United States Patent

Phillips et al.

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[45] **Sept. 5, 1972**

[54] **EGG CARTON LATCHING DESIGN**

[72] Inventors: **Robert James Phillips,** 3712 Colony Park, Tyler, Tex. 75701; **Robert L. Reasor,** 1610 Osage; **Donald F. Wiley,** 2308 Lynn, both of Big Spring, Tex. 79720

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[21] Appl. No.: **81,242**

[52] **U.S. Cl.** .....**229/44 R,** 229/45

[51] **Int. Cl.** **B65d 85/32**

[58] **Field of Search**.....229/44 R, 45, 2.5, 29 M

[56] **References Cited**

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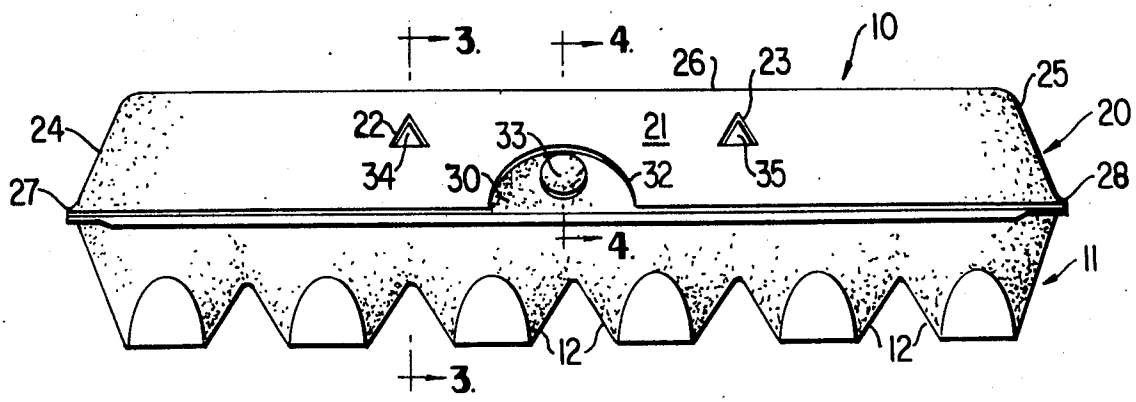
Primary Examiner—Donald F. Norton

Attorney—Sol B. Wiczer and M. N. Cheairs

[57] **ABSTRACT**

An egg carton incorporating an easy-open latching feature comprising an outwardly extending protuberance on the carton locking flap which extends into a cutout section at the bottom edge of the cover front wall. By depressing the protuberance, the carton latching mechanism is disengaged permitting convenient, one-handed opening of the carton. There is also provided an improved latching mechanism wherein the bottom surface of each locking lug is planar and horizontally oriented when the carton is closed.

