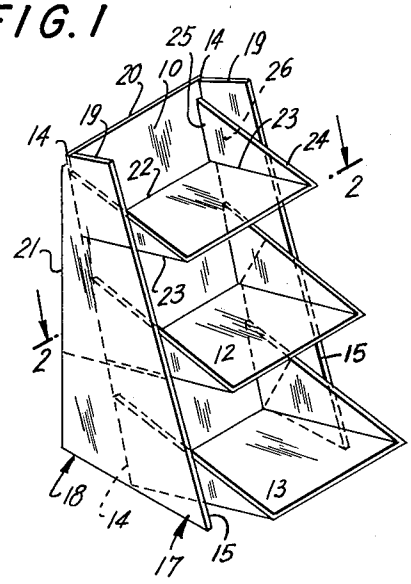
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KNOCK-DOWN CARDBOARD SHELF STRUCTURE

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FIG. 1



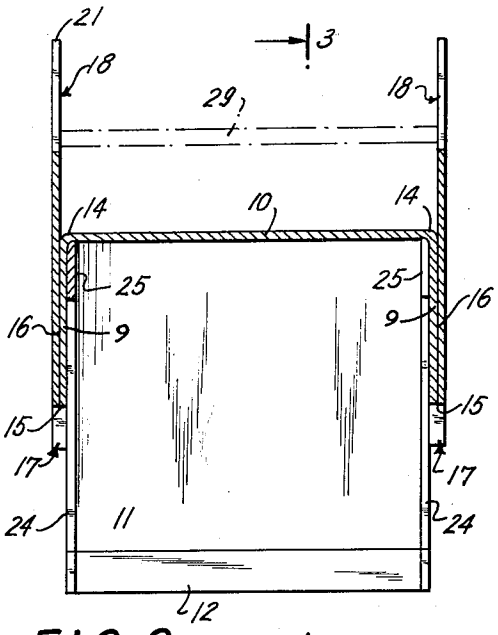
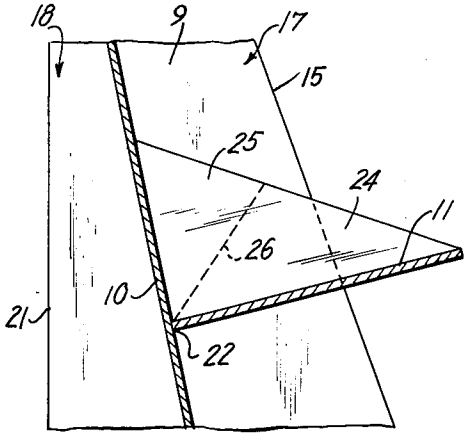


