

Aug. 27, 1968

G. A. SNOW ET AL

3,398,875

EGG CARTONS

Filed Dec. 30, 1966

3 Sheets-Sheet 1

Fig. 1.

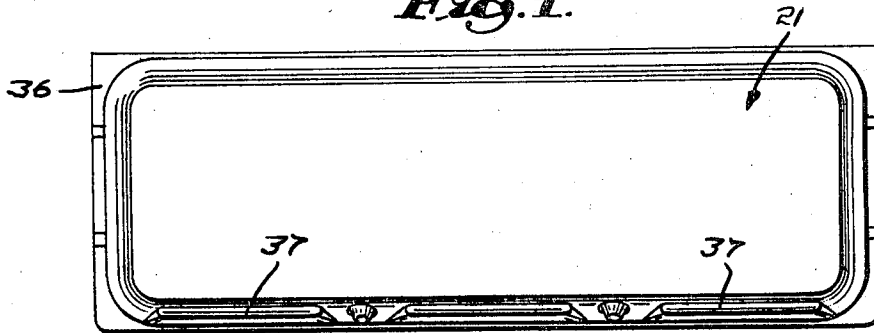


Fig. 2.

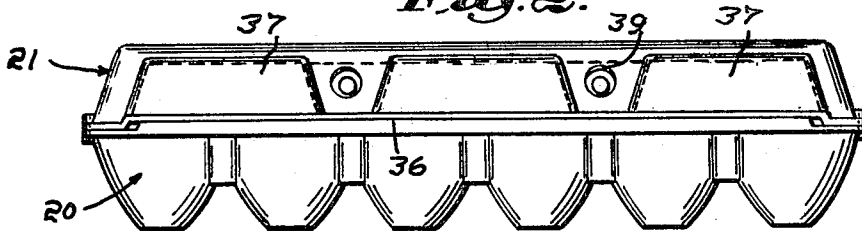


Fig. 3.

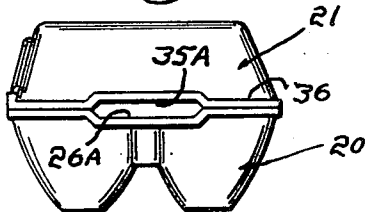


Fig. 10.

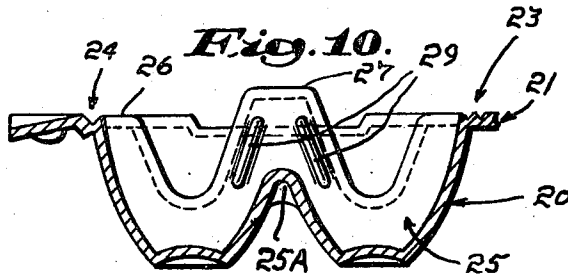


Fig. 11.

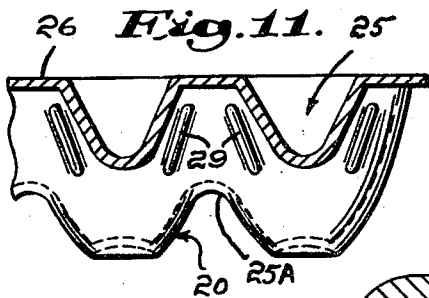


Fig. 12.

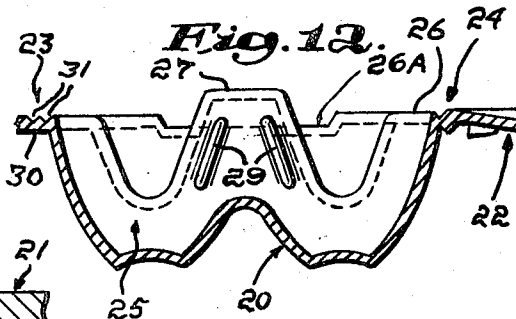


Fig. 13.

