Sept. 21, 1943. J. S. STOKES 2,330,015

CONTAINER

Original Filed Aug. 16, 1939 2 Sheets-Sheet 1

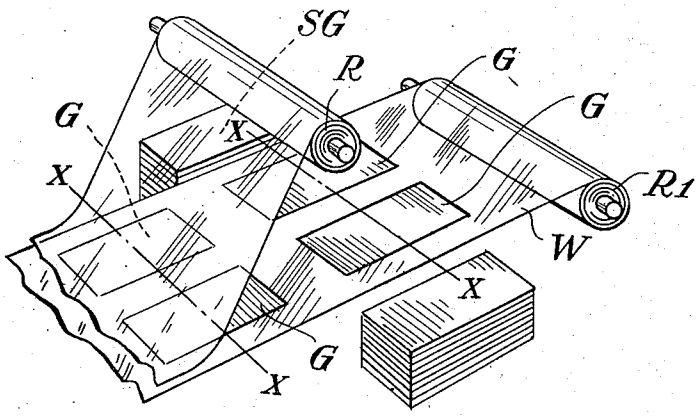


Fig. 2.

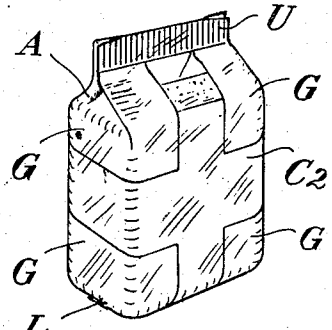


Fig. 3.

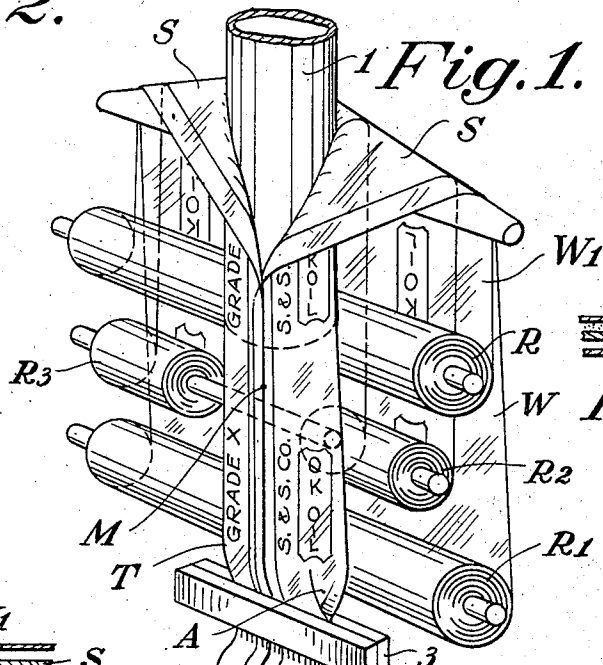


Fig. 1.

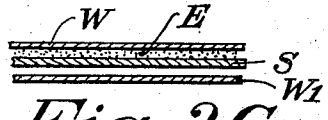


Fig. 2C.

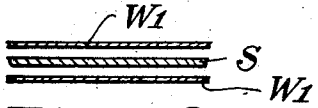


Fig. 2A.

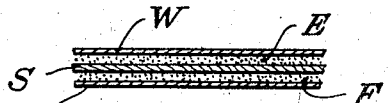


Fig. 2D.

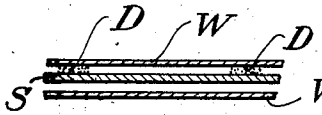
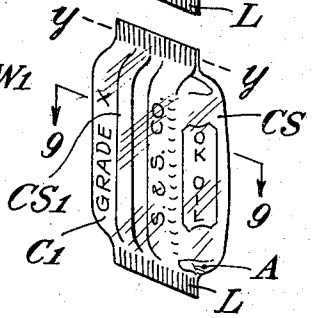


Fig. 2B.