7 Claims, 5 Drawing Figures



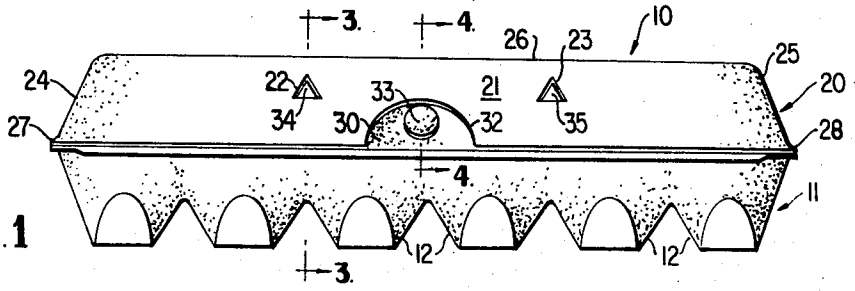


FIG. 1

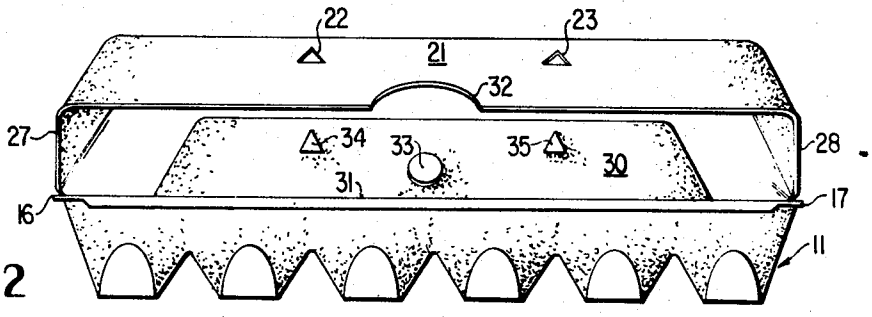


FIG. 2

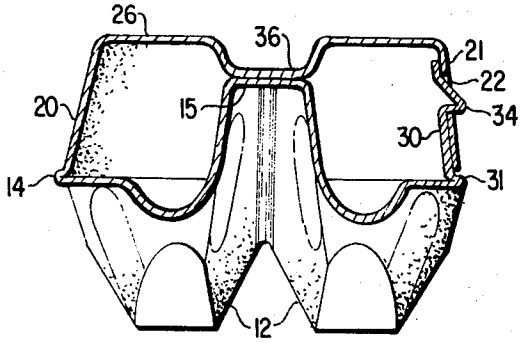


FIG. 3

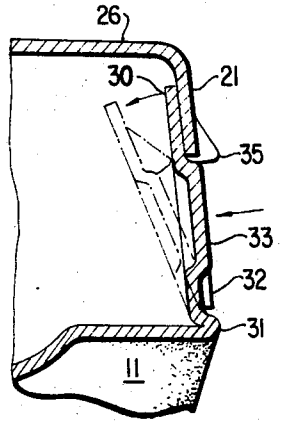


FIG. 4

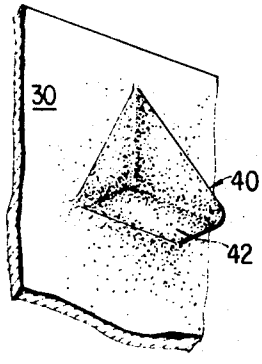


FIG. 5

INVENTORS
ROBERT L. REASOR
ROBERT J. PHILLIPS
DONALD F. WILEY

BY M. Norwood Cheairs
ATTORNEY

EGG CARTON LATCHING DESIGN

BACKGROUND OF THE INVENTION

The present invention relates to molded egg cartons of the type comprising an integral tray, cover and locking flap. More particularly, this invention relates to an improved latching design for such cartons.

There have been proposed a multitude of designs for the latching mechanism of the commonplace egg carton which is generally characterized by a tray having a plurality of cells for the placement of eggs, a tray-like cover section integrally hinged to one side wall of the tray and a locking flap integrally hinged to the opposite side wall of the tray. In the closed or latched configuration, the locking flap extends upwardly within the carton in face-to-face relationship with the front wall of the cover, and because of the natural resiliency of the carton material, the flap is biased outwardly against the cover wall thereby forcing the latching mechanism into engagement.

Two common latching designs are those wherein the latching mechanism comprises a pair of spaced apertures in the cover front wall and a corresponding pair of outwardly extending locking lugs on the locking flap and those wherein the apertures are contained in the locking flap, with inwardly projecting bridges or lugs being formed on the inside surface of the cover front wall. Of the two basic designs, the former has gained wider attention because of ease in molding techniques and conformance with standard carton filling machinery. However, this type of latching mechanism was first designed for and primarily employed with respect to molded pulp egg cartons as shown in U.S. Pat. No. 2,990,094.

The use of the latching mechanism of the former type above described, with molded plastic egg cartons manufactured in accordance with heretofore known egg carton designs has suffered a significant dilemma. This dilemma is that of providing a carton which will stay closed during normal handling operations by the packer, shipper, wholesaler, etc., all the way down to the ultimate consumer, while at the same time supplying the housewife with a carton which can easily be opened to gain access to the contents. For obvious reasons, the first consideration has been given priority, with the result that commercially available egg cartons are extremely cumbersome to open and as a rule require two hands to do so. Thus, for example, considering an egg carton having its latching mechanism comprised of a pair of locking lugs extending outwardly through apertures in the cover front wall, it is necessary to either simultaneously depress the two lugs while lifting the cover open, or to grasp the bottom of the carton, flex the front wall of the cover outwardly and, thence, force the lower edge of the locking apertures up over the lugs. Both operations require two hands. Generally, an operation such as the latter is needed to open cartons employing inwardly directed locking lugs.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a molded egg carton design having a latching mechanism which may readily be opened by employing a simple one-handed operation.

Another object of this invention resides in the provision of an improved egg carton latching mechanism

which enables the cartons to be more securely locked without materially increasing the difficulty in opening the same.

Other objects and the nature and advantages of the instant invention will be apparent from the description hereinbelow taken in conjunction with accompanying drawings.

Thus, in accomplishing the objects of this invention, there is provided a molded egg carton comprising a cellular tray for the placement of eggs, an overlying tray-like cover hingedly connected to the tray along mutually adjacent edges and a locking flap integrally and hingedly connected to the tray along the side thereof opposite the side to which the cover is connected. The front wall of the cover and the locking flap contain at least one set of latching elements which are adapted to interengage upon closing of the carton with the locking flap projecting upwardly from the tray in face-to-face relationship with the inside surface of the cover front wall. The easy-opening feature of the invention is provided by a cutout section adjacent the midpoint of the lower edge of the front wall of the cover, and a corresponding outwardly extending protuberance adjacent the midpoint of the lower margin of the locking flap. The protuberance is adapted to extend into the cutout, whereby the former may conveniently be depressed causing the locking flap to thus be deflected inwardly to disengage the latching elements.