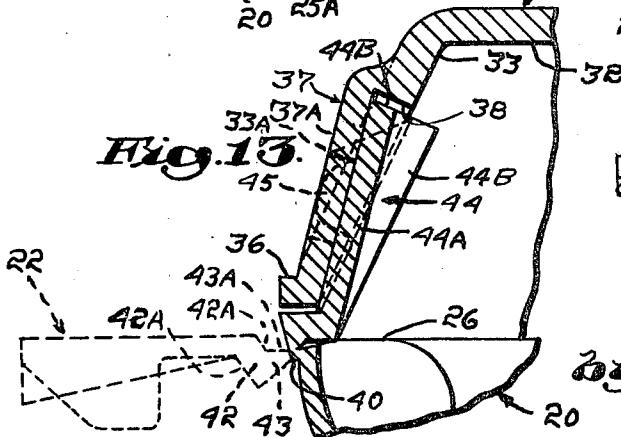
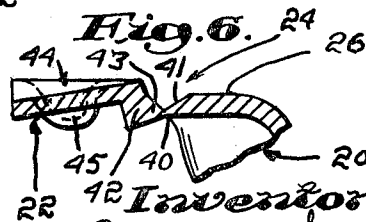


Fig. 6.



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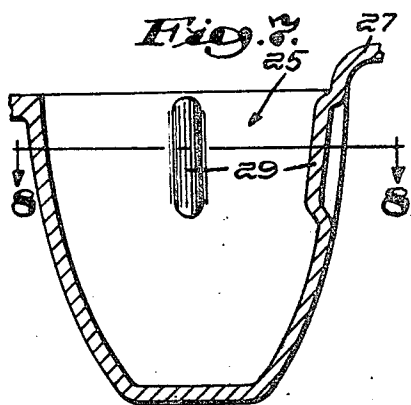
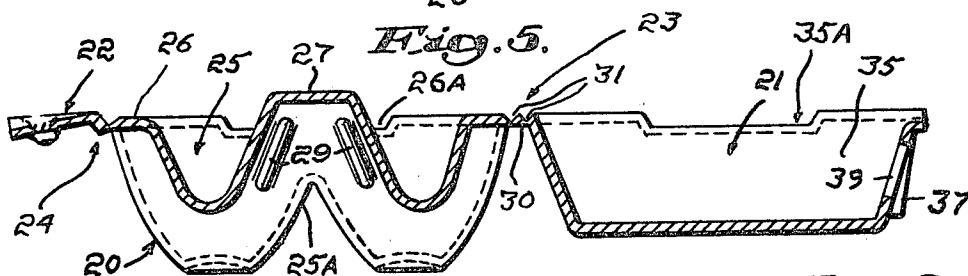
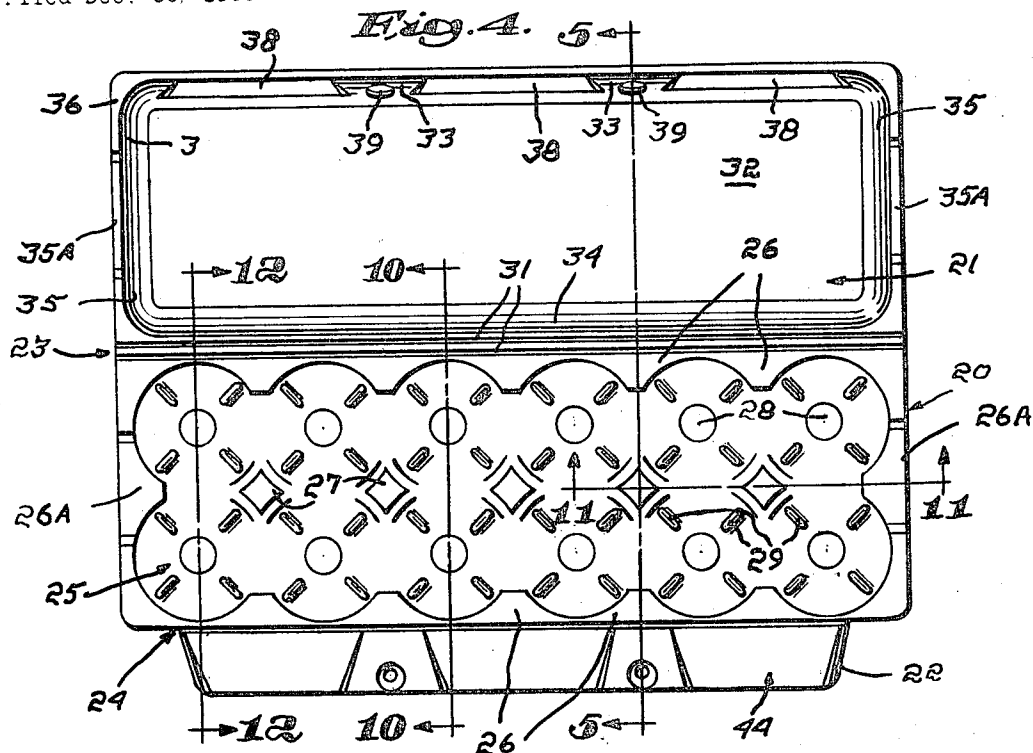
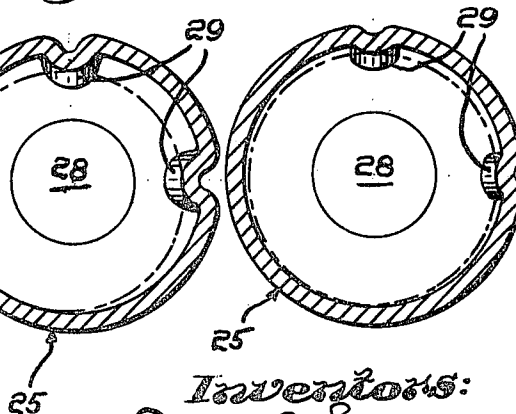


