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3,223,306

CARTON WITH DUAL LOCKING FLAPS

Filed April 20, 1964

2 Sheets-Sheet 1

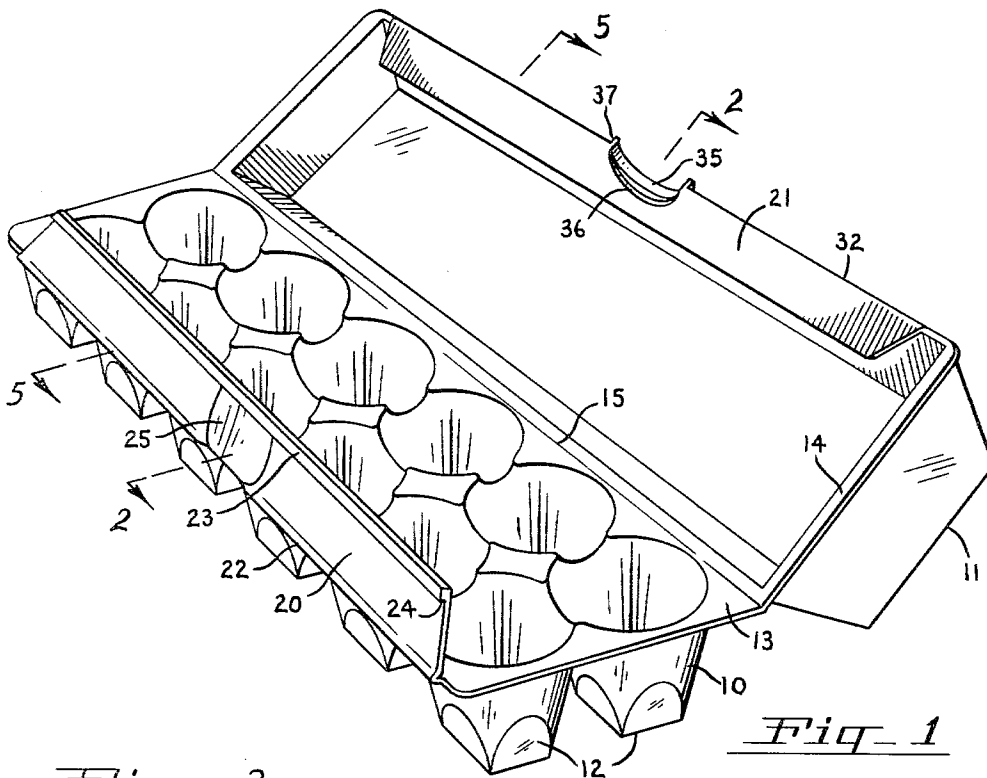


Fig. 1

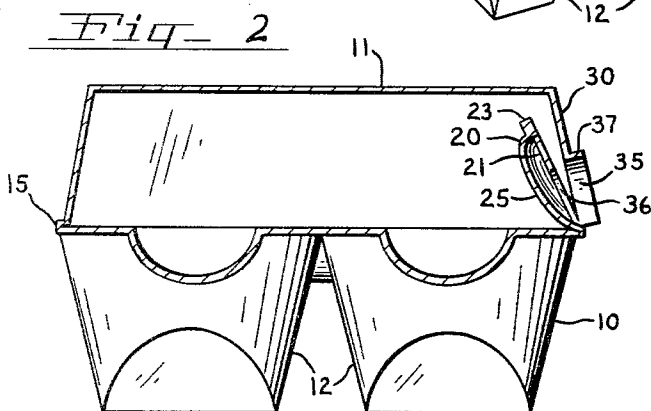


Fig 2

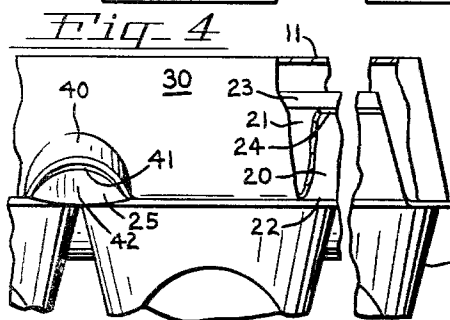
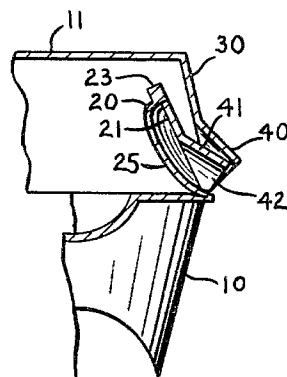
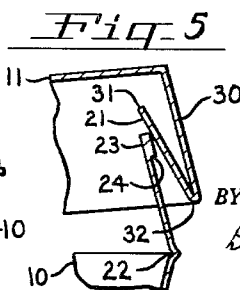
Fig 4

