July 7, 1970 K. D. BIXLER 3,519,192

MOLDED CARTON LOCK

Filed Feb. 6, 1969

FIG. 1

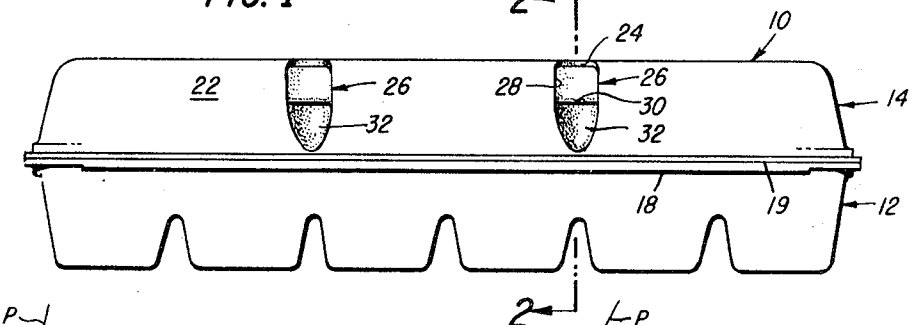


FIG. 2

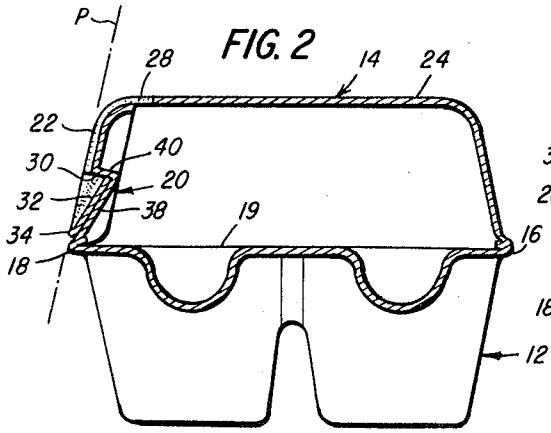


FIG. 3

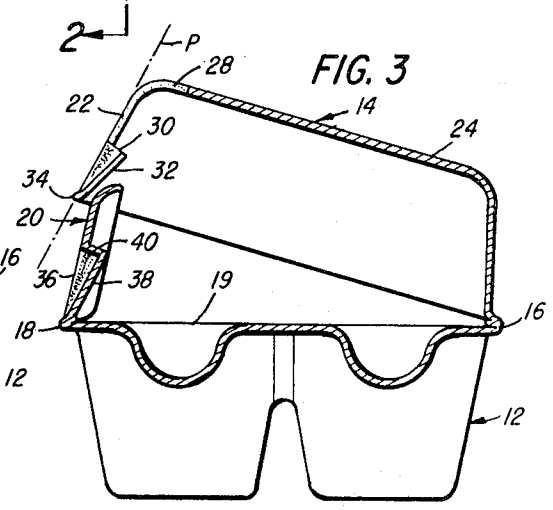


FIG. 4

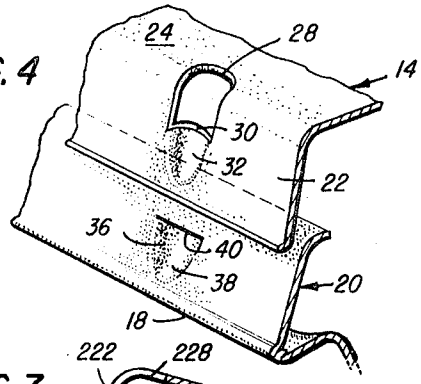


FIG. 5

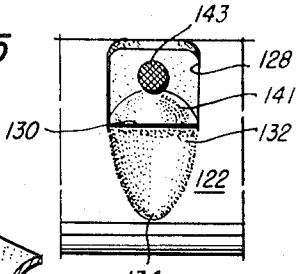


FIG. 6

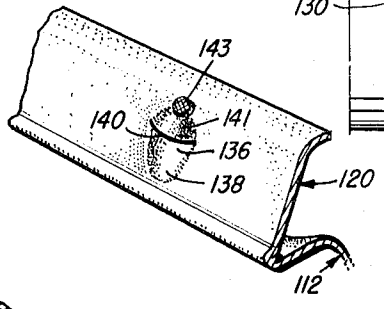
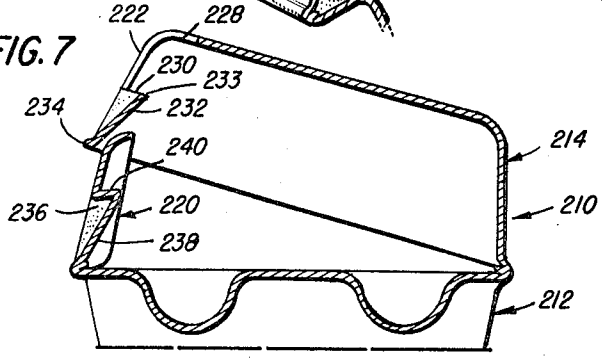


FIG. 7



INVENTOR

KENNETH D. BIXLER

BY

KARL W. FLOCKS

ATTORNEY

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MOLDED CARTON LOCK

Kenneth D. Bixler, Huntington, N.Y., assignor to Diamond International Corporation, New York, N.Y., a corporation of Delaware

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ABSTRACT OF THE DISCLOSURE

A molded carton having a tray, integral hollow cover and lock flap and including cooperating lock portions in the forward wall of the cover and the lock flap, in which a lock portion on the flap comprise one or more indented walls terminating in upper transverse ledges, and a lock lip defined by an inwardly extending wall complementary to the indented portion on the lock flap and bordering a hole through the forward wall of the cover exposing therebeneath, when the carton is closed, the lock flap which, when depressed, permits the cover to be opened, and in which a bulge or indicia provided on the lock flap above the transverse lip is exposed at the hole in the cover forward wall but beneath the outer surface thereof whereby a user is apprised as to where to depress the lock flap to operate the lock.

Many types of locking arrangements for molded cartons have been previously proposed as illustrated, for example in U.S. patents to Reifers No. 2,843,304 and No. 2,990,094.

The present invention contemplates a novel locking arrangement usable on cartons of the general type disclosed in the above-mentioned Reifers patents.

