Aug. 18, 1959 H. F. DRNEC ET AL 2,900,123

HEAVY DUTY PAPERBOARD CONTAINER

Filed June 12, 1957 2 Sheets-Sheet 1

Fig. 1

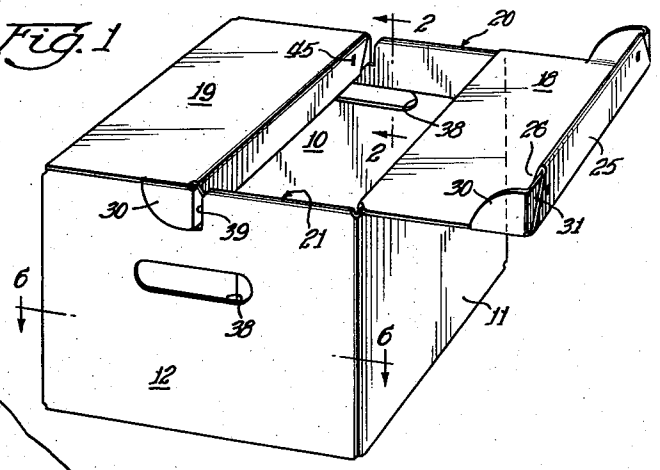


Fig. 3

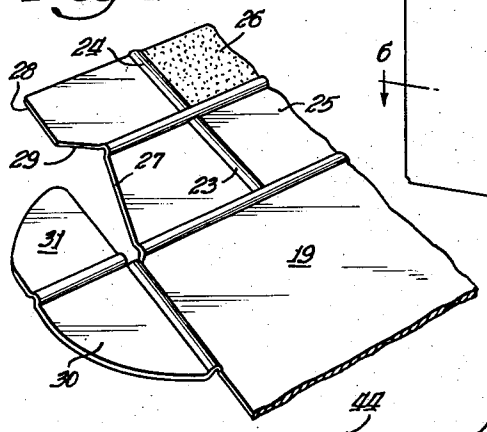


Fig. 2

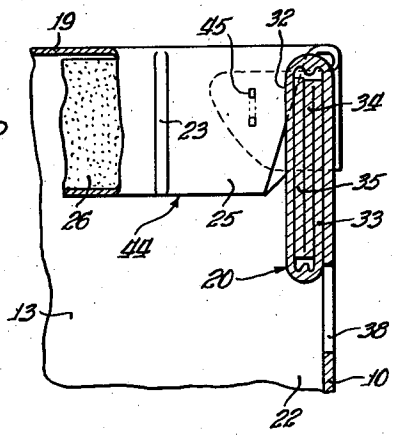


Fig. 4

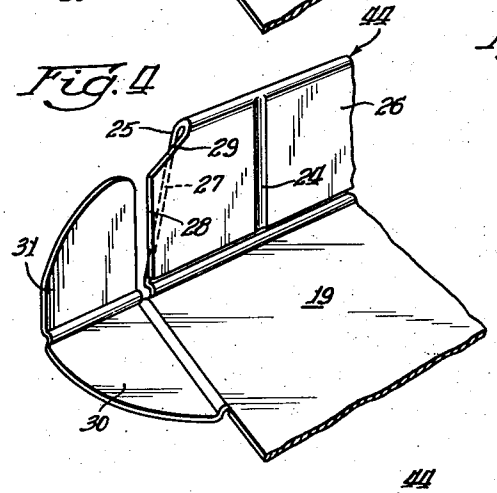
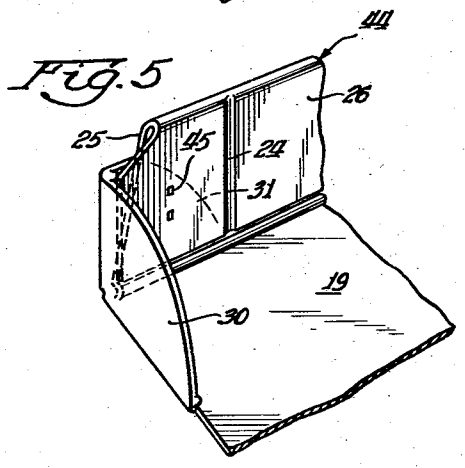


