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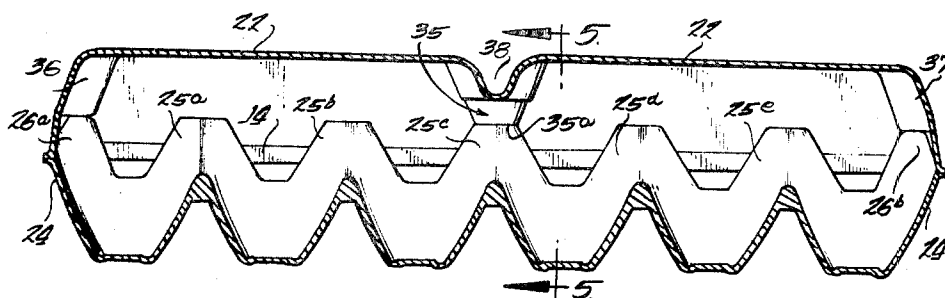
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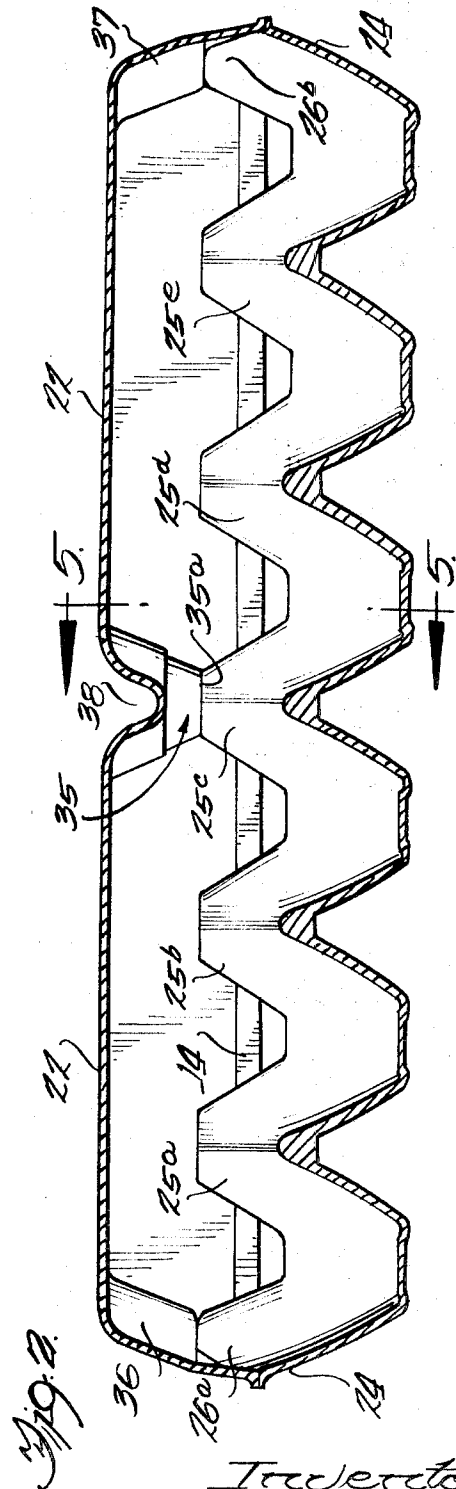
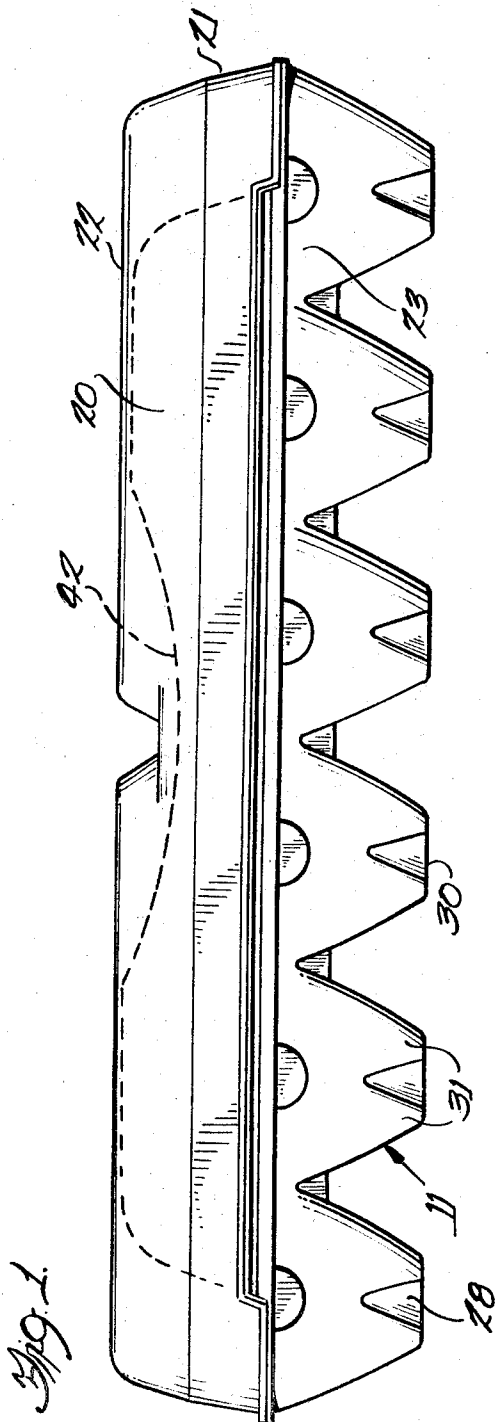
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[54] **CARTON FOR FRAGILE ARTICLES**
5 Claims, 7 Drawing Figs.

