April 11, 1967 W. GEISLER 3,313,465

CARTONS HAVING MOLDED PULP END WALLS

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Fig. 1.

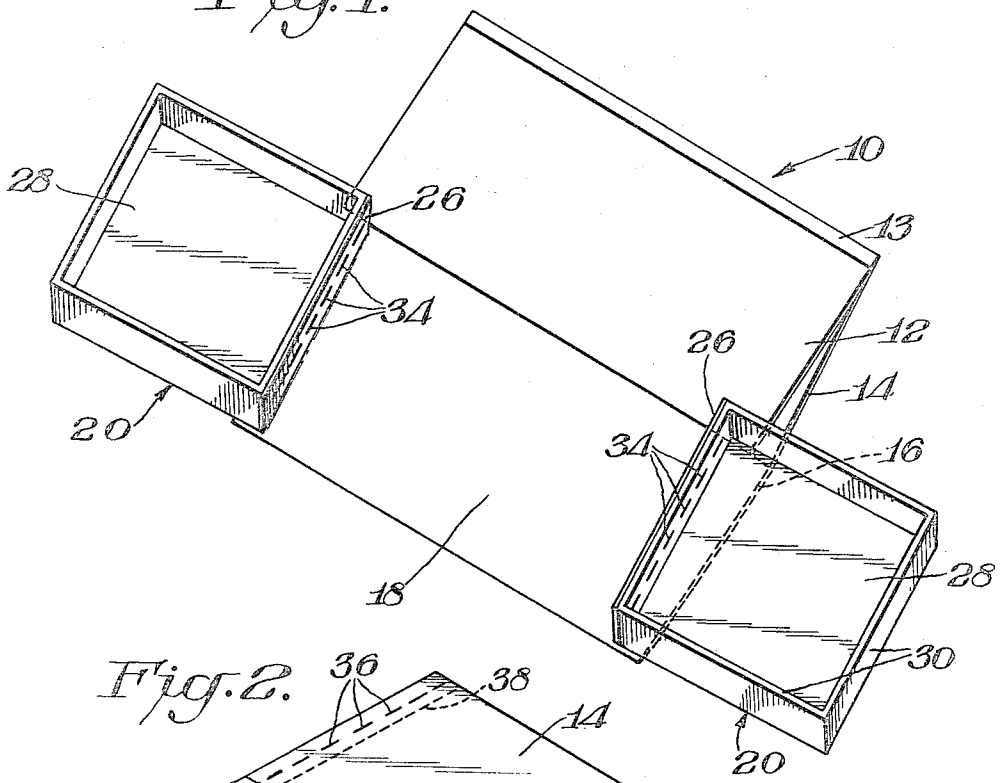


Fig. 2.

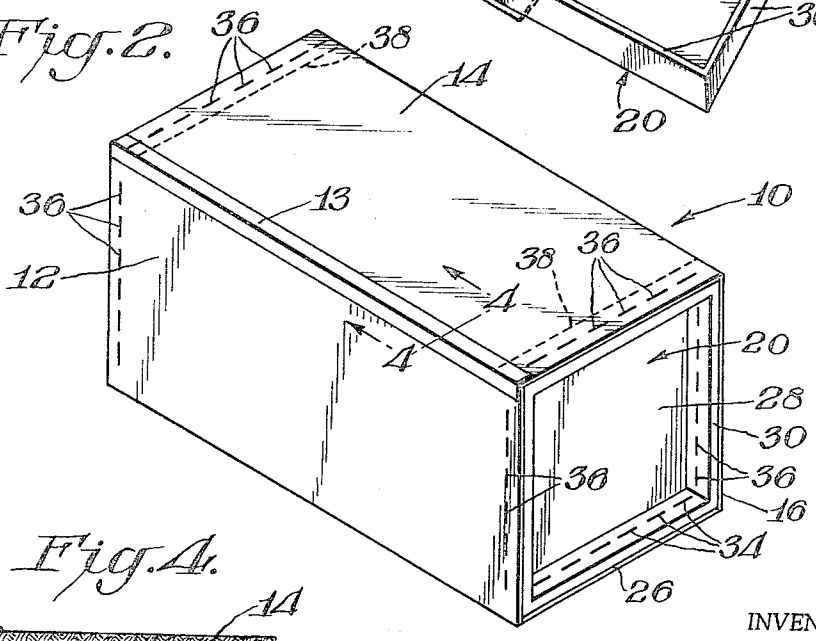
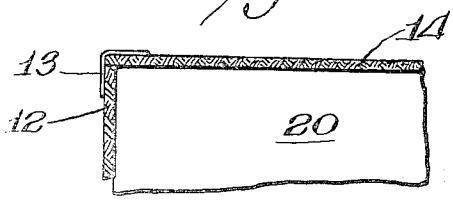


Fig. 4.