Primary objects of the present invention are to provide a novel lock between a forward cover wall and outwardly biased lock flap of a molded carton in which the locking portions are substantially flush or beneath outer surface of the cover of the carton; to provide a novel lock of the character mentioned above in which the lock flap includes an indented wall terminating in an upper transverse ledge intermediately of the carton flap, and engageable with a correspondingly shaped lock lip formed beneath a hole on the forward wall of the carton cover; to provide an improved lock of the character mentioned above in which indicia or a bulge is formed on the lock flap above the ledge and which is exposed at the hole when the carton is closed to apprise a user as to how to open or operate the lock.

These together with other and more specific objects and advantages of the invention will become apparent from a consideration of the following description when taken in conjunction with the drawing forming a part thereof wherein:

FIG. 1 is a front elevational view of a molded carton, in a closed condition, and which incorporate locks of the present invention;

FIG. 2 is an enlarged vertical section taken substantially on the plane of line 2—2 of FIG. 1;

FIG. 3 is a sectional view, similar to FIG. 2 showing the carton cover in a partially open condition;

FIG. 4 is a fragmentary perspective view showing one of the cooperating locks of FIGS. 1–3, the parts generally being in the attitude illustrated by FIG. 3;

FIG. 5 is a fragmentary, enlarged front elevational view, similar to a portion of FIG. 1, showing a modification of the lock flap;

FIG. 6 is a fragmentary perspective view showing the portion of the lock flap incorporating the modification shown in FIG. 5; and

FIG. 7 is a fragmentary section, similar to FIG. 3, showing a further modified lock.

