CARGO CONTAINER CONSTRUCTION


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ABSTRACT

This application discloses a cargo container construction which provides an erection and knockdown arrangement which keeps the parts together in knockdown condition so that no parts will be lost and so that all parts needed for reerection will be carried by the units handy for use when reassembly is desired; also a construction designed to form a package of minimum size in the dismantled or knockdown condition with full assurance that no parts will be lost and that no components will be crushed or marred if the dismantled packages are stacked on each other or with other goods for return shipment; and especially a construction which can be quickly and easily erected with full assurance that no parts will be missing.

1 Claim, 13 Drawing Figures
CARGO CONTAINER CONSTRUCTION

BACKGROUND OF INVENTION

Cargo containers of the general type dealt with in the present invention have previously been provided but for the most part they have been assembled with loose parts such as bolts, screws, and the like, which are subject to loss when the container is dismantled for return, with the result that the containers often cannot be reassembled until missing units and assembly elements have been replaced, besides, the construction taking too much time to erect and dismantle.

SUMMARY OF THE INVENTION

The present invention provides a container construction in which most of the panels forming the walls of the container are permanently connected together in foldable condition, with other panels readily shiftable from assembled to dismantled condition and in which all of the units carry permanently with them captive elements needed for securement in assembly so that no securement elements can be lost; also the panel units are so designed that they fit together to form a knockdown return package of minimum size and one which will readily stack with safety against damage.

DESCRIPTION OF DRAWINGS

The objects, features, and advantages of the invention will be apparent from the following description of an exemplary embodiment, reference being made to the accompanying drawings thereof, wherein:

FIG. 1 is a perspective view, largely diagrammatic, showing a container construction embodying the invention, the fore and aft doors being folded on top to show the interior;

FIG. 2 is an end elevation of the assembled knockdown package formed of the dismantled units;

FIG. 3 is a longitudinal elevation of the knockdown package shown in FIG. 2;

FIG. 4 is an enlarged section of a typical inboard end-bottom corner construction, the view being taken about on the line 4-4 of FIG. 1;

FIG. 5 is a view similar to FIG. 4 but showing an outboard corner construction, the view being taken about on the line 5-5 of FIG. 1;

FIG. 6 is a view similar to FIG. 4 but showing a side construction with the door closed, the view being taken about on the line 6-6 of FIG. 1;

FIG. 7 is an enlarged section at the inboard top corner, the view being taken about on the line 7-7 of FIG. 1;

FIG. 8 is an enlarged section at the forward top corner with the door closed, taken about on the line 8-8 of FIG. 1;

FIG. 9 is a vertical section showing elevation of the shear panel;

FIG. 10 is a vertical section showing the shelf mounting arrangement;

FIG. 11 is an enlarged horizontal section taken on the line 11-11 of FIG. 10;

FIG. 12 is an enlarged horizontal section at the side edge of the door, taken on the line 12-12 of FIG. 1;

FIG. 13 is a broken vertical longitudinal section showing a modified shelf mounting.

DESCRIPTION OF EXEMPLARY EMBODIMENT

The container shown diagrammatically in FIG. 1 is of a shape adapted to fit in the cargo space of aircraft having sides sloping outward and upward from the floor. The container includes a base or floor panel 10, an inboard end panel 11, an outboard end panel 12 with lower inclined panel portion 12a hinged at 12b to an upper generally vertical panel portion 12c, a top or roof panel 13, a forward folding door panel 14, an aft or rear folding door panel 15, a vertical rigidifying shear panel 16, and shelves 17.

In the exemplary container shown, the top panel 13 has the greatest area, say 60 inches wide and 80 inches long, and is selected as a preferred foundation unit for the knockdown package unit shown in FIGS. 2 and 3. The shelves fit within the interior space of the assembled erected container so they can be placed beneath the top panel to be completely covered by it while lying clear of the mounting elements on the top panel for the doors and end panels.

The top panel has depending end wall stub projection elements 20 and 21 at its ends, the vertically narrower of which—here the inboard projection 20—is deep enough to provide space for the shelf members below the end member which is first folded over. To this projection the inboard end panel 11 is swingably connected, as by a piano-type hinge 22. The outboard stub projection element 21 is enough wider than the inboard one to accommodate for the folded thickness of the first-folded end panel and to the lower edge of this projection element 21 the upper panel portion 12c of the outboard end panel 12 is swingably connected, as by a piano-type hinge 23. The hinge 12b of the outboard end panel provides that the panel as a whole will lie flat when folded up.

While the inboard panel is shown to be folded up before the outboard panel, the arrangement may be reversed. The end panel units are shorter vertically than the top panel and narrower horizontally than the overall width of the container with the doors closed, so are covered within the area of the top panel when folded into knockdown assembly position.

The doors 14, 15 are permanently secured to the sides of the top panel by piano-type hinges 24. Each door comprises a plurality of panel portions, three as shown, hinged together along adjacent horizontal edges but it is not necessary to consider these details except to note that they may have resilient sealing strips to form tight joints when closed. The top main hinge joint will be described hereinafter as an example.

The bottom or floor panel 10 and the shear panel 16 are separably connected to associated parts in the erected assembly by captive fasteners carried by associated parts to be described, and when dismantled are placed on top of the assembly. The floor panel is shown below the shear panel in the knockdown assembly but the order may be changed if desired. The knockdown assembly can be held together as a unitary package in various ways, such as by strapping, clamping together, encompassing in protective coverings, or various other ways and it is not believed essential to describe any particular packaging securement for an understanding of the present invention.

