July 15, 1958 R. F. REIFERS 2,843,304

MOLDED PULP CARTON LOCK

Filed Nov. 20, 1952

Fig. 1

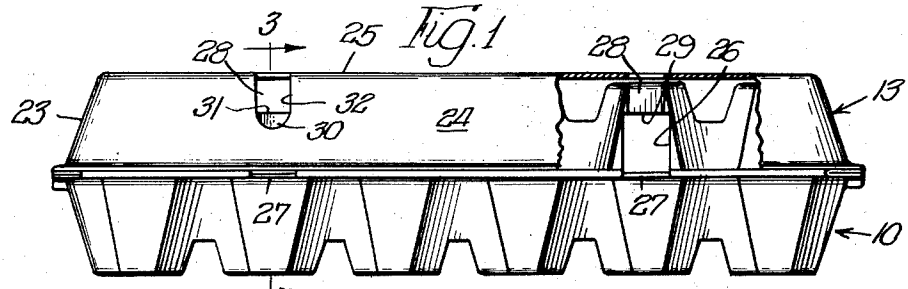



Fig. 2

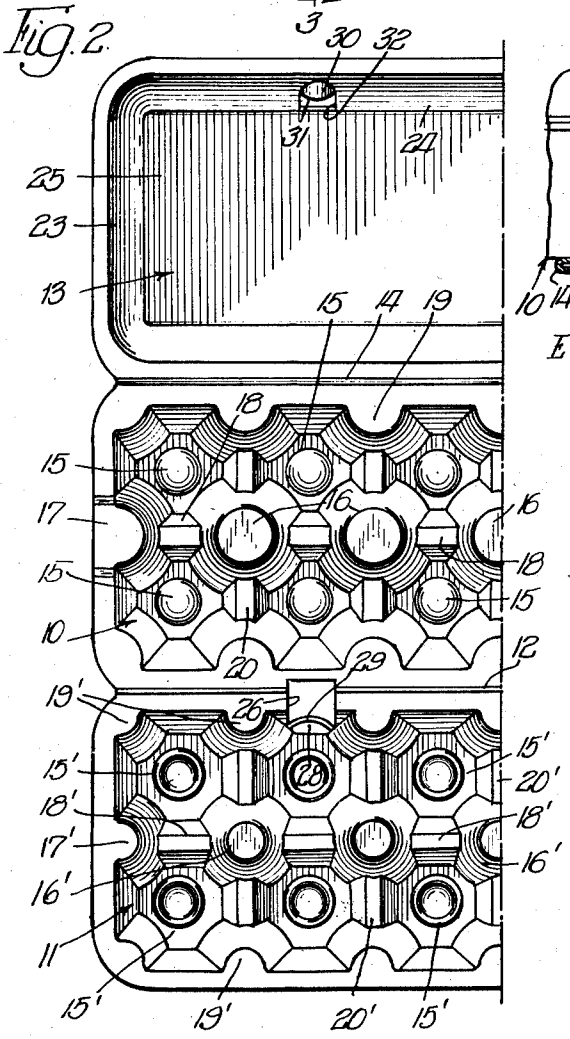
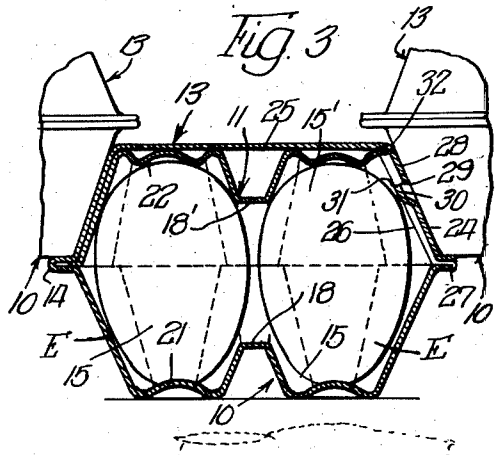



Fig. 3



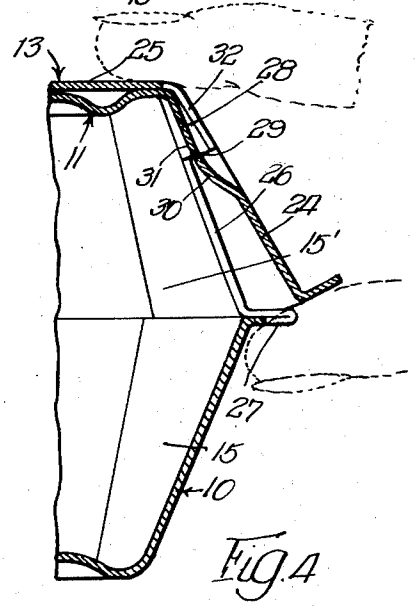




Fig. 4

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# MOLDED PULP CARTON LOCK

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5 Claims. (Cl. 229—29)

The present invention relates to improvements in a simple and inexpensive molded paper pulp egg carton and, more particularly, to improved provisions for engaging and locking the several hinged egg encasing sections of such a carton in closed condition.

