April 25, 1967 D. H. ROUS 3,315,869

BOOK CARTON

Filed May 19, 1965 3 Sheets-Sheet 1

FIG. 1

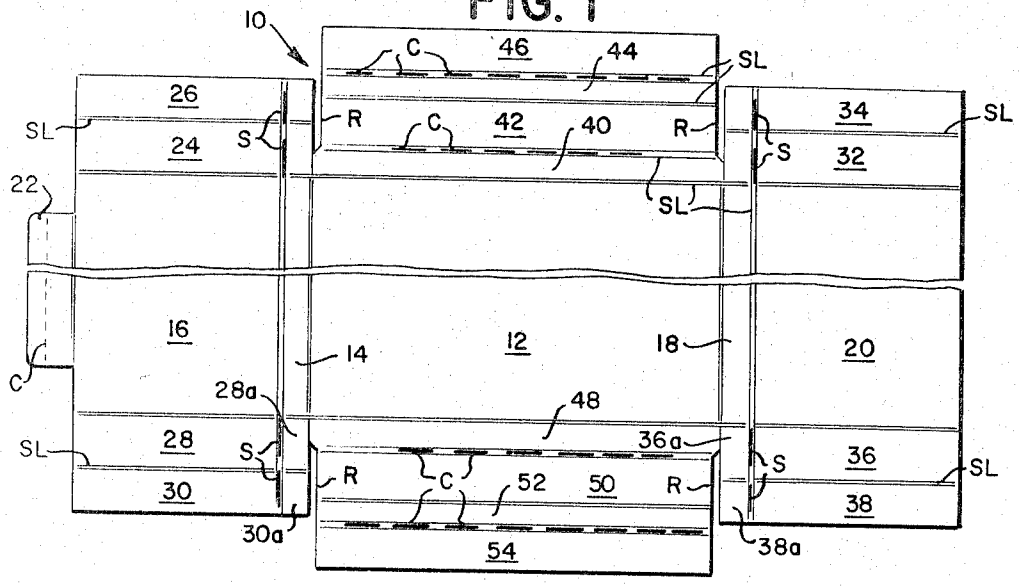


FIG. 2

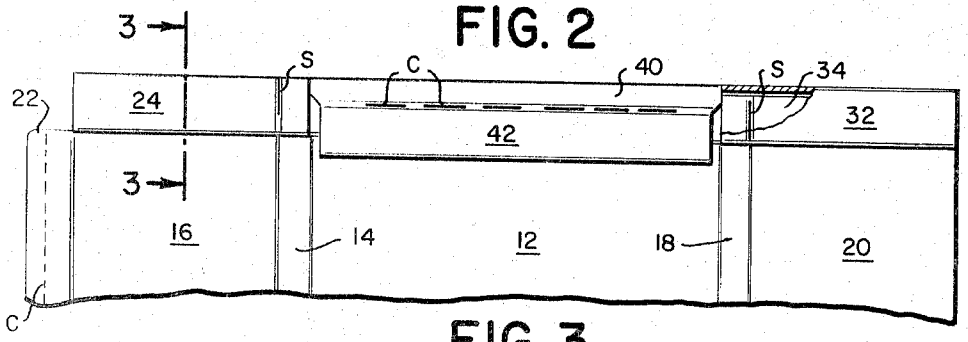
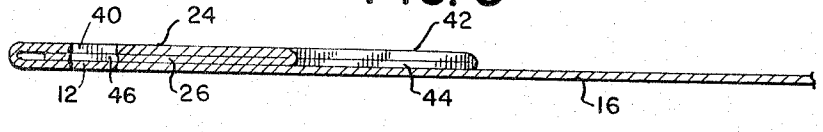