Fig. 5



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Fig. 8

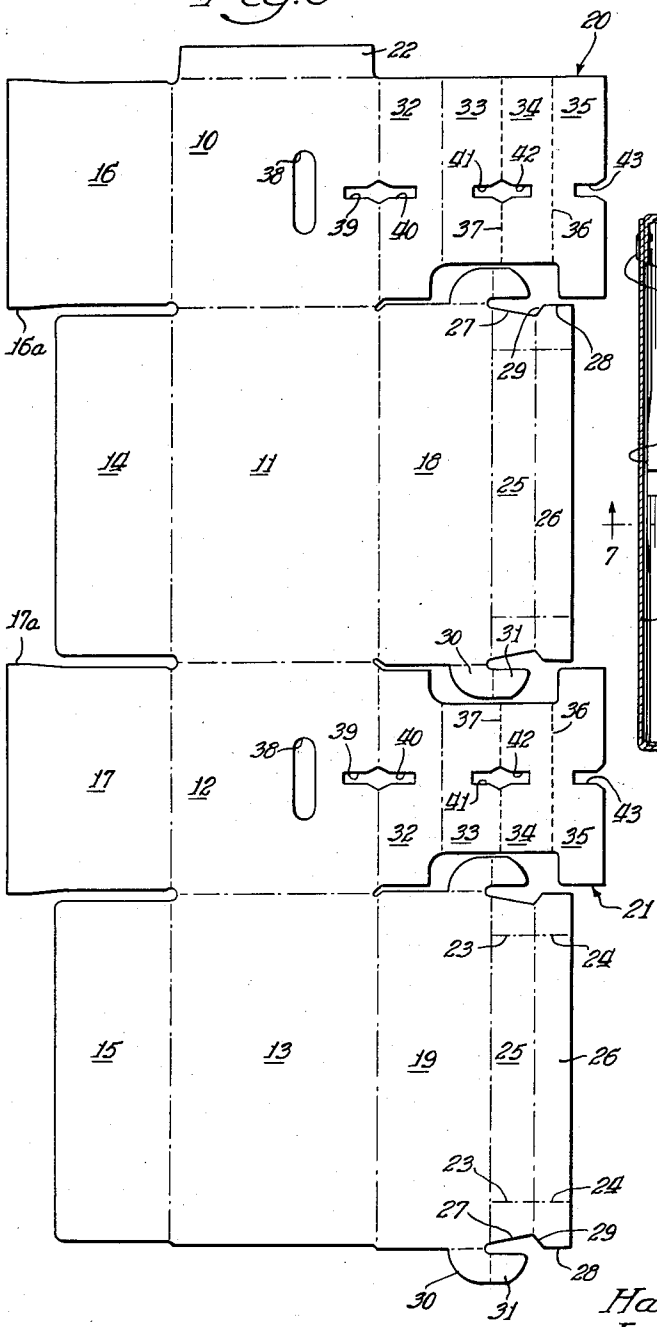


Fig. 6

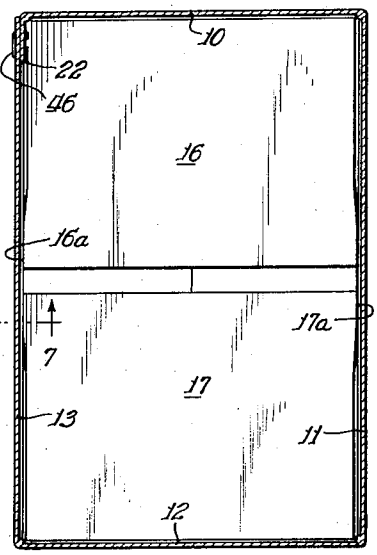
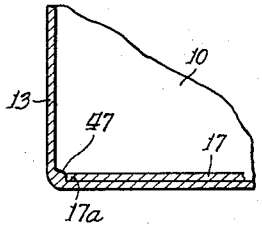


Fig. 7



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HEAVY DUTY PAPERBOARD CONTAINER

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Application June 12, 1957, Serial No. 665,154

5 Claims. (Cl. 229—45)

This invention relates to heavy duty paperboard containers for use in the handling and shipment of bottled beer and other beverages, and for analogous purposes.