It is a general object of the invention to provide improved locking means for a multiple section molded carton, preferably composed of a cellular bottom section, a cellular inner cover section and a non-cellular, tray-like outer cover section, wherein the inner cover section carries one or more locking apertures and associated molded locking lips, and the outer cover section carries an equal number of molded latching and locking lugs which are engageable in said apertures and coact with said locking lips to produce a novel and improved snap-locked relationship of the two sections.

More particularly, it is an object of the invention to provide a carton snap lock arrangement in which the locking member on an outer cover member is, in locked condition of the carton, disposed flush with the outer surface of that member, hence permits flush stacking engagement of corresponding such surfaces of a number of cartons, yet in which the locking member referred to is readily and quickly unlatched in uncovering the contents of the carton.

Still more specifically, it is an object of the invention to provide a three section molded paper pulp carton wherein a wall of a tray-shaped cover is molded to provide an internally projecting locking lug and wherein an adjacent cell surface of an inner cellular cover member is also molded to provide a locking lip with which the lug has snap engagement, the inherent rigid, well braced nature of the cellular member affording an anchor of suitable stability to permit effective snap engagement of its lip by the locking lug, and the comparative flexibility of the wall of the non-cellular outer cover member affording desired yieldability in releasing the parts from snap-locked relation.

Yet another object is to provide a three section molded carton of the sort described in the preceding paragraph, featuring inner and outer cover members integrally hinged to opposite margins of a cellular bottom section, in which the snap-lug bearing wall of the outer section is on its unhinged side and the hinge of the outer section to the bottom section binds upon the latter, thus to produce a torque action at the last named hinge which augments the positiveness of engagement of the locking lug and lip by spring urging the same toward one another.

A still further object is to provide a three section molded pulp carton having features as described above, in which a very large portion of the surface of an outer cover, including a wall in which locking lugs are formed as mentioned, is exposed and is flat to receive printed matter or ornamentation.

The foregoing statements are indicative in a general way of the nature of the invention. Other and more specific objects will be apparent to those skilled in the art upon a full understanding of the construction and operation of the improvements.



A single embodiment of the invention is presented herein for purpose of illustration. It will be appreciated that the invention may be incorporated in other modified forms coming equally within the scope of the appended claims.

In the drawings:

Fig. 1 is a view in front elevation, partially broken away, illustrating the improved carton and locking provisions holding the same in a closed condition;

Fig. 2 is a top plan view of the carton in the open, generally coplanar relation of its component sections in which it is discharged from the conventional molding and drying equipment;

Fig. 3 is a somewhat enlarged view of the closed carton in transverse vertical section along a line generally corresponding to lines 3—3 of Fig. 1, also illustrating the staggered stacking of a number of the cartons which is made practical by the improved locking provisions; and

Fig. 4 is a still further enlarged fragmentary view in section similar to Fig. 3, showing the manner in which the outer cover section of the improved carton is manipulated in disengaging its coacting locking elements.

The improved locking arrangement according to the invention is preferably incorporated in a molded paper pulp carton of the three section type, such as is disclosed in the patent to Ruth M. Schilling, No. 2,600,130, of June 10, 1952, entitled Egg Carton. It comprises a cellular egg receiving section **10**, a cellular inner cover section **11** integrally hinged to a side margin of section **10** by means of a longitudinally extending molded crease **12**, and a plain non-cellular or tray-like outer cover section **13**, hinged by a similar crease **14** to the opposite side margin of bottom section **10**.

With reference to bottom section **10**, two parallel rows of egg receiving cells **15**, six cells in each row, are shown in the embodiment of the invention chosen for illustration. They are defined by a center row of upstanding, longitudinally spaced, post-like abutments **16** and end wall abutments **17** of slightly lesser height at the ends of each row. These members are arranged in longitudinal alignment and are integrally connected by partial height longitudinal partition elements **18**. Similarly, each of the divider posts or abutments **16** is integrally connected with side wall abutments **19** by integral, partial height transverse partition elements **20**.

