Sept. 8, 1970 H. E. CIPOLLA 3,527,339

COLLAPSIBLE FREIGHT CONTAINER

Filed Dec. 12, 1968 2 Sheets-Sheet 1

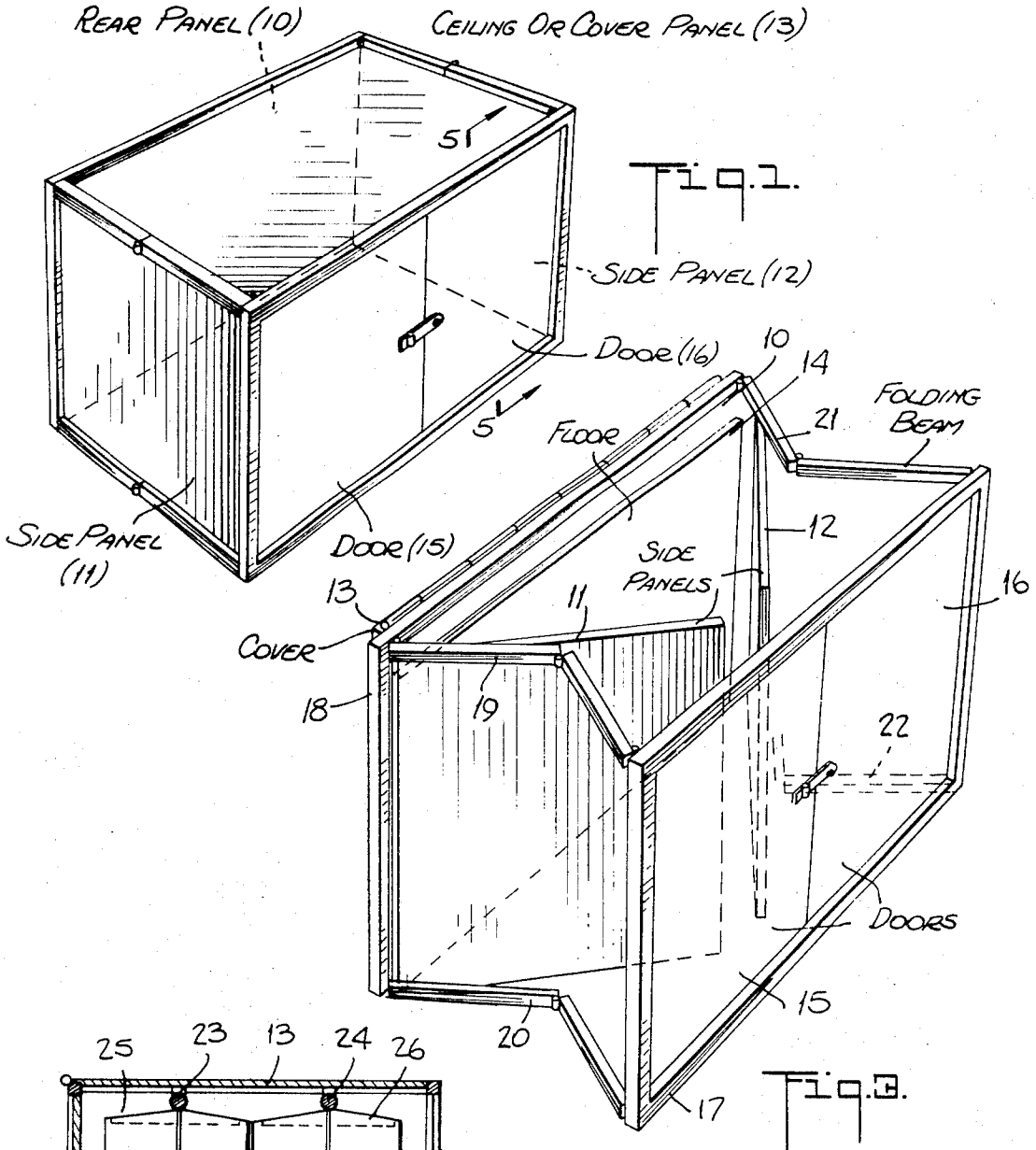



Fig. 1.