FIG. 2

3

FIG. 3



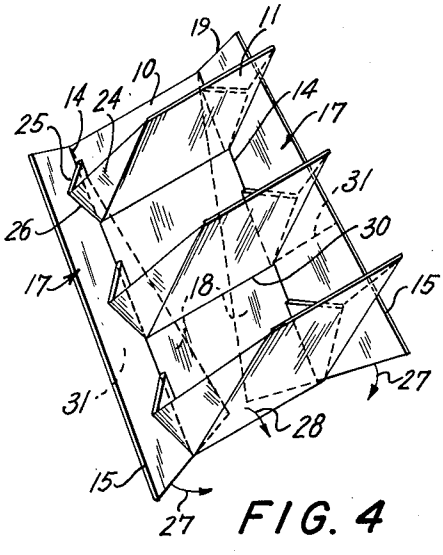


FIG. 4

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FIG. 5

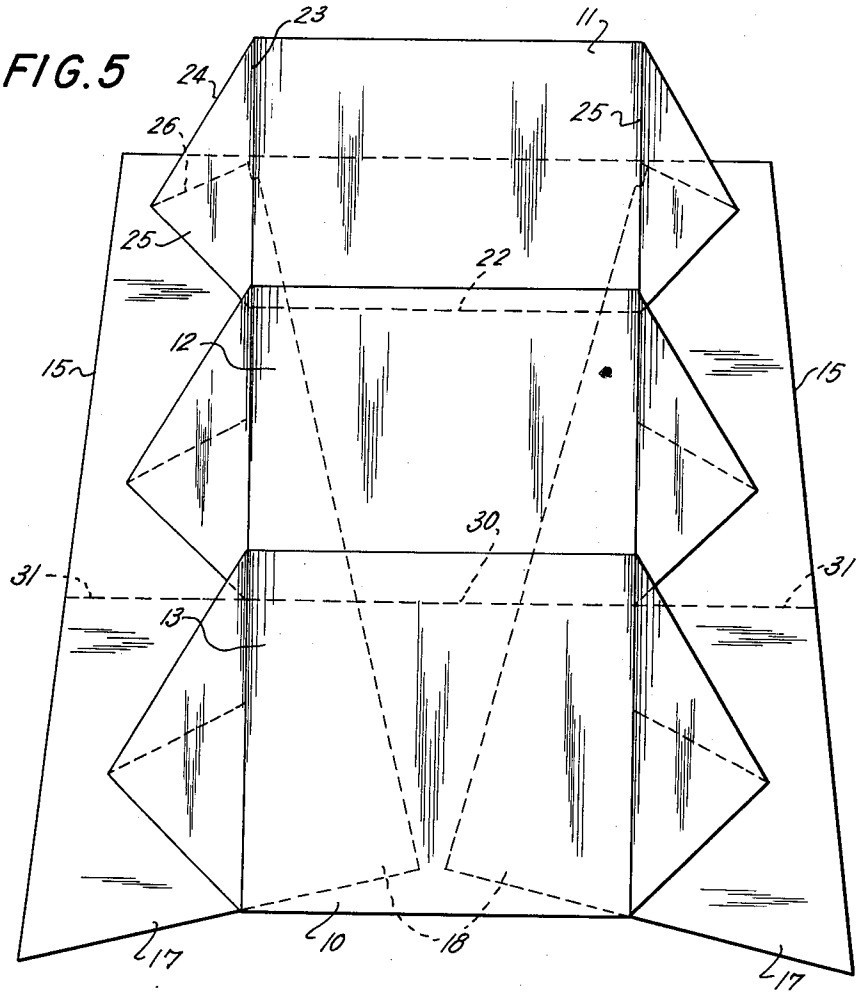


FIG. 6

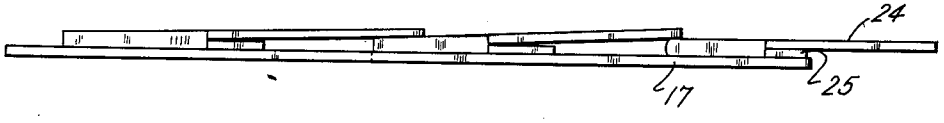
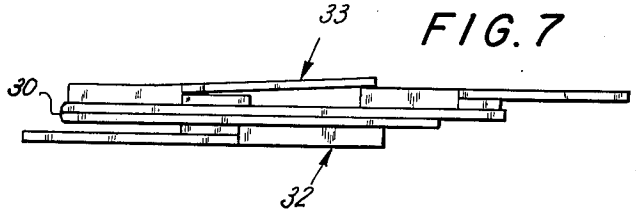


FIG. 7



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KNOCK-DOWN CARDBOARD SHELF STRUCTURE

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4 Claims. (Cl. 211—135)

The present invention relates generally to display structures, and has particular reference to collapsible or knock-down devices composed of cardboard or equivalent material.

It is a general object of the invention to provide an inexpensive structure for use in supermarkets, department stores, and similar establishments, the device being characterized by an ability to be converted, almost instantaneously, from a relatively flat, collapsed or knock-down condition to an operative set-up condition defining one or more superposed shelves upon which merchandise can be supported and displayed.

The term "cardboard" as used herein is intended to include within its scope all the grades and thicknesses that are currently available on a commercial scale and are suitable for the purpose, including sheet material composed partially of corrugated layers of paper or the like. The term will obviously include within its scope, also, other inexpensive materials available in sheet form and bendable and interengageable in the manner hereinafter to be described.

The improved structure comprises, in brief, an upright rear wall panel, side wall panels hinged to the rear wall along its lateral edges, and one or more shelf panels hinged to the rear wall and adapted to swing between a collapsed position substantially flat against the rear wall and an operative position extending forwardly from the rear wall. The side panels are articulated to the shelf or shelves in such a way that by merely bringing the side walls forwardly with respect to the rear wall the shelf or shelves will automatically assume operative positions.

A general objective of the invention is to provide a construction which can be simply and inexpensively manufactured, which may be collapsed into a substantially flat condition for storage and shipment, and which can be readily adjusted into operative condition by the user, without calling for any unusual skills or tools.