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Fig. 5.

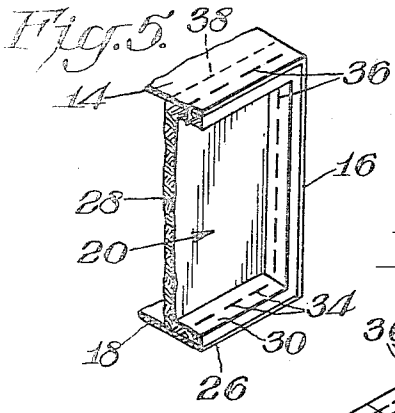


Fig. 3.

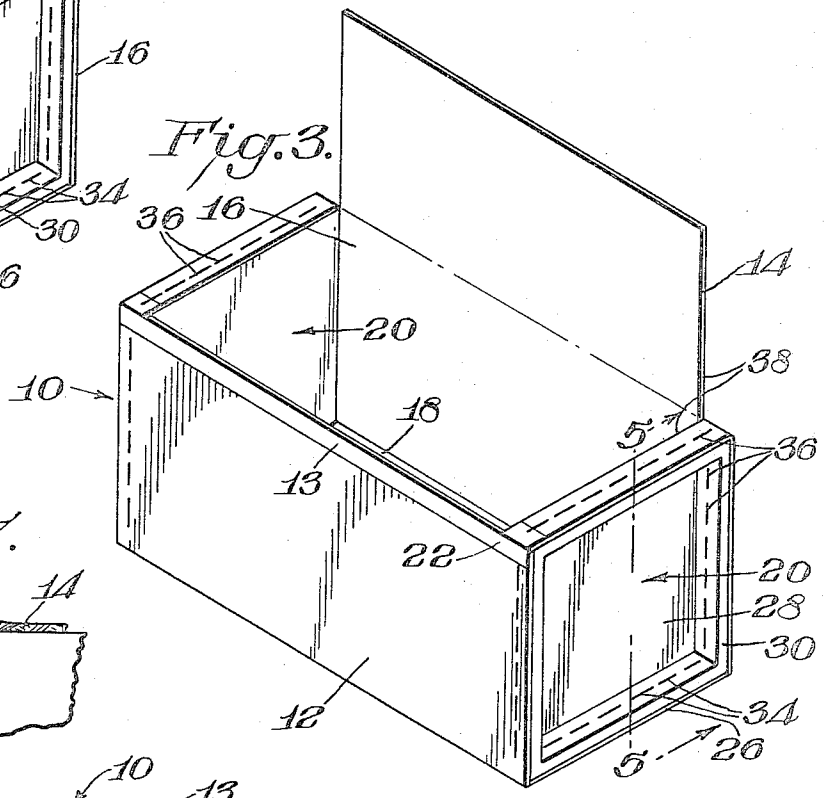


Fig. 7.

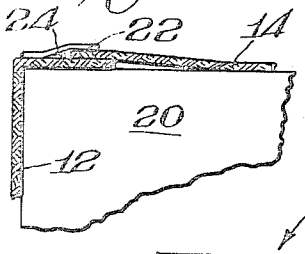
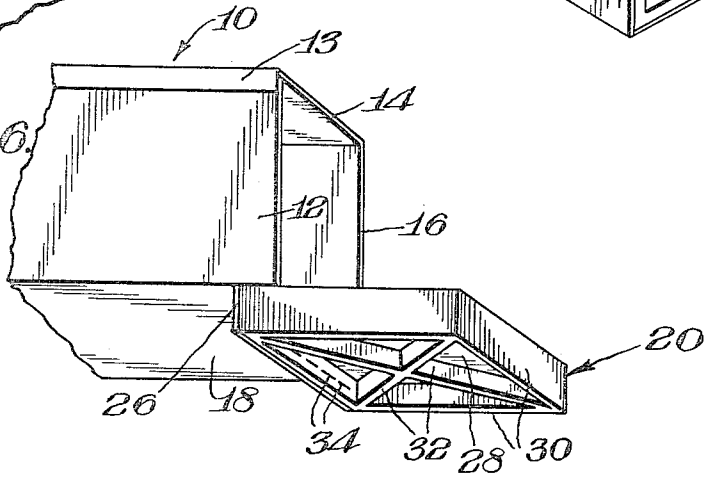


Fig. 6.



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CARTONS HAVING MOLDED PULP END WALLS

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This invention relates to containers, and more particularly to shipping cartons having molded pulp end walls.

