ABSTRACT OF THE DISCLOSURE

A knockdown box or crate that may be formed from relatively stiff paperboard or corrugated paperboard with the bottom, sides and top or closure member being formed as a unitary structure. The ends of the box or crate are formed as separate parts that are positioned within rigid frame members that in turn are configured to receive and hold the unitary body portion of the box or crate while still permitting free movement of the top or closure member.

BACKGROUND OF THE INVENTION

The present invention relates to containers of the type generally known as knockdown boxes or crates which may be readily assembled without employing fastening means such as nails, screws or the like. Containers of this type are usually re-used and thus differ from the type of container that is employed to ship merchandise to produce and upon reaching its destination is destroyed in one fashion or another. A re-usable container is, in the ordinary course of business, returned in an empty condition to its point of origin. Thus from an economic standpoint it is highly desirable to be able to ship a large number of containers in a railroad box car or a tractor trailer truck. Thus some two or three crates or boxes in their knockeddown or collapsed state will occupy approximately the same amount of space as a single crate or box in its set-up condition.

In certain types of knockdown boxes or crates the end walls or panels are formed as an integral part of the body of the box. Thus creases or fold lines must be provided in the end panels which will permit them to be folded into the body of the box during the collapsing operation. While such an arrangement permits the box or crate to be collapsed it materially limits the number of times such a box or crate can be used as the end walls or panels tend to provide the necessary rigidity to a box or crate. In order to permit the body of the box to collapse or be folded there have been instances where the end walls or panels have been removable. Such an arrangement might be satisfactory in a wooden crate or box wherein grooves were provided in the sides of the box or crate for said end wall or panels. However, an arrangement of this type is not practical or feasible in knockdown or collapsible boxes or crates formed from cardboard or paperboard. In some prior art efforts, the boxes or crates have been formed from a plurality of separate parts which are assembled as a complete unit. A box or crate of this type usually does not have a closure or lid and being formed from a plurality of parts always presents the problem of some of the parts being lost or misplaced in shipment.

SUMMARY OF THE INVENTION

The present invention is directed to a knockdown or collapsible box or crate wherein the body of the box is a unitary structure consisting of the bottom and two sides and a top. The end panels are positioned within rigid frame members that may be formed from some suitable material, such as metal or plastic, and the frame members are detachably connected to an end of the body unit. The frame members with the end panels positioned thereon provide rigid end supports for the body unit thus insuring a sturdy container when in its assembled form and permitting repeated re-use of the box or crate. In addition the body unit is so configured that when connected to the rectangular shaped frame members, the closure member of lid may be repeatedly opened or closed at will.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of a box or crate embodying the present invention; FIGURE 2 is a sectional view of an end of a box or crate embodying the present invention, the view being taken on the plane 2—2 of FIGURE 1; FIGURE 3 is a horizontal sectional view of a side of a box or crate of the present invention, the view being taken on the plane 3—3 of FIGURE 1; FIGURE 4 is an exploded view of an end wall or panel and a frame member with a portion of the body unit of a box or crate of the present invention; FIGURE 5 is a vertical sectional view showing in detail the positioning of an end wall or panel in a frame member; and FIGURE 6 is a sectional view showing the closure member in its closed or locked position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings there is shown in FIGURES 1 and 4, a box or container having a bottom 10 and sides 12 with one of the sides being formed with an extension that constitutes a lid or closure member 14 for the box. The lid or closure member has formed integral therewith, along its free elongated edge, a pair of spaced tabs or locking tongues 16. The other side 12 has formed therewith along its upper longitudinal edge an inwardly extending flap or flange 18 that is provided along a fold line 19 of the side and flap with a pair of spaced slots 20 that are of a size to receive the tabs or tongues 16. The bottom 10, sides 12, top 14 and flap 18 are formed as a unit from a single piece of material, such as heavy cardboard or corrugated paperboard, so as to be able to withstand the normal wear of handling and the like during shipping. The box is formed with conventional crease or fold lines 21 between the bottom 10 and sides 12 and the closure member 14 and side 12 to permit the collapsing and folding thereof into a compact unit or package in order to conserve shipping space when the box is being returned empty to its initial shipping point.

The collapsible box or crate is provided with a pair of rectangular shaped metal end frames 22, FIGURE 4, each of which comprises a flat body portion 24 that terminates at one edge in a flange segment 26 and at the other edge in a short flange or lip 28. As shown in FIGURE 4, the flange or lip 28 at the top of the frame 22 is continuous and uninterrupted while the flanges or lips 28 on the two sides and bottom of the frame are formed with a plurality of spaced notches or cuts 30. The end frames 22 are formed from aluminum or a suitable light gauge metal which will be susceptible of providing a rigid and strong end frame capable of withstanding a certain amount of abuse during the handling and shipping of the box or crate in its assembled and loaded condition. A rectangular shaped end wall or panel 32 is designed to be positioned within each of the end frames 22 during the assembling of the box or crate. The end wall or panel 32 is provided, adjacent its upper end, with a crease or fold line 34 so as to form an increment or extension 36. Thus in mounting the end panel within the frame 22 the increment or extension 36 will lie along the inner surface of the body portion 24 and abut the lip 28 so as to force the outer face of the end panel into engagement with the inner face of the flange 26. The end panel
3,485,433

22 is also formed with a suitable opening 38 and flap 40 which serves as a smooth handhold for lifting and moving the box or crate.

