March 4, 1952 F. H. SHERMAN 2,587,909

MOLDED PULP EGG CARTON

Filed Feb. 17, 1947 2 SHEETS—SHEET 1

Fig. 1

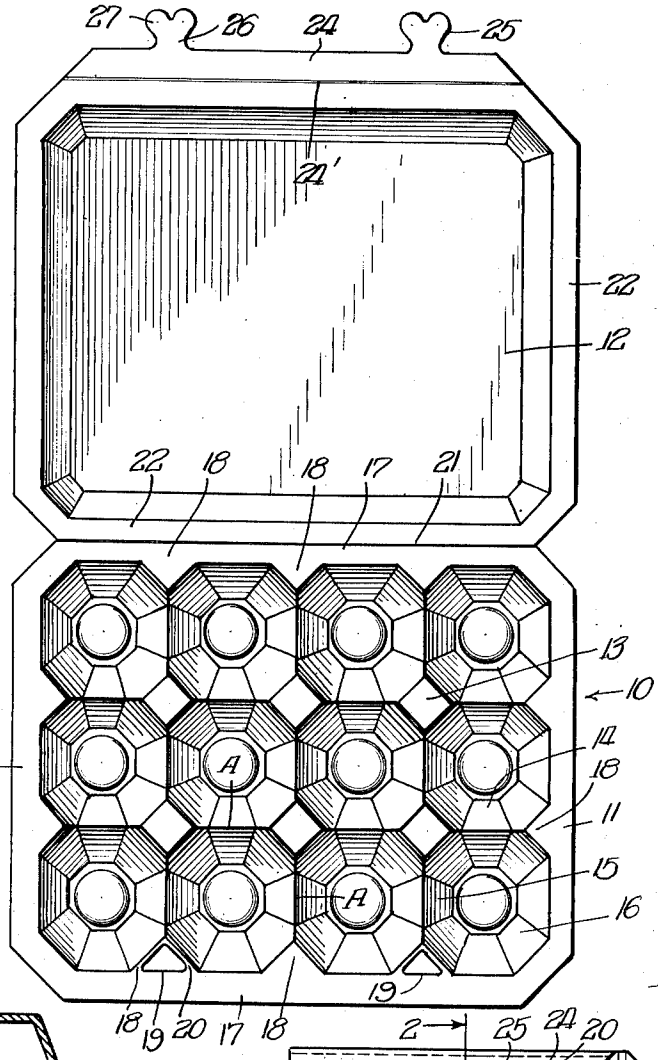

Fig. 2

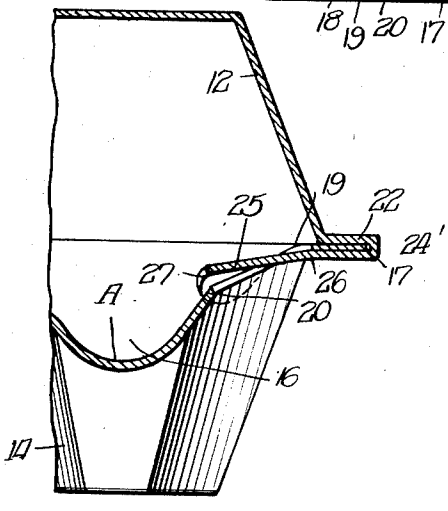

Fig. 3

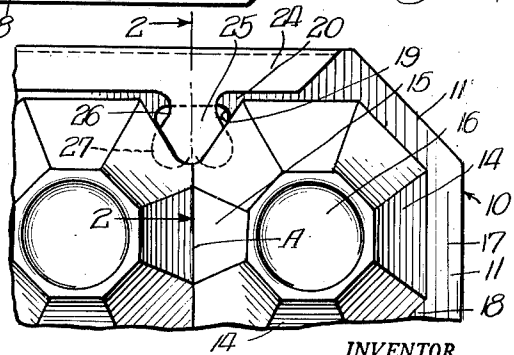