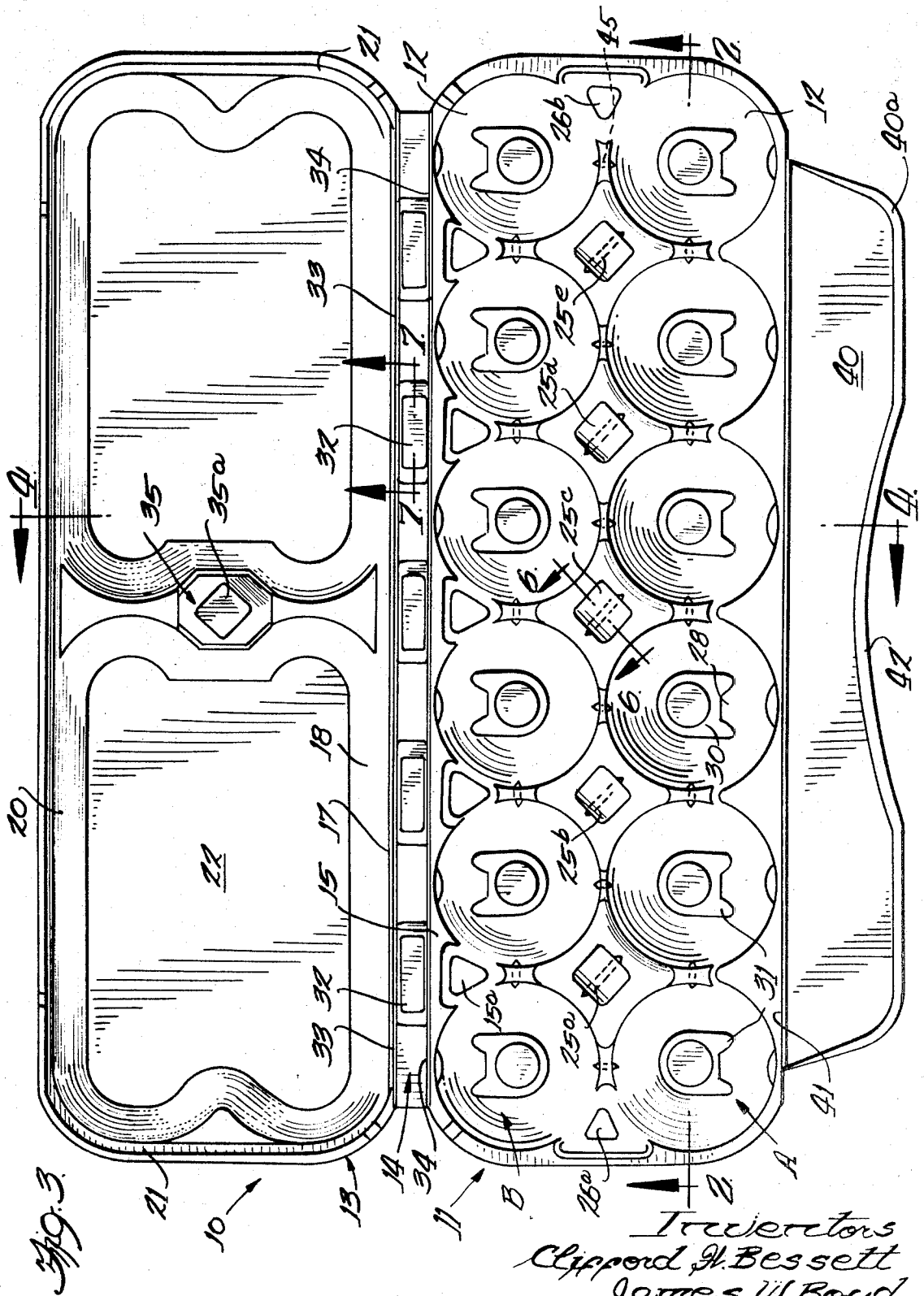
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 2.5, 29 M