Fig. 2.

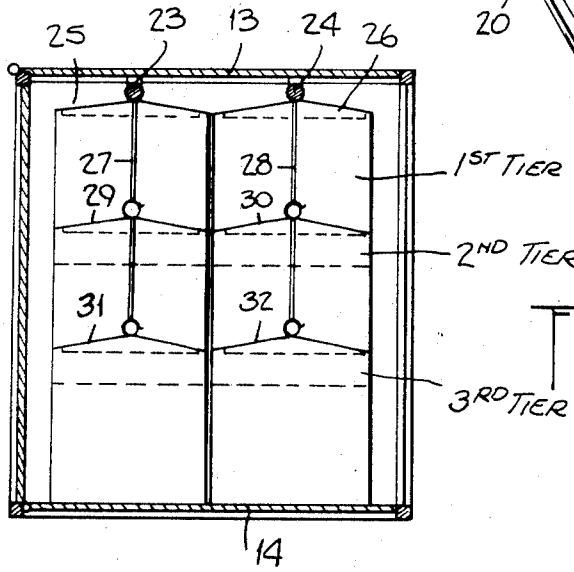



Fig. 3.

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Fig. 2.

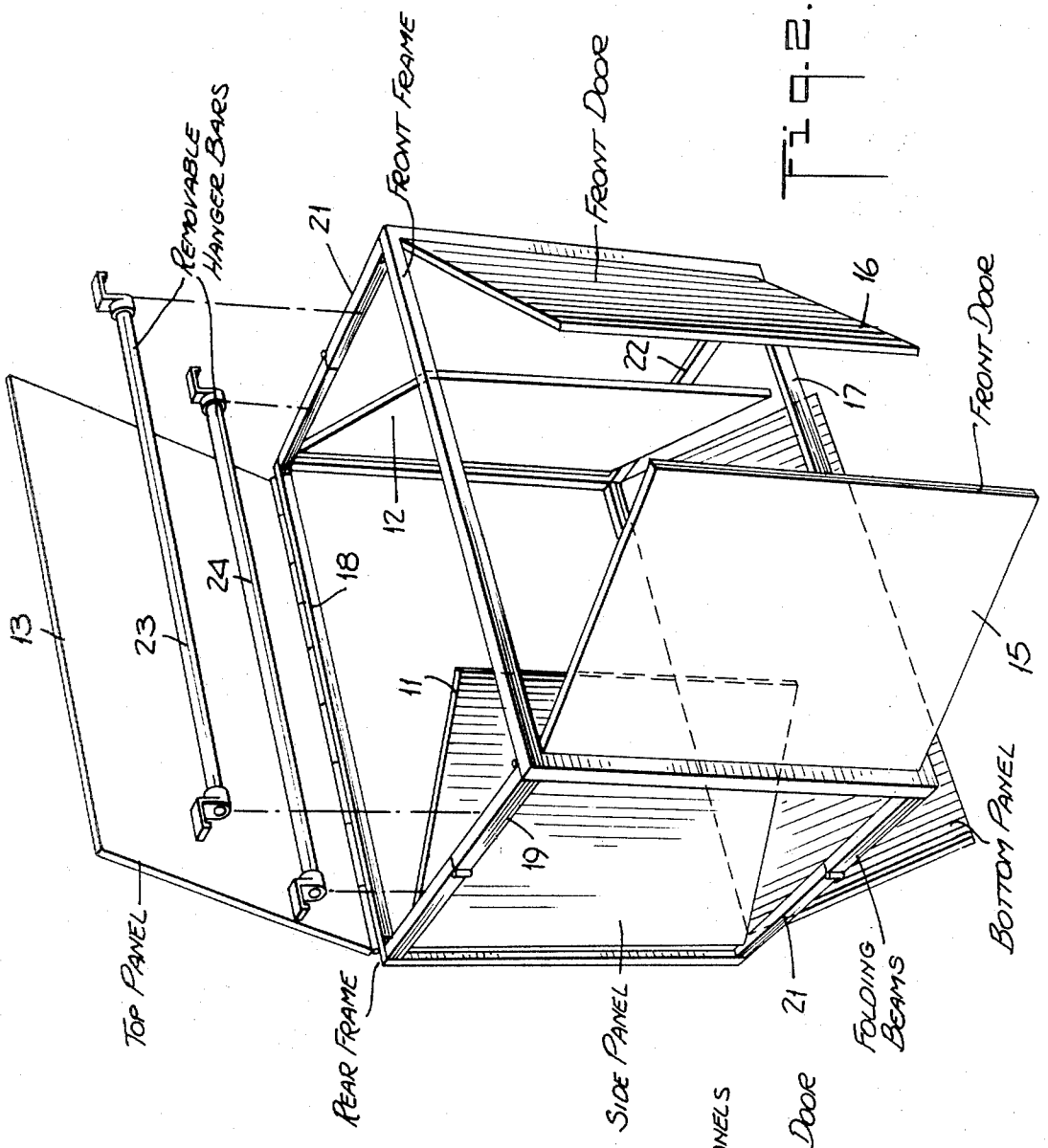
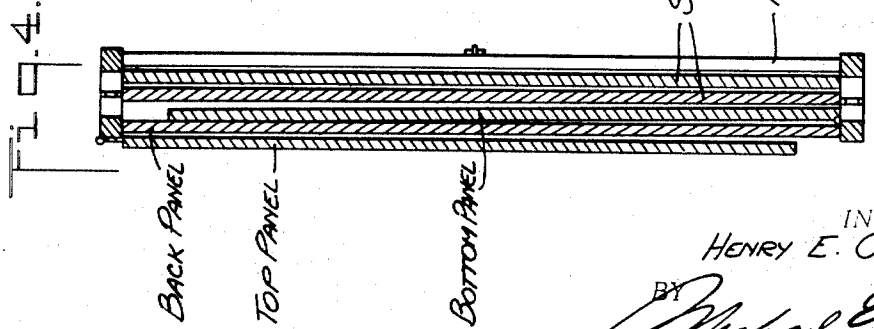



