

March 12, 1968

R. K. SMITH

3,372,855

REINFORCED CONTAINER

Filed Oct. 4, 1965

3 Sheets-Sheet 1

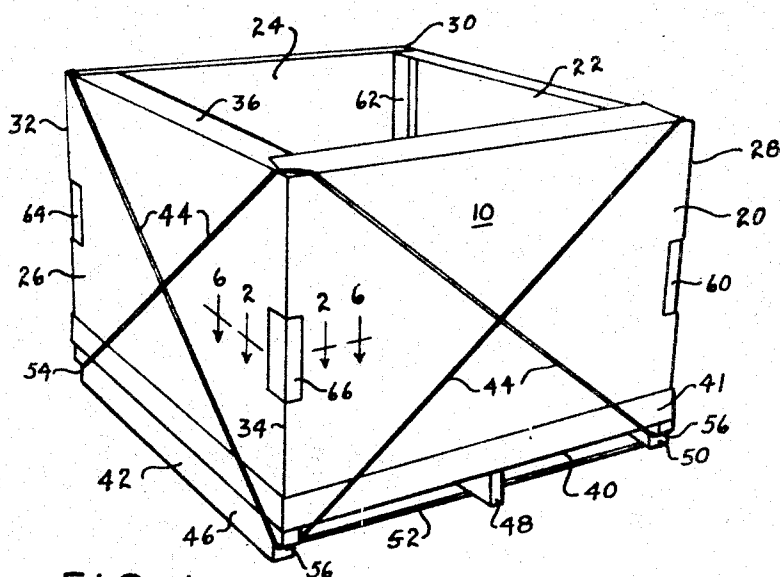


FIG. 1

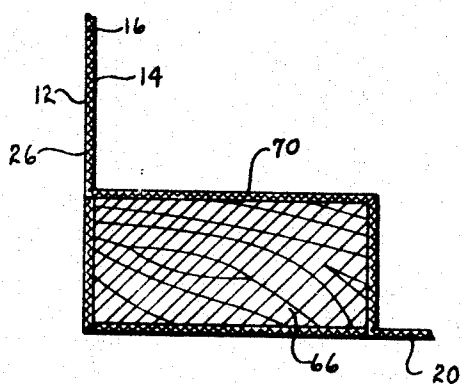


FIG. 2