Containers of the general type referred to, provided with protective cover members or panels, are well known and extensively used. They are formed from blanks cut from sheets of thick or heavy solid paperboard. The blanks are folded and set up by machinery and the containers are in a highly competitive field in which the cost of production is of primary importance. It is of importance that the cover panels be restrained against endwise displacement, when closed, and that the side and end walls of the body of the container be maintained in squared relation, with the end walls perpendicular to the side walls, during the folding and setting up operations, to enable accurate and high speed operation of the machines used for that purpose and assure accuracy in the containers produced. It is also important that waste of paperboard in cutting of the blanks be avoided, in the interests of low production costs, and that the end walls of the container be provided with hand holes, for convenience in handling, and with effectively reinforced handle portions above the hand holes.

Our invention is directed to a container of the character stated which preferably may be formed from a one piece blank and is provided with positioning tabs restraining the cover panels against endwise displacement and having associated holding tabs, which may be assembled with expedition and facility in folding the blank to container form. We also provide means whereby the side and end walls of the body of the container are squared up and maintained so during the final steps, including the securing together of the bottom closure flaps, of the folding and setting up operations, thereby assuring high speed production and accuracy of the completed containers. We further provide for cutting of the combined positioning and holding cover panel tabs from flaps foldable to provide reinforced handle portions above the hand holes in the end walls, thereby avoiding waste of material while assuring handle portions of adequate mechanical strength. Further objects and advantages of our invention will appear from the detail description.

In the drawings:

Figure 1 is a perspective view of a container embodying our invention, with one of the cover panels in full open position;

Figure 2 is a fragmentary sectional view, on an enlarged scale, taken substantially on line 2—2 of Figure 1, with the outer panel of the cover panel tuck flange partly broken away;

Figure 3 is a perspective fragmentary inner face view of one of the cover panels, including the tuck flange and the associated combined positioning and holding tabs, in extended condition;

Figure 4 is a view similar to Figure 3 but with the inner

panel of the tuck flange folded over onto and secured to the outer panel thereof and the holding tab positioned for insertion into the end portion of the tuck flange;

Figure 5 is a view similar to Figure 4, but with the holding tab inserted into the end portion of the tuck flange;

Figure 6 is a sectional view taken substantially on line 6—6 of Figure 1;

Figure 7 is a fragmentary sectional view, on an enlarged scale, taken substantially on line 7—7 of Figure 6; and

Figure 8 is an inner face view of the blank from which the container of Figure 1 is produced.

The container shown in Figure 1 is formed from the substantially rectangular blank shown in Figure 8, which is cut from comparatively heavy or thick solid paperboard. The blank is suitably cut and scored to provide a first end wall panel **10**, a first side wall panel **11**, a second end wall panel **12**, a second side wall panel **13**, outer bottom closure flaps **14** and **15** attached at their outer edges to the lower edges of the side wall panels **11** and **13**, respectively, along fold lines, inner bottom closure flaps **16** and **17** attached at their outer ends to the lower edges of the end wall panels **10** and **12**, respectively, along fold lines, cover panels **18** and **19** attached at their outer edges to the upper edges of the side wall panels **11** and **13**, respectively, along fold lines, and handle panels **20** and **21** attached at their lower edges to the upper edges of the end wall panels **10** and **12**, respectively, along fold lines. A relatively narrow attaching or securing flap **22** is attached along a fold line to the outer side edge of the first end wall panel **10** the width of which, exclusive of flap **22**, is less than the width of the second end wall panel **12** by an amount equal to the thickness of the paperboard, for a purpose to be described presently.

