Oct. 13, 1953 J. W. COX 2,655,303

MOLDED PULP CARTON

Filed March 28, 1947 2 Sheets-Sheet 1

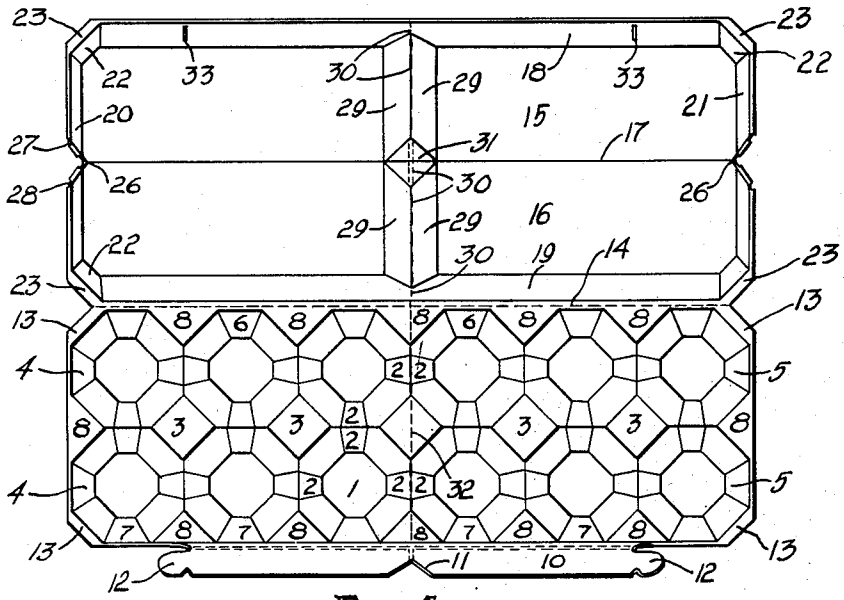


FIG. 1

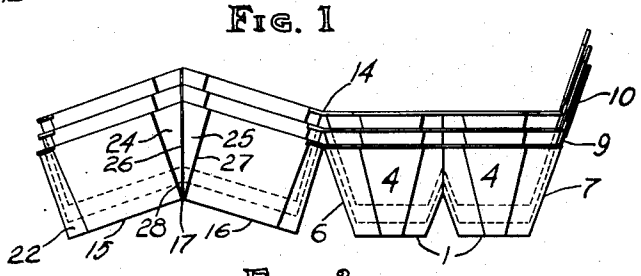


FIG. 2

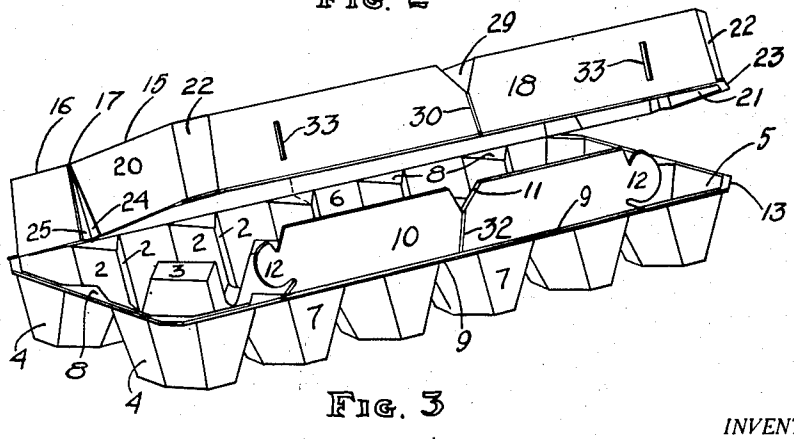


FIG. 3

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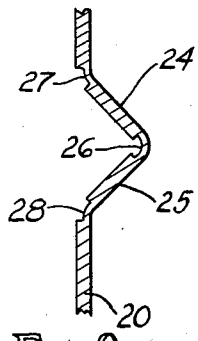