INVENTOR
John S. Stokes
BY
Cornelius L. Ethret
ATTORNEY

Sept. 21, 1943. J. S. STOKES 2,330,015

CONTAINER

Original Filed Aug. 16, 1939 2 Sheets-Sheet 2

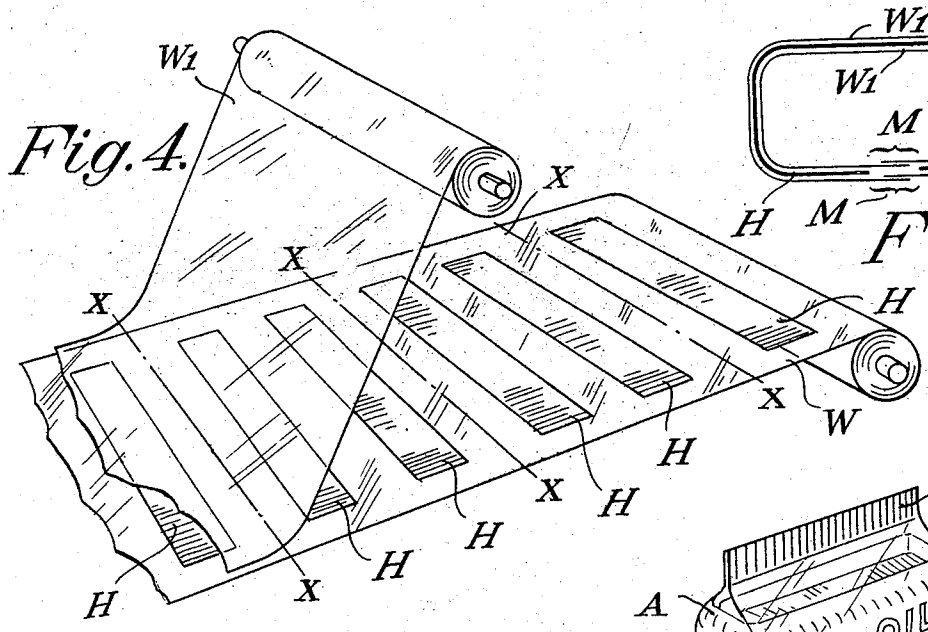


Fig. 4.

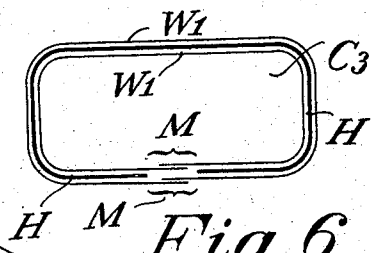


Fig. 6.

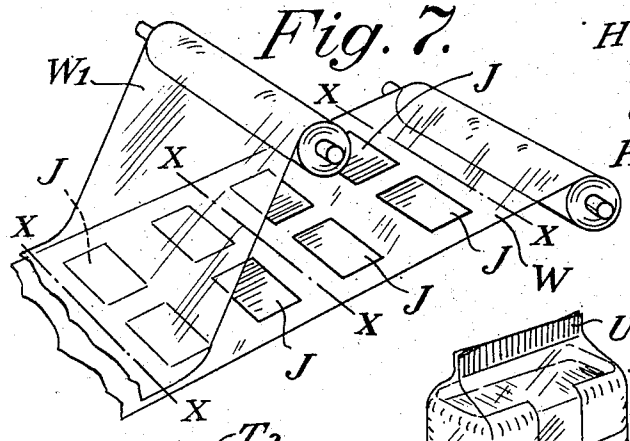


Fig. 7.

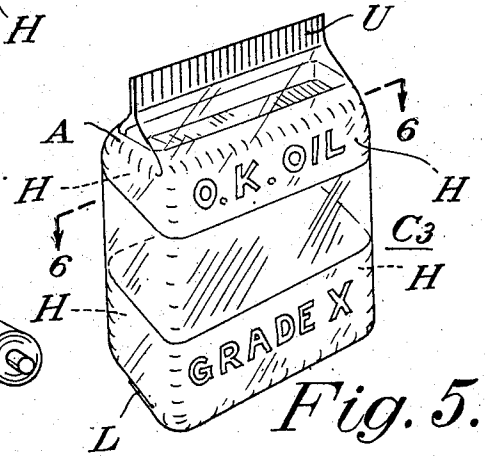


Fig. 5.