The knockdown package of a container which, when erected, is about 60 inches wide by 80 inches long and about 66 inches high is relatively light, say about 250 pounds when made largely of corrugated aluminum sheets about 0.025 inch thick, and the depth of the knockdown package is less than 10 inches. The floor is preferably made of a strong light material, such as laminated balsa wood.

FIG. 4 shows a typical quick connection for the inboard end. Here the floor or base panel 10 at the ends is provided with an extruded stringer 30 of light material, such as aluminum, having spaced holes with female fastener elements 31 and an undercut goods-hold-down groove 32. The bottom of the inboard end panel 11 is provided with an extended stringer 33 which at spaced points carries captive turnable fastener clamping bolts 34, such as Simmons plate-type receptacle P-2, adapted to enter the holes and engage with the elements 31 to clamp the parts together when the elements 34 are turned.

The outboard connection is the same and the same reference characters are used, except that the stringer 33' is angular to conform to the inclined lower panel portion 12a.

On the sides for the doors, as shown in FIG. 6, the stringer 35 is quite similar to the end stringers 36, having the same kind of goods-tie-down groove, but does not have fasteners for the door; these being on the sides of the doors.

The doors 14, 15, when closed, assist in holding the container in shape and for this purpose, as shown in FIG. 6, have shear pins 36 along the lower edge which enter holes in the rail or stringer 35 when the door is brought down. A plate 37 is secured to the inner side of the lower edge of the door and this...
plate wedges against the side of a flexible sealing strip 38 secured to the stringer 35 to seal against the entry of water. However, air can pass up corrugations of the door, which are open at the bottom, for ventilation; screening being provided over the corrugation ends to exclude vermin, if desired.

On the sides of the doors, FIG. 12, they are provided with edge strips 39 and shear pins 40 which enter holes in an edge strip 41 of the end panels, a resilient sealing strip 42 being provided between adjacent surfaces. The doors at various places, at least at one place at each end of each subpanel portion of the doors, are pulled tight against the edges of the end panels by suitable latches of known swing-over and pull-in type, only the ends of the latches being shown. The latches are of such design that they lie within the thickness of the panels so as to avoid adding thickness in the knockdown package.

FIG. 9 shows in a general way how the shear panel 16 is secured in position when the container is erected. It is strengthened and rigidified by strip elements 45 around its edges. At the top it carries shear pins 46 which enter holes in a rib strip 47 carried by the top panel 13. The end panel 12 on each portion 12a, 12c is provided with a rib 48 and between the elements 45 and the ribs 48 there are secured captive fastener elements, such as those already mentioned for securing the end panels to the floor panel. Herein such fastener connections are indicated at 49, in places without detail, the particular fastening means being subject to wide selection, the important point being that quick-acting captive fasteners which do not project to any extend from the sides of the panels will be used.

If the shear panel should extend out to the floor panel the floor panel can be provided with a medial strip and the lower edge of the shear panel secured thereto in a manner like that described for securement to the end panel.

The shelves 17 need not be fastened down, merely supported on the end wall panels, desirably by means which do not increase the panel thickness appreciably in knockdown assembly. In one form, shown in FIGS. 10, 11, the shelf support means comprises a ledge plate 50 hinged to the end panel at 51 and having end projections 52 which swing up when the ledge plate 50 is swung down, the projections 52 engaging stop elements 53 fixed to the end panel corrugations in the valleys. The ledge plates 50 and their projections 52 swing around to lie flat against the end panels in the knockdown assembly.

The shelf supporting means described is merely suggestive of a wide variety of possible means which might be provided. It is important that the shelf length should not be so long as to prevent placement in the knockdown package between the depending projections 20, 21 of the top panel, as shown in FIG. 3, unless, of course, some other knockdown package assembly arrangement is used.

FIG. 13 shows a modified shelf supporting arrangement in which the shelf 17 is provided with end projections 50' which enter corrugation valleys of the end panels and rest on ledges 53' secured therein. The projections could be shortened by bending them down, in which case they could hook over a support plate secured across the corrugations of the end panels.

In dismantling, the shelves are removed first and, with the doors folded on top of the top panel, the shelves are inserted beneath the top panel 13, angular elements 54 being provided beneath the top panel for supporting them. The shear and floor panels are disconnected and removed. The end panels are swung up in position beneath the top panel. It is noted that the assembly is relatively light so can be turned over or on edge or otherwise handled in making the layup. After stacking, the parts can be secured in a pack in any convenient way, as mentioned, by strapping, clamping, or the like.

While one embodiment, with slight variations in detail, has been described for purposes of illustration, it is to be understood that there may be various embodiments and modifications within the general scope of the invention.

What is claimed is:

1. A cargo container construction adapted for quick erection and knockdown assembly without loss of parts, comprising in combination, a top panel, end panels hinged to the ends of the top panel with the hinge lines at different distances from the top panel to cause one end panel to lie over the other end panel when they are folded up with the top panel, folding door panels hinged to side edges of the top panel for folding above the top panel at opposite sides thereof, a bottom panel, detachable connections between the lower edges of the end panels and bottom panel for quickly connecting them to and disconnecting them from the bottom panel, said connections including captive fastener elements carried by one of the panels at each connection edge which cooperate with mating fastener elements carried by the other panel, means including captive fastener elements for securing the door panels to the end and bottom panels, a shear panel detachably secured to the top and bottom panels and to at least one end panel by captive fastener elements when the container is erected, and a shelf panel detachably secured to the end panels when the container is erected, and shear panel and shelf panel being disposed flatwise in the knockdown package assembly when the container is dismantled, said shelf panel being disposed on one side of said top panel and said bottom and shear panels being disposed on the other side of said top panel over said door panels in the knockdown package assembly.