Referring to the drawing in detail, a molded one-piece carton is indicated generally at 10; and the carton is produced in any suitable manner. The carton includes a lower tray portion 12, an upper hollow cover 14 hinged along the rear side edge at 16, and hinged to the opposite, forward edge at 18 is a lock flap indicated generally at 20. The cover 14, when the carton is closed, rests on the upper margin of the tray; see FIGS. 1 and 2, and although not described in detail, the tray may include vertical posts, saddles, etc. forming a series of egg-receiving cells or the like. Means (not described in detail) is provided whereby the lock flap 20 is normally biased outwardly or toward the inner surface of the forward wall 22 of the cover when the carton is closed. The forward wall 22, as do the rear and end walls of the cover 14, converge upwardly to a slight degree, and are formed integral with the top wall 24.

Indicated generally at 26 are longitudinally spaced locks having cooperating portions formed on both the forward wall 22 of the cover and the lock flap 20. Since these locks are identical in structure and function, only one will be described in detail. Additionally, in 2 x 6 egg cartons, for example, which are designed to be separated in two 3 x 2 carton segments, a pair of locks is desirable for each of the separated segments. Only one of the locks will be described in detail, and the invention relates to an improved lock usable alone or in cooperation with other locks.

The locks 26 includes a hole 28 through which flaps 18 is engaged and depressed to permit the cover to be opened. The hole 28 is formed generally at the intersection of the top 24 and adjacent portion of the carton forward wall 22. At the lower margin of the hole 28 an inwardly angled lock edge 30 is formed defining the upper edge of a downwardly and outwardly angled reinforcing wall 32, semi-elliptical in elevation; see FIG. 1, and which merges down generally to the lower marginal edge 34 of the forward wall 22. Formed on the lock flap 20 and extending generally above the hinge 18 is a cavity, recess or indentation 36 defined by an inwardly extending wall 38 corresponding in shape or complementary to the wall 32 on the cover, and terminating in a transverse lock-ledge 40 beneath which the lock lip 30 will be disposed when the carton is closed in the manner shown in FIG. 2.

As seen in FIG. 2, when the carton is closed, the locking portions formed on the flap will be disposed below a plane P passing through the outer surface of the front wall 26 of the carton. This arrangement is highly desirable when packing the closed and filled cartons in a packing case, and further there will be no projecting parts which might be accidentally engaged to cause the carton to be opened accidentally.

Still further, the indented wall 38 beneath the lock ledge 40 provides a substantial and highly stabilized construction affording positive locking. Still further, with respect to the structure and function of the cooperating lock parts, when the cover 14 is open as shown in FIG. 3, and is then closed, the outwardly biased lock flap 20 will be first cammed inwardly by angular wall portions 32 of the lock lip, and the ledge 40 will engage over edge 30, providing a "snap-like" action when the carton is closed.

Referring to FIGS. 5 and 6, a lock flap 120 of a carton tray 112 has formed therein a cavity 136 including inwardly angled, semi-elliptical walls 138 terminating in an upper transverse lock-ledge 140 functioning in the same manner as correspondingly identified parts of FIGS. 1–4. Formed above the lock lip 130 is a slightly raised bulge or embossment 141 which can have adjacent the upper end thereof a textured, embossed or letter form indicia 143. The bulge 141 will be raised only

to the degree that it will still be disposed beneath the outer plane of the carton cover when the carton is closed. Additionally, as seen in FIG. 5, the forward wall **122** of the carton has a hole **128** formed above the inwardly angled lock lip **130** beneath which is an indented wall **132**. When the carton is closed from the position shown in FIG. 3, the lower edge **134** of the wall **132** will initially engage the embossment **141** and thus the lock flap **120** will be displaced inwardly a slightly greater distance than during the locking of the embodiment of FIGS. 1–4, for example.

When the carton is closed, see FIG. 5, the indicia dot **143** will be visible through the hole **128**, thus apprising a user how to operate the lock and unlock the carton, i.e., by depressing the lock flap **120** at the indicia dot **143**.

Considering FIG. 7, a slightly modified carton is indicated at **210** and includes a tray **212** and a cover **214** corresponding to those elements similarly identified in FIG. 1, for example. The cover **214** includes in the forward wall **222** a hole **228**, the lower margin of which being defined by a lock-lip **230** and an indented outwardly angled wall **232** extends toward the lower free edge **234** of the wall **222**. The included angle between the margin **230** and wall **232** is slightly less than 90°. Accordingly, an angled cover beak portion **233** is formed which can function with "over pass" closing of the cover to create a slightly tighter fitting lock than that of the embodiment disclosed in FIGS. 1–4, for example.

