**, an outwardly and laterally extending flange **26** extends around the bottom of the cover section's rear, side, and front walls and a corresponding flange **28** extends around the top of the bottom section's rear, side, and front walls, the flanges **26** and **28** being in substantial flush load-bearing engagement when the carton is closed.

In accordance with the invention, a protruding lip **30**, that is coextensive with a portion of the cover section's lateral flange **26**, extends outwardly from the bottom of the cover section's front wall **18** intermédiate its ends. Similarly, a lip **32**, that is coextensive with a portion of the bottom section's lateral flange **28**, extends outwardly from the top of the bottom section's front wall **20** and forms an angular locking channel **33** with wall **20**. As shown in FIGS. **1**, **4**, and **5**, protruding lips **30** and **32** are also in substantial flush engagement when the carton is closed.

In accordance with the present invention, a longitudinal locking bar **34** having a U-shaped cross section is provided to lock the cover and bottom sections together. U-shaped locking bar **34** comprises a first leg **36** hinged along one longitudinal edge to the forward edge **37** of the cover section's protruding lip **30**. When locking bar **34** is in locked position, and as shown in FIG. **5**, leg **36** extends downwardly and in front of the bottom section's front wall **20**. Locking bar **34** further includes a bottom leg **38** that extends rearwardly from the bottom longitudinal edge of leg **36** when the bar is in locked position.

The opposing or second leg **40** is substantially similar to first leg **36** and extends upwardly from the inner longitudinal edge of bottom leg **38** to complete U-shaped locking bar **34**. As best shown in FIG. **4**, both legs **36** and **40** flare outwardly from the bottom of the U towards its open end, so that the distance between the upper edges of legs **36** and **40** at the top of the U, when bar **34** is in unlocked position, is greater than the distance between the forward edge **37** of cover section's protruding lip **30** and locking channel **33**. Preferably, a locking flange **42** extends outwardly from the upper longitudinal edge of leg **40**.

To lock the carton shut, cover section **10** is rotated about hinge **22** into closed superimposed relation with bottom section **12**. Locking bar **34** is then pivoted down toward bottom section **12** and up under lip **32**, the resilience of locking bar **34** permitting legs **36** and **40** to flex inwardly so that locking flange **42** can be wedged into locking channel **33** between the bottom section's front wall **20** and its protruding lip **32**.

To open the carton, and as best shown in FIG. **5**, pressure is applied to the front wall **20** of bottom section **12** in the direction of arrow **44** to flex the wall and increase the angular relationship between the wall and its protruding lip **32**, thereby releasing the bar's locking flange **42** that has been wedged in channel **33**. Due to the resilience of the locking bar's structure, flange **42** will pop out of interlocking engagement with channel **33** and urge the bar back toward unlocked position, as shown in FIG. **4**.

In accordance with a preferred embodiment of this invention, and as best shown in FIGS. **1**, **4**, and **5**, rib means are provided between bottom section's front wall **20** and its protruding lip **32** to reinforce the angular relation of locking channel **33** and provide more positive locking. As embodied, the rib means comprises a front flange **50** extending downwardly from the forward edge of protruding lip **32** and rearwardly extending side flanges **52** (see FIG. **1**) interconnecting front flange **50** with bottom section's front wall **20**. Depending side flanges **52** are located at opposite ends of projecting lip **32** and are spaced apart a sufficient distance to provide clearance for locking bar **34** when it is pushed up into locking position.

Flanges **50** and **52** thus form a boxlike configuration with projecting lip **32** to reinforce the lip against upward movement by the pressure of wedged locking flange **42**. To further strengthen the integrity of lip **32**, a rib **54** can be provided around the lower edges of flanges **50** and **52**. Preferably, rib **54** extends outwardly a sufficient distance to bear against the inner surface of leg **36** of locking bar **34** when the bar is in locked position, but should not interfere with the locking operation of the bar.

While the carton described in the drawings and illustrating the locking device of this invention is a preferred carton design for eggs, the invention is applicable to a variety of egg carton shapes and other similar cartons. An egg carton, for example, having three (3) parallel rows of four (4) egg accom-

modating cells each could easily be used with the present locking mechanism.

The invention thus provides a new and improved locking device for molded egg cartons. The locking device facilitates the easy closing of the carton with automatic and positive looking, especially adaptable to automatic egg packaging equipment, and the easy opening and closing of the carton by the consumer. Further, the locking device can be integrally molded with the egg carton from a sheet of suitable material using conventional molding techniques.

The invention in its broader aspects is not limited to the specific details shown and described and departures may be made from such details without departing from the principles of the invention and without sacrificing its chief advantages.

I claim:

1. An egg carton comprising a bottom section having a frontwall and a rearwall; a cover section having a frontwall and a rearwall, the cover and bottom sections' rear walls being hingedly connected so that the cover section can assume a closed superimposed position with respect to the bottom section; a first protruding lip extending along at least a portion of the upper edge of the bottom section's frontwall, said lip forming an angular locking channel with the outer surface of the bottom section's frontwall; a second protruding lip along a corresponding portion of the bottom edge of the cover section's frontwall, the protruding lips being in substantial abutting engagement with one another when the sections are in closed position; and a U-shaped and longitudinally locking bar comprising:

a. a first leg hinged along its top longitudinal edge to the forward edge of the cover section's protruding lip permitting the locking flap to be pivoted between locked and unlocked positions, said first leg extending downwardly in front of the bottom section when the bar is in locked position;

b. a bottom leg extending rearwardly from the bottom longitudinal edge of the first leg; and

c. a second leg extending upwardly from the inner longitudinal edge of the bottom leg, said second leg being wedged into the angular locking channel when the bar is in locked position to hold the sections together.

2. The carton of claim 1, wherein the carton and locking bar are of unitary molded construction.

3. The carton of claim 2, wherein the carton and locking bar are formed of molded polystyrene foam.

4. The carton of claim 1, including a longitudinal locking flange extending outwardly from the upper longitudinal edge of the locking bar's second leg, said locking flange being wedged into the angular locking channel between the bottom section's frontwall and its protruding lip when the bar is in locked position.

5. The carton of claim 1, including rib means interconnecting the frontwall of the bottom section and its protruding lip to reinforce the angular relation of the locking channel.

6. The carton of claim 5, in which the rib means includes a front flange extending downwardly from the forward edge of the bottom section's projecting lip and side flanges extending downwardly from the ends of the projecting lip, said side flanges interconnecting the front flange with the frontwall of the bottom section and being spaced apart a sufficient distance to permit the locking bar to be pivoted into locked position.

7. The carton of claim 6, including a horizontal rib extending outwardly from the bottom edge of said front and side flanges.

8. The carton of claim 1, including laterally extending flanges on the upper and lower edges of the walls of the bottom and cover sections, respectively, said flanges being coextensive with the projecting lips on the frontwalls of said sections and being in substantial flush load-bearing engagement with one another when the sections are in closed position.