The bottom 10 and sides 12 are each provided with a plurality of spaced aligned slots 42 that are spaced inwardly of the box a distance approximately equal to the bevel portion 24 of the end frame 22. The slots 42 are arranged to coincide with the spacing of the lips 28 of the end frames 22 so that when the end frame is mounted on the end portion of the box or crate the lip 28 will extend into the slots. The side wall 12 and its integrally formed closure member 14 have formed at each end thereof along a portion of their fold or crease line 21 a rectangularly shaped notch 44 that is of a depth commensurate with the width of the body portion 24 of the end frame 22. As shown in FIGURE 4 the continuous lip 28 at the upper edge of the end frame 22 is formed with beveled end portions 46 which provides for a relatively smooth and snug fit for the end of the frame 22 in the notch 44 of the side wall 12 and closure member 14. While only one beveled end portion of the lip 28 is necessary to mounting the end frames 22 on the box unit, by having a pair of beveled end portions permits the end frame to be interchanged. The flap 18 is not as long as the side 12 as a short segment has been removed from each end of the flap along its fold or crease line 19 to permit the end frame 22 to be mounted upon the box unit.

In assembling the box or crate the sides 12 are arranged in a frame normal to the bottom 10 and an end frame 22 is then moved into position so that the end portion of the bottom may be inserted into said frame until the slots 42 are brought into registry with the spaced segments of the bottom lip 28. The sides 12 are also inserted into the end frame along with the bottom 10 and the slots 42 in the sides are brought into registry with the lip 28 so that the lip may be inserted into said slots and thereby connect the end frames to the box unit. The ends of the bottom 10 and sides 12 are in abutting engagement with the flange 26 of the end frames 22 when the lips 28 are inserted into the slots 42. It is essential that in positioning the end frames 22 for receiving the bottom and sides of the box that care be exercised in having the continuous and uninterrupted lip 28 at the upper end of the box body portion 24 of the end frame 22 will project into the notch 44 and at the same time it will overlie the upper ends of the side wall 12 and abut the ends of the flaps 18. With the bottom and sides positioned in the end frame 22 the end walls or panels 32 are then inserted between the side walls 12 with the increment or extension 32 being inserted first into the end frame between the flange 26 and lips 28, FIGURE 5, after which the end panel is then pushed between the side walls until its lower edge rests the lower flange 26 on the end frame, FIGURES 2 and 3. With the end panels 32 mounted within the end frames 22 the sides 12 will be forced outwardly while the bottom 10 will be forced downwardly to insure that the lip segments 28 are extending into the slot 42. The ends of the closure member or lid 14 will overlie the topmost body portion 24 of each end frame 22 when the tabs 16 are inserted into the slots 20 for securing the closure member, FIGURE 1.

The box or crate may be formed with any suitable product or item and the lid then closed and locked whereby a plurality of boxes may then be stacked upon one another in a truck or railroad box car for shipment. Upon reaching their destination the boxes are emptied and may then be collapsed by pushing the end panels 32 inwardly of the box until said panels may be removed from the end frame and box unit. The bottom and sides may then be removed from the end frame and said bottom, sides and lid may be folded along their crease lines 19 and 21 and the end panels 32 may then be inserted into the end frames 22 so that the box may then be returned to its point of origin as a small compact unit. Although the above description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention.

1. A box or crate comprising a bottom and sides and top formed as a unitary structure from a single piece of material with fold lines between said bottom and sides and said top and one side, said bottom and sides having spaced slots formed in each end portion thereof, a rigid rectangularly shaped end frame member for each end of said bottom and sides, said end frame members having spaced lip members provided on three sides thereof with a continuous and uninterrupted lip member on the other side, said bottom and sides having the ends thereof receivable in a frame with said spaced lip members extending into the slots in said bottom and sides, a rectangularly shaped end panel for each of said end frame members, said end panel having a hinged extension along one edge thereof, said end panel positioned between said sides and upon said bottom with said extension in said end frame in abutting engagement with said uninterrupted lip member, said end panel forced into said end frame for securing said end frames upon said bottom and sides, said top and said one side having a notch formed at each end thereof along their fold line to receive said end frame members and said top overlying said end frame members in its closed position.

2. A box or crate as set forth in claim 1 wherein one side is provided with a flap of a length less than the length of said side, said flap and side having spaced slots formed therein and said top having space tabs formed thereon for insertion into said slots to retain said top in a closed position.

3. A box or crate as set forth in claim 1 wherein said bottom and sides and top are formed from cardboard and are foldable along their fold lines to form a collapsed and compact unit.

4. A box or crate as set forth in claim 1 wherein said end frames are formed with a flat body portion terminating in a flange segment at one edge and a lip at the other edge, said lip being uninterrupted along one edge and having beveled end portions to facilitate the mounting of the body portion of said end frame in the notch formed in said side wall and top.

5. A box or crate as set forth in claim 4 wherein the extension on said end panel lies along the inner surface of said body portion and engages said uninterrupted lip to retain the upper edge of said end panel in engagement with said flange and said end panel is formed with an opening and cooperating flap to define a handle for said box or crate.

References Cited

UNITED STATES PATENTS
1,974,527 9/1934 Bliss ------------------ 229—23
2,465,324 3/1949 De Mian ------------------ 229—44

FOREIGN PATENTS
730,661 5/1932 France.

DAVID M. BOCKENEK, Primary Examiner
U.S. Cl. X.R.

217—15, 69