Fig. 4.




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# COLLAPSIBLE FREIGHT CONTAINER

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## ABSTRACT OF THE DISCLOSURE

A collapsible freight container for shipping garments and the like, the container when empty, being capable of being reduced to a compact structure which may be transported at low cost. The container is constituted by a framework formed by identical rectangular front and rear frames whose corners are interconnected by foldable cross beams. A rear panel is fixedly supported on the rear frame, a floor panel being hinged to the bottom section of the rear frame and side panels being hinged to the end sections thereof, whereby in the collapsed state, the floor panel is folded against the inner wall of the rear panel and the side panels are folded against the floor panel. The ceiling panel of the container is hinged to the top section of the rear frame and in the collapsed state folds against the outer wall of the rear panel. Doors are hinged to the ends of the front frame, and in the collapsed state they lie adjacent the folded-in side panels, thereby providing a highly compact structure.

This invention relates generally to freight containers for shipping goods, and more particularly to a collapsible container especially adapted to transport articles of apparel.

In shipping garments, attempts have been made to use large, box-like containers whose dimensions are sufficient to accommodate hundreds of garments on hanger bars mounted within the container. While such containers are strongly built and serve as an efficient means for shipping garments from a manufacturer to a customer, in order to reuse the container, it must be shipped back to the manufacturer, and this presents a problem.

In formulas for determining railroad, cargo-plane or other carrier charges, both the volume and weight of the loaded container are taken into account. Hence even though a container may be lightly loaded or even empty, the shipping charge therefor is still quite substantial, for its volume is as great as a fully loaded container. This factor has heretofore discouraged the use of large shipping containers for clothing which are returned empty.