One way of achieving these general objects and advantages, and such other benefits as may hereinafter be pointed out, is illustrated in the accompanying drawings, in which—

FIG. 1 is a perspective view of a shelf structure embodying the features of this invention, shown in set-up condition;

FIG. 2 is a plan view, partly in section, substantially along the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary sectional view substantially along the line 3—3 of FIG. 2;

FIG. 4 is a perspective view, on the scale of FIG. 1, showing the parts in an intermediate position between fully collapsed and fully set-up conditions;

FIG. 5 is a face view of the device in fully knockdown condition; and

FIGS. 6 and 7 are end views of the structure, in collapsed condition, illustrating a possible further stage of folding.

In the device chosen for illustration, a substantially rectangular rear wall panel **10** is associated with three shelf panels **11**, **12** and **13**. As best indicated in FIG. 2, the panel **10** forms the center section of a larger blank which is scored and shaped to define not only the rear wall but also the side walls of the structure. More particularly, it will be noted that the blank is folded along the lateral

edges of the rear wall **10**, as indicated at **14**, to form wings **9** that extend forwardly, these wings being again folded at **15** to define areas that extend rearwardly to an extent beyond the plane of the rear wall **10**. The overlying parts are permanently secured together, by adhesive or otherwise, as at **16**, so that each side wall panel as a whole consists of a part **17** that extends forwardly from the rear wall, and a part **18** that extends rearwardly from that wall. The connection along the lateral edges **14** of the rear wall remains a hinged connection, so that the side wall panels can be adjusted, at will, between the substantially parallel relationship best shown in FIGS. 1 and 2, and the collapsed or knocked-down relationship shown in FIG. 5.

The hinges along the lines **14** allow the parts to be collapsed in such a way, that the rear parts **18** of the side wall panels lie substantially flatwise against the rear face of the rear wall **10**, as best indicated in FIG. 5, while the forward parts **17** of the side wall panels extend outwardly.

When the structure is set up into the condition of FIG. 1, the side wall panels afford a firm footing, as will be readily understood. The contours of the front edges **15**, and of the top edges **19** of the side walls and **20** of the rear wall **10**, may be varied without affecting the basic nature or mode of operation of the structure. The same is true with respect to the rear edges **21** of the side wall panels.

Each shelf is articulated in the manner best illustrated in FIGS. 2 and 3 with respect to the uppermost shelf **11**. The shelf panel is coextensive in length with the width of the rear wall **10**, so that the rear edge **22** of the shelf can, if desired, have a length which extends fully from one lateral edge **14** to the other. This rear edge is in a hinged relationship to the rear wall **10**, although an actual hinge is not necessary to accomplish this purpose. Articulated to the end edges **23** of the shelf panel are attachment pleats. Each pleat is composed of a pair of hingedly connected sections, and the rear section is secured flatwise to the adjacent side wall panel. In FIG. 3 the front section is indicated at **24**, and the rear section at **25**. They are hingedly connected along a line **26**. Preferably this line extends at an angle of 45° to the plane of the shelf panel **11**, but this is not essential since it may be desirable, under certain circumstances, to arrange the rear wall **10** at a slight inclination to the vertical, or to arrange the shelves at a slight inclination to the horizontal. The essential thing is that the hinge line **26** passes through the point of intersection of the rear edge **22** of the shelf and the adjacent lateral edge **14** of the rear wall. This makes it possible to compel the shelf movements to follow movements of the side wall panels, and vice versa. For example, if the parts are in the relatively flattened collapsed condition of FIGS. 5 and 6, then swinging the side wall panels forwardly in the direction of the arrows **27** of FIG. 4 will automatically bring each shelf downward and forward in the general direction of the arrow **28**. This adjusting movement will cease when the sections of each attachment pleat have been brought into a single plane, with the adjacent side wall panel lying flatwise against the pleat, on the outside.

When the parts have been brought to this set-up condition, a releasable means may be applied, if desired, to retain the side wall panels in the desired relationship. This can be accomplished by any simple means for pressing the side wall panels toward each other when the structure is set up. One way of accomplishing this is to interpose a rod or element **29** between the rear parts **18** of the side wall panels, as indicated in FIG. 2, this element being composed of wood or other rigid material that can serve as an inexpensive readily-applicable prop to hold the parts **18** apart. Obviously, by holding the parts **18**

apart, the forward parts **17** will be pressed toward each other.

When the shelf structure is loaded with merchandise or the like, the weight of this material on the shelves will serve, further, to retain the structure in its operative set-up condition.

The depiction of three shelves in the device illustrated is intended to indicate the possibility of providing any desired number of shelves, each being articulated to the rest of the structure in the manner described. In most cases it is desirable to make the shelves progressively deeper toward the base. This contributes to stability, and displays the merchandise items to better advantage.

