An end opening, end loading container of three-piece construction has strengthened side and end walls, thereby providing improved stacking strength while using a minimum amount of material.

4 Claims, 4 Drawing Figures
END OPENING CONTAINER WITH IMPROVED STACKING STRENGTH

BACKGROUND OF THE INVENTION

In recent years there has been a substantial shift in the type of corrugated containers used in packaging from the conventional top opening containers to end opening, end loading containers. Conventional top opening containers are shipped by the manufacturer in the form of flattened tubes. In use, the tube is squared up, bottom flaps folded and sealed, contents inserted and top flaps folded and sealed to complete the package.

If the nature of the contents is such that the container itself must have high vertical stacking strength, a separate collar may be inserted into the tubular container prior to insertion of the contents. As an alternative, flattened tubular containers are available in which a vertical collar has been adhered within the container during manufacture.

End opening containers are shipped in the form of flat blanks which are formed into containers in the user’s plant on automatic equipment. The formed container is open at one end and contents are normally pushed into it horizontally, also by automatic equipment. In addition to the advantages of automatic equipment, an end opening container usually requires substantially less material than a top opening container.

Despite the aforementioned advantages, end opening, end loading containers have not been adaptable to packaging of heavy products, such as bulk prunes, raisins or the like, which themselves do not contribute materially to the stacking strength of the completed package. Unfortunately, insertion of a loose collar into an end opening container is very awkward and time consuming. Further, applicant is unaware of any commercial method whereby a collar may be attached to an end opening blank from which a container may be formed with an integral collar. Thus, when such products have been packaged in end opening containers and the containers have been palletized in relatively high stacks, crushing of the containers has resulted from the weight of the product combined with the low vertical stacking strength of the containers, the only recourse being to make the entire blank of costly, high strength material.

PRIOR ART

Top opening containers with improved stacking strength are disclosed in U.S. Pat. Nos. 3,275,217, No. 3,190,533, No. 3,063,615 and No. 2,710,134. Top opening three-piece containers are also well known in the art, as exemplified by U.S. Pat. Nos. 2,022,191, No. 1,697,709 and 1,627,311. Further, top opening three-piece containers with increased stacking strength in two vertical walls are disclosed in U.S. Pat. No. 3,197,108 and No. 3,434,648. None of these patents disclose an end opening, end loading container with high stacking strength.

SUMMARY OF THE INVENTION

It is an object of the invention to overcome the briefly described shortcomings of end opening, end loading corrugated containers by providing such a container with improved vertical stacking strength. In the preferred embodiment this is accomplished by forming the container from three individual parts, a primary blank and two similar secondary blanks.

The primary blank comprises top and bottom panels, a back panel and front closure flaps. It is also provided with side closure tabs attached to the top, bottom and back panels. Each secondary blank comprises a side panel and front and back portions, and each such secondary blank is formed of high stacking strength material, preferably a double layer of corrugated paperboard.

When the secondary blanks are combined with the primary blank by attachment of the aforementioned tabs to the side panels of the secondary blanks, the front and back portions of said secondary blanks extend along the interior surfaces of the front and back walls of the container thereby providing high stacking strength to all vertical walls of the container.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects of the invention will become apparent from the following description and accompanying drawings wherein

FIG. 1 is a plan view of the inner surface of a primary blank used in formation of the container;
FIG. 2 is a plan view of a secondary blank used in formation of the container;
FIG. 3 is a perspective view showing the primary blank and the secondary blanks positioned for folding and sealing; and
FIG. 4 is a perspective view of the container in completed condition ready for insertion of contents.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

The container of this invention is constructed from a primary blank and two similar secondary blanks. The primary blank forms the top and bottom walls of the container as well as partially forming the back and front walls. Since high stacking strength is neither necessary or desirable in the top and bottom walls and since the major portion of the stacking strength required in the front and back walls is provided by the secondary blanks, the primary blank may be made of relatively lightweight material. The preferred material is conventional corrugated paperboard which is formed from a layer of corrugated medium with a layer of linerboard adhered to each surface thereof.