Each of the cover panels **18** and **19** is provided at its inner edge with a relatively narrow outer panel **25** attached thereto along a fold line and having attached to its lower edge, along a fold line, a panel **26** of somewhat less width than panel **25**. The ends of panel **25** are cut at an inclination downward and inward thereof, as at **27**, and the ends of panel **26** are, for the major portion of their width, perpendicular to the upper edge thereof, as at **28**, and are connected to the ends **27** of panel **25** by inclined edges **29**. An arcuate positioning tab **30** is attached to each end of each of the cover panels **18** and **19** along a fold line and adjacent the ends of panel **25**, and a folding tab **31**, also of generally arcuate shape at its outer edge is integrally attached to tab **30** along a fold line which is aligned with the fold line between panel **25** and its associated cover panel. Each of the handle flaps is provided with parallel transverse lines of scoring separating it into four parallel panels **32**, **33**, **34** and **35**. The score line **36** between panels **34** and **35** is a slit score line formed of a plurality of rather closely spaced slits extending completely through the paperboard, and the score line **37** between panels **33** and **34** is a cut score line formed by a continuous cut extending from the outer face of the blank and for the major portion of the thickness of the paperboard. All of the other score lines of the blank are die score lines impressed therein from the outer face thereof and, in view of the thickness of the paperboard may be of a width of approximately one-eighth of an inch. It will be noted that the intermediate panels **33** and **34** of the handle flap **21** are of less width than the end panels **32** and **35** thereof, providing material from which the combined positioning and holding tabs **30** and **31** at the adjacent ends of the cover flaps **18** and **19** is cut, it also being noted that panels **33** and **34** of the handle flap **20** are of less width than the

panels 32 and 35, providing material from which the combined positioning and holding tabs 30 and 31 at the adjacent end of cover panel 18 is cut. The panels 25 and 26 of the cover panels 18 and 19 are provided, a short distance from each end thereof, with a transverse line of scoring 23 and 24, respectively, aligned with each other, such scoring being die scoring and indicated by dot and dash lines, as are the other die scores of the blank.