Fig. 8.

Fig. 9.



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Fig. 14.

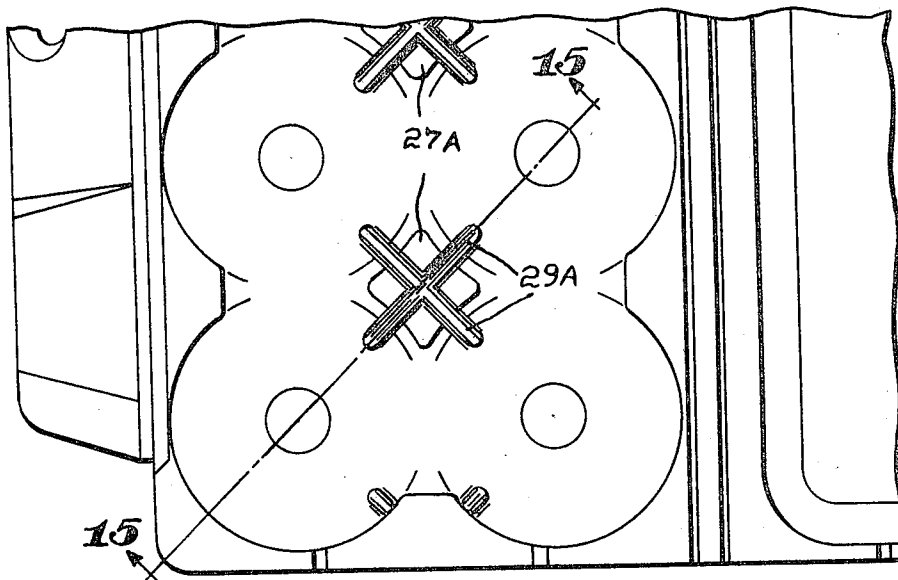


Fig. 15.

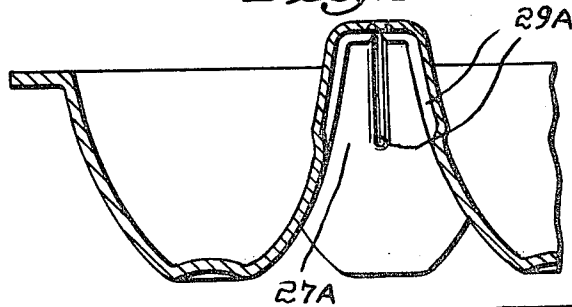
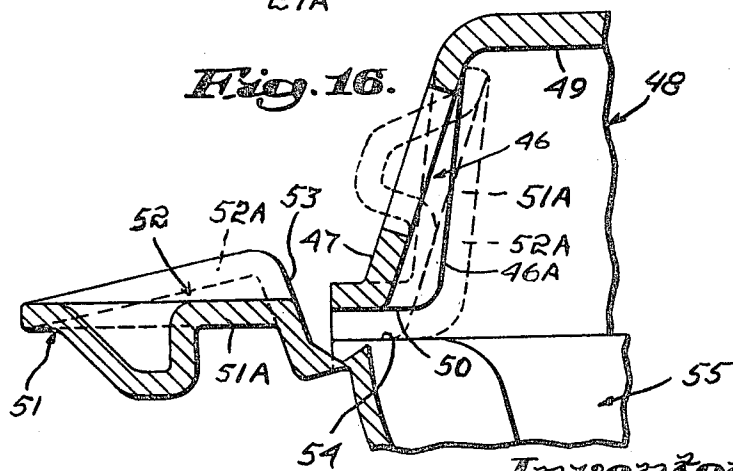


Fig. 16.