The secondary blanks which provide the container with high stacking strength should be made of material with higher compressive strength in a vertical direction, preferably double corrugated which is formed from two layers of corrugated medium with a layer of linerboard adhered theretofore and an additional layer of linerboard adhered to the exterior surface of each layer of corrugated medium. To obtain maximum vertical strength from this material, the corrugations in each layer of medium should run in a vertical direction in the completed container.

Referring now to FIG. 1, the primary blank comprises front flap 10, top panel 11, back panel 12, bottom panel 13 and front flap 14 hingedly connected in series along scorelines 15, 16, 17 and 18. Top tabs 20, back tabs 21 and bottom tabs 22 are hinged respectively to each side of the top, back and bottom panels along scorelines 23 and 24. A scoreline 25 in front flap 10 and a scoreline 26 in front flap 14 provide means to
assist in opening the container as will be described later herein.

In addition, a tear strip opener may be provided in the back panel of the blank if desired. This tear strip 27 comprises parallel cut lines 28 and 29 extending transversely across back panel 12 and back tabs 21, and tear tab 30 protruding slightly beyond the free edge of one of the tabs 21. Further diagonal cut lines 31, 32, 33, and 34 are provided in the back panel extending inwardly from the junctures of scorelines 16 and 17 with scorelines 23 and 24. These cut lines lie at an angle of about 45° to scorelines 16 and 17 and extend until they intersect one of the aforementioned transverse cut lines 28 and 29.

All of these previously mentioned cut lines are made on the interior surface of the blank and extend only for a limited depth into the panels, that is, through the interior linerboard of the corrugated paperboard and preferably partly through the corrugated medium.

Referring now to FIG. 2, a secondary blank for use in forming this container is depicted. As previously noted, the secondary blank is made of double corrugated with the corrugations arranged so that they run in a vertical direction in the completed container. Two secondary blanks are used in each container but, since they are similar in structure, only one will be described. The secondary blank comprises a side panel 40, with a front portion 41 and a back portion 42 hinged to the respective ends thereof along scorelines 43 and 44.

Back portion 42 of the secondary blank is dimensioned such that it is substantially equal in width to one half the width of back panel 12 of the primary blank, so that in the completed container the free ends of back portions 42, which lie along back panel 12, will substantially abut each other. Front portions 41 are similarly dimensioned with respect to front flaps 10 and 14 of the primary blank.

As has been previously mentioned, automatic machinery is available in the marketplace to form the primary blank and secondary blanks described above into a completed container. Since this machinery comprises no part of this invention, it will not be described in detail. Only a method which may be used will be described.

Referring now to FIG. 3, the three blanks required are shown in position for formation of the container. A pair of secondary blanks are held in position so that side panels 40 will form the sides of the container. Back portions 42 of the secondary blanks are folded inwardly until they make an angle of 90° with the respective side panels 40, and the respective free edges of said back portions are in substantial abutment. A suitable adhesive is then applied to the interior surfaces of front tabs 20, back tabs 21 and bottom tabs 22 of a primary blank and this blank in then positioned with the interior surface of its back panel 12 in face to face contact with the exterior surfaces of back portions 42.

A ram or pusher, represented schematically at 45, then moves leftwardly in FIG. 3 into contact with the interior surfaces of back portions 42 of the secondary blanks. Upon further movement of this ram, the combination of blanks is pushed through a forming member shown schematically at 46. In passing through the forming member, top panel 11 is folded downwardly and bottom panel 13 is folded upwardly along scorelines 16 and 17 respectively until these panels contact the top and bottom edges of side panel 40.

Simultaneously, tabs 20, 21 and 22 are folded inwardly along scorelines 23 and 24 into face to face contact with side panels 40. This contact is maintained for a sufficiently long period to permit the aforementioned adhesive to set.