Each of the end wall panels 10 and 12 is provided, a short distance from the upper edge thereof, with a transverse hand hole 38 and each is further provided with a slot 39 extending from its upper edge and flared at its upper portion and opening into a similar slot 40 in the contiguous handle panel 32. The handle panels 33 and 34 are provided with slots 41 and 42, respectively, opening into each other and flared at their adjoining ends and the handle panel 35 is provided with a slot 43 extending from its outer edge—its lower edge in the completed handle portion of the container—similar to slot 39 in the end wall panel. In cutting the blank of Figure 8 suitable clearance or easement is provided between the panels for convenience in folding of the blank into container form, as is known. The folding of the blank into container form is performed by high speed machinery, as above noted. In the folding operations the panels of the handle flaps 20 and 21, after having their inner faces coated with a suitable adhesive, are folded into handle form, panel 34 being folded inward onto panel 33 and panel 35 being folded outward onto the outer face of panel 34, after which the panels 33, 34 and 35 are folded over together onto the inner face of the corresponding end wall panel and are maintained under appropriate pressure until the adhesive has set thus securing all of the panels together and to the upper portion of the end wall. The slots in the handle panels are so disposed that, in the completed handle structure they are in register providing a slot extending from the upper edge of the end wall of the container, as shown more clearly in Figure 1, the handle structure comprising five thicknesses of paperboard and three of such thicknesses or plies extending substantially the full width of the corresponding side wall of the container, as will be clear from Figures 1, 2 and 8. Also, in the folding operation, adhesive is applied to the panels 26, at the inner face thereof and panels 26 are then folded over onto panels 25 and maintained under appropriate pressure until the adhesive has set. When the panel 26 is folded over onto the panel 25 the lines of scoring 23 and 24 abut one another and provide spacing means for holding the end portions of those panels, outward beyond the lines of scoring 23 and 24 spaced apart a distance somewhat less than the thickness of the paperboard. Referring to Figure 3, the inner face of panel 26 is shown as provided, inwardly beyond the line of scoring 24, with a coating of adhesive indicated by the stippling. In Figure 4 panel 26 is shown as folded over onto and secured to panel 25, the two panels 25 and 26 together constituting a tuck flange 44 integrally attached at its upper edge along a fold line to the inner edge of the cover panel 19. Thereafter the holding tab 31 is folded at right angles to the positioning tab 30 and is then inserted endwise into the adjacent end portion of the tuck flange 44 by swinging the positioning tab about the score line between that tab and the corresponding cover panel, such as panel 19. The lines of scoring 23 and 24 are spaced from the ends of panels 25 and 26, respectively, a distance at least as great as, preferably somewhat greater than, the length of holding tab 31, to permit endwise insertion thereof in the manner stated, as clearly shown in Figures 2 to 5, inclusive. In that connection, it will be noted that in the tuck flange 44 each end of the panel 26 projects outwardly beyond the panel 25 providing an element which serves as a guide for inserting the holding tab 31, facilitated by the arcuate shape of the outer edge of that tab. After the holding tab 31 has been inserted into the end of the tuck flange 44 it may be secured therein in any suitable manner, conveniently by a staple 45. The positioning tabs 30 at the ends of the cover panels are then disposed perpendicular thereto so as to extend downward along the outer faces of the end walls of the container, as will be clear from Figures 1 and 5, when the cover panels are in closed position. The partially folded blank is then folded so as to dispose the side wall panels 11 and 13 in parallel relation spaced apart by the end wall panels 10 and 12 also disposed in parallel relation and perpendicular to the side wall panels, with the securing flap 22 seating on the inner face of the side wall panel 13 at the corresponding end thereof, to which it is suitably secured, conveniently by stitching or stapling, one of the staples being shown at 46 in Figure 6. Thereafter the inner faces of the outer bottom closure flaps 14 and 15 are coated with a suitable adhesive, the inner bottom closure flaps 16 and 17 are folded upward and inward and the flaps 14 and 15 are then folded upward, after which flaps 16 and 17 are moved downward so as to seat upon the flaps 14 and 15 and are held under appropriate pressure until the adhesive has set, thus completing the bottom closure of the container. In that connection, it will be noted that the inner end portions 16*a* and 17*a* of the inner bottom closure flaps 16 and 17, respectively, are of increased width relative to the remainder thereof. As previously stated, the paperboard is of substantial thickness and the lines of scoring, with the exceptions above noted, are die formed and of appreciable width. When the outer bottom closure flaps 14 and 15 are folded into positions at right angles to the corresponding side wall panels 11 and 13, the paperboard at the lines of scoring bulges inward of the container, as shown at 47 in Figure 7. That provides a bead extending along each side wall of the container at the bottom and interiorly thereof and the width of the inner end portions 16*a* and 17*a* of the inner closure flaps 16 and 17, respectively, is such that those portions fit tightly between the inwardly bulged lines of scoring or beads 47. In the final setting up and securing of the bottom closure means of the container the inner end portions of the inner bottom closure flaps are forced downwardly between the beads 47 and exert a wedging effect which assures that the body of the container is properly squared up with the side walls perpendicular to the end walls thereof. That guards against twisting or skewing of the container in the final steps of setting up thereof thereby assuring accuracy and facilitating the setting up operation. As previously noted, the width of the end wall 12 of the container body is greater than the width of the end wall 10 by an amount equal to the thickness of the paperboard so that when the securing flap 22 is secured to the inner face of side wall 13 the ends of the set up container are of the same external width, which is also conducive to accuracy.