It is readily apparent from the foregoing description of the present easy-opening latching feature that the same may be incorporated in egg cartons manufactured in accordance with either of the two common designs discussed hereinabove, i.e., designs employing locking lugs extending outwardly from the locking flap as well as those designs where the locking flap contains apertures and the locking lugs extend inwardly from the front wall of the cover. In other words, the only limitation placed on the latching feature of this invention is that the opening procedure of the carton into which the feature is to be incorporated involves either the inward rotation of the locking flap and/or the outward deflection of the cover front wall.

In another aspect of the present invention, a latching mechanism is provided in a molded carton wherein latching is achieved by interengagement of locking lugs extending outwardly from the locking flap and corresponding apertures in the front wall of the carton cover, the latching mechanism comprising locking lugs having the entire lower surface thereof substantially planar and having said lugs oriented so that the planar surface lies in an essentially horizontal plane when the carton is in the closed configuration. Optionally, the improved degree of latching residing in the latching mechanism can be further enhanced by providing that the lower periphery of each locking aperture be cut on a straight line, and at such an angle through the cover wall that the peripheral edge will be biaxially horizontal when the cover is in the closed position. It is preferred to employ the latching mechanism of the present invention in combination with the above-described easy-opening latching feature; however, it need not necessarily be so employed, since the present latching mechanism does not appreciably increase the difficulty of opening the subject cartons when compared to prior art designs.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevation view of an egg carton according to the present invention in the closed configuration;

FIG. 2 is a view similar to FIG. 1, but showing the egg carton in a partially opened position;

FIG. 3 is a closed sectional view taken on the line 3—3 in FIG. 1;

FIG. 4 is a partial cross-sectional view taken along the line 4—4 in FIG. 1, and illustrating with phantom lines the operation of the latching feature; and

FIG. 5 is a perspective view of a locking lug according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, wherein like reference characters are used to designate like or corresponding parts throughout the several view, there is shown in FIG. 1 an egg carton **10** comprising a tray generally designated as **11** and a cover generally designated as **20**. Tray **11** comprises a plurality of cells **12**, and in the carton **10** which is illustrated there are two rows of cells, each row having six cells therein. The cover **20** has a front wall **21** that is characterized by being planar from end to end thereof.

Cover front wall **21** is provided with a pair of spaced apertures **22** and **23** therein adjacent the upper margin thereof. The end walls **24** and **25** of cover **20** are generally outwardly tapering, from the planar top **26** of cover **20** and the end walls **24** and **25** each has at the bottom thereof an outwardly extending generally horizontal flange, the flange of end wall **24** being designated **27** and the flange of end wall **25** being designated **28**.

Located adjacent the midpoint of the lower edge of cover front wall **21** is a cutout section **32** through which access may be gained to latch-release button **33** integrally formed on a carton locking flap **30**.

Referring now to FIG. 2, there is shown the carton **10** in partially opened position, there being revealed by the upward movement of cover **20** the locking flap **30**. Locking flap **30** is integrally joined to the upper margin of tray **11** at a hinge line **31**. In addition to the latch-release button **33** located near the midpoint of the lower margin of locking flap **30**, the flap also contains integrally formed, outwardly extending locking lugs **34** and **35**.

Cover **20** is hingedly connected to one side of tray **11** at hinge line **14**, as may be seen in FIG. 3, and the tray **11** is preferably characterized by having upstanding posts therein, such as post **16** shown in FIG. 3, which engages with the underside of the depending lugs **36** extending downward from the underside of top **26** of cover **20**. Tray **11** has at the ends thereof horizontally extending flanges **16** and **17**.

It will be understood that the carton **10** is manufactured by a molding process, and the carton is then shipped to a desired point and filled with eggs, it being then in the opened position thereof, with the cover **20** being at one side of tray **11** and the locking flap **30** extending outwardly from the other side thereof. By passing the carton **10** through automatic equipment, the locking flap **30** is rotated about hinge line **31** into the position shown in FIG. 3 and the cover **20** is rotated about the hinge line **14**. The bottom edge of cover front wall **21** will move downwardly past the locking lugs **34** and **35**, at which point a camming action will take place between the said locking lugs **34** and **35** and the interior side of cover front wall **21**, if necessary. Cover **20** will thereupon continue to rotate until finally the apertures **22** and **23** will be in register with the locking lugs **34** and **35**, respectively, and the interior surface of cover front wall **21** no longer being in contact with the locking lugs **34** and **35**, these lugs **34** and **35** will be snapped through the apertures **22** and **23**, respectively, by virtue of the natural resiliency of the carton material in the hinge line **31**, and in the locking flap **30**. The carton **10** will then be securely locked and the parts will occupy the position shown in FIG. 3, with the locking lugs extending through the apertures, as exemplified by locking lug **34** extending through aperture **22**, and preventing opening pivotal movement of cover **20**.