FIG. 9

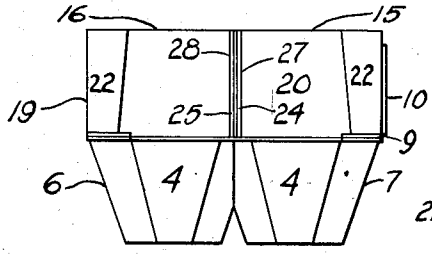


FIG. 4

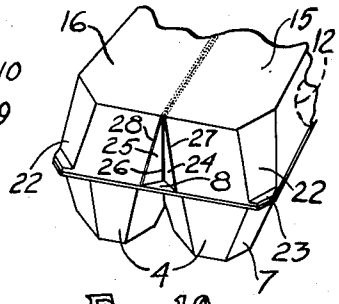


FIG. 10

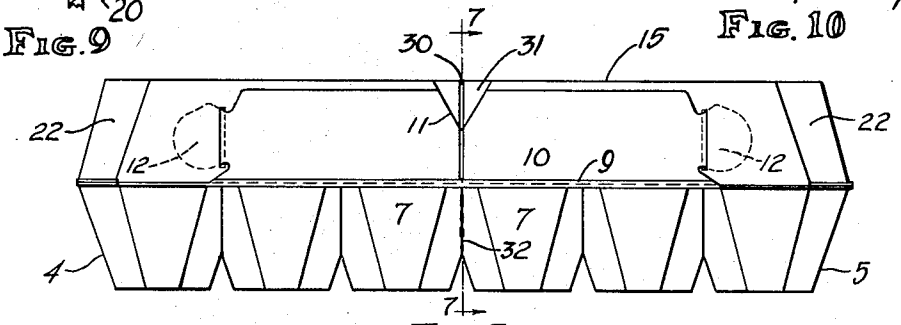


FIG. 5

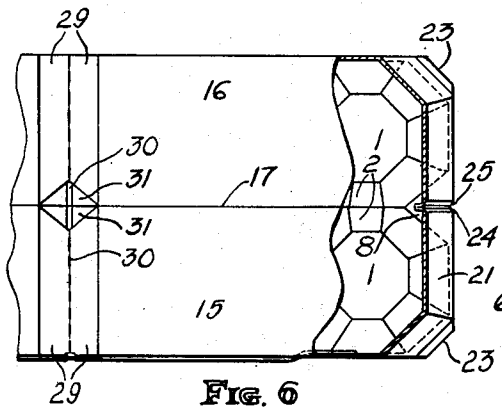


FIG. 6

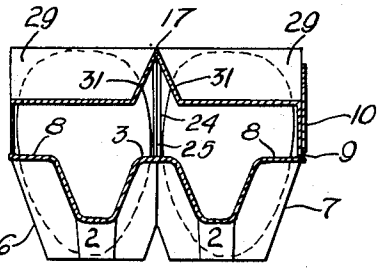


FIG. 7

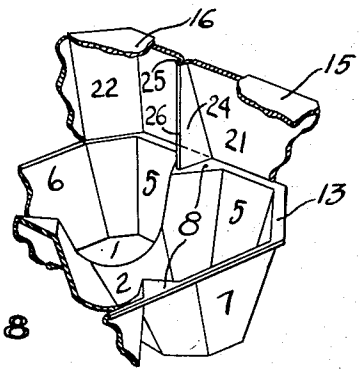


FIG. 8

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MOLDED PULP CARTON

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Application March 28, 1947, Serial No. 737,891

11 Claims. (Cl. 229—2.5)

1

This invention pertains to improvements in molded pulp cartons, in particular those which are used to package eggs.

An object of the invention is to provide a molded carton which is easily manufactured, being characterized by the outward angular divergence of the top and bottom section side walls, which permits the cartons to be readily removed from the molding dies and drying forms on which such cartons are made and nested for shipment, while affording increased egg receiving space internally of the carton as compared to previous cartons of this general type.

Another important object is that of providing a carton having the above advantages which will fit into a standard egg case, each carton occupying no more space in the case than would a conventional filler of identical egg capacity, enabling the cartons to be packed 30 dozen to a case.

Still another important object of the invention is to provide a carton which has great resistance to the vertical and lateral stresses to which egg cartons are subjected, by reason of the novel construction of the cover and bottom sections thereof.

Yet another object of the invention is the provision of a carton of the above character which is readily divisible into two article containing portions.

Another object of the invention is to provide a carton of the foregoing type having an effective lock whereby the carton sections may be held together in their closed position, the lock also functioning to strengthen the carton against rupture or undue flexure.