The lock flap **220** of this embodiment, includes the cavity **236** and transverse ledge **240** which forms with the indented wall **238** and an included angle substantially corresponding to the angle formed by lip **230** and wall **234** is formed on the forward wall of the cover of the carton. In all other respects, the embodiment of FIG. 7 functions in the same manner as the previously described embodiments.

Although the indentations, **38**, **138** and **238** are illustrated as originating at the hinge line of the lock flap, the indentation may be slightly shorter in length, and of a slightly lesser degree of depth and still afford the flush-type locking arrangement that is afforded by all of the embodiments disclosed and described.

It will be obvious to those skilled in the art that various changes may be made without departing from the scope of the invention and the invention is not to be considered limited to what is shown in the drawings and described in the specification.

What is claimed is:

1. In a molded carton, a bottom tray, hollow cover and lock flap, said cover and lock flap being hingedly connected to opposite side edges of said tray, said cover engaging the upper margin of said tray when the cover is closed, the lock flap being disposed adjacent the rear surface of the cover forward wall and normally biased toward that surface when the carton is closed; the improvement comprising lock means between said cover forward wall and said lock flap in which:

said lock flap includes at least one cavity comprising outer wall portions and an indented wall portion formed therebetween by an inner flap wall surface extending inwardly and upwardly above the flap hinge to an intermediate portion of said flap and terminating in an outwardly oriented transverse ledge the outer edge of which is generally in the plane of said outer wall portions,

said cover forward wall including a lock lip having an edge inwardly of an outer surface of said cover forward wall and having a hole above the edge of said lock lip whereby a portion of the lock flap is exposed when the carton is closed, the lock edge defining an edge of an inwardly disposed cover wall portion relating to the inner wall of the lock flap cavity and the edge of the lock lip engages the outwardly oriented transverse flap ledge when the carton is closed.

2. The structure as claimed in claim **1** in which a lock lip on the forward wall of the cover and the indented wall of the cavity extend angularly adjacent a lower edge portion of the forward wall of the cover and the lock flap, respectively.

3. The structure as claimed in claim **1** in which the transverse ledge and the wall therebeneath are disposed at an angle of substantially 90°.

4. The structure as claimed in claim **1** in which the transverse ledge and indented wall therebeneath form an included angle of less than 90°.

5. The structure as claimed in claim **1** in which said lock flap includes an indicia portion above said transverse ledge which is exposed through said hole when the carton is closed whereby a user is immediately apprised of the flap area to be pressed in order to operate the carton lock.

6. The structure as claimed in claim **1** in which said lock flap includes a bulge formed above said transverse ledge and which is exposed at said hole, the bulge being disposed below the surface of the cover forward wall when the carton is closed.

7. In an integral molded egg carton of the type having a cellular tray, an inverted dished cover hingedly connected to the rear side of said tray, a latching flap hingedly connected for partial rotation to the front side of said tray, wherein said latching flap is normally biased outwardly away of the space above said tray and is provided with a latching formation for cooperation with another latching formation on the front wall of said cover with said latching flap disposed adjacent the inside face of the cover front wall when said carton is closed, said carton being further characterized by:

the said flap having an outer wall surface on each side of an inner wall surface and a latching ledge connecting said inner wall surface with said outer wall surface at the upper periphery of said inner wall surface, said latching ledge bridging said inner wall surface at its topmost margin and connecting the outer wall surface on each side of said inner wall surface, said inner wall surface and the two sides of the outer wall surface and said bridging latching ledge forming a cavity,

the said cover front wall having an outer wall surface on each side of an inwardly disposed wall portion, an opening in said inwardly disposed wall portion having an exposed lower margin adapted to latchingly cooperate with the latching ledge on said flap, when said carton is closed with the flap disposed adjacent the inside face of said cover front wall, and the inner wall portion of said cover front wall disposed adjacent the inner wall surface of said flap and the bridging ledge of said flap visible through the opening in said cover front wall over the lower margin of said opening.

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DAVIS T. MOOREHEAD, Primary Examiner