The paperboard of which the container is formed is of substantial thickness and possesses considerable resiliency. The tuck flanges 44 tend to spring outwardly from the inner edges of the cover flaps 18 and 19, the latter being of such width that the holding tabs 31 and the end portions of the tuck flanges engage into the slots 39 in the end walls of the container, when the cover flanges are in closed position. The tuck flanges 44 are then held in pressure contact with each other for retaining the cover panels closed, the width of the slots 39 in the end walls of the container being such as to accommodate slight outward deflection of the tuck flanges 44 in closing of the cover panels. In the completed container the handle structures are disposed at the upper edges of the hand holes 38 and provide rounded gripping surfaces while also providing adequate mechanical reinforcement of the upper portions of those walls, as above explained.

It will be understood that the sequence of folding operations above stated in the setting up of the blank to

provide the container is by way of example only, and that the folding operations may be performed in any appropriate sequence. It will also be understood that changes in detail may be resorted to without departing from the field and scope of our invention, and we intend to include all such variations, as fall within the scope of the appended claims, in this application in which the preferred form only of our invention has been disclosed.

We claim:

1. In a paperboard container, a body portion comprising side and end walls and bottom closure flaps, said end walls having slots intermediate their sides extending from their upper edges, cover panels hinged at their outer edges to the upper edges of said side walls and provided at their inner edges with downwardly extending tuck in flanges respectively comprising an outer panel and an inner panel integrally attached at its lower edge for substantially the full length thereof to the lower edge of said outer panel and folded over onto the latter, said flange panels having cooperating spacer means disposed inwardly from the ends thereof effective for holding their end portions spaced apart and being secured together in face to face relation between said spacer means, positioning tabs secured to the ends of the respective cover panels disposed to extend therefrom downwardly along the outer faces of said end walls adjacent said slots in the closed position of said cover panels, and holding tabs secured to said positioning tabs and inserted endwise between the end portions of said flange panels and disposed to extend into said slots in the closed position of said cover panels, said spacer means being spaced from the ends of said inner panels of said truck in flanges a distance at least as great as the length of said holding tabs and spacing the end portions of said flange panels apart a distance approximating the thickness of said holding tabs to facilitate endwise insertion thereof into the ends of said tuck in flanges.

2. In a paperboard container, a body portion comprising side and end walls and bottom closure flaps, said end walls having slots intermediate their sides extending from their upper edges, cover panels hinged at their outer edges to the upper edges of said side walls and provided at their inner edges with downwardly extending tuck in flanges respectively comprising an outer panel and an inner panel integrally attached at its lower edge for substantially the full length thereof to the lower edge of said outer panel and folded over onto the latter, said flange panels having cooperating spacer means disposed inwardly from the ends thereof effective for holding their end portions spaced apart and being secured together in face to face relation between said spacer means, positioning tabs integrally secured to the ends of the respective cover panels disposed to extend therefrom downwardly along the outer faces of said end walls adjacent said slots in the closed position of said cover panels, and holding tabs integrally secured to the inner edges of said positioning tabs and inserted endwise between the end portions of said flange panels with a friction fit therebetween and disposed to extend into said slots in the closed position of said cover panels, said spacer means being spaced from the ends of said inner panels of said tuck in flanges a distance at least as great as the length of said holding tabs and spacing the end portions of said flange panels apart a distance slightly less than the thickness of said holding tabs to facilitate endwise insertion thereof into the ends of said tuck in flanges.