FIG. 3



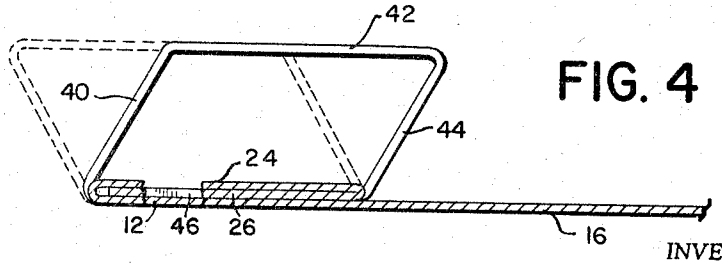


FIG. 4

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FIG. 5

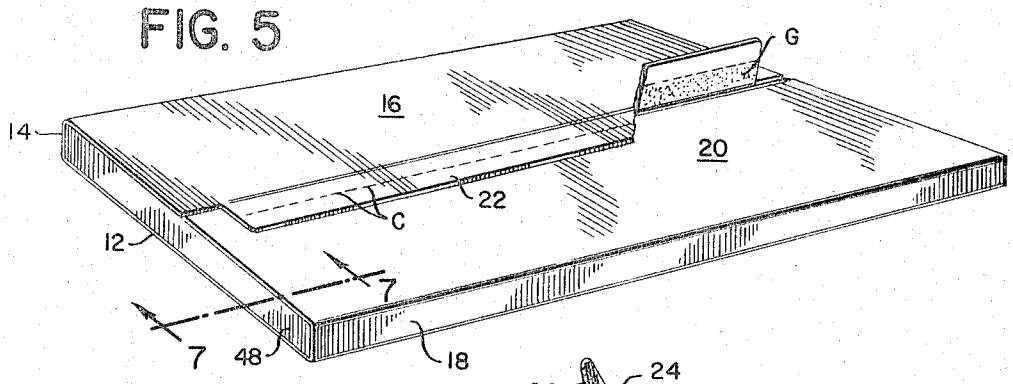


FIG. 6

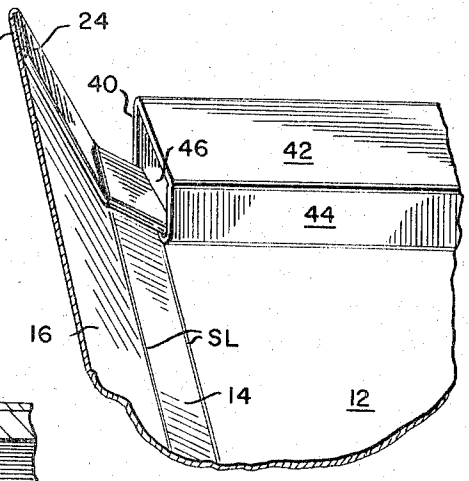


FIG. 7

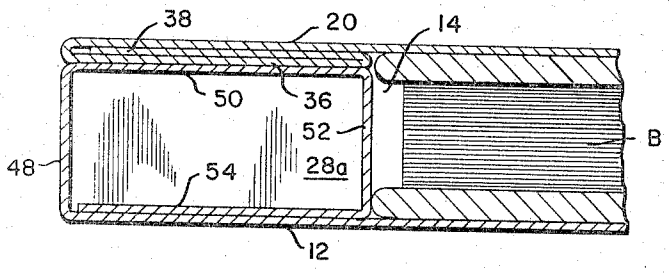
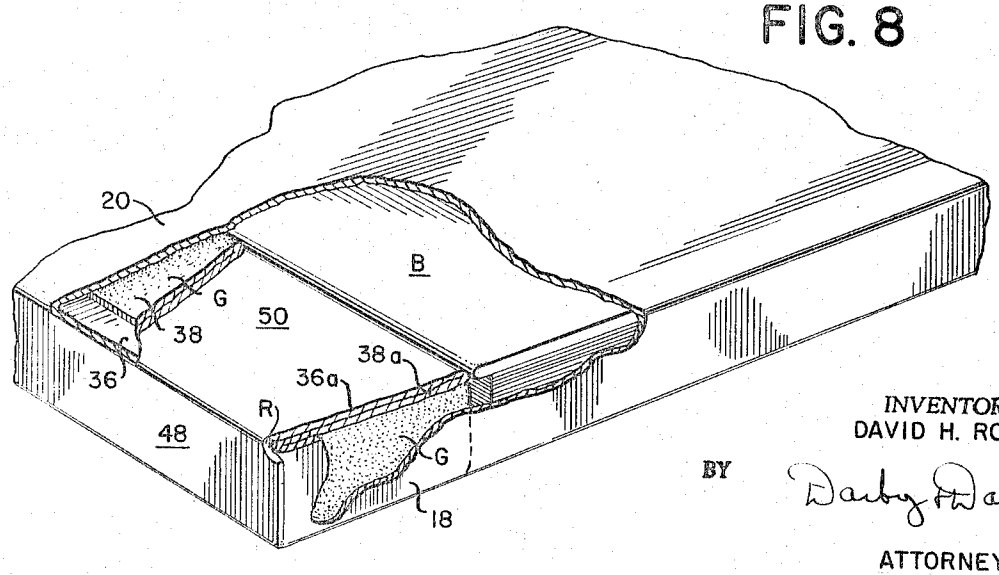