Prior to the present invention, shipping cartons of corrugated cardboard, fiberboard or other known materials for packing various articles such as citrus fruit and the like were subject to several disadvantages. For instance, known cartons consisting of several integral overlapping end flaps require excessive material, and this is particularly so with corrugated cardboard where it is necessary to overlap the board in two or more directions to obtain the desired rigidity of the end walls. The cost of this additional material to obtain the desired strength is substantial when it is considered that cartons or containers of this general variety are used only once. Furthermore, in cartons or containers of non-rectangular cross-sectional configuration, the problem of folding the end flaps without using excessive material is multiplied as the number of sides is increased. Finally, the usual end wall construction material has poor wet strength. As a consequence, accidental wetting e.g. by warehouse flooding, may cause a filled carton toward the bottom of stack to partially collapse and damage its contents.

Accordingly, it is an object of the present invention to provide a container having molded pulp end walls which obviates the above problems.

Another object of the present invention is to provide a shipping carton of corrugated cardboard or fiberboard sides and molded pulp end walls which may be folded flat for storage and opened to a normal container position for filling.

Another object of the present invention is to provide a shipping container which may be loaded from one or both ends and then permanently closed, and which further has a side opening feature for later easily removing the contents from the carton.

Novel features and advantages of the present invention will become apparent to one skilled in the art from a reading of the following description in conjunction with the accompanying drawings wherein similar reference characters refer to similar parts, and in which:

FIG. 1 is a perspective view of the container of this invention in the collapsed position with the ends folded outwardly;

FIG. 2 is a perspective view of the container of this invention in the expanded position with the ends folded closed;

FIG. 3 is a view similar to FIG. 2 with one side wall opened for easy access to empty the carton;

FIG. 4 is a fragmentary sectional view on line 4—4 of FIG. 2 showing an arrangement for sealing or joining two of the side walls of such a carton;

FIG. 5 is a fragmentary sectional view on line 5—5 of FIG. 3 showing the manner in which the molded pulp end walls are secured to the side walls;

FIG. 6 is a fragmentary perspective view of a carton in the expanded position with an end wall open for loading, and wherein the end wall is of a modified configuration; and

FIG. 7 is a fragmentary sectional view similar to FIG. 4 showing a modified arrangement for providing side opening of a carton.

Referring to the drawings, a six-sided container **10** of generally rectangular configurations is illustrated. This

comprises four flat, generally rectangular side walls **12**, **14**, **16** and **18** and two end walls generally designated **20**. Each of the four side walls may be formed of corrugated cardboard, fiberboard, masonite, light wood or any other suitable material having the proper qualities for the purposes to which the container will be put. The opposite edges of each side are flexibly joined to form a tubular structure which, as shown in FIG. 1, may be collapsed to a generally flat plane for shipping and storage purposes. For instance, if the side walls are composed of cardboard or fiberboard, the flexible joints therebetween may be provided in known manner by longitudinal creases.

In such a construction, the final joint between the side walls **12** and **14** may be formed as illustrated in detail in FIG. 4. The top wall **14** butt overlaps the upper edge of the front wall **12**, and is taped thereto as at **13**.

A modified joint is illustrated in FIG. 7 wherein the top edge of the wall **12** is folded toward and into the plane of the top wall **14**. The wall **14** overlaps the folded edge of the wall **12** and is secured thereto by suitable fastening means such as a strip of adhesive tape **22**. Such a joint may further include a rip or tear cord **24** in a known arrangement whereby the cord may be pulled to tear the tape and break the joint between the walls. These arrangements, as noted below, provide side access to the container for unloading purposes.

From FIG. 1, it will be noted that the bottom wall **18** is scored and folded outwardly near each end, at **26** to form a flap. The folded outer portion **26** is utilized to permanently secure the end walls **20** thereto so that they may be swung into the same general plane as the collapsed walls for storage purposes or into a plane generally normal to the side walls for end closing purposes.

The end wall members **20** are formed as essentially flat polygons shaped to fit telescopically within the ends of the tubular structure formed by the four side walls. As such, each end wall **20** comprises a flat web portion **28** having a substantially thickened wall portion or flange **30** around its periphery. As a result of the pulp molding process for manufacturing these end members, the peripheral walls flare slightly to a wider dimension as their distance from the flat web portion **28** increases. The flanged wall portion **30** is of substantial depth to afford a rigid structure which not only holds the carton side walls in their expanded configuration, but serves to provide a container having the end wall strength necessary for stacking a number of such filled containers on top of one another without the bottom ones being crushed.

