

Dec. 2, 1969

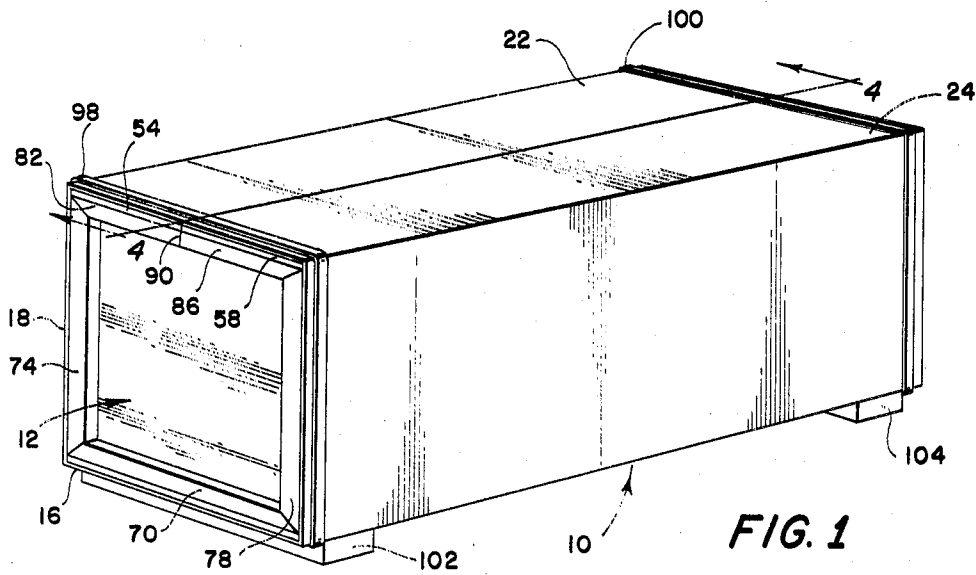
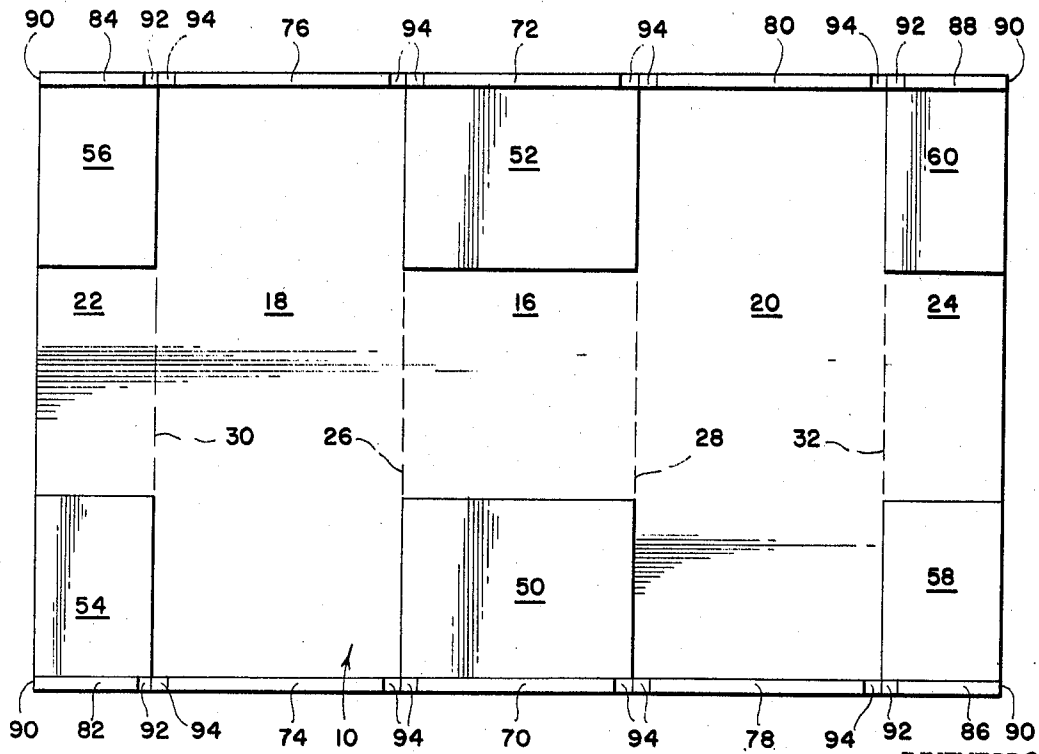
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3,481,457