FIG. 8



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FIG. 9

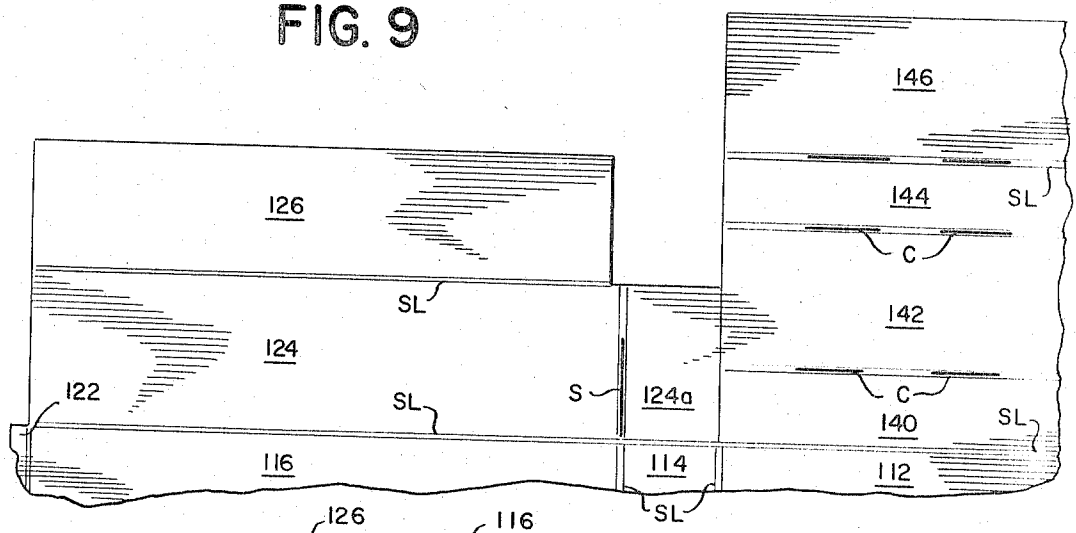


FIG. 12

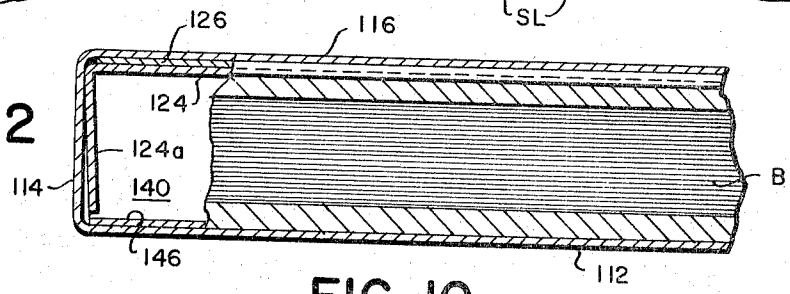
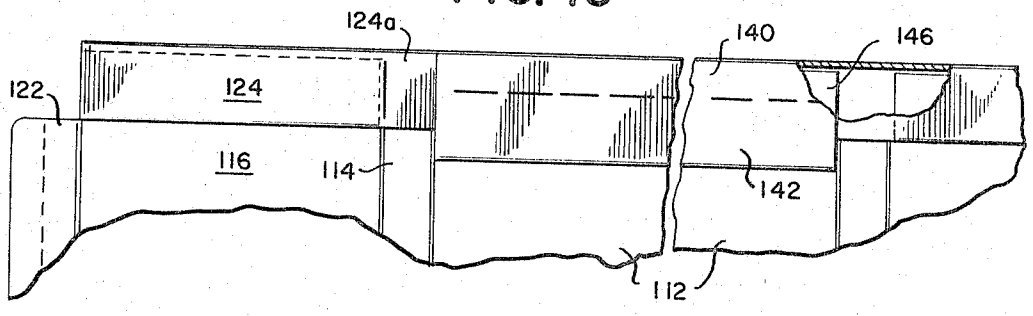