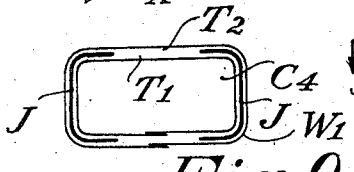


Fig. 9.

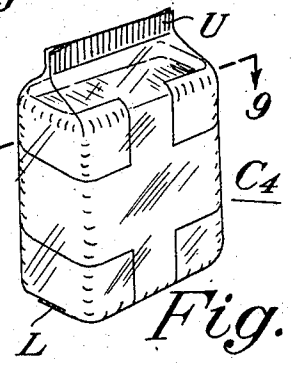


Fig. 8.

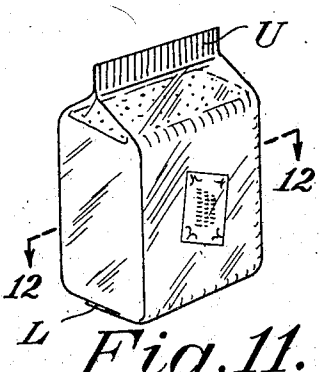


Fig. 11.

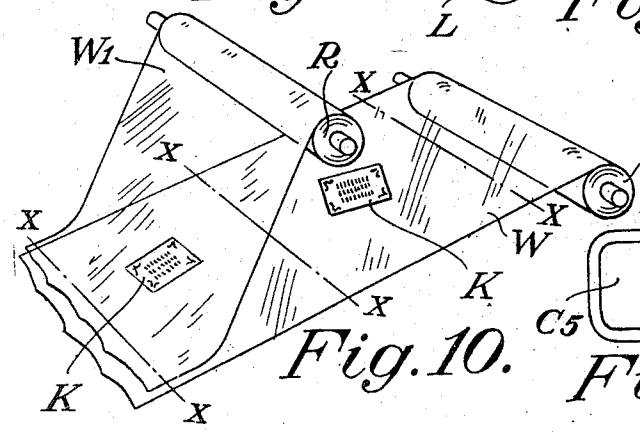


Fig. 10.

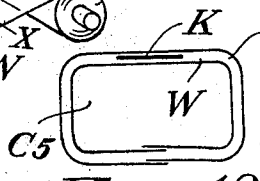


Fig. 12.

INVENTOR
John S. Stokes
BY
Cornelius D. Ehret
ATTORNEY

Patented Sept. 21, 1943 2,330,015

UNITED STATES PATENT OFFICE

2,330,015

CONTAINER

John S. Stokes, Huntingdon Valley, Pa., assignor to Stokes and Smith Company, Philadelphia, Pa., a corporation of Pennsylvania

Original application August 16, 1939, Serial No. 290,378. Divided and this application July 20, 1940, Serial No. 346,477

4 Claims. (Cl. 229—55)

My invention relates to multi-ply containers made of flexible sheet material, particularly Cellophane, Pliofilm and the like.

In accordance with my invention, the plies of container material attached to each other at the ends of the container retain between them, with or without attachment thereto, one or more elements which may be utilized solely for purpose of display, solely for reenforcement of the container, or for both purposes; more particularly, in one form of multi-ply container, there are two elements between the plies, each element forming a substantially continuous band at one end of the container to reenforce the corners and edges whereas, in another form of container, there are two pairs of elements between the plies, each element reenforcing two corners of the container.

My invention further resides in containers having the features hereinafter described and claimed.

This application is a division of my application Serial No. 290,378, filed August 16, 1939, upon which has issued Letters Patent #2,260,064.