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Fig. 4

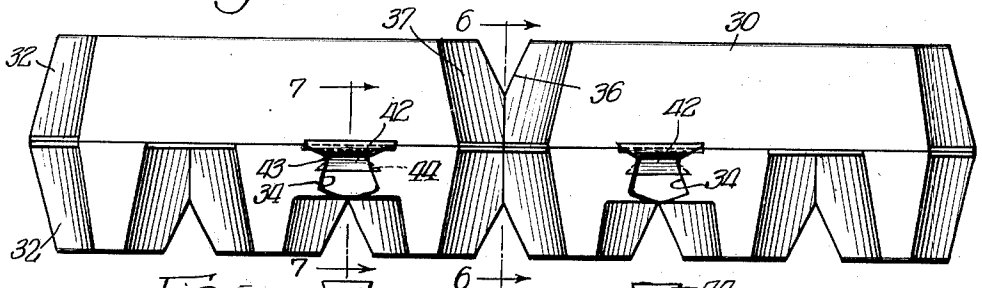


Fig. 5

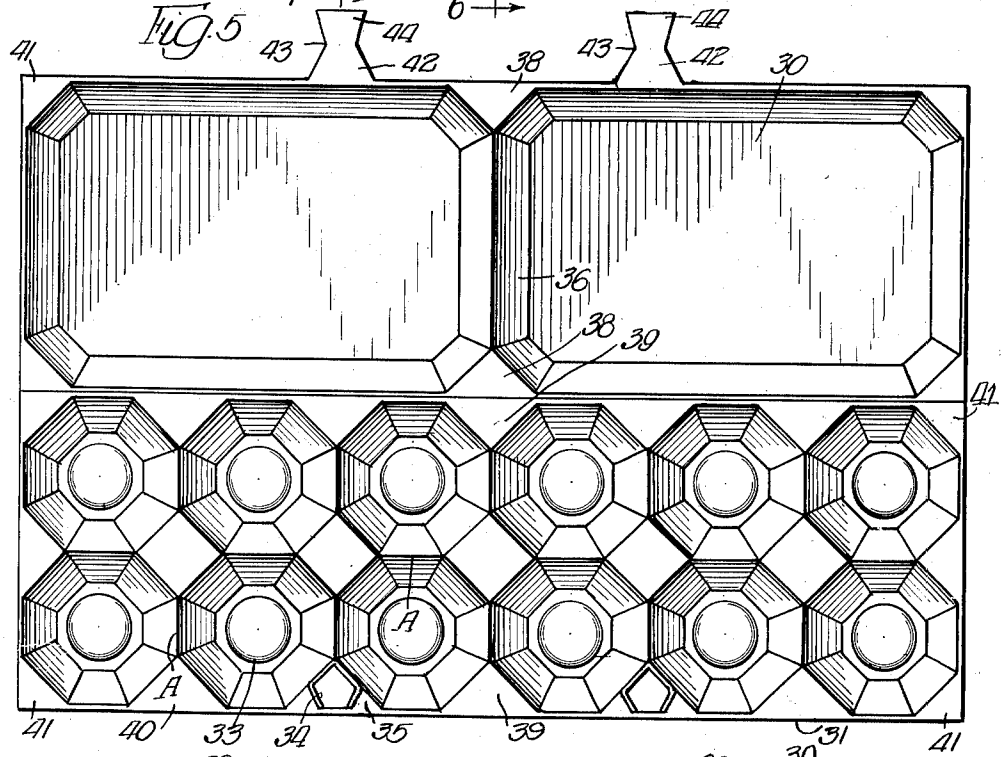


Fig. 7

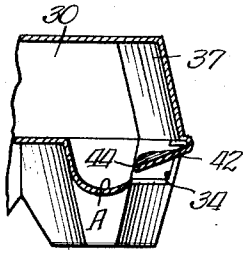
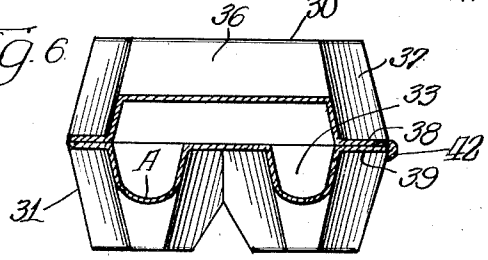