CONTAINER

Filed Jan. 3, 1968

3 Sheets-Sheet 1



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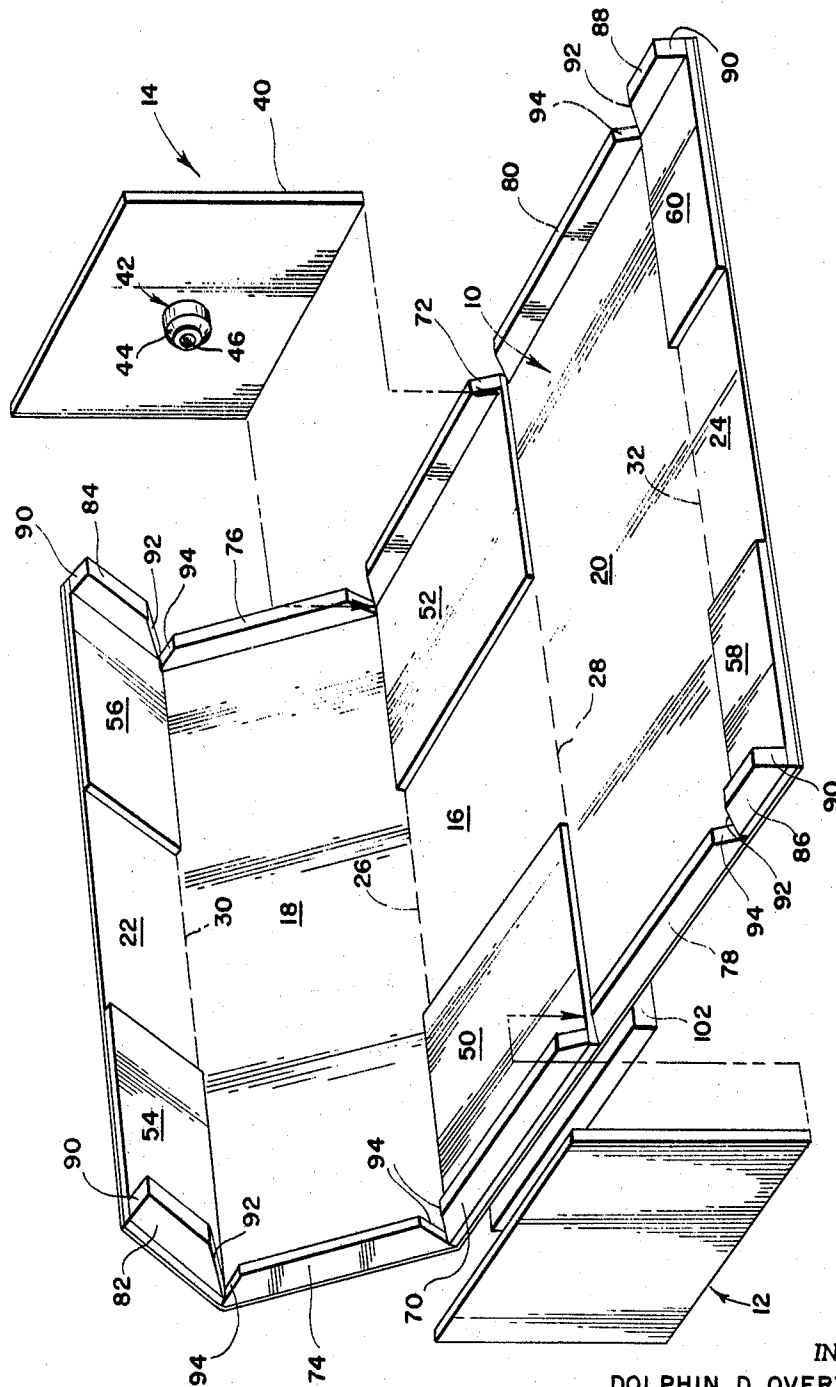
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3 Sheets-Sheet 3