3. In a paperboard container, a body portion comprising side and end walls and bottom closure flaps, said end walls having slots intermediate their sides extending from their upper edges, cover panels hinged at their outer edges to the upper edges of said side walls and provided at their inner edges with downwardly extending tuck in flanges respectively comprising an outer panel and an inner panel integrally attached at its lower edge for substantially the full length thereof to the lower edge of said outer panel and folded over onto the latter, said flange panels having cooperating spacer means disposed inwardly from the ends thereof effective for holding their end portions spaced apart and being secured together in face to face relation between said spacer means, positioning tabs integrally secured to the ends of the respective cover panels disposed to extend therefrom downwardly along the outer faces of said end walls adjacent said slots in the closed position of said cover panels, and holding tabs integrally secured to said positioning tabs and inserted endwise between the end portions of said flange panels with a friction fit therebetween and disposed to extend into said slots in the closed position of said cover panels, said spacer means being spaced from the ends of said inner panels of said tuck in flanges a distance at least as great as the length of said holding tabs and spacing the end portions of said flange panels apart a distance slightly less than the thickness of said holding tabs to facilitate endwise insertion thereof into the ends of said tuck in flanges, positioning tabs integrally secured to the ends of the respective cover panels disposed to extend therefrom downwardly along the outer faces of said end walls adjacent said slots in the closed position of said cover panels, and holding tabs integrally secured to the inner edges of said positioning tabs and inserted endwise between the end portions of said flange panels with a friction fit therebetween and disposed to extend into said slots in the closed position of said cover panels, the inner flange panels extending beyond the ends of the outer flange panels providing guide elements for insertion of said holding tabs, said spacer means being spaced from the ends of said inner panels of said tuck in flanges a distance at least as great as the length of said holding tabs and spacing the end portions of said flange panels apart a distance slightly less than the thickness of said holding tabs to facilitate endwise insertion thereof into the ends of said tuck in flanges.

4. In a paperboard container, a body portion comprising side and end walls and bottom closure flaps, said end walls having slots intermediate their sides extending from their upper edges, cover panels hinged at their outer edges to the upper edges of said side walls and provided at their inner edges with downwardly extending tuck in flanges respectively comprising an outer panel and an inner panel integrally attached at its lower edge for substantially the full length thereof to the lower edge of said outer panel and folded over onto the latter, said flange panels having cooperating spacer means disposed inwardly from the ends thereof effective for holding their end portions spaced apart and being secured together in face to face relation between said spacer means, positioning tabs integrally secured to the ends of the respective cover panels disposed to extend therefrom downwardly along the outer faces of said end walls adjacent said slots in the closed position of said cover panels, and holding tabs integrally secured to the inner edges of said positioning tabs and inserted endwise between the end portions of said flange panels with a friction fit therebetween and disposed to extend into said slots in the closed position of said cover panels, said holding tabs decreasing in width inwardly and the inner flange panels extending beyond the ends of the outer flange panels with the ends of the latter inclined downwardly and inwardly for guidance and ready insertion of said holding tabs, said spacer means being spaced from the ends of said inner panels of said tuck in flanges a distance at least as great as the length of said holding tabs and spacing the end portions of said flange panels apart a distance slightly less than the thickness of said holding tabs to facilitate endwise insertion thereof into the ends of said tuck in flanges.

5. In a paperboard container, a body portion comprising side and end walls and bottom closure flaps, said end walls having slots intermediate their sides extending from their upper edges, cover panels hinged at their outer edges to the upper edges of said side walls and provided at their inner edges with downwardly extending tuck in flanges respectively comprising an outer panel and an inner panel integrally attached at its lower edge for substantially the full length thereof to the lower edge of said outer panel and folded over onto the latter, said flange panels having transverse scorings at their opposed faces disposed inwardly from the ends thereof effective for holding their end portions spaced apart and being secured together in face to face relation between said scorings, positioning tabs integrally secured to the ends of the respective cover panels disposed to extend therefrom downwardly along the outer faces of said end walls adjacent said slots in the closed position of said cover panels, and holding tabs integrally secured to the inner edges of said positioning tabs and inserted endwise between the end portions of said flange panels with a friction fit therebetween and disposed to extend into said slots in the closed position of said

cover panels, said scoring being spaced from the ends of said inner panels of said tuck in flanges a distance at least as great as the length of said holding tabs and spacing the end portions of said flange panels apart a distance slightly less than the thickness of said holding tabs to facilitate endwise insertion thereof into the ends of said tuck in flanges.

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