Inner cover section **11** is subdivided internally in like fashion into two rows of six cells each by integrally molded provisions including longitudinally aligned center posts, and abutments at ends and sides of the section together with connecting partition elements. Such provisions are practically identical in the respective sections **10**, **11**, save for the fact that the cells of inner cover section **11** are larger in size than cells **15**; this is because the larger end of the egg is placed upward in the carton. Accordingly, the various cells and means defining the same in section **11** are designated by the same reference numerals, primed, as are employed in connection with the parts of bottom section **10**.

Bottom section cells **15** are provided with upwardly rounded egg cushioning seats **21**, as illustrated in Fig. 3; while the corresponding cells **15'** of inner cover section **11** are provided with egg engaging formations **22** for a similar purpose, but presenting a concave surface to the egg tops. Further description of the internal cell structure of section **11** is omitted in the interest of brevity, except to the extent that the improved locking means are concerned.

Outer cover section **13** is, as indicated above, of non-cellular, tray-like cross section, consisting of end walls

23, side walls 24 and a flat top panel 25 integrally connecting the same. The walls converge upwardly, as shown in Fig. 3, as do the external surfaces of inner cover section 11 which define the polygonally shaped sectional outline of the respective cells 15, 15'.

A locking or detent aperture 26 is formed in the external surface of each of a pair of egg receiving cells 15' spaced longitudinally from one another in the row extending along the front of the carton, as viewed in Fig. 1. These apertures are relatively large in size and are rectangular in shape. They extend from a point somewhat above the vertical midpoint of the section 10 (Figs. 3 and 4) downwardly through the molded crease 12 hingedly articulating sections 10 and 11, and terminate somewhat inwardly of the outer marginal limit of bottom section 10. See Fig. 2. They thus define a finger opening 27 at hinge crease 12 which gives access to the finger of a user in manipulating outer cover section 13 to open the carton.

By reference to Figs. 2 and 4 it will be noted that the cells 15' whose outer surfaces are thus apertured are outwardly and downwardly bulged or domed adjacent their top to provide a rounded locking shoulder 28 whose locking lip 29 over-hangs the top of aperture. The aperture and shoulder are readily produced by the use of an appropriate plug in a properly shaped molding screen to prevent deposition on a pre-determined area of the latter of a size equal to that of the opening.

Outer cover section 13 is also similarly molded to provide latching lugs 30 in transverse alignment with the apertures 26, hence with the centers of the respective egg cells 15, 15'. As indicated in Figs. 2, 3 and 4, lugs 28 extend inwardly of section 13 from a flush relationship with front wall 24 of carton section 13, being of laterally and upwardly rounded contours and terminating in an upper locking edge or lip 31. This lip is sharply defined and horizontal. Lugs 30 underlie rectangular openings 32 in the front cover wall 24, and the latter insure that the lugs have unimpeded action in snap-engaging beneath the locking lip 29 of inner cover member shoulders 28 when the carton is closed. Openings 32 extend from locking lip 31 upwardly to the junction of front cover wall 24 and top panel 25 of section 13.

In use, upon placement of eggs E in the cells 15 of bottom section 10, inner cellular cover 11 is first rotated 180° about its integral hinge 12 to the bottom 10, following which outer cover section 13 is similarly rotated in the opposite direction about hinge 14. The outer cover nests snugly over the inner, locking lugs 30 sliding downward over the forward or outer surfaces of the apertured walls of two cells 15', and over bulged shoulders 28 thereof. The outer wall 24 of the outer cover member is cammed outwardly, until the locking lip 31 of lug 30 snaps inwardly beneath the locking lip or edge 29 of the locking shoulder 28. The carton is thus locked and will remain so until lugs 30 are positively disengaged. Abutments 16' and 19' have supported engagement by the respective corresponding abutments 16 and 19 of bottom section 10, affording a stable support for the inner cover member, so that the latter is braced very well indeed.

The locking lugs 30 extend inward from points flush with the front outer wall of the outer cover 13, so that when a plurality of cartons are stacked in staggered relation, as shown in Fig. 3, nothing projects from the carton to be displaced or damaged by engagement or impact, or to prevent such stacking. The inner cover member, being molded in a cellular and closed, container-like outline, and being strongly braced as described, has desired rigidity and strength at its locking shoulders 28 to afford a satisfactory and reliable anchor for the lock. There is no likelihood of inward spring at this point to cause accidental release of locking lug 30. At the same time, front cover wall 24 is sufficiently flexible to enable the same to be manually lifted upwardly and outwardly, as indicated in Fig. 4 of the drawings, when it is desired to release the lock for access to the carton contents.