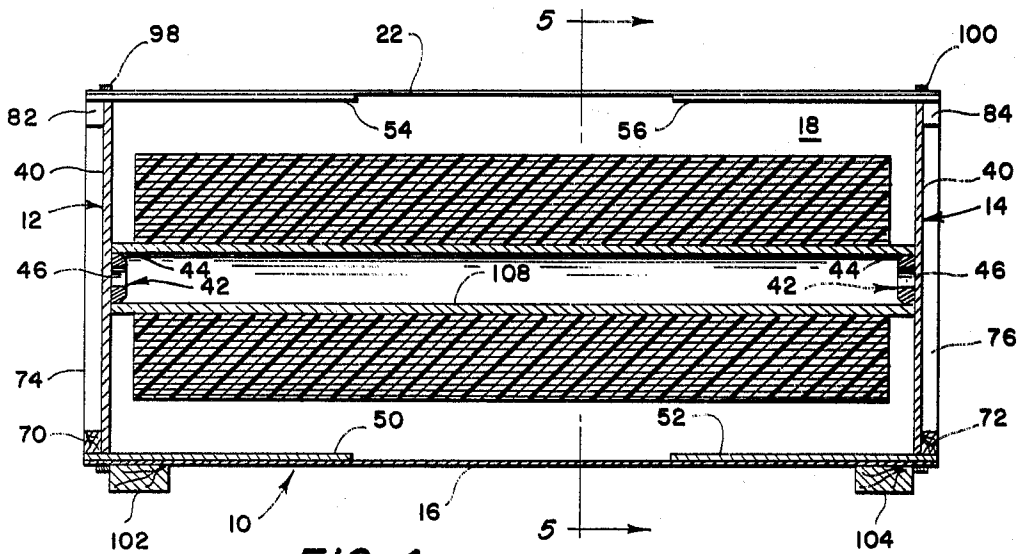


FIG. 4

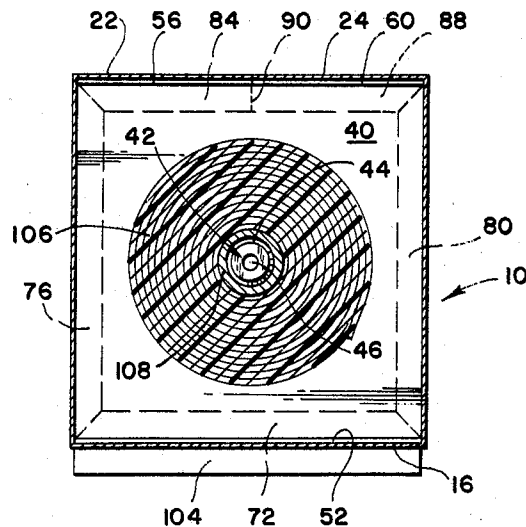


FIG. 5

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3,481,457

CONTAINER

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6 Claims

ABSTRACT OF THE DISCLOSURE

A shipping container for enclosing and suspending cylindrical rolls of product is provided. The container includes a foldable shell that forms the bottom, top, and side walls of the container and a pair of independent end panels that each includes suspension means for engaging one end of an article to permit the article to be suspended between the end panels. Cleats are attached to each of the shell. The cleats about the outer wall of each of the end panels when the container is assembled to reinforce the end panels and to resist outward longitudinal forces exerted on the end panels. Reinforcing members may be attached to the shell to strengthen the container. Means are provided for securing the shell to the end panels after the shell is folded into a rectangular configuration. Skids may be mounted on the lower surface of the shell so that the assembled container rests on the skids.