Fig. 6



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Patented Mar. 4, 1952

2,587,909

UNITED STATES PATENT OFFICE

2,587,909

MOLDED PULP EGG CARTON

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Application February 17, 1947, Serial No. 729,168

5 Claims. (Cl. 229—2.5)

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The present invention relates to improvements in molded pulp cartons, more particularly to such cartons as produced for the packaging of eggs. This application is a continuation-in-part of a copending application Serial No. 517,385, filed January 7, 1944, now abandoned.

Egg cartons of the construction shown in Patent No. 1,975,129 which are molded from a slurry of paper pulp have attained wide popularity in the trade. They have the advantage of lightness in weight and may be compactly nested for shipment and storage. A proper design of molded pulp carton is characterized by substantial strength and resistance to rupture or collapse under load, notwithstanding its comparative lightness in weight. However, a perplexing problem of long standing is the provision of a suitable self-contained lock and bracing construction. The lack of such a locking mechanism has resulted in the use heretofore of separate metallic clips for securing the cover and bottom together.

A general object is to provide a carton comprising cooperating tray-like article-enclosing sections having incorporated therein means for preventing telescoping movement of the sections when they are in article-enclosing relation and improved means for latching the sections in said relation and for preventing relative lateral shifting thereof.

It is a more specific object of the invention to provide a molded pulp carton of the general type herein described, in which a bottom section having egg receiving cells or compartments is provided with a hinged cover section having a locking member provided with a marginal entrant tab which projects outwardly, the bottom section having an opening for interlockingly receiving said member, whereby the bottom and cover sections are secured together in the closed position thereof and restrained from relative lateral shifting by a lock which is engaged with the bottom section from the outside thereof.

It is another object of the invention is to provide a molded pulp carton of the general type herein described in which a bottom section is provided with a cup-like article-receiving cells or compartments which merge or coalesce below the upper part of the bottom, and a cover section hinged to the bottom section for enclosing eggs placed in the cells, the bottom section having an aperture in the front wall thereof transversely in front of the reentrant zone between adjacent eggs in the merging cells at that side, and the cover section having an integral, outwardly extending locking tab adapted to be passed through the aperture from the outside of the carton and to lie in the reentrant area between the convex surfaces of said adjacent eggs so as to lock the cover in closed position.

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It is a further object of the invention to provide a molded carton of the above type in which the sections are provided with coacting abutting means adapted to limit the closing movement of said sections and thereby prevent telescoping when the sections are in closed relation, together with novel, interlocking tab and aperture means on the sections for latching said sections in said closed positon and preventing relative lateral shifting thereof.

A still further object of the invention is to provide a carton comprising coacting tray-like sections and latching means on said sections for securing the same in article-enclosing relation wherein said latching means comprises an aperture in the side of one of said sections and an integrally molded, planar tongue member on the other section having an enlarged end which is adapted to be projected inwardly through said aperture from the outside thereof, and wherein said latching means is positioned between the adjacent pair of touching, rounded articles enclosed by said sections.

These and other objects of the invention will be obvious from the description of the preferred form of carton and modification thereof embodying the principles of the invention which are shown by way of illustration in the accompanying drawings, in which

Fig. 1 is a plan view of an open molded pulp carton embodying the principle of the present invention;

Fig. 2 is an enlarged fragmentary view in transverse vertical section on line 2—2 of Fig. 3, illustrating the locking arrangement between the cover and bottom sections when the latter are in closed relation;

Fig. 3 is a fragmentary bottom plan of the closed carton, further illustrating said locking arrangement;

Fig. 4 is a view in front elevation, illustrating a modified embodiment of carton incorporating the invention;

Fig. 5 is a top plan view of the carton of Fig. 4 with the top and bottom sections in open position as molded;

Fig. 6 is a view in transverse section along a line corresponding to line 6—6 of Fig. 5; and

Fig. 7 is a view in transverse section on line 7—7 of Fig. 4.