Fig. 5



Fig. 3

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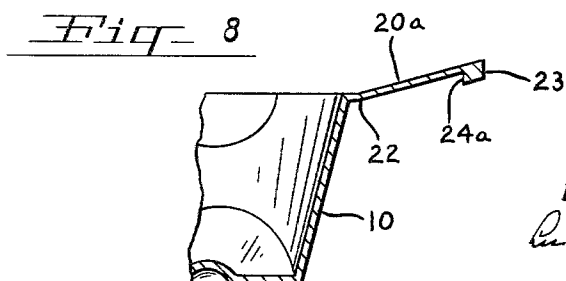
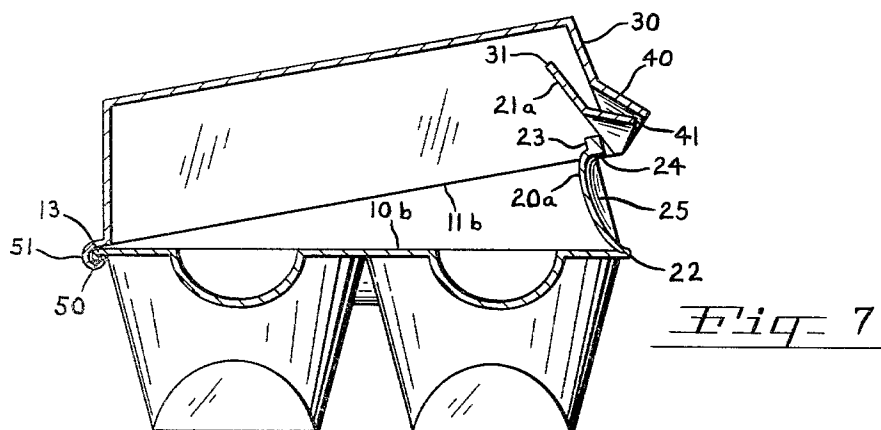
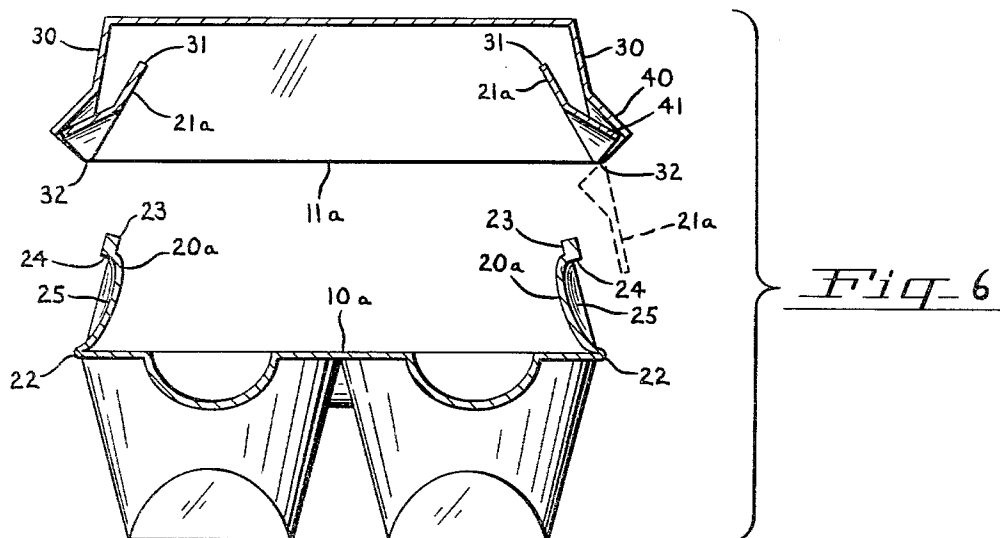
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2 Sheets-Sheet 2



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CARTON WITH DUAL LOCKING FLAPS

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3 Claims. (Cl. 229—2.5)

This invention relates to improved locking means for holding the cover of a carton closed.