This invention relates to containers. More particularly, this invention relates to containers that are capable of being rapidly assembled from a flat, knocked-down condition, and that are strong enough to be stacked on top of each other without damage to the containers at the bottom of the stack even when loaded with a heavy product.

Sheets of cloth, plastic film and the like are commonly rolled about hollow cylindrical cores to form rolls. In roll form, the sheet material is convenient to handle and takes up a minimum of floor space.

Some sheet materials such as velvet cloth and plastic film in roll form may be damaged by the weight of the entire roll of material being transferred through a relatively small portion of the external cylindrical surface of the roll of material to a flat supporting surface. The roll of cloth or film may be matted down or the entire roll may take on an undesirable oval shape. This problem has been solved by extending the ends of the central core of the rolls so that the core may be suspended by the container.

Suspension containers for rolls of heavy material such as cloth and plastic film have tended to be either susceptible to crushing of the container and article when several containers are stacked on top of each other or have been excessively heavy.

There has been a continuing search for lightweight suspension containers that when loaded with a heavy article can be stacked one on top of the other without crushing of the containers or the articles at the bottom of the stack.

The bulk and weight of many cloth or film rolls makes them relatively difficult to handle. Thus it has previously been difficult to place the rolls in suspension containers, and difficulties have been encountered in removing such rolls from the container. These article handling problems with heavy rolls have to some extent curtailed the usage of suspension containers with heavy rolls.

Accordingly, it is a primary object of the invention to provide a new and improved suspension container.

A further object of the invention is to provide new and improved suspension containers that are light-in-weight and yet have sufficient strength to be stacked without

crushing of the lower containers in the stack even when the containers are each loaded with heavy articles.

Another object of the invention is to provide a container that may be easily assembled around a suspended article to obviate the problems involved in placing an article to be suspended within a preformed shipping container having vertical walls, and that may be easily disassembled to obviate the problems in removing a suspended article from such a shipping container.

Yet another object of the invention is to provide a new and improved suspension container that encloses an article and forms a barrier to dirt and small foreign objects.

A still further object of this invention is to provide a suspension container that prior to use may be shipped and stored in a knocked-down form that requires a minimum of shipping and storage space.

Additional objects of the invention will be set forth in part in the description that follows, and in part will be obvious from the description, or may be learned by practice of the invention, the objects and advantages being realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

To achieve the foregoing objects and in accordance with the purpose of the invention as embodied and broadly described herein, the container of this invention comprises a foldable shell including a bottom panel, a pair of side panels, and at least one flap extending from an upper edge of at least one of said side panels for folding into a horizontal position to form a top for the container; a pair of independent end panels positioned above the bottom panel in the assembled container, each of the end panels including suspension means for engaging one end of a product to permit suspension of the product between the end panels; bottom, side, and top cleats attached to the inner surface of the foldable shell adjacent the ends of the bottom and the side panels and the flap, respectively, with the cleats abutting the outer wall of each of the end panels about the periphery of the end panels in the assembled container for reinforcing the end panels and for resisting outward longitudinal forces on the end panels; and means for securing the shell to the end panels.

Preferably, the container includes two flaps, and reinforcing means are attached to the bottom panel and each flap for transferring vertical compressive forces to the end panels and the cleats.

It is preferred that the suspension means of the end panels include a suspension plug attached on the inner surface of each of the end panels for supporting a hollow article that extends between the end panels and that the means for securing the shell to the end panels includes tying means that extend over the bottom and side panels and the flaps adjacent the plane of the outer surface of the end panels.