For illustration of various forms of containers made in accordance with my invention, and of preferred methods of making them, reference is to be had to the accompanying drawings in which:

Fig. 1 in perspective illustrates the formation of filled containers from webbing;

Fig. 2 in perspective illustrates the formation of multi-ply webbing suited for making another type of container;

Figs. 2A, 2B, 2C and 2D are sectional views of multi-ply webbing referred to in explanation of Fig. 2 and other figures;

Fig. 3 in perspective shows a filled container made from the webbing of Fig. 2;

Fig. 4 in perspective illustrates the formation of another type of multi-ply webbing;

Fig. 5 in perspective shows a container made from the webbing of Fig. 4;

Fig. 6 is a section taken on line 6—6 of Fig. 5;

Fig. 7 in perspective shows the formation of another type of multi-ply webbing;

Fig. 8 in perspective shows a filled container made from the webbing of Fig. 7;

Fig. 9 is a section taken on line 9—9 of Fig. 8;

Fig. 10 illustrates formation of another type of multi-ply webbing;

Fig. 11 shows a container made from the webbing of Fig. 10;

Fig. 12 is a section taken on line 12—12 of Fig. 11.

Referring to Fig. 1, the webs W, W1 removed, respectively, from the rolls R, R1 are shaped about the hollow form 1 and their marginal edges joined to form a multi-ply tube T; preferably, the webs W, W1 are of Celiophane, Pliofilm, or other web material which is thermoplastic because coated, impregnated with, or consisting of thermoplastic material; when the webs are of such material, the joinder of their overlapping margins is effected by application of heat and pressure effected, for example, by a heated roll or platen which presses the overlapping margins of the webs against the form 1.

Below the end of the form 1, the multi-ply tube T is flattened and transversely sealed by the heated clamping tools 2, 3, to close the bottom of a container next to be filled and to seal the top of a previously formed and filled container C. The tools 2 and 3, while clamping the web between them, are moved downwardly to feed additional web material from the rolls R, R1 over the form 1 where their edges are joined to form a further section of tubing T with longitudinal seam M. When the tools 2, 3 are released and again moved to the clamping position shown in Fig. 1, there is sealed the upper end of another container which, between the successive clamping movements of the tools 2, 3, was filled by introduction of material through the hollow form 1. Thus, by repeated clamping movements of the tools 2, 3, and their downward movement, there is formed a succession of filled containers; machines suitable to perform aforesaid steps are shown in Zwoyer Patent No. 1,986,422, Sonneborn et al. application Serial No. 259,748, filed March 4, 1939, Patent No. 2,200,971, May 14, 1940, and Maxfield application Serial No. 205,937, filed May 4, 1938, Patent No. 2,199,708, May 7, 1940.

To produce the "square" type container shown in Fig. 1 and other figures, the opposite sides of tube T are tucked in before the tube is flattened by sealing tools 2, 3, thus to form the gusset folds A. A suitable mechanism for effecting this tucking operation is described and claimed in Sonneborn et al. application Serial No. 297,484, filed October 2,1939, Patent No. 2,294,215, August 25, 1942.

In accordance with the present invention, the container is formed from multi-ply webbing shaped and marginally joined to comprise nested tubes which are substantially free of attachment to each other except at the transverse seals formed by the tools 2, 3, or equivalent, defining the ends of the containers. The inner and outer tubes, depending upon the method of sealing, may be attached to each other by joinder of

their marginal seals or may be entirely free of attachment except at the transverse seals.

The space between these two tubes is utilized, in the modification shown in Fig. 1, to receive the strips S, S1 fed from the rolls R2, R3, between the webs W, W1 as they pass toward the form 1.

The strips S, S1, so introduced between the nested tubes forming the multi-ply tube T, may serve as reenforcements for the webs W, W1; the strips S, S1 may be of the same material as the webs W1, W2 or of different material; they may, for example, be paper, fabric, metal foil, or other sheet material. When the web W1 is of transparent material, such as Cellophane or Pliofilm, either or both of the strips S, S1 may be decorated or printed for display purposess to avoid need for use of expensive printed Cellophane, Pliofilm, or like material.