Referring to FIG. 6, a modified shape of end wall is shown which includes diagonal cross ribs **32** within the peripheral flange portions **30** to afford additional strength against collapsing during rough handling. It will be realized, of course, that many other shapes may be utilized within the precepts of this invention depending upon the overall shape of the carton and the use to which it will be put.

The end walls **20** of whatever configuration are formed of heavy duty molded pulp material according to known manufacturing processes. It will be appreicated that different compositions of material may be utilized for different purposes. For instance, a mixture of virgin kraft and groundwood pulp together with a substantial proportion by weight of at least one moisture and strength imparting agent would be appropriate. For citrus fruits in humid climates, a typical specific composition for the end wall members is 48% virgin kraft, 32% groundwood and 20% asphalt, a composition having high wet, tear, compression and tensile strengths. The percentage of asphalt or other moisture retarding ingredients may be varied to obtain an essentially water-resistant end member for ship-

ping cartons which will resist collapsing under adverse moisture conditions.

In use, the above described carton is shipped and stored flat as shown in FIG. 1. The end walls **20** of each carton are fastened by means such as staples **34** to the folded-back end portions **26** of the side wall **18**. For loading, the side walls **12**, **14** and **16** are folded into their open position, as shown in FIG. 6, with the end walls **20** still swung outwardly. The carton may then be loaded from one or both ends, whereupon the molded pulp ends or end are swung inwardly to the telescoped position within the side walls. As shown in FIG. 2, the end walls are secured to the remaining three side walls by means of a conventional stitching operation utilizing staples **36** or other fastening means. Intermittent perforations **38** may be provided across the wall **14** cutting through the tape near the ends leaving the end portions of the top wall attached to the flange **30** of the end members when the carton is opened. This provides a filled, six-sided carton tightly closed and having end walls of extreme rigidity and a provision for side wall opening for easy unloading.

Thus a shipping carton having molded pulp end walls has been disclosed which utilizes less material than standard containers of similar size and which is of increased strength. Furthermore, it will be apparent that the disclosed structure provides ready hand grips for manually transporting the cartons no matter which side is up. Additionally, the molded pulp end walls, which may occupy the position of two side walls or of top and bottom walls, depending upon the orientation of the carton in use, may be formed originally with ventilation openings if desired, or with horizontal ridges on the inner side to receive trays of crushable type products or the like, or with pockets or dividers to regulate the position of large articles within the carton. Finally, it will be clear that containers according to this invention may be constructed with a number of sides greater than four, and the non-rectangular ends closed by appropriately designed polygonal end members of heavy duty molded pulp.

While the above described embodiment constitutes the preferred mode of practicing this invention, other embodiments and equivalents may be resorted to within the scope of the actual invention, which is claimed as follows.

What is claimed is:

1. A lightweight container comprising plural generally rectangular side walls flexibly joined at their edges to form a tubular structure collapsible to assume a generally flat configuration for storage purposes or expansible to assume an open configuration of polygonal cross-section for container purposes, a pair of similar end wall members of heavy duty molded pulp material, the end wall members being detachable from the side walls so

that they may be made of a material different from the side walls, each being shaped to fit telescopically within the open tubular structure for closing the ends thereof, one edge of each end wall member being flexibly attached to a flap on an end of one of the rectangular side walls to swing into the same general plane as the collapsed side walls for storage purposes or into a plane generally normal to the expanded side walls for end closing purposes, each end wall member having flange means at its periphery to afford adequate molded pulp material for fastening with the ends of the remaining rectangular side walls, said flange means flaring outwardly, and intermittent perforations being on at least one of the rectangular side walls for providing side access to the container for emptying the contents thereof.

2. A lightweight container as set forth in claim **1** including contoured portions on each end wall member which extend as ribs across the member within the peripheral flange means to increase the strength of the container.

3. A lightweight container as set forth in claim **2** wherein there are four generally rectangular side walls, and the pair of end wall members each comprise a four-sided polygonal shape.

4. A lightweight container as set forth in claim **2** wherein the molded pulp end wall members are formed of a composition including a mixture of virgin kraft and groundwood pulp together with a substantial proportion by weight of at least one moisture retarding and strength imparting agent.

5. A lightweight container as set forth in claim **4** wherein the rectangular side walls are made from a different material than the end wall members.

References Cited by the Examiner

UNITED STATES PATENTS

423,833	3/1890	Stivenson	220—72
1,595,356	8/1926	Moseman	229—51
2,215,348	9/1940	Cowan	229—51
2,469,497	5/1949	Conway	229—6
2,551,090	5/1951	Bergstein	220—41
2,787,397	4/1957	Radford	220—72
2,885,135	5/1959	Friday	229—2.5

FOREIGN PATENTS

80,424	4/1920	Austria.

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