ABSTRACT: A carton for accommodating a plurality of fragile articles is provided which includes a tray section, a cover section, and a hinge section interconnecting the backwalls of the cover and tray sections. The tray section is provided with upwardly extending members disposed adjacent the ends thereof; said members engage the interior surfaces of the end walls of the cover section and guide the latter into proper superposed relation with respect to the tray section when said cover section is moved to its closed position.

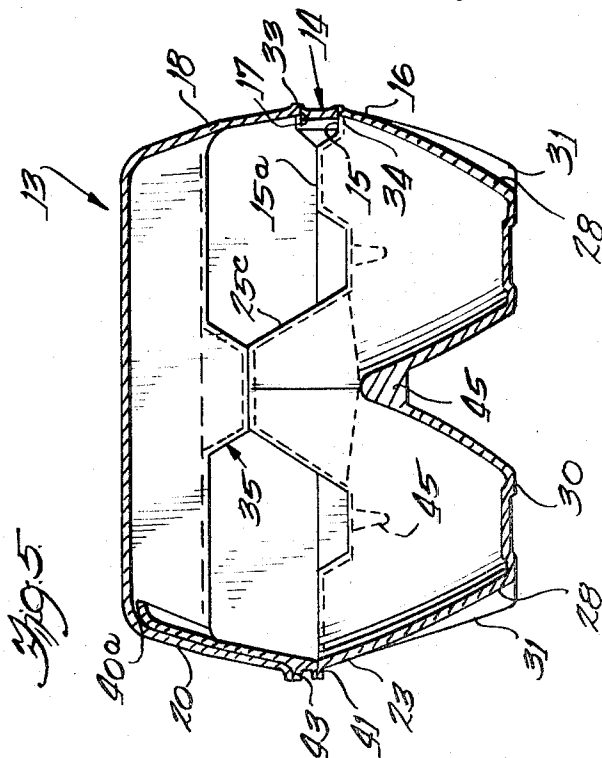
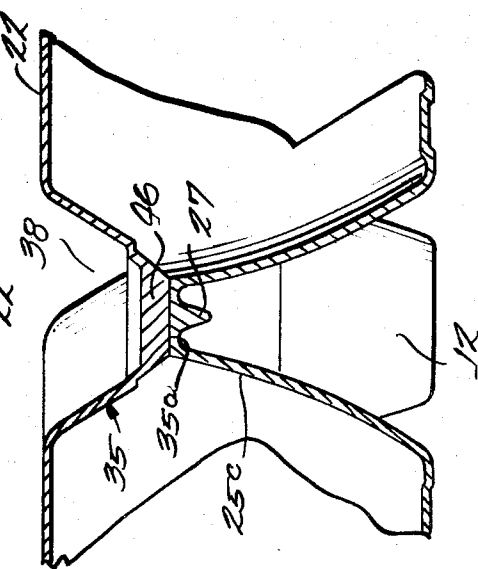
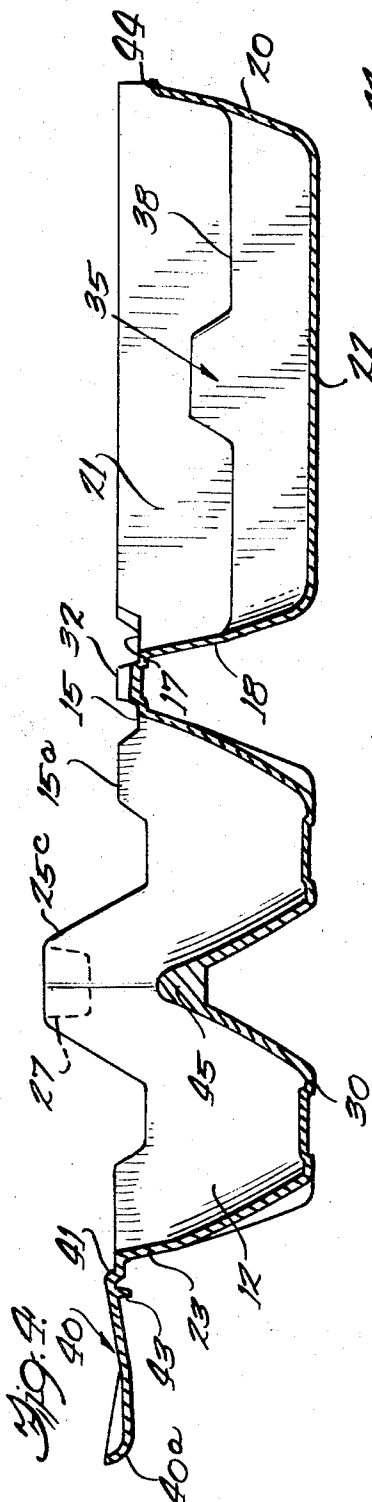




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CARTON FOR FRAGILE ARTICLES

BACKGROUND OF THE INVENTION

Various molded pulp or plastic cartons for accommodating fragile articles, such as eggs, have heretofore been provided. Such prior cartons, however, incorporated numerous structural design features which resulted in the cartons being beset with one or more of the following shortcomings: a) they were difficult and expensive to form; b) the structural stability of the carton was weakened; c) the cartons were not readily denestable; d) difficulty was encountered in loading and closing the cartons with automatic equipment; e) only minimal protection for the accommodated articles was afforded; f) the cartons were incapable of effectively accommodating articles varying in size and shape; g) the loaded cartons were not properly sized and therefore were not suitable for bulk shipping in standard shipping containers; h) the cartons were awkward to manually manipulate; and i) suitable areas were not provided on the carton to receive printed or embossed indicia.

SUMMARY OF THE INVENTION

Thus, it is an object of this invention to provide a carton which avoids the aforementioned shortcomings.

It is a further object of this invention to provide a carton which may be readily molded or otherwise formed from either woodpulp or a variety of plastic materials.

It is a still further object of this invention to provide a carton which is attractive in appearance and is of simple inexpensive and compact construction.