For forming filled containers, each of the transverse seal sections formed by the tools 2, 3 between the successive containers is severed transversely intermediate its horizontal edges so that the lower part of it forms the seal U for the upper end of one container and the upper part of the same seal section forms the seal L for the lower end of the next container. When, however, it is desired to make open-end containers subsequently to be filled, each transverse seal section is cut along one edge, for example *y—y*, instead of intermediate its edges. In either case, when the multi-ply tube T is severed to detach an individual container, the reenforcing strips S, S1 are concurrently cut to leave within the multi-ply wall of the container the two elements CS, CS1 cut from the strip S, S1, respectively.

Particularly when the multi-ply containers are filled and sealed at both ends, the elements CS, CS1, within each container, may be free of attachment to either the inner or outer ply and may be held in place within the multi-ply wall by the clamping effect of the end seals and by some adhesion at the end seals between S, S1, W and W1; or when the strips S, S1 are of thermoplastic material, they may be free of attachment within the multi-ply wall except where firmly joined to the inner and outer tubes or plies by the sealing action of the tools 2, 3.

When the sole or principal purpose of strips CS, CS1 is to reenforce the webs W, W1, it is preferable they be left free, as above described, within the multi-ply wall, Fig. 2A, that the container may more readily conform to a shape induced by pressure without undue distortion, and so be less apt to break or crack at its corners or edges; moreover, movement of the strips within the plies reduces the possibility of coincidence of weakened areas of the plies and strips.

However, as shown in Fig. 2B, the strip S or S1 may be attached at small spaced areas, indicated generally by the dabs or spots D of adhesive, to one or the other of the webs W, W1; or, as shown in Fig. 2C, the strip S or S1 may be attached throughout one face thereof, as indicated by the coating E of adhesive, to one or the other of the webs W, W1; or, as shown in Fig. 2D, both faces of strip S or S1 may be, throughout, attached to both webs W and W1, generally as indicated by adhesive coatings E, F. It is to be understood that the dotted areas D, E, F represent attachment by adhesive, or attachment by heat-sealing of thermo-plastic materials.

The number of strips introduced between the webs W, W1, Fig. 1, may be smaller or greater than two; however, when the webs W, W1 are of transparent material, the total width of the strip or strips introduced between the webs is, particularly if the strip or strips are opaque, less than the circumference of the completed containers, thus to provide for inspection of the container contents through transparent wall structure of the container beyond the interwall strip.

When the outer web W1 is of transparent film, such as Cellophane, Pliofilm, or the like, the finish of the paper strips S, S1 need not be of high grade because the sheen of the film insures smooth, pleasing appearance of the containers; the covering of strips S, S1 by the transparent film W1 also preserves the legibility of the printing on the container because the film, compared with the paper strips, has negligible tendency to absorb grease, oil, or the like, during handling of the containers.

In the modification shown in Fig. 2, the webbing again comprises two webs W, W1 fed from supply rolls R, R1 toward a form 1, such as shown in Fig. 1. While the webs are moving or at rest in their path from the supply rolls R, R1 to the form 1, there is introduced between them a series of groups of elements G which are spaced from each other transversely and longitudinally of the web; preferably, the longitudinal spacing between the elements G is materially less than the distance, between lines *x—x*, corresponding with the length of web required for one container.

Consequently, when the composite web W, W1, G, is shaped around the form 1, there is produced a multi-ply tube T within whose multi-ply wall there are two series of longitudinally spaced elements G; the sealing tools 2, 3 flatten the multi-ply tube and seal it transversely across each pair of elements G, and subsequently knife structure, not shown, severs the multi-ply tube transversely within the limits of each seal section, thus to form a series of filled containers, similar to that shown in Fig. 3.

Assuming the elements G are of thermoplastic material, each of them, in the package C2 shown in Fig. 3, is in part thermoplastically bonded into one end of one of the seals U or L and the major or remaining part of each element G may be free of attachment to either of the inner or outer plies of the package. Each of the elements G overlies and reenforces that part of the package which is most susceptible to breakage; namely, the corners and edges and particularly the sharp bends within the gusset folds A at the corners of the container at which its closed end walls, top and bottom, meet the side walls.