The invention may also be described as a container for suspending a product therein comprising a foldable shell including a bottom panel, a pair of side panels, and a pair of flaps extending from the upper edge of each side panel, the flaps being foldable into a horizontal position in contact with each other to form a closed top for the container; a pair of independent end panels positioned above the bottom panel in the assembled container, the end panels including suspension means for engaging and supporting the product between the end panels; a pair of spaced reinforcing bottom members attached to the inner surface of the bottom panel and extending inwardly from the ends of the bottom panel; a pair of spaced reinforcing top members attached to the inner surface of each of the flaps with the top members extending inwardly from the ends

of the flaps; bottom, side, and top cleats attached along the outer ends of the inner surfaces of the bottom members the side panels, and the top members, respectively, with the cleats abutting the outer wall of each of the end panels about the periphery of the end panels in the assembled container for reinforcing the end panels and for resisting outward longitudinal forces on the end panels; and tying means for securing the shell to the end panels, with the tying means extending over the bottom and side panels and the flaps of the shell.

Preferably, the width of each of the flaps is about one-half the width of the container to permit opening and closing the container along its longitudinal center line.

It is also preferred that the container include transverse skids that are mounted on the undersurface of the bottom panel below the reinforcing bottom members.

Desirably the tying means extend over the bottom and side panels and the flaps adjacent the plane of the outer surface of the end panels.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements shown and described.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory but are not restrictive of the invention. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate one embodiment of the invention and together with the description, serve to explain the principles of the invention.

Of the drawings:

FIG. 1 is a perspective view of a container constructed in accordance with this invention;

FIG. 2 is an exploded perspective view of the container of FIG. 1 with the securing means omitted;

FIG. 3 is a top plan view of the foldable shell, cleats, and reinforcing means of the container of FIG. 1;

FIG. 4 is a sectional view of the container shown in FIG. 1 taken along line 4—4 of FIG. 1, illustrating a cylindrical article enclosed in and supported by the container; and

FIG. 5 is a sectional view of the container shown in FIG. 4 taken along line 5—5 of FIG. 4 with the securing means omitted.

Reference will now be made in detail to the present preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings.

As shown in the drawings, the container of this invention comprises a foldable shell, generally 10, that forms the bottom, top, and the side walls of the container; and a pair of end panels, generally 12 and 14, that form the end walls of the container.

As best seen in FIGS. 1-3, shell 10 includes a bottom panel 16, a pair of side panels 18 and 20, and a pair of flaps 22 and 24. The bottom panels, side panels, and the flaps are defined by a plurality of score lines with score lines 26 and 28 separating the bottom panel from side panels 18 and 20, respectively. Score line 30 separates side panel 18 and flap 22 and score line 32 separates side panel 20 and flap 24.

Preferably the shell 10 is rectangular, and the score lines extend perpendicularly to the end of the shell to form rectangular side and bottom panels, and flaps. In the most preferred form of the invention, the flaps 22 and 24 both have a width dimension equal to approximately one-half the width of bottom panel 22. This facilitates assembly and disassembly of the container as described in more detail below.

Shell 10 may be made from a variety of suitable materials such as fiberboard and corrugated paperboard which possess desirable puncture, compression and bursting strength.

In accordance with the invention a pair of end panels are provided that form the end walls of the container. The end panels each have suspension means for engaging

one end of a product to permit suspension of the product between the end panels. As here embodied, and as shown in FIGS. 2, 4, and 5, the end panels 12 and 14 are substantially identical and include a generally flat rectangular sheet 40, and a suspension plug 42 attached to the inner surface of each sheet 40.

The width of sheet 40 corresponds to the width of bottom panel 16 and the height of sheet 40 is slightly less than the height of the side panels 18 and 20 so that shell 10 may be folded over the edges of the end panels. Sheet 40 is preferably constructed of a rigid material such as plywood.

