

May 14, 1968

R. C. SCHURCH  
COLLAPSIBLE CONTAINER

3,383,003

Filed May 9, 1966

2 Sheets-Sheet 1

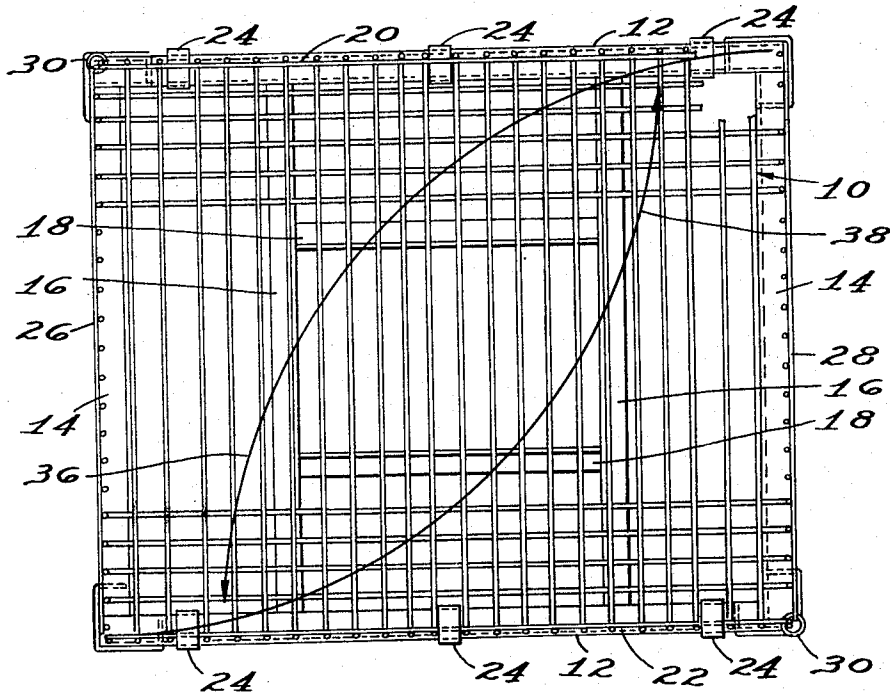


FIG. 1

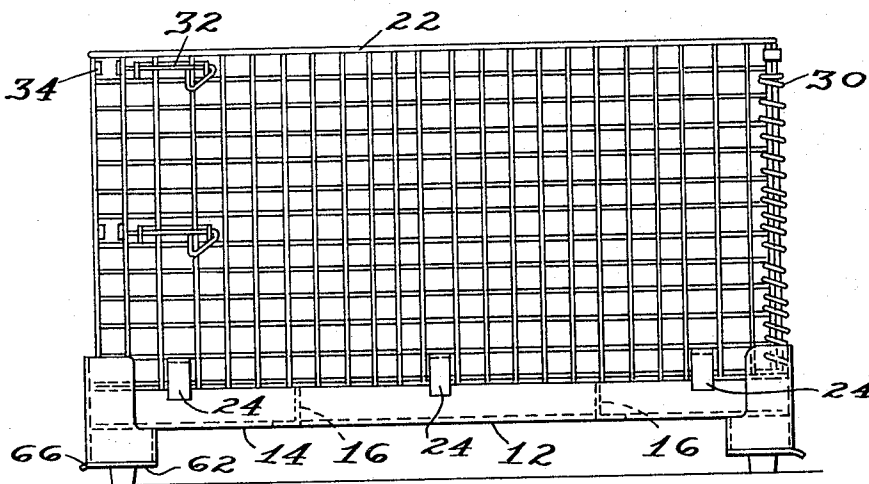


FIG. 2

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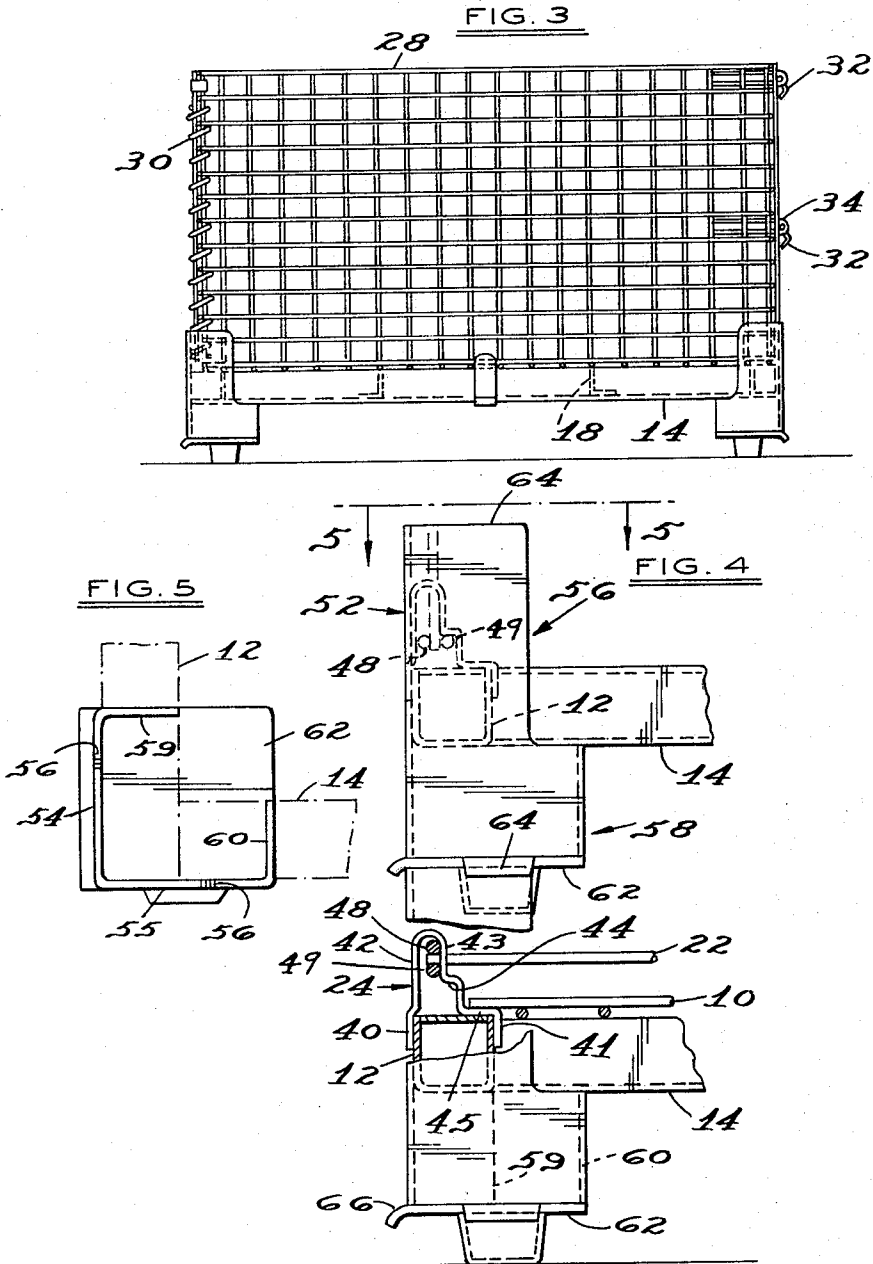
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**COLLAPSIBLE CONTAINER**

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 4 Claims. (Cl. 220-6)

**ABSTRACT OF THE DISCLOSURE**

A collapsible container having a frame supporting a bottom and four side members, foldable from an upright to a collapsed position superimposed on the bottom. Corner posts on the frame have corner plates which outwardly overlap the lower corners of the side members when upright, and confine folding movement thereof inwardly of the frame. Hinge straps connect the lower edge of two side members to the frame between the corners and, with the corner plates, resist outward bulging.

This invention relates to improvements in the construction of a collapsible container used for the handling, shipment and storage of articles, and having side walls which can be folded or collapsed from an upright position to a substantially flat position for storage or shipment of empty containers.

Containers of this type are conventionally made with the side members formed by wire mesh panels. An opposite pair of these panels, which for convenience will be termed the "sides" are each hinged at their lower edge to one side edge of the bottom of the container. Each side has one of the remaining pair of panels, or "ends" hinged thereto at one corner of the container, this hinged connection between one side and one end of the container extending vertically when the sides and ends are upright. Latch devices detachably connect the sides and ends at the corners where there are no vertical hinges. To collapse the container, each end is unlatched and swung about the vertical hinge into adjacent relation with one side, and the side and end are then folded onto the bottom. When the folding operation is carried out in the manner intended both sides and ends lie substantially flat on the bottom and within the side edges thereof. This folded relation of the sides and ends is obtained only when the folding is done properly. Improper folding results in damage.