The elements G may be fed from stacks SG thereof, Fig. 2, or may be cut from strips and fed in successive groups between the webs W, W1.

To preclude possibility of displacement of the elements G after engagement with one or both of the webs W, and until they are held in place as by the sealing performed by the tools 2, 3, they may be attached to web W, for example, at one or more small areas; when the elements G and web W are of thermoplastic material, this may be effected by stencilled adhesive applied in advance of the region of engagement between the webs W, W1.

Though superficially resembling the type of container shown and described in my copending application Serial No. 277,132, filed June 3, 1939, Patent No. 2,259,866, October 21, 1941, the con-

tainer C2, Fig. 3, is an improvement both from standpoint of appearance and strength; because the reenforcing elements G are not attached to both and preferably neither of the plies, there is greatly decreased tendency for the material of the container wall to be weakened by repeated flexure at any definite place.

Preferably, as shown, the total area of the elements G is less than that of the container C2, so that when the webs W, W1 of the multi-ply wall are transparent, the contents are visible from the exterior of the container through its wall beyond the reenforcing elements which are usually, though not necessarily, opaque.

In the modification of Fig. 4, while the webs W, W1 are en route to the tube 1, about which they are shaped and their marginal edges joined to form a multi-ply tube, there is disposed between them a series of longitudinally spaced elements H having, in general, the purpose and function of the strips S, S1 of Fig. 1 and the elements G of Fig. 2. Each pair of elements H, H is so spaced longitudinally of the web that the distance between their remote edges measured longitudinally of the web is less than the length of web material, between lines x—x, required to make a container. The elements H may be entirely free of attachment to either or both of the webs W, W1 or each of them may be attached, at least in one or two small areas, to at least one of the webs, to prevent their displacement during formation of the containers.

As the composite webbing, comprising the webs W, W1, and reenforcing elements H, is shaped about the form 1, there is produced a multi-ply tube whose inner and outer plies are unattached except at the transverse seals formed by the tools 2, 3 and perhaps additionally at the longitudinal seals M, dependent upon the manner in which they are formed. In any event, each container formed from the webbing of Fig. 4 comprises intermediate its ends, as shown in Fig. 5, two bands H lying within its multi-ply wall and substantially encircling it (Fig. 6). These bands may serve simply to reenforce the package C3, or additionally or alternatively, they may be used for decorative or display purposes when at least the outer web W1 is of transparent material such as Cellophane or Pliofilm. When both webs W, W1 are of transparent material, the contents of the container C3 are visible between the two encircling elements H, H.

When used for reenforcing purposes, the width of the elements H should be such that they overlie the corners of the package C3 and reenforce the sharp bends within the gusset folds A at its corners formed by the meeting of the closed end walls with the side walls; because the reenforcing elements H, H are substantially free of attachment to each of the plies or tubes, there is absent the stiffening or embrittling effect of adhesive which would stiffen the wall and make it more susceptible to breakage; furthermore, because the elements H are free of attachment to the inner and outer plies, the possibility of relative movement lessens the tendency for the wall locally to weaken at any definite place.

Referring to Fig. 7, while the webs W, W1 are moving or at rest on their way toward the form 1, Fig. 1, there is introduced between them a series of groups of elements J; each group comprises four elements spaced from each other transversely and longitudinally of the web. The distance between the remote edges of each pair of elements J, J, measured longitudinally of the web, is less than the distance, between the lines x—x corresponding with the length of webbing required for a container. The elements J may be free of any attachment to the webs, or they may be attached in part or in whole to either or both of the webs, generally as shown in Figs. 2B–D. Preferably, they are substantially entirely free of any attachment.

The shaping of the webbing and joinder of its marginal edges about the form 1 results in a multi-ply tube between whose inner and outer walls there are included a series of groups of elements J; the sealing tools 2, 3 flatten the multi-ply tubing transversely at intervals to define a series of containers C4, Fig. 8, each having within its multi-ply wall and between its ends four reenforcing elements J, each embracing and reenforcing one corner of the finished container. When at least the outer ply is transparent, any one or more of the elements J may have thereon decoration or printing visible from the exterior of the package and whose visibility is preserved by the overlying and protective web W1.