FIG. 10



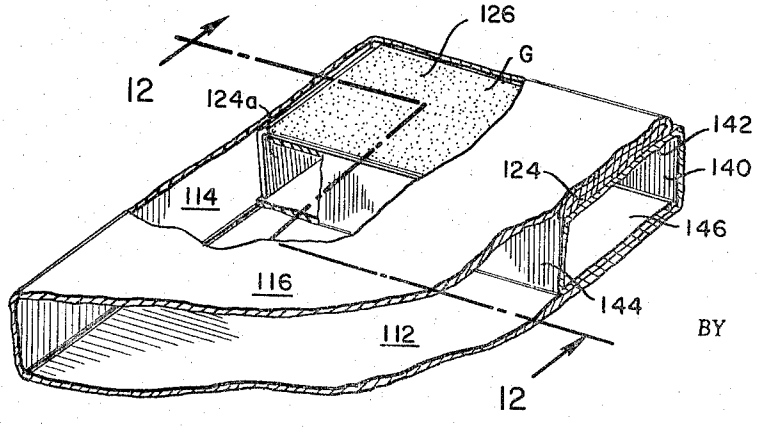


FIG. 11

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3,315,869

BOOK CARTON

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Filed May 19, 1965, Ser. No. 457,124
10 Claims. (Cl. 229—34)

This invention is directed to features of construction for cardboard cartons or containers suitable for the packaging and transportation of various items of commerce, but particularly useful for books.

One object of the invention is to provide a container constructed so as to provide extra protection for its content at the corners.

A more specific object of the invention is to provide a fibrous container having integral reinforcements for the corners in the form of multi-plies of the container material.

Still another object of the invention is to devise a single-piece fibrous container having, when erected, tubular walls along an opposite pair of sides but, prior to erection, collapsed to minimize its bulk during storage and transportation to the place of use.

Another object of the invention is to provide an article of manufacture of this type of a configuration and dimension suitable for feeding, erection, filling and closure rapidly by automatic machinery.

Still another object of this invention is to provide a container blank constructed to have end walls and cover flaps which are reinforced at their sides by multiple plies of the material of which the container is constructed for reinforcing it at its corners.

Other and more detailed objects of the invention will be apparent from the following disclosure of the two embodiments of this invention shown in the accompanying drawings for illustrative purposes.

In those drawings:

FIGURE 1 is a plan view of the single-piece fibrous carton blank, from which one form of the container of this invention can be made;

FIGURE 2 is a plan view of the upper half of the blank of FIGURE 1 in an intermediate state of processing;

FIGURE 3 is a cross sectional view taken on the line 3—3 of FIGURE 2 with portions broken away, showing the structure in enlarged dimensions;

FIGURE 4 is a view of the structure of FIGURE 3, showing the manner in which the tubular side walls are forced to final position at the time of erection of the carton;

FIGURE 5 is a perspective view of the filled carton ready for shipment, but also indicating the manner in which opening thereof is facilitated;

FIGURE 6 is a perspective view of one corner of the carton;

FIGURE 7 is a cross sectional view taken on the line 7—7 of FIGURE 5;

FIGURE 8 is a fragmentary view of a typical corner of the filled container with parts broken away for illustrative purposes;

FIGURE 9 is a plan view of a typical corner like that of FIGURE 1 of a blank but showing a modified structure;

FIGURE 10 show the modified structure in an intermediate state of processing;

FIGURE 11 is a fragmentary perspective view of a typical corner of the modified container with parts broken away for illustrative purposes; and

FIGURE 12 is a cross sectional view on the line 12—12 of FIGURE 11.

As an example, it will be recognized that in the packaging and transportation of books in large numbers it is important that the transportation package be adapted to automatic filling and closing.

In the transportation of books by mail, for example, the container to be successful must afford ample protection for the corners of the books, especially hard cover books. It seems that in transportation they are frequently damaged through normal handling by blows imparted to the corners of the container. This is true even in the type of container which has a pair of tubular side walls at an opposite pair of sides, between which the book lies with its top and bottom edges in contact therewith. A purpose of this invention is to provide integral multi-ply protection for the tubular sides at the corners and to further provide a construction for insuring that the closed container will accommodate without distortion these reinforcing multi-plies.

Another object of this invention is to incorporate in a carton blank of this type a construction which will provide for a minimum thickness of the blank during its storage and transportation to the filling plant.