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EGG CARTONS

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10 Claims. (Cl. 229—2.5)

ABSTRACT OF THE DISCLOSURE

Egg cartons having a cover hinged to the rear edge of a carton bottom and a locking flap hinged to the front edge thereof, the locking flap having a projection which extends through a hole in the front wall of the cover when the flap is positioned to underlie the front wall of the cover when the cover is closed, the flap and cover front wall having vertical channels establishing inner and outer wall portions, one set of wall portions being more nearly vertical than the other set of wall portions, together with a special flap hinge and with a cover front wall having seats internally of the cover front wall engageable by the upper edges of the flap.

The present invention relates to molded containers for articles needing protection of which eggs are but one example and the invention is herein discussed primarily with reference to egg carton embodiments. Cartons for such uses have a bottom formed with egg-receiving pockets, a cover integral with and hingedly connected to its rear edge, and a locking flap integral with and hingedly connected to the front edge of the bottom to fold upwardly and inwardly into an operative position in which it underlies the front wall of the cover when it is closed, the front wall of the cover and the flap including complementary interlocking portions that then become interengaged.

Other special-purpose containers have bottoms formed with article-receiving compartments and covers hingedly connected thereto. When these were formed of material that would otherwise be too flexible, the bottoms and covers have been reinforced by stiffening channels. The covers, when such containers were closed, were supported by the upper edges of the bottom and their edges were also seated on shoulders formed marginally thereof. Releasable means were commonly provided to lock the covers to the front wall of their container bottoms.

Egg cartons are made to nest and have their bottoms and tops of approximately the same depth. When molded from pulp or a plastic of about the same stiffness as pulp, no satisfactory connection directly between the carton bottoms and the covers is practicable. For that reason, locking flaps are used and considerable effort has been directed to the prevention of their becoming disengaged from the covers incidental to the handling and transportation of the cartons. Such locking flaps have also been used to brace the covers adjacent their junction with their front walls in the manner of such other special-purpose containers.

The present invention is concerned with the relationship of the locking flaps to the covers and particularly to the front walls thereof and also both to their connection with and their support by the carton bottoms.

In accordance with the invention, a carton has its locking flap and the front wall of its cover formed with vertically disposed reinforcements in the form of mating channels providing the inner and outer wall portions are so inclined relatively to each other that one set of wall portions is outwardly and downwardly inclined and the

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other set is more nearly vertical. Adjacent its front edge, the carton bottom includes shelf structure on which a marginal portion of the flap rests with the channel portions that are the more nearly vertical with respect thereto increasing the effectiveness of the reinforcements.

A preferred construction of the invention is to have the reinforcing channels of the front cover wall terminate substantially below its junction with the flat portion of the cover and to so dimension the locking flap that portions of it are engageable by the shoulders established on the interior surface of the front wall of the cover when the cover is closed. A particular objective of the invention is to have such flap portions and the seats with which they are engageable so inclined that downward pressure on the carton cover forces the locking flap and the front cover wall into such mutual contact that ensures that the means interlocking them do not become accidentally released.

Another preferred feature of an egg carton in accordance with the invention is the construction of the hinge integrally joining the locking flap to the carton bottom. In accordance with this feature, the flap has a shoulder provided with a tapering web connecting it with the front portion of the bottom at or adjacent its upper edge and defining the hinge line between it and the locking flap. The flap shoulder and the web include planar, angularly disposed surfaces. The front edge of the carton bottom has shelf structure and an outwardly and downwardly inclined marginal portion against which said planar flap portions seat when the locking flap is operatively disposed.

As problems exist in packing eggs above a predetermined size in any such carton, another objective of the invention is to provide egg-receiving pockets that are self-adjusting to a relatively wide, egg size range. In accordance with the invention, this objective is attained by providing each pocket with a channel that presents an internal, vertical rib within that pocket to be engaged by the egg that is seated therein. The ribs, and there are desirably two for each pocket, are preferably located where the pocket walls are so spaced from each other that the channels may flatten to expand a pocket without affecting any other pocket.