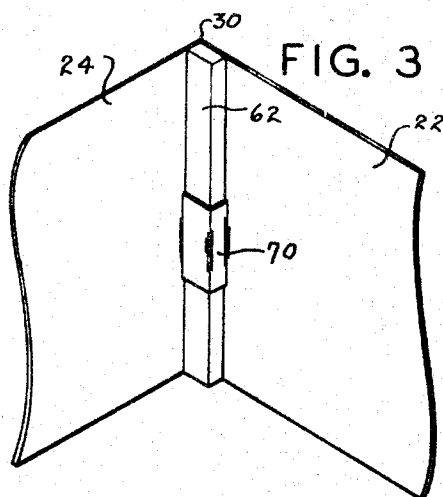


FIG. 3

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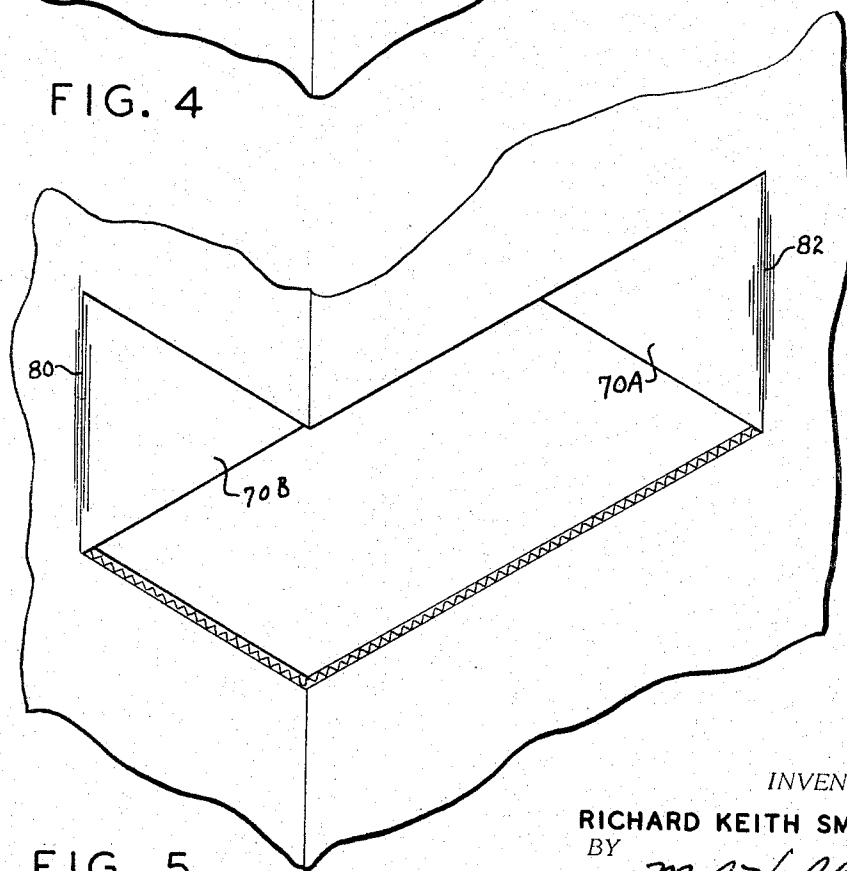
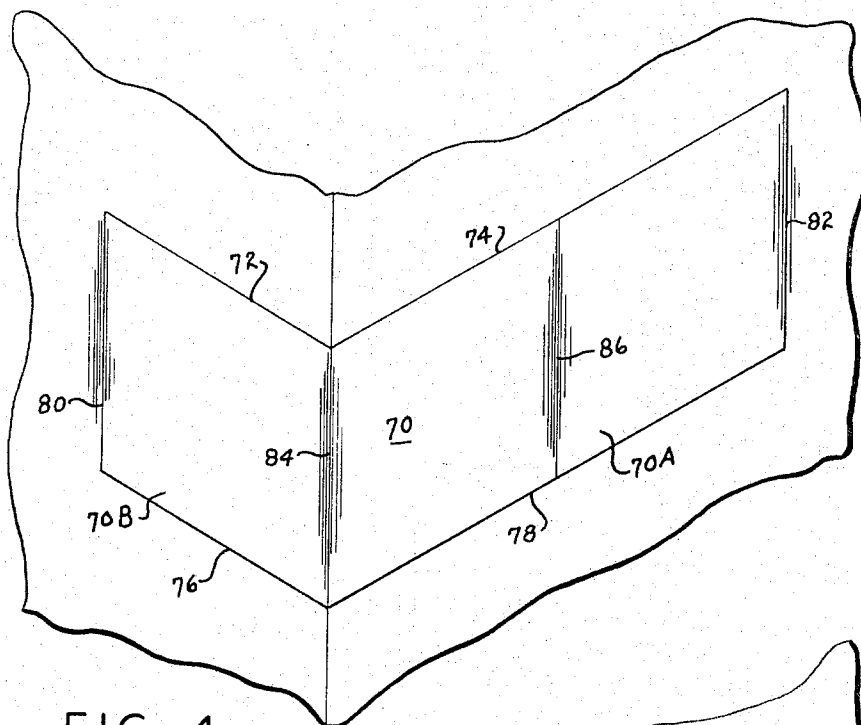
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FIG. 6