Another highly important object is to provide a carton which achieves the objects set out hereinabove and which additionally provides greater internal capacity in the cover section than in the bottom section, a factor of great importance in egg cartons inasmuch as the eggs are always disposed in the carton with the large end up.

The foregoing statements are indicative in a general way of the nature of the invention, but 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 device.

One embodiment of the invention is presented herein for purpose of exemplification, but it will be appreciated that the invention is susceptible of incorporation in other modified forms coming equally within the scope of the appended claims.

In the drawings,

Fig. 1 is a plan view of a carton embodying

2

the invention as it appears when removed from the drying form;

Fig. 2 is an end elevation showing a plurality of the cartons as they appear when nested;

Fig. 3 is a perspective view of the carton as it appears when the cover section is being folded over into covering relation to the bottom section;

Fig. 4 is an end elevation of the closed carton, illustrating particularly the coplanar position assumed by the top panels of the cover section and the substantially parallel, vertically extending relation assumed by the cover section side walls in the closed position of the sections;

Fig. 5 is a front elevation of the carton in closed condition;

Fig. 6 is a fragmentary plan view of one end of the closed carton shown in Fig. 5, the top being broken away to show the position taken by certain cover section wall gussets in the infolded condition thereof attending closing of the carton;

Fig. 7 is a cross-sectional view taken on the line 7—7 of Fig. 5 showing the one end of a carton portion after division of a carton into two portions less-than-dozen egg capacity;

Fig. 8 is a fragmentary perspective of the closed carton with parts broken away to further illustrate the position assumed by the cover section wall gussets in the closed position of the sections;

Fig. 9 is an enlarged fragmentary view in horizontal section, illustrating the reduced thickness construction of the fold lines defining certain gussets characterizing the carton; and

Fig. 10 is a fragmentary top perspective view illustrating a carton embodying the present invention in a slightly modified form.

The present invention pertains generally to a substantially flangeless, molded pulp carton which is of primary use as an egg container. It consists of a bottom section having walls extending angularly upwardly from a bottom which is divided into a plurality of cells, the bottom section being integrally hinged to a cover section which is foldable over into covering relation to the bottom section, the cover section being so formed that its walls are outwardly divergent in its open position (as it leaves the molding form) but extend substantially vertically in the closed position of said section. In the last named position the walls are supported on the upper wall margins of the bottom section whereby the cover is well supported against displacement under pressure. The cover affords greater article containing space than is provided in the bottom section, a matter of particular importance in egg cartons.

Referring to drawings, the reference numeral 1 indicates a bottom wall connecting panel which is traversed in both longitudinal and transverse directions by a plurality of angularly upwardly directed partition-forming panels 2. These merge at their apices to define two-walled partitions forming the sides of adjacent article receiving cells. Panels 2 also merge with the sides of hollow cell separating pyramids 3, and certain of the panels 2, adjacent the bottom section walls, turn upwardly to merge with such walls. Numerals 4 and 5 indicate the opposed bottom section walls and numerals 6 and 7 indicate, respectively, the opposed bottom section, rear, and front side walls. The cells defined by the aforementioned elements are each of a size appropriate to contain an egg positioned therein with its small end down. Horizontal cell-connecting ledges or shoulders 8 are formed laterally of the upper wall margins of the bottom section, extending inwardly of the walls thereof between each adjacent cell.

A locking flange 10 is formed as an integral extension of bottom section front wall 7, and is bendable with respect to such front wall along a line of bend indicated by numeral 9. Flange 10 has a downwardly directed V-shaped notch 11 formed therein which traverses a substantial portion of the width of such flange. At opposed ends of flange 10 are locking tongues 12 which are insertable into certain openings of the cover section to lock the sections in closed relation.

Horizontal corner flanges 13 are located on the upper margin of the bottom section, between the sides and ends thereof. These extend outwardly of the section perimeter at the corners thereof, but still lie within the outlines defined by the wall margins if the same were extended to meet at right angles.