In the accompanying drawings, there are shown illustrative embodiments of the invention from which these and other of its objectives, novel features, and advantages will be readily apparent.

In the drawings:

FIGURE 1 is a top elevation of an egg carton in accordance with the invention,

FIGURE 2 is a front view thereof,

FIGURE 3 is an end view of the carton,

FIGURE 4 is a top elevation of the carton, the carton being shown as opened,

FIGURE 5 is a section taken approximately along the indicated lines 5—5 of FIGURE 4,

FIGURE 6 is a fragmentary section transversely of the hinge connection between the locking flap and the bottom of the carton,

FIGURE 7 is a vertical section, on an increased scale, through an egg-receiving pocket,

FIGURE 8 is a section taken approximately along the indicated lines 8—8 of FIGURE 7,

FIGURE 9 is a view similar to FIGURE 8 illustrating the expansion of the pocket by an egg,

FIGURES 10, 11, and 12 are sections taken, respectively, substantially along the indicated lines 10—10, 11—11, and 12—12 of FIGURE 4,

FIGURE 13 is a fragmentary, vertical section through the locking flap and the front wall of the cover of a closed carton,

FIGURE 14 is a fragmentary view of an open carton

in accordance with another embodiment of the invention, FIGURE 15 is a section, on an increased scale, taken approximately along the indicated line 15—15 of FIGURE 14, and

FIGURE 16 is a view similar to FIGURE 13 but illustrating yet another embodiment of the invention.

The egg carton illustrated by the drawings comprises an egg-receiving and supporting bottom, a cover, and a locking flap, generally indicated at 20, 21, and 22, respectively. The cover 21 and the flap 22 are integrally joined to the back and front, respectively, of the carton bottom 20 by hinges generally indicated at 23 and 24, respectively.

The carton bottom 20 has a plurality of pockets generally indicated at 25, shown as arranged in two parallel rows of six pockets each. The outer portions of the walls of the pockets 25 are interconnected by outwardly extending webs or shelves 26, which establish the plane of the upper surface of the bottom 20 except centrally of its ends where the shelves are depressed as at 26A. Hollow posts 27, projecting above that plane, are so spaced between the two rows that each is common to and forms part of the wall of four pockets 25. Those parts 25A of the pocket walls between the posts 27 and between a post 27 and a shelf 26 or 26A terminate below the plane of the shelves 26. The wall structure 25A is common to two pockets 25 and is in the form of an inverted V. Elsewhere, the walls of adjacent pockets 25 are spaced apart.

Each pocket 25 is to support the lower portion of an egg and is generally egg-shaped but has a convex bottom 28. In order that the pockets 25 may serve to hold and support any egg whose dimensions are within an acceptably wide range, each pocket 25 is provided with a pair of inwardly disposed, vertical ribs 29, each shown as extending part way up each post 27 and, accordingly, spaced about 90° apart. In the case of the pockets 25 at the end of the carton tray 20, a rib 29 of each extends part way up its wall structure in the zone where the corresponding wall structure of two end pockets merge and form a shelf 26A. The ribs 29 are channels of U-shaped cross section with the channels of each row of pockets opening towards the other row. The ribs 29 present downwardly and inwardly inclined straight edges which are shown as terminating substantially above the bottom of each pocket to be engaged by an egg placed therein. While these ribs enable eggs within a substantial "undersize" range to be securely supported, the pocket wall thickness and the nature of the material from which the cartons are molded are such that the ribs 29 yield to effect the enlargement of any pocket that receives an egg whose pocket-entering portion is within a substantial "oversize" range.

A web 30 joins the cover 21 to the rear upper edge of the carton bottom 20, and has a pair of parallel V-shaped cuts 31 which establish the hinge 23. The cover 21 has a flat-surfaced top 32 and integral, outwardly and downwardly sloping front, rear, and end walls 33, 34, and 35, respectively, of a height such that when the cover 21 is in its carton-closing position, there is space for the upper portions of eggs seated in the pockets 25. The cover 21 has a marginal flange 36 and the end walls 35 are recessed as at 35A in a manner such that, when the cover 21 is closed against the bottom 20, the recesses 26A and 35A define slots ensuring ventilation from end-to-end of the carton.