An alternative approach to this problem has been to use so-called disposable "hanger-packs," which are corrugated-board cartons capable of holding about seventy-five articles of apparel, such as dresses, on a hanger rod mounted within the carton. Because the structure of such cartons is relatively weak, one can only pack therein a single tier of clothing, thereby leaving an empty space within the carton under the tier of clothing. Again, since volume is a factor in freight charges, payment for the hanger-pack must be made on the basis of vacant as well as occupied space. Also, in large shipments, of say two thousand or so dresses, it becomes necessary to use and handle a large number of hanger-packs, which adds materially to the overall shipping costs.

Moreover, with small, low-cost disposable containers or hanger-packs even though one does not pay for the return of the containers, it becomes necessary to use a fresh supply with each new shipment, and this is not inexpensive when a large number of packs is involved. A further factor which must be considered is security, for it is much easier to hijack small cartons of clothing



then a large and cumbersome container constructed of materials which cannot be readily broken into.

Accordingly, it is the main object of this invention to provide a collapsible container of large volume which is suitable for efficiently transporting large quantities of clothing, and which may be quickly collapsed, when empty, into a relatively compact structure capable of being shipped back at relatively low cost.

Also an object of the invention is to provide a collapsible shipping container which may be densely packed with clothing to avoid vacant areas therein that add to shipping costs.

Briefly stated, these objects are accomplished in a collapsible container structure constituted by a framework having identical front and rear rectangular frames whose corners are interconnected by foldable cross beams, whereby the two frames may be brought together. A rear panel is fixedly supported on the rear frame, and a pair of doors are hingedly connected to the front frame.

Hingedly onto the top and bottom section of the rear frame are a floor panel and a ceiling panel respectively, while hingedly connected to the end sections thereof are side panels, the arrangement being such that when collapsed, the floor panel folds against the inner wall of the rear panel, the side panels fold against the floor panel and the ceiling panel folds against the outer wall of the rear panel.

For a better understanding of the invention, as well as other objects and further features thereof, reference is made to the following detailed description to be read in conjunction with the accompanying drawing wherein:

FIG. 1 is a perspective view of a container in accordance with the invention in the erected state;

FIG. 2 illustrates, in perspective, the various components of the container in their hinged relation to the framework;

FIG. 3 shows the manner in which the container is collapsed;

FIG. 4 shows the container in the collapsed state; and

FIG. 5 is a transverse section showing the interior of the container, the section being taken in the plane indicated by lines 5—5 in FIG. 1.

Referring now to FIG. 1, there is shown a collapsible container in accordance with the invention. While the container is especially adapted for shipping clothing, it will be appreciated that it is suitable as a general freight container for all forms of products in those situations where the container is to be returned empty for reloading at a point of origin.

The container is formed of a rear panel **10**, a pair of side panels **11** and **12**, a ceiling panel **13**, a floor panel **14** and a pair of doors **15** and **16**. These panels may be of metal, wood or plastic or laminated structures. The framework itself is preferably fabricated of high-strength metal such as aluminum pieces.

As best seen in FIG. 2, the various panels are supported on a framework constituted by identical front and rear, rectangular frames **17** and **18** which are interconnected at their corners by foldable cross beams **19**, **20**, **21** and **22**, such that when the container is collapsed, the front frame is brought into the proximity of the rear frame.

The pair of doors **15** and **16** are hinged to the end sections of the front frame **17**, the doors being provided with suitable latching devices to hold them closed. While the swinging door arrangement has the advantage of opening up the entire interior of the container to permit rapid loading and unloading, the invention is not limited to the door arrangement shown and, in practice, one may use a single door hinged to the bottom or top section of the front frame.

Rear panel **10** is fixedly supported within the rear frame

18, while the side panels 11 and 12 are hingedly attached to the end sections thereof. The ceiling panel 13 is hingedly connected to the upper section of the rear frame, whereas the floor panel 14 is hinged to the lower section thereof. The floor and ceiling panels may be of foldable construction each having two leaves. However, in practice these floor and ceiling panels, when they are of the same or lesser width than the rear panel against which they fold, may be single panels, as shown.