Most prior locking means which can be conveniently molded from pulp are subject to the objection that they include openings and small catches which are easily torn or otherwise damaged in opening the carton the first time. Thus, in the case of egg cartons for example, the locking means are not thereafter effective to hold the carton securely closed so that the carton containing unused eggs can be kept in any other than a flat, horizontal position in the refrigerator. Another objection to most locking means is that they require openings or projections in the front face of the cover which eliminate valuable advertising space. It is highly desirable, especially in egg cartons, to have a flat front face on the cover substantially entirely available for printing.

Objects of the present invention are, therefore, to provide improved locking means for a pulp-type of egg carton and the like, to provide locking means which are not damaged in the first opening of the carton whereby the cover may be opened and securely re-locked repeatedly, to provide locking means which leave substantially the entire front face of the cover available for printing, to provide improved pressure release locking means for cartons for various purposes, to provide a novel dual flap-type of cover lock, to provide flat-type locking means which do not require substantially larger die area than is necessary for the carton and cover itself, and to provide new and improved locking means which can be operated by conventional widely used cover closing mechanisms.

In the present carton the improved locking means comprises a pair of interengageable locking flaps, one of which is molded integral with the bottom portion of the carton and the other of which is molded integral with the cover portion. These flaps are arranged to interengage automatically by merely closing the cover. Conventional holes and projections are eliminated, the locking parts involving one flap edge and a flanged catch on the other flap edge which interengage securely throughout a considerable length of contact. The flaps are readily disengaged by thumb pressure applied through an opening which is arranged so as not to appreciably limit the available printing area on the flat front face of the cover. These features are embodied in a molded pulp egg carton having a hinged cover and also in a carton having a detachable paperboard or plastic cover.

Still other objects and advantages will become apparent and the invention will be better understood from the following description of certain preferred embodiments of the invention illustrated in the accompanying drawings. Various changes may be made, however, in the details of construction and arrangement of parts and all such modifications within the scope of the appended claims are included in the invention.

In the drawing:

FIGURE 1 is a perspective view of a molded pulp egg carton embodying features of the invention with the cover in open position.

FIGURE 2 is a cross sectional view on the line 2—2 of FIGURE 1, between the egg pockets, with the cover closed;

FIGURE 3 is a fragmentary view similar to FIGURE 2, showing a modification;

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FIGURE 4 is a fragmentary front elevation view of the carton in FIGURE 3 with parts broken away;

FIGURE 5 is a fragmentary cross sectional view on the line 5—5 of FIGURE 1, showing the locking action which is common to both forms of carton;

FIGURE 6 is a cross sectional view similar to FIGURE 2, showing a modification having a cover removed from the bottom section;

FIGURE 7 is a similar cross sectional view showing a detachable cover with a hinge; and

FIGURE 8 is a fragmentary sectional view similar to FIGURE 5, relating to the modifications shown in FIGURES 6 and 7.

Two forms of molded pulp egg carton are shown in FIGURES 1 to 5 having essentially the same bottom section 10 and cover section 11. The bottom section 10 is provided with egg pockets 12 and a horizontal rim flange 13 extending around the four sides of the section, at least in the spaces between the outer margins of the pockets. Cover section 11 has a similar horizontal rim flange 14 extending along its ends and hinge side. This arrangement allows the bottom and cover sections to be molded integrally in fully opened position with the two rim flanges 13 and 14 disposed in a common horizontal plane. Thus, the two flanges are joined by a fold line 15 which serves as a hinge for the cover. This is a well-known conventional form of construction which is well adapted for machine molding from pulp.

The novel locking parts on the present carton comprise a flap 20 molded integrally with the upper front edge of the bottom section 10 and a flap 21 molded integrally with the lower front edge of cover section 11. Flap 20 is connected with the front side of rim flange 13 by a fold line which forms a hinge 22. The outer or free edge of flap 20 is thickened to form a catch 23 having a substantial catch surface 24 disposed perpendicular to the plane of the flap. This flap may extend substantially the length of the carton and at its center is formed with a hollow or groove 25 between two adjacent pockets 12 to accommodate the thumb for purpose of release. The width of flap 20 is somewhat less than the height of front face or wall 30 of the cover.