Referring now to the embodiments of the invention illustrated, attention is directed to FIG. 1. A blank indicated generally at **10** is cut from a sheet of suitable fibrous material to have the shape illustrated. This blank is provide with a series of score lines SL to subdivide it into panels. The panel **12** provides the bottom wall for the container. Extending in opposite directions from an opposite pair of edges are the end walls **14** and **18**, to which are connected respectively the cover panels **16** and **20**. Either of these panels, in this case the panel **16**, may be provided with a further extension **22** having a series of short spaced cuts which will be referred to later.

The cover panel **16** is provided at opposite sides with integral extensions **24** and **26**, and **28** and **30**, which are separated by score lines SL as indicated. These extensions are each provided with slits S spaced from their inner ends by a distance substantially equal to or preferably less than the width of the end wall panel **14**. Similarly, the cover panel **20** is provided with the side extensions **32** and **34**, and **36** and **38**, which also have the slits S.

The bottom wall panel **12** is also provided with extensions at its sides. These extensions are scored to define the panels **40**, **42**, **44** and **46**. Similarly, at the opposite side the extension has the panels **48**, **50**, **52** and **54**. The outermost and innermost score lines of the two side extensions are provided with a series of spaced cuts C as shown. Attention is drawn to the fact that the length of these extensions is reduced at each end by being cut back as indicated at R. For purposes of future reference it is noted that the areas set off by the slits S at the inner ends of the panels **28**, **30**, **36** and **38** have been given the reference characters *28a*, *30a*, *36a* and *38a*. The slits S each extend into the score lines as shown at one end.

The blank of FIG. 1 is initially prepared for stacking and transportation and becomes the article of manufacture of the box making plant. This is accomplished by folding the side extensions of the cover panels **16** and **20** upon themselves and then upon the cover panel to the position shown in FIG. 2. By way of example, the extension **34** is folded into contact with extension **32** and the two together are in turn folded into contact with the adjacent areas of the end wall panel **18** and cover panel **20**. The underface of the panel **34** is provided with an adhesive so as to lock the folded structure in the position shown in FIG. 2, see also FIG. 3. The same operations occur in the extensions at the other side of panel **20** and at both sides of panel **16**. As indicated in the

drawings, the slits S of associated extensions overlie each other.

In a similar manner the side extensions of the bottom panel **12** are folded so that with respect to FIG. 1 the underface of panel **46**, to which an adhesive has been applied, is folded around into contact with the upper face of panel **12** and adhered thereto. Adherence in the case of all gluing connections is effected by pressure rollers with the result that extensions **40**, **42** and **44** will be folded down flat. The relationship of the folded parts is clearly indicated in FIGS. 3 and 4 wherein the extension **26** is shown glued to the panel **16**, and the extension **46** is similarly shown glued to the panel **12** lying behind the folded panels **24–26**. (FIG. 3). It might help to note that the extension group which includes the extension **54** for the opposite side is similarly glued to the panel **12**, and this is clearly shown in FIG. 7.

The blank **10** has now been converted to an article of manufacture ready for erection at the packaging plant by automatic machinery. This article has a minimum thickness, which facilitates stacking large numbers thereof for shipment and storage.

In the book packaging plant the tubular side walls for the panel **12** are unfolded upwardly from the flattened position shown in FIG. 3, until they are overstressed to the dotted position shown in FIG. 4. The overstressing, based upon experience, is extended to the point that when the tubes thus lifted are relieved of pressure they will move back to an exactly vertical position, such as indicated in FIG. 7. These foldings and unfoldings are facilitated by the combination of the score lines SL and the cuts C.

With the tubular sides erected to the vertical position the book B is dropped between them so that the spine lies at right angles to them, as illustrated in FIGS. 7 and 8.

The carton is then closed by folding the end walls **14** and **18** upwardly to a vertical position and the cover panels **16** and **20** are then folded down into contact with the top faces of the tubular side walls. This brings the flap **22** over the cover panel **20** to which it is glued in the area indicated at G in FIG. 5, leaving the edge beyond the cutline C free. The relationship of the various parts is further indicated in FIG. 8, which clearly illustrates the manner in which the multi-plies, represented by the small extension **36***a* and **38***a* of end wall panel **18**, are nested into the recess provided by the cutout on the line R. The ends of the tubular sides are closed and hence reinforced by three plies, comprising the plies **36***a*, **38***a* and the outer wall **18**. The slits S extending into the score lines facilitate the formation of sharp corners at the multi-plies by relieving the stress in the carton material during folding. It is not necessary that glue be used on the face of panel **38***a* contacting wall **18**. The same construction, of course, is present at each of the corners of the container. The book B has a width at those sides adjacent the tubular side walls, equal to the length of the tubular side walls. This brings the corners of the books, as shown in FIG. 8, right up to the end wall **18** and, of course, similarly to the end wall **14**. However, the multi-ply construction at the corners is very effective in protecting the book against damage at its corners.