To collapse the device, for shipment, storage, or reuse at some subsequent time, it is merely necessary to swing the side panels outwardly, whereupon the shelves will automatically adjust themselves into the flat relationship shown in FIGS. 5 and 6. A further collapsing is possible, if it is though to be desirable, by providing a scored or otherwise-formed hinge **30** in the rear wall **10** along a line extending transverse to the lateral edges **14** and extending across these edges and across the side wall panels, as indicated at **31**. By means of this transverse hinge it is possible to collapse the structure to a further extent by folding the sections on opposite sides of the hinge into superposed relation. This is best indicated by comparing FIGS. 6 and 7. In FIG. 7 the lower section **32** of the structure has been folded to lie beneath the upper section **33**, the fold line or hinge **30** being shown at the left. Obviously, additional transverse hinges of this character can be provided, if desired. Any such hinge is preferably formed in a manner that allows the adjacent sections of the structure to be folded only in a rearward direction, as shown. This prevents interference with the shelf panels on the front of the structure, since these panels may overlap slightly, as indicated in FIG. 5, depending upon the vertical spacing between shelves and the depths of the shelves.

It will be understood that the details herein described and illustrated may be modified in various respects without necessarily departing from the spirit and scope of the invention as expressed in the appended claims.

What is claimed is:

1. In a knock-down carboard shelf structure, a panel shaped to define an upright rear wall having lateral edges, side wall panels hinged to said rear wall along said lateral edges and adjustable between collapsed positions substantially in the plane of the rear wall and set-up positions having parts of said panels extending forwardly therefrom, at least one shelf panel having a rear edge and end edges and adapted to define a shelf projecting forwardly from the rear wall and in hinged relation thereto along its rear edge, lateral attachment pleats hinged to the end edges of thes helf panel, each pleat being composed of hingedly connected sections the rear one of which is secured flatwise to the adjacent side wall panel, the sections of each pleat being hinged together along a line passing through the point of intersection of the shelf hinge line and the adjacent lateral edge of the rear wall, whereby movement of the side wall panels from collapsed to set-up positions opens said pleats to swing the shelf panel forwardly, and means for releasably pressing said forwardly extending side wall parts toward each other when the structure is set up.

2. In a knock-down cardboard shelf structure, a panel shaped to define an upright rear wall having lateral edges, side wall panels hinged to said rear wall along said lateral edges and adjustable between collapsed positions substantially in the plane of the rear wall and set-up positions extending forwardly therefrom, at least one shelf panel having a rear edge and end edges and adapted to define a shelf projecting forwardly from the rear wall and in hinged relation thereto along its rear edge, lateral attachment pleats hinged to the end edges of the shelf panel, each pleat being composed of hingedly connected sections the rear one of which is secured flatwise to the adjacent side wall panel, the sections of each pleat being hinged together along a line passing through the point of intersection of the shelf hinge line and the adjacent lateral edge of the rear wall, whereby movement of the side wall panels from collapsed to set-up positions opens said pleats to swing the shelf panel forwardly, a hinge formed in said rear wall along a line transverse to said lateral edges, said hinge extending across said edges and side wall panels so that when the side wall panels are in their collapsed positions the sections of the structure on opposite sides of said last-mentioned hinge can be folded into superposed relation.

3. In a knock-down shelf structure, the combination of elements defined in claim 2, in which said last-mentioned hinge is formed to allow the adjacent sections of the structure to be folded only in a rearward direction to bring them into superposed relation.

4. In a knock-down cardboard shelf structure, a panel shaped to define an upright rear wall having lateral edges, side wall panels hinged to said rear wall along said lateral edges and adjustable between collapsed positions substantially in the plane of the rear wall and set-up positions extending transverse to said rear wall, each side wall panel having front and rear edges and the hinge line extending in the medial region of the side wall panel whereby each side wall panel has one part extending rearward and another extending forward with respect to the rear wall when the structure is set up, the rearward parts lying behind the rear wall when the structure is collapsed, at least one shelf panel having a rear edge and end edges and adapted to define a shelf projecting forwardly from the rear wall and hinged along its rear edge to said wall, lateral attachment pleats hinged to the end edges of the shelf panel, each pleat being composed of hingedly connected sections the rear one of which is secured flatwise to the forward part of the adjacent side wall panel, the sections of each pleat being hinged together along a line passing through the point of intersection of the shelf hinge line and the adjacent lateral edge of the rear wall, whereby movement of the side wall panels from collapsed to set-up positions opens said pleats to swing the shelf panel forwardly, and means for releasably retaining the side wall panels in set-up relationship, said means being interposed between said rear parts of the side wall panels.

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