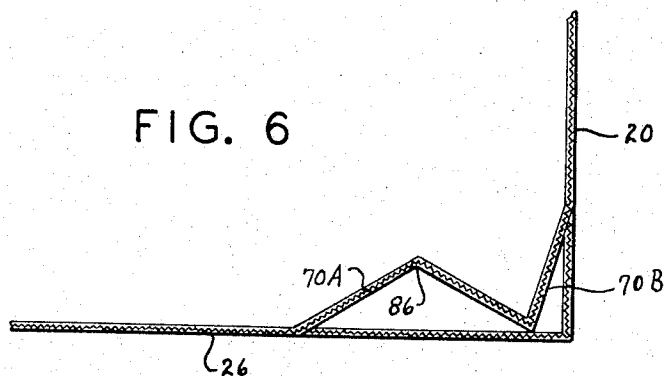


FIG. 7

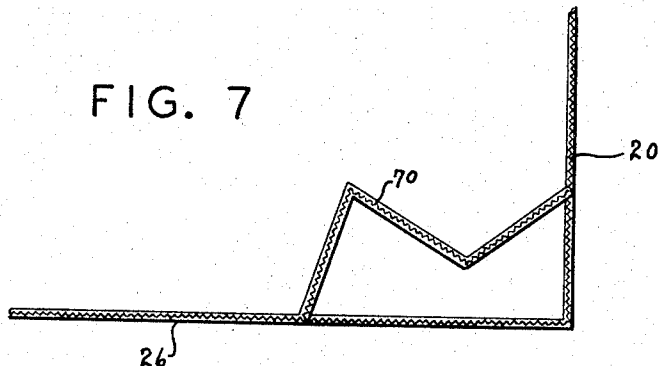
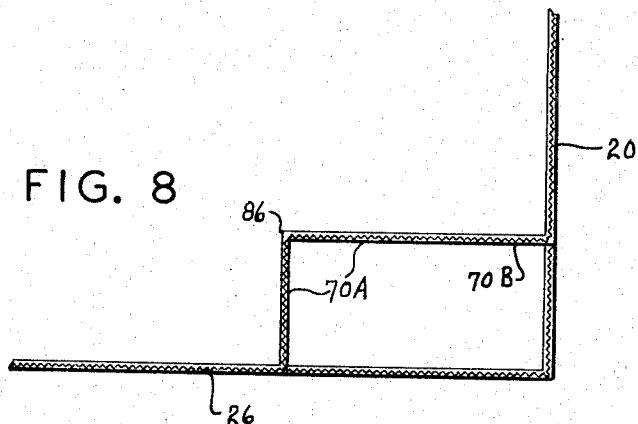


FIG. 8



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REINFORCED CONTAINER

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5 Claims. (Cl. 229—49)

ABSTRACT OF THE DISCLOSURE

A foldable reinforced container constructed of four side panels joined integrally to one another, forming a rectangularly shaped container, having a reinforcing post disposed on the internal side of the panels at each corner thereof and a strap-like member cut from adjoining panels extending around the internal side to hold the post in the respective corner. The strap is formed by two spaced horizontal cuts, and three or four vertical score lines permit the strap to fold inwardly on the panels after the container has been formed into its final rectangular shape.

Relatively large containers of generally rectangular shape are extensively used to handle and ship articles in bulk or in individually wrapped small articles packed into the larger container. These large containers are often required to handle heavy articles or material and are frequently stacked one on top of the other in storage or in shipment. The excess weight on the stacked containers and on the side walls thereof from the heavier articles and material contained therein has required the use of wood throughout the container in both the side walls and the bottom to prevent crushing of the containers on the bottom of the stack and bulging of the side walls. These wooden containers, in addition to being more expensive, are not only heavier than the conventional fiberboard containers but, when empty, are bulkier and more difficult to handle and ship in a space saving condition to the packer or user of the containers. The fiberboard containers are folded into a flat configuration for shipping to the user in a compact, easy-to-handle form, and are readily folded into the container form when they are ready to be used. These conventional fiberboard containers are often used in conjunction with pallets and are moved and loaded onto trucks or boxcars by lift trucks, and will hold most articles of light to moderate weight without collapsing or bulging. However, when heavier articles or materials are placed therein, their limited strength prevents container stacking and the use of the containers for articles and material requiring substantial lateral support in the container. It is therefore one of the principal objects of the present invention to provide a container of fiberboard or another type of flexible sided container, with a reinforcing structure which permits stacking without crushing the containers on the bottom, and which effectively gives lateral support to the sides to prevent bulging.

Another object of the invention is to provide a reinforcing structure for fiberboard containers which can be easily assembled in the container when it is formed ready for packing, and which can be shipped and handled in a compact form along with the folder carton.

Still another object of the invention is to provide a reinforced container of fiberboard and the like, which has virtually unlimited stacking strength and which can be used effectively with or without the reinforcing structure when the character of the articles or material to be shipped and the manner of shipping are such that no reinforcing is required.