In this package, like package C3, Fig. 5, the reenforcing elements terminate short of the end seals to afford increased stability of the package when the lower seal is turned under to square the bottom.

It is quite common to include premium slips, coupons, souvenirs, and the like, in packaged solid materials, but, for obvious reasons, it has not been feasible to do so with liquids. In the modification of my invention shown in Figs. 10 to 12, the space within the multi-ply wall of the containers is utilized to hold such souvenir, coupon, or the like, regardless of whether the contents of the container be liquid or solid.

Referring to Fig. 10, before the webs W, W1 are shaped about the tube 1, Fig. 1, there is introduced between them a series of elements K generically representative of a souvenir, premium coupon, advertising pamphlet, or the like, at intervals each substantially equal to the length of webbing required for a container. Consequently, when the edges of the webbing are joined to form a multi-ply tube, there is within the multi-ply wall of the tube a series of elements K which are isolated from one another when the multi-ply tube is flattened by the sealing tools 2, 3 to form a series of containers each having within its multi-ply wall one of aforesaid elements K. Because the position of element K within its container is ordinarily of no significance, so long as there be one per package, it may not be necessary to attach the elements K to either web, Fig. 10.

In any of the modifications above described, there may be introduced between the nested tubes a conditioning agent or agents serving to maintain or enhance the strength of the container walls; for example, steam or moisture may be introduced between the webs, particularly when of Cellophane, to prevent embrittlement. Another suitable conditioning agent is glycerine which is preferably introduced by incorporating it in the adhesive used, generally as shown in Figs. 2B–D, to attach a reenforcing strip or element within the multi-ply wall of the container; in like manner, moisture may be introduced within the multi-ply wall of the containers by its incorporation in the adhesive used to attach a reenforcing element or strip to one or both of the plies.

In any of the modifications, the number of plies in the container wall may be increased by using additional webbing and shaping it to form one or

more additional tubes nesting with those illustrated.

In any of the modifications herein described, after introduction between them of one or more strips such as S—S5, or elements G—K, the webs, before or after they are shaped into tubing, may be joined to each other throughout and to the introduced strips or elements in any known manner suited to the materials comprising the webbing and the interposed strip or elements.

What I claim is:

1. A multi-ply container comprising at least two nested substantially rectangular tubes flattened and attached to each other at their opposite ends to form seals and define opposite end walls of the container and whose unattached portions not included in said seals define pairs of adjacent side walls of the container, and reinforcing sheet material, free of said seals and of extent longitudinally of the container substantially less than the length of either of said tubes, disposed between said tubes in position to reinforce corners of the container at which the end walls thereof meet pairs of aforesaid adjacent side walls.

2. A filled multi-ply container comprising nested tubes of flexible material sealed at their opposite ends to close and define opposite ends of the container and folded into gussets to provide squared side and end walls, and reinforcing elements, disposed between said tubes at regions not included in the seals and in which they are sharply folded into aforesaid gussets, unattached to said tubes in avoidance of embrittlement of said material at and adjacent the corners of the container.

3. A filled multi-ply container comprising nested tubes of flexible material sealed at their opposite ends to close and define opposite ends of the container and folded into gussets to provide squared side and end walls, and a pair of reinforcing elements extending perimetrically of opposite ends of the container, each disposed between said tubes at regions not included in the corresponding end seal but included in the adjacent regions comprising the gusset folds at said end and therein unattached to said tubes in avoidance of embrittlement of said material at and adjacent four corners of the container.

4. A filled multi-ply container comprising nested tubes of flexible material sealed at their opposite ends to close and define opposite ends of the container and folded into gussets to provide squared side and end walls, and two pairs of reinforcing elements each disposed between said tubes in a region not included in the corresponding end seal but included in an adjacent region comprising a gusset fold and therein unattached to said tubes in avoidance of embrittlement of said material at and adjacent two corners of the container.

JOHN S. STOKES.