Containers of this type are subjected to severe usage, and frequently fail at the hinge connections between the pair of sides and the container bottom.

The present invention is directed to improvements in the construction of containers of this type which positively prevent improper folding of the sides and ends; which provide improved hinge action between the sides and bottom; which retain the sides and ends in proper position reinforced against bulging pressures from loads in the container; and, which provide improved support for stacking or nesting one container upon another particularly when in the folded condition.

According to the invention, a collapsible container of the type having a four-sided frame structure supporting a bottom member and four side members hinged together for folding movement from an upright position of the side members to a folded position in which the side members lie in substantially flat superimposed relation on the bottom member, is characterized by a corner post secured to the frame structure at each corner thereof, each corner post including a portion depending below the frame structure and a pair of upstanding plate-like portions projecting above the bottom member and extending at right angles to each other around the corner of the frame struc-

ture, each plate-like portion outwardly overlapping one of the side members in the upright position thereof whereby the plate-like portions restrain the side members from outward movement relative to the edges of the frame structure when the sides are in their upright position and confine folding movement of the side members to a direction inwardly of the edges of the frame structure.

Preferably each corner post is provided with nesting surfaces on the depending portions thereof engageable with complementary nesting surfaces formed by the upper edges of the plate-like portions of each corner post of a second container for supporting the second container on the first container in nested spaced relation therewith when the sides of the first container are in folded position.

Improved hinge means are also provided for connecting two of the container sides to the bottom structure for folding movement on an axis along one edge thereof, the improved hinge means acting to firmly position the side on the bottom structure when the side is in upright position and to improve folding action to the flat position.

Other features and advantages of the construction will appear from the following description of the representative embodiment thereof shown in the accompanying drawings in which:

FIGURE 1 is a plan view of a wire mesh folding container constructed in accordance with the invention indicating the manner in which the ends are intended to be folded on the sides;

FIGURE 2 is a side elevation of the container shown in FIG. 1;

FIGURE 3 is an end elevation of the container shown in FIG. 1;

FIGURE 4 is an enlarged fragmentary elevation partly in section of a corner portion of two containers nested on each other, the sides of the lower container being folded; and

FIGURE 5 is a plan view of the corner structure, taken as indicated by the line 5-5 of FIGURE 4.

The rectangular form of container shown in FIGS. 1-3 includes frame structure supporting a bottom wire mesh panel member 10, the frame structure consisting of frame members 12 and 14 extending along the sides and ends, cross-members 16 and braces 18 between the cross-members.

Wire mesh side panels 20 and 22 are each secured to one of the side members 12 of the frame structure by a number of hinge straps 24. Wire mesh end panels 26 and 28 are each connected by a helical corner hinge 30 to one of the side panels, the end panel 26 being connected to the side panel 20 and the end panel 28 to the side panel 22. Bayonet type latch bolts 32 mounted on the side panels as best shown in FIG. 2 engage U-shaped clips 34 on the end panels to detachably connect an end panel to a side panel when the parts are in an upright position. Folding of the end and side panels is accomplished by releasing the bolts 32, swinging the end panel 28 about the corner hinge 30 in an inward direction, as indicated by the arrow 36 in FIG. 1, against the side panel 22 and in a similar manner swinging the end panel 26 against the side panel 20 as indicated by the arrow 38. The side panels can then each be swung about the hinge axis provided by the straps 24 into a substantially horizontal position supported by the bottom member.

Each of the hinge straps 24, as best shown in FIG. 4, consists of a generally U-shaped member having depending flange portions 40 and 41 adapted to be rigidly secured to a side member 12 of the frame structure, and having an outer leg 42 forming an upward extension of the outer edge of the frame structure and an inner leg 43 provided with an offset or stepped portion 44 facing the upper surface of the frame structure. The inner leg includes a further offset portion 45 which forms a support-

ing ledge for the edge of the bottom panel 10 of the container. Each strap member 24 is adapted to straddle the lower rod 48 of a side panel, and the inner and outer legs 42 and 43 of the strap member 24 serve to positively position the side panel on the frame side member 12 for support thereby. When the side panel is in upright position, the lower rod 48 thereof tends to assume a centered position on the frame side member 12 beneath the offset step 44 in the inner leg 43 which acts to limit upward movement of the side panel relative to the frame structure. This position of the side panel is indicated in the upper portion of FIG. 4.