To open the package the free edge of the extension **22** is grasped and pulled upwardly to break the glue connection, whereupon the box can be easily opened.

The blank of FIG. 9 is similar to the blank of FIG. 1 with one exception to be noted. The corner of the panel of FIG. 9 can be related to the corresponding corner of FIG. 1 by noting that the corresponding areas are indicated by a three numeral reference character, the last two of which correspond. The one difference between the two panels is that the extension **126** is shortened so as to terminate about in line with the slit S on the panel **124**. The corresponding extensions at the other four corners are similarly shortened. In addition, the extensions at the sides of the bottom panel **112** do not have the cutouts corresponding to the cutouts indicated by the lines R in FIG. 1.

This blank is folded up in the same way as the blank of FIG. 1 was folded, and when the box is erected and closed the construction will be as shown in FIG. 11. In this case the reinforcing at the ends of the tubular side walls will comprise only two thicknesses. In other words, the open end of the tube will be closed, for example, by the extension **124***a* of end wall panel **114** and will also be covered by the adjacent area of the panel **114**. This results, of course, by shortening the panel **126**, as indicated in FIG. 9. Thus, as shown in FIG. 11, for the corner illustrated the end wall **114** overlies the inturned ply **124***a* which covers the end of the associated tube.

For both structures the slits S facilitate the folding of the blank in the multi-plied corners and minimize wrinkling of the material.

Since glue is applied to the underface of the panel **126** and none is applied to the underface of the panel **124**, the area **124***a* is not glued to the overlaid area of panel **114**. The end walls fold easier because of the freedom of this area.

From the above description it will be apparent to those skilled in the art that the subject matter of this invention is capable of some variation in its detail. It is preferred, therefore, that the scope of protection afforded hereby be determined by the claims.

What is claimed:

1. A container formed of a single piece of fibrous material comprising a bottom wall having a pair of tubular side walls and end walls extending at right angles to said side walls, cover flaps extending longitudinally from said end walls, overlying said tubular side walls and folded extensions at the sides of said end walls reinforcing the container at its corners and additional folded extensions at the sides of said cover flaps providing multiplies overlying the ends of said tubular side walls.

2. In the combination of claim **1** said folded over extensions providing multi-thicknesses at the sides of said end walls.

3. In the combination of claim **1** said folded over extensions providing two reinforcing plies at the ends of said tubular side walls and said additional folded extensions providing three plies at the sides of said cover flaps.

4. In the combination of claim **1** said folded over extensions providing three reinforcing plies at the ends of said tubular side walls and said additional folded extensions providing three plies at the sides of said cover flaps.

5. An article of manufacture comprising a single piece blank of fibrous material providing a flat panel having tubes extending along an opposite pair of sides and folded flat to overlie the side edges of said flat panel, extensions of said flat panel at the remaining pair of sides defining end wall panels and cover flaps joined to said end wall panels, said end wall panels and cover flaps lying in the plane of said flat panel, extensions at the sides of said end wall panels and cover flaps folded over and secured to said end wall panels and cover flaps respectively to provide them with reinforcing and stiffening plies, said end wall panel extensions and cover flap extensions being joined together.

6. An article of manufacture comprising a single piece of fibrous board shaped and scored to provide a container, said container when erect having a bottom wall, rectangular tubular walls at an opposite pair of sides of said bottom wall, a pair of end wall panels at the remaining pair of sides of the bottom wall flaps at the sides of said end wall panels remote from said bottom wall, said flaps forming a two-part cover, one cover flap having an extension overlying and secured to the other part with a free terminal edge forming a tear strip.

7. In the combination of claim **6** said end wall panels

and said cover flaps having folded over extensions reinforcing the container at the ends and tops of said tubular walls respectively.

8. In the combination of claim 1, said folded extensions of said end wall panels being joined to said folded extensions of said cover flaps along score lines, forming right angles therebetween; said folded end wall panel extensions being co-extensive with the ends of said tubular side walls.

9. In the combination of claim 6, said folded-over end wall panel extensions being co-extensive with the ends of said tubular side walls.

10. In the combination of claim 7, said end wall panel extensions and said cover flap extensions being joined together by score lines.

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