Further and additional objects will appear from the description, accompanying drawings and appended claims.

In accordance with one embodiment of this invention a molded carton for fragile articles is provided which includes a cellular article-accommodating tray section having front, back and end walls; a cover section having a top panel and front, back and end walls depending from the top panel; and a hinge section foldably interconnecting the backwalls of the cover and tray sections whereby the cover section may be moved into a closed, substantially superposed, relation with respect to the tray section. Adjacent opposite ends of the tray section are provided upwardly extending members which, when the cover section is moved to its closed position, engage the interior surfaces of the cover section end walls and guide the cover section to its proper superposed position with respect to the tray section. The end walls of the cover section are provided with inwardly extending depending elements which abut the upper end limits of the upwardly extending members of the tray section when the cover section assumes its fully closed position.

For a more complete understanding of the invention reference should be made to the drawings wherein:

DESCRIPTION

FIG. 1 is a front elevational view of one form of the improved carton with the cover section thereof shown in its closed position.

FIG. 2 is an elongated sectional view taken along line 2-2 of FIG. 3, but showing the cover section in a closed position.

FIG. 3 is a top plan view of the carton of FIG. 1, but said carton being shown in a fully open position.

FIG. 4 is a sectional view taken along line 4-4 of FIG. 3.

FIG. 5 is a sectional view taken along line 5-5 of FIG. 2.

FIG. 6 is an enlarged fragmentary sectional view taken along line 6-6 of FIG. 3, but showing the cover section in its closed position.

FIG. 7 is an enlarged fragmentary sectional view taken along line 7-7 of FIG. 3.

Referring now to the drawings and more particularly to FIGS. 1 and 3, one form of the improved carton 10 is shown

which is suitable for accommodating a dozen eggs or the like. The illustrated carton 10 is a type commonly referred to in the art as a 2 x 6-style egg carton and may be formed from molded pulp; vacuum-formed or thermoformed from suitable plastic; or formed of plastic by injection molding.

As seen in FIGS. 2-5, carton 10 includes a cellular tray section 11, the cells 12 of which are arranged in two parallel rows A and B of six cells each; a cover section 13; and an elongated hinge section 14, which foldably interconnects the upper edge 15 of the tray section backwall 16 and the lower edge 17 of the cover section backwall 18. In addition to backwall 18, the cover section 13 includes a front wall 20, end walls 21, and a top panel 22 from which all of the walls depend. Likewise, in addition to backwall 16, tray section 11 includes a front wall 23 and end walls 24.

The rows A and B of cells 12 are separated from one another by a row of upwardly projecting hollow posts 25a, b, c, d, and e. As seen in FIGS. 2 and 4, each of the hollow posts terminates above a plane defined by the upper peripheral edge of the tray section. Aligned with and included at opposite ends of the row of posts are upwardly extending hollow members or half posts 26a and b. As seen in FIG. 2, members 26a and b terminate at substantially the same elevation as the posts 25a-e. By reason of the posts and members projecting a substantial distance above the peripheral edge of the tray section improved protection between corresponding articles in rows A and B is provided during loading of the tray section and when the loaded carton is subjected to normal handling.

In order to reinforce the upper end limits of hollow posts 25a-e and also to facilitate denesting of the empty cartons when the latter are arranged in nested relation, there is provided a solid rib 27 for each post which depends from the top of the post and interconnects opposed depending and outwardly flared sidewalls of the post. Each rib 27 in the illustrated embodiment is disposed at an angle with respect to the longitudinal axis of the row of posts.

As seen in FIG. 1, the outwardly facing portion of the exterior of each cell 12 in both rows A and B has formed therein an elongated upwardly extending flute 28. The flute commences from the bottom 30 of the cell and tapers upwardly therefrom and blends into the exterior surface forming the upper portion of the cell. Disposed laterally on either side of flute 28 are elongated upright shoulderlike projections 31, see FIGS. 1 and 3. The function of these projections will be discussed more fully hereinafter.