Referring to Figs. 1 to 3 inclusive of the drawings, the invention is there illustrated as embodied in a molded pulp carton 10 of the general type described in Patent No. 1,975,129 of October 2, 1934, but it should be understood that the invention is equally applicable to other similar cartons, such as the molded pulp carton shown in the modification of Figs. 4 to 7 inclusive, which permits thirty cartons to be packed in a conventional type egg crate.

The carton 10 has tray-like hingedly connected sections which for convenience will be referred to as the bottom section 11 and cover section 12. The bottom section 11 is provided with spaced upstanding elements 13 which are in the general shape of truncated pyramids and which coact with the connecting longitudinal and transverse partitions 14, 15 respectively, in subdividing the bottom section 11 into individual, longitudinally and laterally spaced egg receiving cups, compartments or cells 16.

As clearly illustrated in Figs. 1 and 2, the partitions 14, 14 and 15, 15 which bound adjacent pairs of cells 16 merge with or intersect one another along ridge lines A which are located substantially beneath the top of bottom section 11, which results in the positioning of eggs which are deposited in said adjoining cells in close side-by-side relation to one another. A considerable compacting of space is accomplished by this mergence as compared to certain known cartons in which the cells are spread out and spaced longitudinally and laterally without regard to the minimum space requirements which are important factors in cartons of the present type.

As illustrated in Figs. 2 and 3, the bottom section is characterized by reentrant zones along the front side of the bottom section between adjacent cells, said zones being thus transversely aligned with the space between the convex surfaces of eggs disposed in said respective, vertically merging cells. This provision affords space for the reception of the carton locking means, to be hereinafter described in detail, whereby locking of the carton sections 11 and 12 to one another is made possible without increasing the lateral dimensions of the carton or introducing likelihood of damage to eggs in the cells during the locking operation.

While the cells 16 are illustrated as being of octagonal shape, it is evident that they may be altered considerably in this respect without departing from the principle of the invention. Portions of the egg receiving cells 16 at the sides and ends of the bottom form, in effect, upstanding external wall sections or formations bounding the latter. Outwardly extending marginal ledges 17 define a flange along the upper portion of the sides and ends of the bottom section and are coextensive therewith. A carton of the type possessing these ledges may be referred to as a ledge type carton.

The diagonal and upstanding portions of the outer rows of cells 16 terminate at or merge into the inwardly directed, triangular abutments 18 which constitute inward extensions of the ledge 17. Openings 19 are formed between certain of the egg receiving cells adjacent the outer or front side of the bottom section and these openings preferably lie at points corresponding to the triangular abutment surfaces 18, i. e., where the inner edge of the marginal ledge 17 is connected by an inwardly and downwardly inclined portion 20 merging with the wall sections of the cells 16.

The cover section is connected to the bottom section along the rear of the latter, preferably by an integral hinge construction 21. This cover section has an outwardly extending marginal ledge 22 around the perimeter thereof which abuts the marginal ledge 17 of the bottom section in the closed position of the sections. The front portion of said ledge carries an integral, elongated locking flap or flange 24 which is substantially coextensive in length with the cover section 12. Locking tongue or tab members 25 are formed integral with flap 24 and extend outwardly from the margin thereof, these members preferably having a constricted neck portion 26 and terminating in enlarged end portions in the form of one or more laterally extending portions 27.