Plug 42 has a generally cylindrical configuration and includes a beveled inner end 44 to enable it to slide into a tube or hollow core upon which is mounted a roll of product. A central hole 46 extends through the length of the plug. The plug may be of wood, metal, or molded plastic material. Preferably, the plug 42 is centrally positioned on the inner surface of sheet 40. If wood and plywood are chosen as the materials of construction for the plug and sheet, respectively, the plug may conveniently be attached at the inner surface of the sheet by nailing and edge gluing.

In accordance with the invention, reinforcing means may be provided to strengthen the container and to transfer compressive forces, such as encountered by the lower containers in a stack of filled containers, from the flaps or the bottom panel to the end panels and to cleats which will be subsequently described in detail. This construction permits the cumulative weight of the stacked containers to be transferred through the end panels and cleats of the containers to the bottom of the stack rather than through the articles in the containers. As here embodied, and as best illustrated in FIGS. 2 and 3, the reinforcing means may comprise a pair of reinforcing bottom members 50 and 52 and four (4) top reinforcing members 54, 56, 58 and 60.

Bottom members 50 and 52 extend inwardly from the ends of bottom panel 16 and are attached to the bottom panel 16. The bottom members are preferably rectangular in shape and have a width approximately equal to the width of bottom panel 16.

The reinforcing means also includes top members 54 and 56 attached on the inner surface of flap 22 and top members 58 and 60 attached on the inner surface of flap 24. The width of each of the top members is approximately equal to the width of the flap on which it is attached. Accordingly, because each of the flaps approximates one-half the width of the bottom panel, the width of each of the top members approximates one-half the width of the bottom members.

Preferably the top members and the bottom members are made of plywood or some other strong, lightweight material. The top and bottom members may be attached to the shell by conventional means such as staples or the like (not shown).

In accordance with the invention, bottom, side, and top cleats are provided that are attached to the inner surface of the foldable shell. The bottom, side, and top cleats are positioned adjacent and extend along the ends of the bottom panel and side panel and the flaps, respectively. These cleats abut the outer wall of the end panels along the periphery of the end panels to strengthen the container and to resist outward longitudinal forces that may be exerted on the end panels.

As here embodied, and as shown in FIGS. 2 and 3, bottom cleats 70 and 72 are attached to the outer ends of the inner surfaces of reinforcing bottom members 50 and 52, respectively. Side cleats 74 and 76 are attached to the ends of the inner surface of side panel 18 and side cleats 78 and 80 are attached to the ends of the inner surface of side panel 20. Top cleats 82, 84, 86, and 88 are attached to outer ends of the inner surface of reinforcing top members 54, 56, 58, and 60, respectively. One end 90 of each of the top cleats 82, 84, 86, and 88 extends

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downwardly in the plane of the edge of the reinforcing top member on which it is mounted. The other end 92 of cleats 82, 84, 86, and 88 is mitered as are the ends 94 of cleats 70, 72, 74, 76, 78, and 80 so that miter joints are formed at both ends of each of the last-mentioned group of cleats when the container is assembled.

Preferably, the cleats are positioned with the outer side face of the cleats aligned with the end edge of the panel or flap on which they are mounted. The cleats may be plywood or other suitable material. The cleats may be mounted on shell 10 by any conventional means such as staples (not shown). Reinforcing filament tape may be attached to the ends of side panels 18 and 20 to prevent the staples from tearing the shell. The passage of the staples through the reinforcing top and bottom members on the flaps and bottom panel effectively prevents the staples from tearing these portions of the shell.

In accordance with the invention means are provided for securing shell 10 to the end panels 12 and 14. As here embodied, this means comprises tying means such as bands 98 and 100 which may be of steel or other suitable material that extends over the bottom and side panels and the flaps adjacent the plane of the outer surface of the end panels. Preferably band 98 is centered over the joint formed by the inside surfaces of cleats 70, 74, 78, 82, and 86 and the outer surface of end panel 12. Likewise, band 100 is centered over the joint formed by the inner surfaces of the cleats at the other end of the container and the outer surface of end panel 14. This positioning of the bands permits the container to be tightly secured without being crushed and helps insure that the ends of the container are sealed against the entry of small foreign objects.