The upper edge 15 of the tray section rear wall 16 is provided with a plurality of raised portions or lands 15a, see FIGS. 3 and 5. One such portion is aligned between each pair of adjacent cells 12 comprising the rear row B of cells. The outwardly facing side of each portion 15a is set inwardly a short distance from the hinge section 14 so that when the latter is disposed in its upright position, see FIG. 5, there will be no interference between the hinge section 14 and the portions 15a.

The hinge section 14 the illustrated embodiment is provided with a plurality of longitudinally spaced protuberances 32 which are adapted to extend into the carton interior when the cover section 13 is in its closed position. The protuberances 32 are disposed between a pair of elongated substantially parallel fold lines 33 and 34. Fold line 33 joins the lower edge 17 of the back side 18 of the cover section 13 with one elongated side of hinge section 14, and fold line 34, on the other hand, joins the upper edge 15 of the tray section backwall 16 to the other elongated edge of hinge section 14. The protuberances 32 are adapted to snugly fit between adjacent portions of the cover and tray sections, which portions 17 and 15 assume a substantially superposed relation when the cover section is disposed in its closed position. The portions 15 and 17 coact with the hinge section protuberances 32 so as to prevent the cover section from being overclosed or out of alignment with the tray section 11.

Cover section 13 is provided with a centrally disposed, downwardly projecting post 35. The extent to which the post

depends from the top panel 22 is such that the lower distal end 35a of the post abuts the top of the upwardly extending post 25c formed in tray section 11. In addition to post 35, cover section 13 is provided with inwardly and downwardly extending projections 36 and 37 which are formed in the end walls 21 thereof. As seen in FIG. 2, when the cover section 13 is in its fully closed position, the center post 35 abuts post 25c and the projections 36 and 37 abut members 26a and b, respectively. Thus, with the three-point contact provided by posts and members the top to bottom strength of the carton is markedly enhanced and, as a result, superior protection for the accommodated articles is provided.

Extending forwardly and rearwardly of the center post 35 is an elongated depression 38, the ends of which terminate at the front walls and backwalls of the cover section. The depression 38 provides added stiffness for top 22. If desired, however, the depression 38 may be omitted or the shape thereof may be varied from that shown.

In the illustrated carton 10, the front side of the cover section 13 is reinforced by a bracing flange 40 which is hingedly connected by means of a fold line 41 to the upper edge of the front wall 23 of the tray section 11. The upper edge 40a of flange 40 is bent inwardly a slight amount so as to conform substantially to the shape of the interior surface of the juncture between the cover section front wall 20 and top panel 22, see FIG. 5. Thus, when the flange is disposed in its upright bracing position, it is disposed behind the cover section front wall. In FIGS. 1 and 3 it will be noted that the upper edge of the flange 40 is provided with a concavity 42 at the center thereof so as to avoid any interference between the cover section depression 38 and the upper edge 40a of the flange 40 when the cover section and flange are in the positions shown in FIGS. 1 and 5.

Spaced a short distance above fold line 41 and disposed on the front face of flange 40 is a ledge 43, see FIG. 5, on which the lower edge of the cover section front wall 20 rests when the cover section 13 is in its fully closed position. To compensate for the flange hinge 41 and to properly engage ledge 43, the lower edge of the front wall 20 is recessed at 44. By reason of the recess 44, the remainder of the lower edge of the cover section front wall 20 and end walls 21 are able to contact the upper edge of the respective walls 23 and 24 of the tray section 11.

FIG. 4 illustrates an important feature embodied in the improved carton 10; namely, that the top wall or panel 22 of the cover section 13 and the bottoms 30 of the cells 12 of the tray section 11 are disposed in coplanar relation, when the cover section is in its fully opened position. The relative disposition of the cover and tray sections, shown in FIG. 4, is that which they assume when the carton is disposed on the drying conveyor during the manufacture of the carton, particularly when the latter is formed of molded pulp. Thus, with the coplanar disposition of the cover section top wall 22 and the bottoms 30 of the cells 12, distortion or warpage of the carton during its drying cycle is reduced to a minimum thereby reducing the number of rejected cartons or "seconds" which might otherwise result.