The front wall 33 has a series of vertically disposed, generally indicated channels 37 which serve to stiffen it. In the embodiment of the invention illustrated by the drawings, there are three such channels and these are shown as of substantial width with upwardly and inwardly tapering ends and as tapering upwardly and outwardly from the flange 36 away from the wall 33 and as terminating a substantial distance below the junction of the wall 33 and the top 32 of the cover 21 thus to provide

transversely aligned, internal shoulders or seats 38. In practice, the seats 38 are inwardly and downwardly inclined. Between each two channels 37 there is a locking aperture 39, the apertures being shown as circular. The channels 37 thus provide wall portions 37A that are more nearly vertical than the portions of the wall 33 between them, see FIGURE 13.

The shelves 26 along the front upper edge of the carton bottom 20 include a straight edged narrow outwardly projecting shoulder 40 having its front or outer edge presenting an outwardly and downwardly inclined margin 41, the angle of the margin 41 to the vertical being shown as in the neighborhood of 58°.

The locking flap 22 includes a shoulder 42 extending along its inner edge with the shoulder 42 having a web 43 integrally connected to the shoulder 40 and tapering to define the fold line of the hinge 24. The surfaces 42A and 43A are planar and disposed angularly relative to each other, the angle between them being approximately that defined by the margin 41 and the structure 26. The surface 43A is of approximately the same width as the margin 41 so that when the locking flap 22 is swung upwardly and inwardly into its operative position prior to the closing of the cover 21, the surfaces 43A and 42A engage and are supported, respectively, by the margin 41 and proximate portions of the shelves 26 at the front upper edge of the carton bottom 21. The surface 42B is parallel to the surface 42A and when the locking flap 22 is seated on the outer edge of the carton bottom 20, the surface 42B is parallel to and underlies the front wall 33 of the cover 21 and is engageable thereby when the cover 22 is positioned to close the carton.

The locking flap 22 includes vertically disposed reinforcing channels 44 of the same shape as the channels 37 of the cover front wall 32 and are shown as dimensioned to fit therein. The channels 44 taper downwardly and inwardly from the free end of the locking flap 22 and terminate adjacent the shoulder surface 42B thus to provide outer portions 44A, see FIGURE 13, that are more nearly vertical than the intermediate portions of the flap 22. The upper extremities 44B are engageable with the seats 38 and are so inclined that they interlock and, on downward pressure on the cover 21, the locking flap 22 and the front wall 33 are urged into tight mutually reinforcing relationship with the load favorably distributed relative to the vertical.

The locking flap 22 has locking projections 45, one for each aperture 39 of the cover front wall 33 and extending outwardly therethrough when the cover 22 is in its closed position to hold it against accidental release. The projections 45 do not protrude beyond the plane of the surfaces 37A of the reinforcements 37 which are preferably closely spaced to minimize the chances of the projection being accidentally released from the holes 39. Each locking projection 45, at its base and at its outer end is circular but its upper portion tapers downwardly and outwardly from the upper edge of the flap 22 while its lower portion projects outwardly at right angles to the flap portions 22A.

The embodiment of the invention shown in FIGURES 14 and 15 illustrates the reinforcement of the posts 27A by continuing the channels that establish the ribs 29A in the egg-receiving pockets upwardly along each post 27A and across the top thereof, each reinforcing rib 29A being common to diagonally spaced pockets.

In the embodiment of the invention illustrated by FIGURE 16, a different arrangement of the vertical and tapering channels providing reinforcements of the locking flap and of the front wall of the carton cover is shown.

In the egg carton shown in FIGURE 16, the channels 46 of the outwardly and downwardly inclined front wall 47 of the cover 48 are desirably narrow and project inwardly of and at an angle relative thereto to provide wall portions 46A that are approximately at right angles rela-

tive to the plane of the flat top wall 49 of the cover 48 and provide closed bearing ends 50.

The locking flap 51, while it may otherwise be similar to the locking flap 23, has its vertical, inwardly disposed channels by which it is reinforced, generally indicated at 52 and these are upwardly and inwardly tapered to have mating engagement with the channels 46 of the cover 48 and to provide approximately vertical inner wall portions 52A relative to which the remainder of the flap is outwardly and downwardly inclined when the flap 51 is operatively positioned with its seat 53 resting on the shelf structure 54 of the carton bottom 55 and engageable by the bearing ends 50 when the cover 48 is closed. The flap 51 is shown as having its free edge terminating well below the flat cover wall 49. The flap 52 has locking projections 56 disposed to enter aperture 57 in the front cover wall 47.