Preferably, bottom panel 16 has skids mounted on its lower surface so that the assembled container rests on the skids and not on the bottom panel. It is also preferred that these skids be so arranged that fork lifts, slings and the like may be used in moving the assembled container.

As best shown in FIGS. 1 and 4, a pair of transversely extending skids 102 and 104 are mounted by suitable means on bottom panel 16. Skids 102 and 104 are positioned under reinforcing bottom members 50 and 52 to prevent the application of excessive shearing stress on bottom panel 16. Preferably, the skids are positioned slightly inwardly of the outer surface of end panels 12 and 14 so that bands 98 and 100 may be extended around the shell and do not need to pass over the skids. The horizontal spacing between each end panel and the adjacent skids is kept to a minimum so that downward forces exerted on the end panels do not generate excessive turning moments on the reinforcing bottom member about the skids.

Preferably, a container manufacturer prefabricates the various elements of the container. The elements of the container may then be shipped to the user in a knocked-down condition for assembly by the user to provide economical utilization of shipment and storage space. The container manufacturer would, for example, preferably score shell 10, attach reinforcing bottom members 50 and 52 to bottom panel 16; and attach reinforcing top members 54, 56, 58, and 60 to the flaps; and attach the cleats to the shell, but would not attach the end panels to the shell. Also, a suspension plug 42 would be attached to each of the end panels 12 and 14 and if skids are desired, the skids would be attached to the bottom panel by the manufacturer.

The preferred procedure for assembling the container about an article such as the cylindrical roll 106 on core 108 as illustrated in FIGS. 4 and 5 will be described. During the assembly of the container at the point of use, it is desirable to initially suspend the cylindrical roll of product to be packaged by an auxiliary means, for example, a sling (not shown). The plug 42 of end panel 12 is inserted into the hollow end of the core of the cylindrical roll. Subsequently the plug 42 of end panel 14 is inserted into the other end of the core.

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The end panels 12 and 14 may now be used to suspend the roll of product therebetween and the auxiliary suspending means may be withdrawn. Preferably, however, end panels 12 and 14 with the product roll suspended therebetween are positioned on the reinforcing bottom members 50 and 52, respectively, with panel 12 abutting the inside of cleat 70 and panel 14 abutting the inside of cleat 72 by manipulation of the auxiliary suspending means, before the auxiliary suspending means is withdrawn.

Once the end panels 12 and 14 are in place, side panels 18 and 20 and flaps 22 and 24 are folded into position over the edges of the end panels. Cleats 74 and 78 on the side panels and cleats 82 and 86 on the flaps abut the outer surface of end panel 12 and cleats 76 and 80 on the side panels and cleats 84 and 88 on the flaps abut the outer surface of end panel 14.

When the flaps 22 and 24 are folded inwardly into horizontal position, the inner side edges of the flaps and the ends 90 of the cleats attached to the flaps meet in abutting contact at the longitudinal center line of the container as best illustrated in FIG. 5. This arrangement of the flaps helps to retain the flaps 22 and 24 and the side panels 18 and 20 in the assembled position after they have been folded into place and before the securing means for the container is attached.

After the flaps and the side panels are folded around the end panels 12 and 14, securing means, here illustrated as two bands 98 and 100, are placed laterally around the shell 10 adjacent the outer transverse edge of skids 102 and 104 and in alignment with the end panels 12 and 14. The bands 98 and 100 are then secured to themselves by clips (not shown).

In the disassembly of the container, the bands 98 and 100 are first removed from the container. Then flaps 22 and 24 and side panels 18 and 20 may be folded back to a generally horizontal position extending from bottom panel 16. When the flaps and side panels are in a generally horizontal position, the product roll is exposed and an auxiliary suspending means such as sling may be placed under the product roll and used to raise the product roll and the end panels off of the ground. Next the plugs 42 of the end panels 12 and 14 may be removed from the product roll. The product roll has now been effectively removed from the container and may be easily moved to a new desired location.