A further object is to provide a relatively simple, easily fabricated reinforcing structure for containers of the

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aforesaid type, which can be quickly assembled in the containers without the use of any tools or equipment, and which is effectively retained in place by members formed as integral parts of the container structure.

Additional objects and advantages of the present invention will become apparent from the following description and accompanying drawings, wherein:

FIGURE 1 is a perspective view of a reinforced fiberboard container mounted on a pallet and embodying the present invention;

FIGURE 2 is an enlarged fragmentary cross sectional view taken on line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged fragmentary perspective view showing the details of the reinforcing structure;

FIGURE 4 is an enlarged fragmentary perspective view showing the carton construction without the reinforcing structure therein;

FIGURE 5 is an enlarged fragmentary perspective view showing the container construction ready to receive the reinforcing member; and

FIGURES 6, 7 and 8 are enlarged fragmentary horizontal cross sectional views of the container showing the manner in which the container is preformed for receiving a reinforcing member, the section being taken on line 6—6 of FIGURE 1.

Referring more specifically to the drawings, and to FIGURE 1 in particular, numeral 10 designates a container of generally rectangular shape, constructed of corrugated fiberboard material. The material forming the container is conventional and well known, consisting of two corrugated external layers 12 and 14, and corrugated layer 16 glued or otherwise secured to the two external layers. While this type of construction is often used in containers of this kind, a solid fiberboard or plastic panel material may be used in place of the illustrated construction. The container consists of four side panels 20, 22, 24 and 26 joined integrally to the respective adjacent panels at corners 28, 30, 32 and 34. The upper and lower edges of the four panels are provided with inwardly extending flanges 36 which give reinforcement to the upper and lower edges of the panels. The present container is illustrated as having a bottom 40 with upturned flanges 41 extending around the periphery thereof for receiving the lower edges of the container side panels, and a top (not shown) of similar construction is normally used with the container. The details of construction of the container, such as the flanges, bottom and top, are not considered important with respect to the present invention.

A pallet 42 of well known construction is shown supporting the container and is secured thereto by metal bands 44 secured to the container and the pallet, and securing the container and pallet together in a manner more fully described hereinafter. The pallet shown in the drawings consists of main support members 46, 48 and 50 joined together by a plurality of cross members 52, only one of which is shown in the drawings. The ends of members 46 and 50 are provided with notches 54 and 56 for receiving and retaining bands 44 in place at or near the corners of the pallet.

The four corners are reinforced by non-crushable posts or members, such as two-by-fours 60, 62, 64 and 66, extending the full internal height of the container, side walls and seating firmly against the bottom 40 of the container. While other non-crushable materials, such as layers of fiber-board, angle-iron or tubing, may be used in place of the two-by-fours, the two-by-four is most practical for the reinforcing member. The reinforcing members are held in place by an inwardly extending strap-like element 70 formed by severing the two adjoining side panels along lines 72, 74 at the top and 76, 78 at the bottom. The side panels are preferably scored along lines 80 and 82 at the opposite ends of element 70, and the

element is also scored at the corner 84 and at the middle between the corner and scoring lines 82 on line 86. With these scored portions or lines, the element can be readily folded inwardly from the position illustrated in FIGURE 4 to the positions illustrated in FIGURES 2, 3 and 5.

The scored lines provide one of the unique features of the present reinforcing structure and make it possible to readily transpose the element from the position shown in FIGURE 4 to the position shown in FIGURE 5, where it can receive reinforcing member 62. It is seen that element 70 is firmly secured at its two ends to the respective side panels of the container and forms a continuous band or strap for holding the reinforcing member firmly in the respective corner of the container.

In assembling the reinforcing members 60, 62, 64 and 66, the respective element 70 is folded inwardly from the position shown in FIGURE 4 to the position shown in FIGURE 5 by pressing it with the finger on scored line 86 causing longer section 70A to fold inwardly in a V-shaped configuration. The folding of section 70A inwardly causes section 70B to move inwardly in the manner illustrated in FIGURE 6. Further pressing of section 70A inwardly after the initial pressure has been applied to scored line 86 causes the element to move inwardly through the position shown in FIGURE 7 to the position shown in FIGURE 8 with section 70A being bent into an L-shaped configuration with corner 86 on the inner side and section 70B being positioned in parallel relationship to the adjoining portion of section 70A. With elements 70 shown in the position in FIGURES 5 and 8, the reinforcing members are then slipped into the respective corners within the embrace of elements 70, thus being retained firmly therein and prevented from being dislodged while the container is empty or is being filled.