When the cover 12 is closed, its marginal ledge 22 is adapted to be brought adjacent and substantially in superposed relation to the marginal ledge 17 of bottom section and the abutment surfaces 18 thereon. The locking flap 24 then will project outwardly of the margin of ledge 17 and may readily be bent around said ledge, preferably about a preformed bend line 24', into externally encompassing relation to the ledge 17. The locking members 25 are then projected into the openings 19 from the outside of the carton. Each member will, upon flexing of the enlarged lateral portions or ears 27 thereof, pass through the opening 19 and engage the bottom section adjacent the margin of the opening 19 in interlocking relation therewith to positively hold the cover section to the bottom section in the manner of a hook. Since members 25 are of greater cross-sectional area at their extremities than the width of the opening 19, they will, upon springing back into normal position after insertion in the opening, be in such interlocked relation with the bottom carton section that the sections will not separate, even when the filled carton is lifted by grasping the cover, but will remain securely locked together.

Since the openings 19 are located at the reentrant zones or areas between adjacent, vertically and laterally mergent cells of each of two pairs of said cells, wherein eggs may be disposed in extremely close adjacency, the members 25 are readily projected into said openings from the carton exterior and accommodated internally of the carton in the space between the convex surfaces of two eggs in said adjacent cells. The arrangement is such that there is no interference on the part of the locking means with the bottom section during the closing of the cover section thereover and, accordingly, no crushing stress is applied to the eggs. The enlarged portions 27 of said members 25 are readily accommodated in the internal carton space between egg surfaces and may hence spring freely toward their original flat condition. The insertion and subsequent presence of the locking members 25 cannot result in damage to the eggs. Moreover, the members do not occupy egg space in the cells and they do not depend upon eggs in said cells to hold them in position.

In addition to securing the cover and bottom sections in closed relation, the locking members 25 and flap 24 greatly rigidify the carton in that they prevent possible lateral shifting of the sections relative to one another. Such lateral shifting is the primary cause of much carton failure, since it permits vertical telescoping of the cover and bottom sections and resultant crushing of the eggs. Being positively locked against relative

lateral shift, the loads which are imposed on the carton, as in stacking, are unfailingly sustained at the marginal ledges 17, 22 of the carton sections.

In Figs. 4, 5, 6 and 7 I illustrate the invention as embodied in a somewhat different type of carton which lacks elements corresponding to the aforesaid ledges 17 and 22, hence may be referred to as a ledgeless type. The cover and bottom sections 30 and 31 respectively of this carton are of generally rectangular outline, being provided with diagonal corners 32 as illustrated. The cells 33 of the bottom section are similar to the cells 16 of Figs. 1 to 3 inclusive, in all respects. The openings 34 between adjacent pairs of said cells are positioned in the downwardly and inwardly inclined areas 35, being of the outline illustrated in Fig. 4. The cover section 30 is subdivided into two similar divisible parts by means of the central, transversely extending, preferably V-shaped groove 36, which is located in vertical alignment with a transverse line between adjacent cells 33 at the center of the carton. The ends of this groove open to the front and rear sides of the cover 30 medially of the central recesses 37 in said sides, and the triangular webs 38 at the bottom of said recesses lie coplanar with the margin of the cover section. These webs are adapted to rest on the corresponding triangular webs 39 of the bottom section. Other triangular abutment webs 40 are provided between adjoining cells of the bottom section, which are similar to the abutment surfaces 18 of the first described embodiment. At the corners thereof the cover and bottom sections are provided with outwardly extending triangular web areas 41 adapted to engage one another in the closed position of the cover and bottom sections to sustain the former.

On its front margin the cover section is provided with integral locking members in the form of laterally outwardly projecting tongues or tabs 42, each characterized by a restricted neck 43 and an enlarged head 44 having divergent linear sides. The tongues 42 are vertically aligned with the openings 34 in the bottom section and, when the cover and bottom sections are in closed relation, said tongues are bendable externally around the meeting line of the sections and inserted into the openings 34. The tongues and openings have interlocking engagement to prevent undesired withdrawal, whereby the cover and bottom sections are securely held in said closed relation. The carton is greatly strengthened by these locking elements, since relative lateral shifting, with consequent vertical telescoping and crushing, cannot occur.

The V-shaped transverse division groove 36 enables the carton to be subdivided into two equal halves, each of half-dozen capacity, when desired. It will be noted that the tongue receiving apertures 34 are located immediately adjacent the severed end of the subdivided carton half, which makes the above mentioned strengthening action effective adjacent the relatively weak and more exposed end of the carton where it is most needed.