FIG. 4 also illustrates that the portions 45 of the tray section 11, which interconnect adjacent cells 12, are of solid riblike construction thereby enhancing the rigidity of the tray section and improving the denesting characteristics of the carton. In FIG. 6 it will be noted that the abutting end 35a of the post 35 is also reinforced or rigidified by a solid rib 46.

By reason of the projections 31 formed in outwardly facing portions of the cells 12, greater surface contact is provided between the cells of an upper loaded carton and the top panel of a lower loaded carton, when said cartons are arranged in stacked relation. Thus, the stability of the loaded carton is improved whether said carton is arranged in a stack with other like cartons or is resting on a planar supporting surface.

No means of locking the cover section in its closed position is shown; the reason being that various types of locking means

may be employed without affecting the novel features aforescribed.

Thus, it will be seen that an improved carton for fragile articles has been described which provides superior top to bottom strength when the cover section is in its closed position; minimizes distortion during manufacture of the carton; permits accurate and sustained alignment between the cover and tray sections when they assume a closed position; improves the stability of the loaded cartons when they are arranged in stacked relation; and reduces checking between adjacent eggs in the tray section during loading thereof or during normal handling of the loaded carton.

We claim:

1. A carton for fragile articles comprising a tray section having upright front walls and backwalls interconnected by end walls, the upper edges of said tray section walls forming a supporting ledge; a cover section having a top panel and front walls and backwalls depending therefrom and end walls interconnecting the front walls and backwalls of said cover section, the lower edges of said cover section walls forming a supporting ledge; and a hinge section hingedly interconnecting the backwalls of said cover and tray sections whereby said cover section is movable into and out of a closed substantially superposed position with respect to said tray section, and the supporting ledges of said sections are in registered relation with respect to one another; the end portions of said tray section being provided with upwardly projecting members spaced inwardly from the outer periphery of said tray section ledge, said members, upon said cover section being moved to said closed position, slidably engaging the interior surfaces of the cover section end walls and guiding said cover section into registered overlying relation with respect to said tray section; the end walls of said cover section being provided with inwardly extending elements depending from the top panel, the lower end limits of each depending element being spaced from the front walls and backwalls of said cover section and above the cover section ledge, said element lower end limits abutting the upper end limits of said tray section upwardly projecting members, when said cover section is in said closed position.

2. The carton of claim 1 wherein said cover section top panel is provided with a depending post disposed intermediate said cover section end walls, said depending post abutting the upper end limit of an upwardly extending post formed in said tray section and cooperating with said cover section end wall depending elements to provide at least three-point contact with said tray section, when said cover section is in said closed position.

3. The carton of claim 1 wherein the front, back, and end walls of said cover section flare outwardly and downwardly from the periphery of said top panel, and said tray section is provided with rows of article-accommodating cells disposed adjacent the front walls and backwalls of said tray section, the outwardly facing exterior portion of each cell being provided with an elongated upright flute which forms a pair of spaced shoulderlike projections; the lower end limits of said projections engaging the exposed peripheral portion of the cover section top panel of a like closed carton disposed therebeneath when said cartons are arranged in stacked relation.

4. The carton of claim 1 wherein said tray section includes a plurality of article-accommodating cells arranged in side-by-side relation and forming a row adjacent said hinge section; and said hinge section includes a plurality of longitudinal spaced hollow protuberances, all of said protuberances being aligned between adjacent cells of the row and engaging said cover and tray sections in a like manner when said cover section is in a closed position.

5. The carton of claim 4 wherein said tray section includes a plurality of substantially flat lands disposed in substantially coplanar relation and adjacent said hinge section, each land being aligned with an adjacent protuberance formed on said section.