In accordance with the invention a new and improved container has been provided which is capable of being rapidly assembled and disassembled, which is light-in weight and has sufficient strength to be stacked with containers one on top of each other without crushing of the lower containers in the stack even when the containers are each loaded with heavy articles, and which may be shipped and stored in a knocked-down condition that requires a minimum of shipping and storage space.

It will be apparent to those skilled in the art that various modifications and variations could be made in the present container without departing from the scope or spirit of the invention. For example, the orientation of the container may be changed so that the flaps would form one of the side walls of the container rather than the top wall. In this orientation of the container, reinforcing means if provided could be positioned on the panels at the top and bottom of the rotated container.

The invention in its broader aspects is not limited to the specific details shown and described, but departures may be made from such details within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. A suspension container comprising:

(a) a foldable shell including a bottom panel, a pair of side panels, and two flaps, with a flap extending from an upper edge of each of said side panels for

- folding into a horizontal position to form a top for the container;
- (b) a pair of independent end panels positioned above said bottom panel in the assembled container, each of said end panels having a suspension plug attached on the inner surface of said end panel for engaging one end of an article to permit suspension of the article between said end panels;
- (c) bottom, side, and top cleats attached to the inner surface of said foldable shell adjacent the ends of said bottom and side panels, and said flap, respectively, each of said cleats abutting the outer surface of one of said end panels in the assembled container for reinforcing said end panels; and for resisting outward longitudinal forces exerted on said end panels;
- (d) a pair of spaced reinforcing bottom members extending inwardly from the ends of said bottom panel and attached to the inner surfaces of said bottom panel, with said end panels positioned on said bottom members and one of said bottom cleats positioned on the upper surface of each of said bottom members at the outer end edge thereof;
- (e) a plurality of spaced top members attached to the inner surface of said flaps, said top members extending inwardly from the ends of said flaps, with one of said top cleats positioned on the lower surface of each of said top members adjacent the outer end edge thereof; and
- (f) means for securing said shell to said end panels.
2. The container of claim 1 wherein the width of each of said flaps is about one-half the width of the container to permit opening and closing the container along its longitudinal center line.
3. The container of claim 1 wherein transverse skids are mounted on the undersurface of said bottom panel below said bottom members.
4. The container of claim 1 wherein said means for securing said shell include tying means extending over the bottom and side panels and the flaps adjacent the plane of the outer surface of said end panels.
5. The container of claim 4 wherein said tying means is banding.
6. A suspension container comprising:
- (a) a foldable shell including a bottom panel, a pair of side panels, and two flaps, with a flap extending from an upper edge of each of said side panels for

- folding into a horizontal position to form a top for the container;
- (b) a pair of independent end panels positioned above said bottom panel in the assembled container, each of said end panels having a suspension plug attached on the inner surface of said end panel for engaging one end of an article to permit suspension of the article between said end panels;
- (c) bottom, side, and top cleats attached to the inner surface of said foldable shell adjacent the ends of said bottom and side panels, and said flap, respectively, each of said cleats abutting the outer surface of one of said end panels in the assembled container for reinforcing said end panels; and for resisting outward longitudinal forces exerted on said end panels;
- (d) a bottom reinforcing means extending inwardly from the ends of said bottom panel and attached at the inside surface of said bottom panel, with one of said bottom cleats positioned on the upper surface of said bottom reinforcing means at each outer end edge of said bottom reinforcing means;
- (e) a top reinforcing means extending inwardly from the ends of said flaps and attached to said flaps at the inside surface of said flaps, with one of said top cleats positioned on the lower surface of said top reinforcing means at each outer edge of said top reinforcing means; and
- (f) means for securing said shell to said end panels.

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