Egg cartons in accordance with the invention are well adapted to meet requirements since, once filled and closed, they resist accidental opening during handling and transit.

We claim:

1. A molded carton of the type comprising a bottom including front, rear and side walls and a plurality of article-receiving pockets, a cover including a flat top and depending front, side, and rear walls with at least the front cover wall being outwardly inclined, the rear cover and base walls being integrally and hingedly interconnected, and a locking flap integrally and hingedly connected to the front wall of said base to swing into and out of an upwardly disposed, inwardly inclined operative position in which it is in mutual contact with the rear face of the front cover wall when the cover is in its carton-closing position, said carton being characterized by the bottom including shelf structure extending along the front upper edge of the bottom, the flap including a portion resting on said shelf structure in the operative flap position, the flap and the front cover wall including vertically disposed channels, the channels of the front cover wall commencing adjacent its bottom edge and the channels of the flap commencing adjacent said flap portion, the channels establishing inner and outer sets of wall portions for both said cover front wall and said flap, the wall portions of said inner and outer sets being inclined relative to each other with the wall portion of one set being more nearly vertical than the other, means to lock at least one wall portion of the flap to the corresponding wall portion of the cover front wall, said means comprising a projection on the portion of the flap to be locked and the portion of the cover front wall to be locked having a hole through which the projection extends when the cover is closed with the flap in its operative position, at least some of the flap wall portions of both sets bracing said cover and resisting inward movement of the flap when the cover is in support of a load.

2. The molded carton of claim 1 in which the channels of the front cover wall terminate below the top of the cover to provide a series of longitudinally extending seats and the flap is dimensioned so that upper edges of its outer wall portions are engageable with the seats when the carton is closed.

3. The molded carton of claim 2 in which the seats and seat-engaging upper edges are inclined inwardly and downwardly whereby downward pressure on the cover when the carton is closed urges the locking flap and front cover wall together.

4. The molded carton of claim 1 in which the outer wall portions of the front wall of the cover and of the locking flap are the more nearly vertical wall portions, the channels of the front wall of the cover terminate below the junction of the front wall of the cover and the top thereof to provide internal longitudinally extending seats, and the upper edges of the outer wall portions of the locking flap are engageable with the seats when the carton is closed.

5. The molded carton of claim 1 in which the inner wall portions of the front wall of the cover and of the locking flap are the more nearly vertical wall portions and, the lower ends of the channels of the flap define seats engageable by the lower ends of the channels of the front wall of the cover.

6. The molded carton of claim 1 in which the aperture is circular and the projection is circular at its extremities and includes outwardly and downwardly tapering upper portions and a lower portion that is straight.

7. A molded carton of the type comprising a bottom including front, rear and side walls and a plurality of article-receiving pockets, a cover including a flat top and depending front, side, and rear walls with at least the front cover wall being outwardly inclined, the rear cover and base walls being integrally and hingedly interconnected, and a locking flap integrally and hingedly connected to the front wall of said base to swing into and out of an upwardly disposed, inwardly inclined operative position in which it is in mutual contact with the rear face of the front cover wall when the cover is in its carton-closing position, said carton being characterized by said bottom including a horizontal shelf structure and an outwardly and downwardly inclined margin along its front edge and said locking flap including a shoulder and a tapering web integrally connecting said shoulder and the front portion of said bottom and defining with said front portion a fold line enabling said flap to be swung into and out of said upwardly disposed operative position, said flap shoulder and said web including planar portions then engaging, respectively, said inclined margin and shelf, and the opposite face of said flap shoulder being parallel to said shoulder and then being engageable by the bottom edge of said front cover wall.

8. The molded carton of claim 1 in which the wall portions of the flap and cover front wall to be interlocked are inner wall portions.

9. The molded carton of claim 1 in which the wall portions of the flap and cover front wall to be interlocked are outer wall portions.

10. The molded carton of claim 1 in which the channels of the front cover wall terminate short of the junction of the front cover wall with the cover top wall and the locking aperture of the front cover wall is in an inner wall portion and is located below the upper ends of the channels.

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65 DAVID M. BOCKENEK, *Primary Examiner*.