The bottom section is hinged to a cover section, hereinafter described, along a hinge or fold line 14. As shown, the cover section is formed of planar parts throughout. It comprises a two-part top, including similar front and rear panels 15, 16, respectively, integrally connected to one another along a line of bend 17. As particularly shown in Fig. 2, panels 15, 16 are in non-coplanar relation to each other in the open position of the sections. A planar front side wall 18, a similar rear side wall 19, and opposed end walls 20, 21 are integrally connected to and depend from the top panels 15, 16. End walls 20, 21 are preferably molded at an angle of greater than 90° with respect to panels 15, 16 (see Figs. 5 and 6), while front and rear side walls 18, 19 are molded at about a 90° angle to panels 15, 16, as illustrated in Fig. 2. End walls 20, 21 are joined to front and rear side walls 18, 19 by angularly extending corner panels, each of which is indicated by numeral 22. Along their free margins corner panels 22 have integral, outwardly extending corner flanges 23 similar to bottom section flanges 13 and abutting the latter in the closed position of the sections.

Referring particularly to Figs. 2 and 3, the end walls 20, 21 have triangular, inwardly bendable gussets formed therein, each comprising two triangles 24, 25 connected to one another along a central line of fold 26 and to the respective end walls along fold lines 27 and 28. The apices of triangles 24, 25 meet at the line of bend 17 between the top panels 15, 16. These gusset portions 24, 25 lie coplanar with the end walls in the molding die but are collapsible inwardly of the end walls in the use of the carton, as hereinafter described in greater detail.

Cover section top panels 15, 16 are traversed in major part by traversely extending, angular indentations comprising the angularly directed panels 29 which meet along a weakened score line 30, thus forming a V-shaped recess which extends inwardly of the carton top section from the opposed top section side walls 18, 19. As shown in Fig. 5, the indentation is of the same angularity as notch 11 in the externally bendable locking flange 10 and coincides with said notch in the closed position of the sections. Adjacent their inner ends the indentations formed by panels 29 merge with the angularly upstanding inverted triangular webs 31 which extend upwardly, as particularly shown in Fig. 7, to the full height of panels 15, 16, their bases merging with bend line 17. Score line 30 medially traverses webs 31 as well as the top section, front, and rear side walls 18, 19.

As shown in Figs. 1, 3 and 5, the entire bottom section is also traversed by a weakened score line 32 which extends from the apex of notch 11 across locking flange 10, medially across the middle cover supporting shoulders 8, through the apices of adjoining partition forming panels 2 and medially of an article separating pyramid 3. It will be noted that score lines 30, 32 are in vertical alignment, thus defining a vertical plane along which the carton may be divided into two portions.

As particularly shown in Fig. 3, cover section front wall 18 has a pair of spaced, vertically extending openings 33 formed therein, such openings being in vertical alignment with spaces between adjacent article receiving cells. Said openings 33 are adapted to receive and frictionally hold locking tabs 12 on the flange 10 when the carton sections are closed, to lock the carton and retain locking flange 10 in secure surface abutment with front cover section wall 18.

The cartons forming the invention are moldable in conventional manner. When removed from the drying forms each has the shape of those cartons shown in Figs. 1 and 2, the side walls 18, 19 assuming the position of angular divergence clearly shown in Fig. 2. Side walls 20, 21 are formed in angular divergence from their wall connecting panels as also are bottom section walls 4, 5, 6 and 7 and other upraised portions such as partition panels 2. In consequence of this angularity of all upraised portions, the cartons art easily removed from the dies and drying forms. The angularity of upraised parts also permits nesting of a number of cartons into an easily handled stack and easy unnesting of individual cartons from the stack for use.

When the cover section is folded over the bottom section along hinge line 14, as shown in Fig. 3, a slight pressure on front and rear walls 18, 19 causes the gusset formed by triangles 24, 25 to fold inwardly of the cover section, triangles 24, 25 folding with respect to each other along fold line 26 and with respect to cover section end walls 20, 21 along fold lines 27, 28. At the same time top panels 15, 16 are bent with respect to each other from the divergent, non-coplanar position shown in Fig. 2 to the substantially coplanar position shown in Fig. 4, and front and rear cover section walls 18, 19 assume positions substantially vertical to the upper margins of bottom section walls 6, 7.