The inherent spring of the outer cover serves to maintain the locking lip in proper locked relation prior to this, as illustrated in Fig. 3, and this effect is augmented by a binding action at the rear, cover-bottom hinging crease 14. Engaging the free margin of inner cover section 11, as section 13 does adjacent this crease, there is a torque-stressed condition at the hinge and a resultant spring force to lift the outer cover section thereabout, so as to maintain lug 30 in contact with the upper locking lip 29 of shoulder 28.

The openings 32 in cover wall 24 are of small size, permitting practically the entire surface of that wall as well as the three other walls and top panel 25 to receive printing or ornamentation. The operation of closing and latching the cover is such that it can be performed by existing carton closing machinery without change thereof.

I claim:

1. A carton of one piece molded pulp construction comprising a cellular bottom section, an inner cellular cover section having integrally connected end and side walls, one of which is integrally hinged to a margin of said bottom section, and an outer cover section having a wall of greater flexibility intermediate its ends than at its ends, which wall is integrally hinged to another margin of said bottom section, said inner cover section wall being molded to define side surfaces of a plurality of cells spaced along its hinge to the bottom section and an aperture in at least one of said surfaces extending downwardly through said hinge of the inner cover section, said hinged outer cover section wall being molded to provide an inwardly projecting locking lug which is latchingly engaged with said aperture when said carton is closed, with the outer cover section nested over the inner cover section.

2. A carton of one piece molded pulp construction comprising a cellular bottom section, an inner cellular cover section having integrally connected end and side walls, one of which is integrally hinged to a margin of said bottom section, and an outer cover section having a wall of greater flexibility intermediate its ends than at its ends, which wall is integrally hinged to another margin of said bottom section, said inner cover section wall being molded to define side surfaces of a plurality of cells spaced along its hinge to the bottom section and an aperture in at least one of said surfaces extending downwardly through said hinge of the inner cover section, said aperture being bounded at its top by an outwardly convex locking lip, said outer cover section being molded to provide an inwardly projecting locking lug having an upwardly facing edge which is latchingly engaged with said locking lip of said aperture when said carton is closed, with the outer cover section nested over the inner cover section.

3. A carton of one piece molded pulp construction comprising a cellular bottom section, an inner cellular cover section having integrally connected end and side walls, one of which is integrally hinged to a margin of said bottom section, and an outer cover section having a wall of greater flexibility intermediate its ends than at its ends, which wall is integrally hinged to another margin of said bottom section, said inner cover section being molded to define side surfaces of a plurality of cells spaced along its hinge to the bottom section and an aperture in at least one of said surfaces extending downwardly through said hinge of the inner cover section, said aperture being located in transverse alignment with one of said cells, said outer cover section being molded to provide an inwardly projecting locking lug having an upwardly facing edge which is latchingly engaged with said locking lip of said aperture when said carton is closed, with the outer cover section nested over the inner cover section.

4. A carton of one piece molded pulp construction

comprising a cellular bottom section, an inner cellular cover section having integrally connected end and side walls, one of which is integrally hinged to a margin of said bottom section, and an outer cover section having a wall of greater flexibility intermediate its ends than at its ends, which wall is integrally hinged to another margin of said bottom section, said inner cover section being molded to define side surfaces of a plurality of cells spaced along its hinge to the bottom section and an aperture in at least one of said surfaces extending downwardly through said hinge of the inner cover section, said aperture being located in transverse alignment with one of said cells bounded at its top by an outwardly convex locking lip, said outer cover section being molded to provide an inwardly projecting locking lug having an upwardly facing edge which is latchingly engaged with said locking lip of said aperture when said carton is closed, with the outer cover section nested over the inner cover section.

5. A carton of one piece molded pulp construction comprising a cellular bottom section, an inner cellular cover section having integrally connected end and side walls, one of which is integrally hinged to an outwardly projecting margin of said bottom section, and an outer



cover section having a wall of greater flexibility intermediate its ends than at its ends, which wall is integrally hinged to the opposite margin of said bottom section, said inner cover section being molded to define side surfaces of a plurality of cells spaced along its hinge to the bottom section and a substantially rectangular aperture in at least one of said surfaces extending downwardly through said hinge of the inner cover section, said aperture being located in transverse alignment with one of said cells bounded at its top by an outwardly convex locking lip, said outer cover section being molded to provide an inwardly projecting locking lug having an upwardly facing edge which is latchingly engaged with said locking lip of said aperture when said carton is closed, with the outer cover section nested over the inner cover section.

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