Rim flange 14 does not extend along the front edge of the cover whereby flap 21 is molded as a continuation of front wall 30 as best shown in FIGURE 5. The flap has a sharp cornered straight line free edge 31 which is perpendicular to the plane of the flap. The other edge of flap 21 is a fold line which forms a hinge 32 between the flap and front wall 30.

The two flaps 20 and 21 may be molded in flat position extending outwardly in the common plane of rim flanges 13 and 14, if desired. However, in order to reduce the die area, it is also possible to mold the flaps in upstanding position almost perpendicular to the common plane of rim flanges 13 and 14. In either position of molding it will be apparent that when flap 21 is folded inside the cover preparatory to closing the cover, it will tend to spring back to the left in FIGURE 5 causing it to bear against the upper edge of flap 20 when the latter is deflected inside the cover. At the same time, flap 20 tends to swing outward against flap 21. Then, as the cover is closed, the square upper edge 31 of flap 21 will snap under the catch formation 23 of flap 20 with edge surface 31 abutting the catch surface 24 and holding the cover securely closed. The width of flap 21 is such that when the cover is pressed closed, the edge 31 will snap under catch 23 in this manner.

If flap 20 is molded in outstanding position in the plane of rim flange 13, the springiness of the pulp material in its hinge 22 will cause the flap to be biased outward or to the right in FIGURE 5 to insure sliding con-

tact against the flap 21 when the cover is closed. If flap 20 is molded in upstanding position, it will still have some tendency to spring outward because it must be bent inward to some extent to pass inside the cover. In any event, there is no difficulty in maintaining engagement between the two flaps when the cover is being closed because the presence of eggs within the flap 20 will also tend to urge this flap outward. After the cover is closed the same spring action in hinges 22 and 32 continues to hold the flaps in interlocked engagement and whatever spring action there may be in hinge 15 merely adds to the security of the catch.

In order to open the carton it is only necessary to slide the thumb upward along groove 25 between the two flaps. This automatically depresses flap 20 as far as it will go against the eggs while the thickness of the thumb simultaneously separates the two flaps, causing flap 21 to swing forward toward the inside of front wall 30. Complete separation of the flaps along their entire length is facilitated by pressing the whole cover section 11 firmly against bottom section while the thumb is being inserted. This is not an extra manipulation as it is only normal to grip the carton in this manner with one hand while the thumb or finger of the other hand is inserted to spread the flaps apart. If the ends of the flaps do not readily disengage from each other, the inserted finger may be moved along the flaps to force them apart. The front edge of the cover will yield outwardly sufficiently to permit this manipulation.

In order to facilitate insertion of the thumb in this manner, front wall 30 in FIGURES 1 and 2 is provided with a semi-circular opening 35 and the flap 21 is provided with a registering semi-circular opening 36. It will be apparent that the insertion of a finger through the openings 35 and 36 in FIGURE 2 and upward along the groove 25 will immediately wedge or pry the flaps apart from each other. In order to strengthen the front wall 30 around the edge of the opening 35 and prevent tearing this opening, an outstanding reinforcing flange 37 is provided.

The only difference in FIGURE 3 involves the provision of an eyelid formation 40 in the front wall 30 instead of opening 35 and the provision of an eyelid formation 41 in flap 21 instead of opening 36. These eyelids project forward at an angle to provide an opening 42 for insertion of a thumb or finger. A thumb or finger projected upwardly through the opening 42 and along the surface of groove 25 will pry the flaps apart and unlock the cover the same as described above. It will be remembered that the groove 25 is located between the eggs whereby there is space for such a groove even with large eggs in the carton.

It is evident in FIGURES 1 and 4 that neither the opening 35 nor eyelid 40 remove a substantial area of the flat front wall 30 from availability for printing. This is attractive to the egg producer because a flat surface is desirable for printing and the surface 30 of each carton is prominently visible when the cartons are stacked. Cartons having conventional lugs and openings in the area of front wall 30 can be printed only on the top of the cover where the printing may not be observed when the cartons are stacked.