It is seen that the foregoing reinforcing member and element do not interfere with the compact folding of the container when it is being shipped to the user for packaging. In that condition, the element is in the position shown in FIGURE 4 with sections 70B and 70A parallel with their respective panels, and the container is capable of being folded into a flat, easily handled condition in the same manner as conventional containers. The two-by-fours or other reinforcing members are preferably shipped separately in proper length for assembling as soon as the containers are ready for use.

Another important feature of the present invention is the second reinforcing structure, consisting of two metal bands, each placed over the top of the container above the post at one corner and beneath the post at the next succeeding corner. The band continues around the container, over and under the successive reinforcing members, and the ends are joined and clamped to form a complete, taut, looped structure. A second band is placed in the same manner over and under members of adjacent corners crossing the first band in the center of each side panel. Thus, it is seen that the reinforcing members 60, 62, 64 and 66 form a non-crushable or non-collapsible support at the corners for the band, and the bands crossing the center of each of the panels form angular reinforcing members to prevent bulging of the side panels when the container has been filled. In the embodiment illustrated in FIGURE 1, instead of the bands passing directly beneath the bottom of the respective reinforcing members, the container has been placed on a pallet and the bands pass beneath the pallet directly under the various reinforcing members. The two ends of each member 46 and 50 are notched as shown at numerals 54 and 56 to provide recesses for retaining the bands in place at the ends of the two members and directly beneath members 60, 62, 64 and 66, and for preventing the bands from slipping and becoming loose. In this arrangement, the pallet and the container are held firmly together, so that they can be moved, transported and stacked as a unit. The reinforcing members 60, 62, 64 and 66 perform the

same function with or without the pallet when used in conjunction with the steel bands, and perform the reinforcing function when used alone, i.e., without either of the steel bands. The reinforcing members give the required strength to the side walls, and the side walls in turn hold the members in vertical position so that, when the containers are stacked, the members form substantially continuous non-crushable and non-collapsible columns which give sufficient support for the cartons on or near the bottom to permit relatively high stacking. They also give sufficient support to the cartons to prevent the articles or material therein from being damaged by the weight of the succeeding cartons.

While only one embodiment of the present invention has been illustrated herein, it is apparent that the present reinforcing structure can be used satisfactorily with various types of containers of various shapes, and changes in the reinforcing structure may be made to satisfy requirements without departing from the scope of the invention.

I claim:

1. A foldable reinforced container, comprising four side panels joined to one another at their edges to form right angle corners, an element severed in part from two adjoining panels by two spaced horizontal cuts at each corner and having two sections, each section extending from the corner to the end of the respective element, a score line at said end of each element, a score line at said corner, and a score line in one of said sections spaced from the corner and from the respective end score line for folding said section inwardly, after said panels are in right angle position to one another, from on a plane with the respective panel to a position perpendicular thereto, and simultaneously folding said other section from on a plane with the respective panel to a position perpendicular thereto, and a reinforcing member in each of said corners having a cross sectional dimension corresponding substantially to the two sections of said element such that said member is retained firmly in the corner with the element around said member on the sides opposite the adjacent side panels, said member being substantially the same height as said panels.

2. A foldable reinforced container as defined in claim 1 in which one of said element sections is twice as long as the other element section and a score line is disposed on said longer section halfway between the corner score line and the score line at the respective end of the element.

3. A foldable reinforced container as defined in claim 1 in which a score line spaced from the corner score line and from the score line at the end of the respective section, is provided in both sections.

4. A foldable reinforced container as defined in claim 1 in which the last mentioned score line is positioned in the middle of the respective section.

5. A foldable reinforced container as defined in claim 3 in which said score lines in said sections are equally spaced from the corner score line and the score lines at the respective ends.

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