The completed container, ready for insertion of contents is shown in FIG. 4. Conventionally, the contents of the container are then pushed horizontally into the open front of the container, front portions 41 of the secondary blanks are folded inwardly to a 90° angle and front flaps 10 and 14 are closed. Closure of these flaps may be maintained by adhesive, staples, tape or any other suitable means.

In the completed container, top panel 11 and bottom panel 13 of the primary blank form the top and bottom walls respectively of the container. The container side walls are formed from side panels 40 of the secondary blanks by attachment to tabs 20, 21 and 22. The back end wall of the container is formed from back panel 12 of the primary blank and back portions 42 of the secondary blanks while the container front end wall is formed from front flaps 10 and 14 of the primary blank and front portions 41 of the secondary blanks.

Thus it can be seen that this container provides users with the benefits of an end loading end opening container, to wit, a minimum use of packaging material and adaptability to automatic equipment, while also providing the heretofore unavailable advantage of high stacking strength. The top and bottom panels, where high stacking strength is unnecessary, may be formed of relatively lightweight, inexpensive material, while the relatively expensive, high stacking strength material is concentrated in the vertical side, front and back walls. Further, this high stacking strength material extends substantially entirely around the vertical walls, leaving no weak points.

Means are provided in the front wall of the closed and sealed container for ease of opening. In sealing front flaps 10 and 14 to underlying front portions 41, glue may be applied to said flaps only in the areas between scorelines 15 and 25 and between 18 and 26. Thus, when these flaps are sealed in closed position, the areas between scoreline 25 and the free edge of flap 10 and between scoreline 26 and the free edge of flap 14 are not adhered. Thus, fingers may be inserted in these areas and the entire flap may be expeditiously pulled free to open the front of the container, leaving only front portions 41 to be folded outwardly.

Additional opening means may be provided in the back wall of the container as hereinbefore mentioned. To operate this opening means, tear tab 30 in back tab 21 may be grasped and pulled outwardly, thus easily ripping away the entire length of tear strip 27, dividing back panel 12 into upper and lower segments. However, these segments of said back panel are still held firmly in position by the remaining portions of back tabs 21 which are sealed to side panels 40. In order to complete operation of this opening means, one need only grasp the free edges of the remaining back panel segments and pull outwardly. A minimal outward force will split these segments along diagonal cut lines 31, 32, 33, 34, opening the container and providing access to the contents.

Preferably, these containers are provided with opening features in both front and back walls. Not only does this permit easy access to the contents through either end but also, by opening both front and back the empty
container may be easily flattened for expeditious disposal.

What is claimed is:

1. A generally rectangular, end opening, end loading container having high stacking strength, constructed from a primary blank and a pair of secondary blanks,
said primary blank made of relatively lightweight material and comprising a top panel, a back panel, a bottom panel and front closure flaps all hingedly connected along parallel scorelines, and tabs hinged along scorelines to the sides of each of said panels,
each secondary blank made of relatively heavier material having high stacking strength and comprising a side panel and front and back portions hinged to the respective ends of said side panel along scorelines, each of said portions having a free end remote from such scoreline,
said container comprising top and bottom walls formed from the top and bottom panels of said primary blank,
side walls formed from the side panels of said secondary blanks by attachment to the tabs of said primary blank,
a back end wall formed from the back panel of said primary blank and the back portions of said secondary blanks,
a front end wall formed from the front closure flaps of said primary blank and the front portions of said secondary blanks,
whereby said side walls and said end walls comprise a vertical layer of high stacking strength material, and
opening means in an end wall of said container.

2. The container of claim 1 wherein the free ends of said back portions and the free ends of said front portions are respectively in substantial abutment and said layer of high stacking strength material extends substantially entirely around the vertical periphery of said container.

3. The container in claim 1 wherein opening means are provided in each of said end walls, one of said opening means comprising a transverse, removable tear strip and diagonal, limited depth cut lines in said back wall extending from the corners of said wall inwardly to said tear strip.

4. The container of claim 1 wherein the material of said primary blank is conventional corrugated paperboard and the material of said secondary blanks is double corrugated paperboard.

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