Although a two by six pocket arrangement is illustrated, the invention may also be applied to a three by four, or other arrangement, or to a carton for other purposes with or without pockets.

In FIGURE 6 the bottom section 10a may be molded of any suitable material with or without pockets for the articles to be contained in the carton. Integral hinged flaps 20a are provided on two opposite sides of the bottom sections similar to the single flap 20 in FIGURE 1. These flaps are preferably molded in outstanding position as shown in FIGURE 8 and when the cover is to be applied, they are raised up and pressed inwardly as shown in FIGURE 6. The resilience of the material causes the flaps to spring outward toward their molded position

whereby they must be held in the FIGURE 6 position while the cover is being applied.

Similarly, the cover 11a has flaps 21a on two of its opposite sides similar to the single flap 21 in FIGURE 3. The flaps 21a are preferably molded in line with the front and back faces 30 so as to project downward as indicated by broken lines in the case of the flap on the right side of the cover in FIGURE 6. Then, when the cover is to be applied to the bottom section, the flaps 21a are bent inwardly and upwardly as shown in solid lines whereby each pair of flaps 20a and 21a will interengage and lock as shown in FIGURE 3. This locking engagement is maintained by the tendency of the flaps 20a to spring outward and the tendency of flaps 21a to spring inward. This spring action holds them together as in FIGURE 3. The cover 11a is preferably made of paperboard or plastic. A transparent plastic may be employed in order to make the contents of the carton visible without opening the carton.

The carton in FIGURE 6 may be opened from either side as described in connection with FIGURE 3. It is not necessary to disengage both pairs of flaps by inserting the fingers between the flaps on opposite sides of the carton but the cover may be unlocked in this manner if desired. Ordinarily, it is more convenient to insert a thumb or finger under the eyelid 41 on one side of the carton and upwardly along the groove 25 to disengage only one of the pairs of locking flaps. Then the side of the cover which has been released may be raised and caused to hinge about the hinge line 22 on the opposite side of the carton. During this movement the cover may be moved laterally away from the disengaged side of the bottom section and this will unlock the other pair of flaps making the cover removable from the bottom section.

FIGURE 7 shows a modification with a different form of detachable hinge connection between the cover 11b and bottom section 10b. This hinge comprises a downturned flange 50 on the projecting rim portion 13 on the rear side of the carton and a rolled lip 51 on the back edge of the cover section. These two parts hook together in closing the carton and are held in interengagement as long as the cover is locked by flaps 20a and 21a. When these locking flaps are disengaged as above described, the cover may be lifted and the rolled lip 51 disengaged from flange 50 if desired.

In FIGURE 7 the bottom section 10b may be molded of any suitable material with or without pockets and the cover section 11b may be molded of paperboard or plastic. The rolled hinge lip 51 may be formed to its curled shape after molding.

FIGURE 8 shows a catch having an abutment surface 24a at a raked angle for greater retention of the upper edge 31 of the companion flap in locking. This modification may be employed in any of the cartons, if desired.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. A molded pulp egg carton comprising a bottom section having egg pockets to receive the lower portions of eggs, an upstanding locking flap hinged to the upper edge of one side of said bottom section, said flap being molded with a thickened upper edge having a downwardly facing shoulder surface forming a catch abutment extending along the outer side of said upper edge, a cover having sufficient depth to receive the upper portions of eggs in said pockets, a locking flap hinged to the lower edge of said one side of said cover and adapted to be folded back in upstanding position within the cover for engagement of its upper edge under said catch abutment when the cover is closed on the bottom section, said lower edge of the cover seating on said upper edge of the bottom section when the cover is closed whereby the hinge lines of the two flaps are adjacent to each other and the flaps extend parallel to each other in face to face relation, said last flap and cover having registering openings ad-

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jacent the hinge of the last flap to admit an operator's finger between the flaps for disengaging the flaps from each other to unlock the cover, said first flap having a recess behind said registering openings to guide the operator's finger upwardly between said flaps, and means for securing the opposite side of the cover to the opposite side of the bottom section.

2. A carton as defined in claim 1, said securing means on said opposite side comprising a hinge.

3. A carton as defined in claim 1, said securing means on said opposite side comprising flaps on said bottom section and cover the same as on said one side whereby the cover is removable.

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