In use, the abutment areas 38, 39, 40 and 41 which are spaced around the margins of the cover and bottom sections are adapted for abutting engagement to sustain the cover. As in the first embodiment, relative lateral shifting of the sections is prevented by the cover locking means and the sections are maintained in vertical alignment eliminating possibility of telescoping and crushing of the carton contents.

As in the first described form, the location of

apertures in the manner described affords ample room to accommodate the locking members, notwithstanding the closely adjacent relation of cells 33, a relation which is essential in a practical commercial carton. It is possible to project the locking tongues 42 through the openings 34 from the exterior of the carton into the space between adjacent convex egg surfaces without danger of damaging the eggs and without causing said tongues to occupy egg space in the cells. Latching of the sections is done after the same have been manipulated to fully closed and engaged relation, whereby the closely adjacent eggs in the bottom section are not subjected to any crushing force, either during said closing manipulation or during the subsequent latching step.

What is claimed is:

1. A molded carton, comprising a bottom section having spaced upstanding walls intermediate the ends thereof dividing the carton into adjacent cells, said bottom section having a tab-receiving opening between said cells, a shoulder along the margin of said bottom section, a cover section secured to said bottom section, said cover section having a portion resting upon the shoulder on said bottom section, an extension on said cover section projecting outwardly from said portion, including a locking tab on the free side of said extension, said extension being bent over in encompassing relation around said bottom section margin and said tab being tucked through the opening into said bottom section between said cells.

2. An integrally molded fibrous carton of the type described, comprising top and bottom sections having pairs of side and end walls and marginal ledges projecting outwardly of the section walls, said sections being hingedly connected at corresponding walls thereof and being engageable with one another on said ledges, one of said sections having a locking flap comprising an extension of the ledge on the wall thereof opposite the hingedly connected walls, the other section having an opening in the wall thereof opposite the hingedly connected walls, which opening is located adjacent the ledge on said wall of said other section, said flap being wrapped around said last named ledge in parallel surface contact therewith to maintain the sections in closed relation, said flap having an integral locking element thereon projecting therefrom which is frictionally receivable in said opening to maintain the sections in said relation and restrain relative lateral displacement thereof.

3. A molded pulp carton, comprising a cellular bottom section having upstanding walls forming a row of egg receiving cells, a marginal ledge on said bottom section, and a cover section secured to said bottom section, said cover section having a marginal ledge in superimposed relation with respect to said first named ledge, the ledge on one of said sections having an integral extension bent over inwardly in encompassing relation with respect to the lelge on the other of said sections and including a portion securing said extension in said encompassing relation.

4. A molded pulp carton, comprising a cellular bottom section having upstanding walls forming a row of egg receiving cells, a marginal ledge on said bottom section, and a cover section secured to said bottom section, said cover section having a marginal ledge in superimposed relation with respect to said first named ledge,

the ledge on one of said sections having an integral extension bent over in encompassing relation with respect to the ledge on the other of said sections and including a portion fixedly engaging said other section securing said extension in said encompassing relation, said portion interengaging said other section adjacent the outer cells of the bottom section.

5. A molded pulp carton comprising a bottom section subdivided into article receiving cells and a cover section for said bottom section having side walls and hinged along one side thereof to said bottom section, said bottom section having abutment means adjoining the marginal edge opposite its hinged side and a detent aperture below said last named edge, said cover section engaging said abutment means in the closed relation of the sectons, said cover section side wall opposite the hinged side being provided with an integral locking member which normally projects edgewise and outwardly thereof as a side extension of the cover section marginal edge, and substantially in the plane thereof and, when said

sections are in closed relation, is bent through a substantial arc out of its normal position around the margin of said bottom section and in locking engagement with said detent aperture from the exterior of the bottom section.

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Executrix of the Estate of Francis H. Sherman, Deceased.

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