When the container is erected, all hinged panels are locked in place on the framework by suitable retractable locking mechanisms or catches of standard design (not shown). Use is also made of hinges which permit the associated panels to occupy their assigned positions in the collapsed state and to occupy their proper positions on the framework in the erected state, the hinge structures being such as to preclude separations at the hinge positions which would otherwise admit dust or other foreign matter into the container.

In collapsing an empty container, first the ceiling panel 13 is unlatched from the framework and folded against the outer surface of rear panel 10. Then the floor panel 14 is unlatched and folded against the inner surface of the rear panel 10, after which the side panels 11 and 12 are folded against the floor panel.

The foldable beams 19 and 22 are then bent in, thereby bringing the front frame 17 and the doors 15 and 16 thereon against the group of panels already folded on the rear frame. Thus the collapsed structure is highly compact, and when returned by carrier, the freight charge will be primarily determined by weight rather than volume.

In order to support articles of apparael within the container, a pair of hangers bar 23 and 24, as shown in FIG. 1 are removably mounted at their ends on the top cross beams 20 and 21 at spaced positions. Two rows of apparel are directly suspended from these bars by a suitable set of hangers 25 and 26, as shown in FIG. 5 to form an upper tier of clothing. Vertical stringers 27 and 28 are attached to the bars and connected to the stringers is a second set of hangers 29 and 30 for supporting an intermediate tier of apparel in overlapping relation with the upper tier. Also connected to the stringers is a third set of hangers 31 and 32 for supporting a lower tier of apparel in overlapping relation with the intermediate tier.

The reason for overlapping the tiers is in order to densely pack the container, not only to make optimum use of the available space but also to restrict the freedom of movement of the articles of apparel to prevent them from rubbing against each other in transit. Such rubbing may cause damage to the clothing and possibly rip off buttons, etc.

Obviously, the invention is not limited to but two hanger rods or only three tiers of clothing, for the dimensions of the container and the nature of the articles to be shipped will determine the type of hanger set up appropriate for maximum utilization of the available space.

While there has been shown and described a preferred embodiment of a collapsible freight container, in accordance with the invention, it will be appreciated that many



changes and modifications may be made therein without, however, departing from the essential spirit of the invention.

What I claim is:

1. A collapsible shipping container for clothing comprising:
   (a) a framework constituted by front and rear rectangular frames and inwardly foldable upper and lower cross beams interconnecting the corners of said frames, said framework being formed of high-strength metal pieces;
   (b) a rear panel fixedly mounted on said rear frame;
   (c) a pair of side panels hingedly mounted on the end sections of the rear frame, said side panels in the erected state of the container occupying the space between the cross beams;
   (d) a ceiling panel hinged to the upper section of the rear frame, said ceiling panel in the erected state covering the top of said container and in the collapsed state lying against the outer surface of the rear panel;
   (e) a floor panel hinged to the lower section of the rear frame, said floor panel in the erected state providing a base for said container and in the collapsed state lying against the inner surface of said rear panel, the side panels in the collapsed state then lying against the floor panel;
   (f) a door element hinged to said front frame, said front frame and the door element thereon being disposed adjacent said rear frame in the collapsed state; and
   (g) hanger bars removably attached to said upper cross beams in the erected state and extending across said container for supporting clothing therein.

2. A container as set forth in claim 1, further including stringers attachable to said bars for supporting sets of hangers to permit overlapping tiers of clothing to be held in the container.

3. A container, as set forth in claim 1, wherein said ceiling and floor panels are formed by foldable leaves.

4. A container as set forth in claim 1, wherein said door element is constituted by a pair of door sections hinged to the end sections of the front frame.

5. A container as set forth in claim 1, wherein said framework is formed of metal and said panels of wood.


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WILLIAM T. DIXSON, JR., Primary Examiner

U.S. Cl. X.R.

217—14; 220—6