As shown in Figs. 6 and 8, when the cover section is folded over into complete covering relation to the bottom section, as shown in Fig. 4, triangles 24, 25 are in face-to-face contacting relation, with their bases supported upon a shoul-

der 8 at the end of the bottom section. Where, as shown on the drawings, the width of top panels 15, 16 corresponds to the width of the bottom section wall margins, cover section walls 18, 19 assume a substantially parallel relation with the free edges of front side wall 18 resting upon other shoulders 8 adjacent the upper margin of bottom section front wall 7. In closed condition of the cartons the cover section affords augmented space for the large ends of the eggs projecting thereinto, as compared to conventional cartons having covers characterized by sloping walls. It will be noted that in the closed position of the sections the outwardly directed corner flanges 13 and 23 of the bottom and cover section, respectively, meet in abutment.

When front and rear side walls 18, 19 are in the position noted above, locking flange 10 may be bent over from the outwardly directed angular position shown in Figs. 2 and 3 along line of bend 9 into exterior surface abutment with cover section side wall 18, as shown in Fig. 4, and end hooks 12 may be inserted into openings 33, thereby locking the sections together.

The abutting relation between the free edges of triangles 24, 25 and shoulders 8, supplemented by the support given by the abutment of the free edges of cover section front wall 18 with other shoulders 8, and the abutment of corner flanges 13, 23 with one another, gives excellent support to the cover section against vertical pressures. When locking flange 10 is positioned against and affixed to cover section wall 18 additional resistance to vertical pressures is afforded. The locking flange in its vertical position strengthens the sections against lateral pressures and prevents any tendency of the cover to telescope over the bottom section.

It will be noted that the planar form of the cover section top panels and walls, and the similar form of the locking flange, provide an excellent surface for application thereto of printing, such as a design, advertising matter, etc.

The carton may be easily divided by firmly grasping one end comprising half the carton and by applying pressure in a direction away from the juncture of triangular webs 31 and fold line 17. Upon such manipulation, initial rupture usually occurs at the juncture of weakened score line 30 and fold line 17, and complete severance will occur along weakened score lines 30, 32. As shown in Fig. 7, each severed portion will then have one cover section indentation wall 29 and one bottom section partition wall 2 as egg retaining ends.

In order to facilitate inward disposition of the end gussets defined by triangles 24, 25, it is highly desirable in all embodiments that the gusset fold or bend lines 26, 27, 28 be weakened somewhat. To this end said lines are molded in a lessened thickness, as illustrated in Fig. 9, by a procedure well understood by those skilled in the art. This enables the gussets to be collapsed inwardly by a slight finger pressure coincident with the swinging of the cover section into closing relation to the bottom section and eggs disposed therein.

In Fig. 10 I illustrate a slightly modified application of the invention to a carton, by which some saving in pulp material is possible. The advantageous features discussed above are retained. In the form of Fig. 10, it will be observed that the end gusset is relatively open, the gusset members 24, 25 being spaced and at a substantial angle to one another, rather than in the

side-by-side contacting relation illustrated in Figs. 1 to 8. A tripod-like support for the cover end wall results, which rests on the subjacent shoulder or ledge 8 and contributes to a very strong and crush resistant cover indeed.

I have disclosed a specific cover construction enabling successful molding of the carton in a conventional die, yet affording increased egg space and a very strongly braced construction in operative condition, characterized by a laterally collapsible, integral gusset feature. It will be evident to those skilled in the art that the foregoing advantages may be attained by modifications of structure well within the novel principles of construction herein involved. Accordingly, I do not wish to be restricted to the exact form or relation of parts shown except as limited by the scope of the appended claims.

I claim:

1. A molded pulp carton comprising a bottom section having upstanding walls, the space between the walls being divided into a plurality of article receiving cells, a cover-section comprising a top of an overall width corresponding to that of the bottom section, said top having pairs of opposed side and end walls attached thereto and being traversed by a bend line between opposite margins thereof, at least two of said walls being in non-parallel relation in the unclosed position of the cover, said top being bendable along said bend line to shift said two walls toward parallel relation in the closed position of the cover.

2. A molded pulp carton comprising hingedly connected bottom and cover sections, one thereof comprising plural, normally non-coplanar panels bendably joined together and having a pair of walls extending divergently from the sides thereof in the inoperative position of said section, said panels being bendable toward a coplanar relation to shift said pair of walls toward a less divergent relation in the operative position of the cover section.