Referring now to FIG. 4, there is illustrated the latch-release mechanism consisting of latch-release button **33** formed in locking flap **30**, and cutout section **32** in the cover front wall **21**. The latch-release button **33** is generally in the form of a protuberance extending outwardly from locking flap **30** and into cutout section **32** when the carton is in the closed configuration. While the latch-release button **33** may extend any desired distance into cutout **32**, it is preferred that it not extend beyond the plane defined by the outside surface of cover front wall **21**. Most preferable is the design illustrated in FIG. 4 wherein the latch-release button **33** is approximately flush with cover front wall **21**.

The operation of the latch-release mechanism is likewise illustrated by the phantom lines in FIG. 4. Thus, it is seen that by depressing latch-release button **33**, the locking flap **30** is rotated inwardly along hinge line **31** thereby aiding in the disengagement of the latching elements of the carton, e.g., locking lug **35**.

In FIG. 5, there is illustrated a portion of the locking flap **30** containing a locking lug **40** according to this invention. The salient feature of the improved lug is that the lower surface **42** thereof is substantially planar, and the lug is oriented on flap **30** such that planar surface **42** lies in an essentially horizontal plane when the carton is in the closed configuration. There is thus provided a more secure latching mechanism than in cartons employing conventional locking lugs which characteristically are rounded in design and generally have their lower surfaces inclined upwardly. The present degree of improvement is enhanced if, together with the foregoing locking lug **40**, there is employed a cover front wall aperture such as illustrated by reference numerals **22** and **23** in FIGS. **1** and **2** and by reference numeral **22** in FIG. **3**. Specifically, such an aperture has its lower periphery cut along a horizontal straight line on both the longitudinal and transverse axes of the carton front wall **21**. It will of course be appreciated that the upper portion of the locking lug **40** shown in FIG. **5** may be of any desired shape and is not limited to that illustrated.

The molded cartons of this invention may be fabricated from any of the known materials employed for this use such as conventional pulp fibers, or from any of the more recently popularized foamed thermoplastic synthetic plastic materials, such as foamed polystyrene. However, the present invention is most advantageously employed when the egg cartons are forms of foamed polystyrene.

Thus, there has been provided an egg carton of a design having a tray with a cover and a locking flap integrally joined to opposite sides thereof, the carton being readily closed by automatic equipment to remain securely latched during normal handling, and at the same time possessing an easy-opening feature allowing the consumer to readily open the carton with one hand. Additionally, there has been provided an improved locking lug design allowing for more secure latching than that of conventional egg carton designs.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

What is claimed is:

1. A molded egg carton comprising a cellular tray, an overlying tray-like cover hingedly connected to the tray along mutually adjacent edges and a locking flap integrally and hingedly connected to the tray along the side thereof opposite the side to which the cover is connected, the cover front wall and locking flap having at least one set of latching elements which are adapted to interengage upon closing of the carton with the locking flap projecting upwardly from the tray in face-to-face relationship with the inside surface of the cover front wall, said cover front wall having a cutout section therein adjacent the midpoint of the lower edge thereof, and said locking flap having an outwardly extending protuberance adjacent the midpoint of the lower margin thereof, said protuberance adapted to extend into said cutout in the cover front wall, whereby said protuberance may be depressed causing the locking flap to be deflected inwardly thereby disengaging the latching elements.

2. A molded carton according to claim 1, wherein said outwardly extending protuberance on the locking flap does not extend beyond the plane of the outer surface of the cover front wall when the carton is in the closed configuration.

3. A molded carton according to claim 1, wherein said latching elements comprise a pair of spaced apertures on the cover front wall and a pair of outwardly extending locking lugs on the locking flap, said lugs adapted to extend through said apertures when the carton is in the closed configuration.

4. A molded carton according to claim 3, wherein the entire lower surface of each locking lug is substantially planar and lies in an essentially horizontal plane when the carton is in the closed configuration.

5. A molded carton according to claim 4, wherein the lower periphery of each of said apertures in the cover front wall is straight-cut and biaxially horizontal when the carton is in the closed configuration.

6. A molded carton according to claim 1, fabricated from pulp fibers.

7. A molded carton according to claim 1, fabricated from foamed thermoplastic synthetic plastic.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,688,971 Dated September 5, 1972

Inventor(s) ROBERT JAMES PHILLIPS ET AL

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet insert

-- [73] said Phillips and said Reasor assignors to International Technovation, Inc., Dallas, Tex., a corporation of Delaware, said Wiley assignor to Cosden Oil & Chemical Company (Cosden), Big Spring, Tex., a corporation of Texas.

Signed and sealed this 8th day of May 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.