When the side and end panels are disconnected by loosening the latch bolts 32, when an end panel has been swung into face-to-face relation with a side panel and the side panel is to be folded, the side panel can be moved slightly toward the outer edge of the frame so that the lower rod thereof will extend into the elongated upper portion of the strap member 24 thereby permitting the side panel and end panel folded thereon to be swung into a substantially horizontal position supported by the bottom member as indicated in the lower part of FIG. 4.

An improved corner post 52 is provided at each of the four corners of the frame structure. Each corner post, as best shown in FIGS. 4 and 5 is of sheet metal construction bent to form a pair of side plates 54 and 55 at right angles to each other and having portions 56 which project above the frame structure and bottom panel 10 of the container, and portions 58 depending below the frame structure, the depending portions being additionally provided with in-turned flanges 59 and 60 which serve to support the frame side members 12 and 14 respectively and to reinforce and support the corner post structure as well as a bottom plate 62 secured to the lower edges thereof. Each upper portion 56 of one of the corner posts outwardly overlaps the lower corner portion of a side or end panel member when such member is in its upright position and thus these upper plate-like portions 56 serve to properly position the side and end panels on the frame structure for support thereby and also positively confine folding movement of the side and end members to a direction inwardly of the edges of the frame structure. Improper folding movement of the ends and sides is not possible.

The depending portion 58 of each corner post is provided with nesting means formed by the bottom plate 62, which as shown in FIG. 4 is engageable with complementary nesting means formed by the upper edges 64 of the corner post side plates 54 and 55, the corner post being long enough so that a second container can be stacked on a first container in spaced relation therewith when the sides of the first container are in folded position as shown in FIG. 4. The lower portions 58 of the corner post are sufficiently long to enable the forks of the lift truck to be inserted under a container or between adjacent stacked containers. Preferably the bottom plate 62 of each corner post is provided with one or more down-turned side edges 66 to properly position and retain an upper container on a lower one either in the folded or upright position of the sides.

The combination of the improved hinge strap and corner post improves the positioning of the side and end panels of the container on the frame structure when in upright position, when being folded and when in folded position.

While preferred embodiments have been described above in detail, it will be understood that numerous modi-

fications might be resorted to without departing from the scope of the invention as defined in the following claims.

I claim:

1. A collapsible container of the type having a four-sided frame structure supporting a bottom member and four side members hinged for folding movement of the side members from an upright position to a folded position in which the side members lie in substantially flat superimposed relation on the bottom member; characterized by a corner post secured to the frame structure at each corner thereof, each corner post including a portion depending below the frame structure and a pair of upstanding plate-like portions projecting above the frame structure and extending at right angles to each other around a corner thereof, hinge means carried by the frame structure and engaging each of a pair of side members at a plurality of locations along the lower edge thereof intermediate a pair of corner posts, said hinge means positioning said lower edge relative to the frame structure when each of the side member engaged thereby is in an upright position and permitting folding movement of each such side member with vertical movement of the lower edge thereof relative to the frame structure, each plate-like portion outwardly overlapping and engaging a lower corner of one of a pair of adjacent side members in the upright position thereof whereby the plate-like portions and hinge means restrain the side members from outward movement relative to the edges of the frame structure when the side members are in their upright position and the plate-like portions confine folding movement of the side members to a direction inwardly of the edges of the frame structure.

2. A collapsible container as claimed in claim 1 wherein the hinge means connecting a side member to the frame structure comprises a plurality of hinge straps secured to the frame structure in spaced relation to each other along one side thereof, each hinge strap having a pair of legs adapted to straddle the lower edge of a side member, one of said legs including a horizontally off-set portion adapted to overlie the lower edge of the side member in the upright position thereof, and said pair of legs forming an elongated vertically extending portion adapted to receive the lower edge of the side member in the folded position thereof.

3. A collapsible container as claimed in claim 1 wherein the depending portion of each corner post is provided with turned in flanges extending under and supporting the frame structure.

4. A collapsible container as claimed in claim 3 wherein the depending portion of each corner post is provided with a plate secured to the bottom edges thereof including the turned in flanges, said plate reinforcing the depending portion of each corner post and forming nesting means for supporting one container on another container.

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