3. A molded cellular carton comprising a bottom section divided into a plurality of article receiving cells and having angularly upstanding side and end walls, a cover section integrally hinged to the bottom section, including a top having two panels integrally and bendably connected to one another and normally disposed in angular, non-coplanar relation to one another in the open position of the cover, opposed side walls laterally connected to said panels and outwardly divergent in the open position of the sections, and opposed end walls connected to the ends of the panels, said end walls being so constructed and arranged as to permit bending of said panels along the bendable connection thereof toward coplanar relation in the closed position of the sections, thereby bringing the side walls into a less divergent relation to form a cover of substantially rectangular cross section.

4. In a molded pulp container, a bottom section having upstanding walls and ledges formed adjacent the upper wall margins, and a cover section integrally hinged to the bottom section and comprising a multiple panel top having pairs of planar side and end walls dependent therefrom, the panels of said top normally being in angularly divergent, non-coplanar relation to each other and said side and end walls being in angularly divergent relation to each other in the open position of said cover section, the panels forming the top being bendable to-

ward coplanar relation to shift the walls of one of said pairs into less angular relation in operative condition of the cover section, the free edges of the cover section walls abutting the bottom section ledges in closed position of the sections.

5. In a molded carton, a bottom section, a cover section hinged to and foldable over the bottom section, one of said sections comprising a generally planar multi-panel top having pairs of opposed side and end walls extending therefrom in outwardly divergent relation in the open position of the sections, which walls engage marginal portions of the bottom section in the closed position of the sections, and flexible gussets in two of said opposed walls which are foldable to permit the other two opposed walls to assume greater verticality in the closed than in the open position of the sections.

6. A molded pulp carton comprising a bottom section having upstanding walls and article containing cells formed within the walls, there being supporting shoulders formed adjacent the wall margin between certain adjacent cells, a cover section having integrally connected, outwardly divergent side and end walls in the open position of the former, the end walls having gussets formed therein which are foldable internally of the cover section to permit the side walls to assume positions of less divergence in the closed than in the open position of the sections, said gussets abutting said supporting shoulders in the closed position of the sections to give support to the cover section against vertical pressures.

7. A molded pulp carton comprising a bottom section divided by upstanding partitions into a plurality of article receiving cells, a cover section integral with said bottom section and foldable thereover into covering relation, said cover section comprising a top panel having side walls dependent therefrom in outwardly divergent relation in the open position of the cover and in such position having a width across the lower edges of the walls greater than the width across the upper edges of the bottom section, and end walls integrally connected to said panel and side walls, portions of said cover section being bendably connected to bring said side walls into abutment with the upper edges of the bottom section in the closed condition of the carton.

8. A molded pulp carton comprising a bottom section divided by upstanding partitions into a plurality of article receiving cells, a cover section integral with said bottom section and foldable thereover into covering relation, said cover section having a top wall connecting portion having side and end walls laterally attached thereto, said walls being in outwardly divergent relation in the open position of the cover and in such position having a peripheral dimension along the lower edges of the walls greater than the peripheral dimension of the upper edges of the bottom section, portions of said cover section being bendably connected to bring said walls into abutment with the upper edges of the bottom section in the closed position of the sections, in such position said cover section having a peripheral dimension along the lower edges of the walls corresponding to the peripheral dimension of the upper edges of the bottom section.

9. A molded pulp container, comprising a bottom section having ledges adjacent two opposite walls, a cover section having opposed downwardly extending walls, and two in-fold sections formed in each of two opposite walls thereof, said in-fold sections having a common fold line and being positioned above said ledges.

10. A molded pulp carton, comprising a bottom having rows of egg-receiving cells, a cover formed of two sections flexibly joined longitudinally, each of said sections being divided by a transverse depression positioned between adjacent rows of cells in said bottom, which depression terminates short of the junction of said sections.

11. A molded pulp carton, comprising a bottom section having rows of egg-receiving cells, a cover formed of two sections flexibly joined longitudinally between adjacent rows of cells in said bottom, each of said sections being divided by a transverse depression positioned between adjacent rows of cells in said bottom, which depression terminates short of the junction of said sections, downwardly extending front, rear and end walls on said cover, and in-folded gussets in said end walls extending adjacent the junction of said sections.

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