July 24, 1962 A. L. WHITON 3,045,889

CONTAINER

Filed Sept. 22, 1960

2 Sheets-Sheet 1

Fig. 1

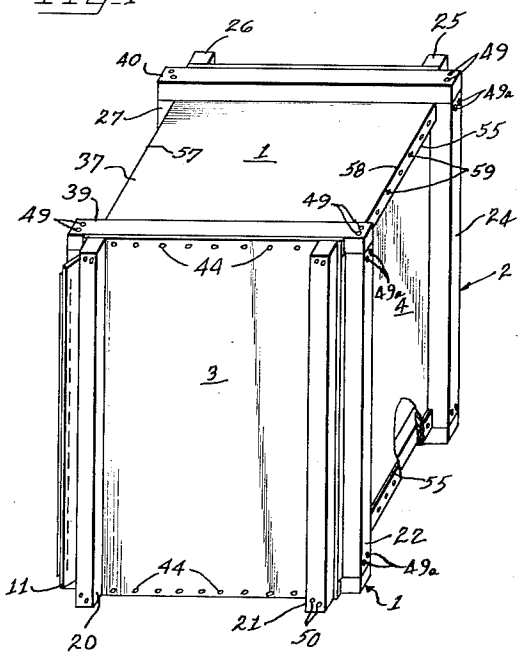


Fig. 2

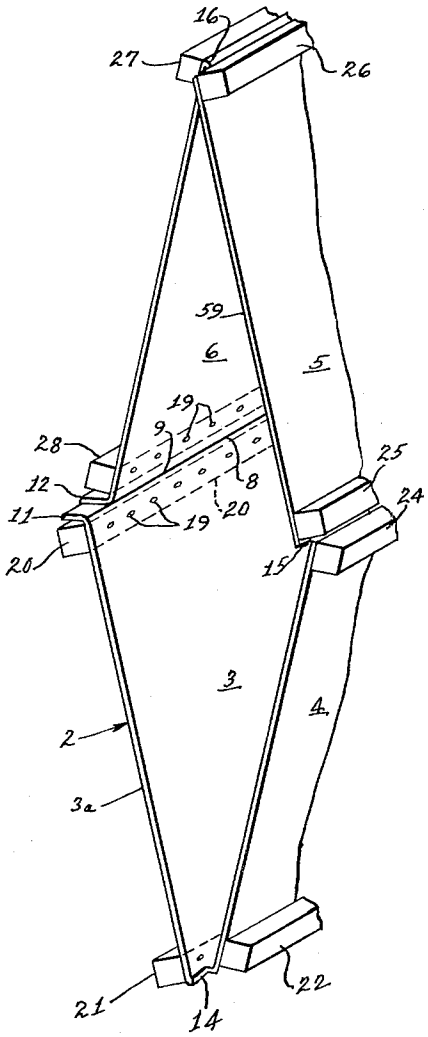
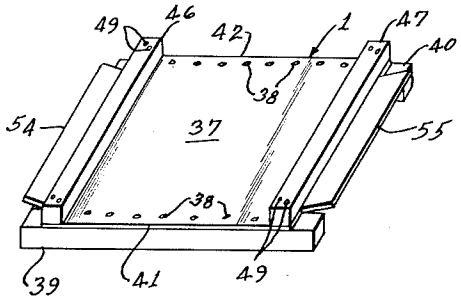


Fig. 3



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CONTAINER

Filed Sept. 22, 1960 2 Sheets-Sheet 2

Fig. 4

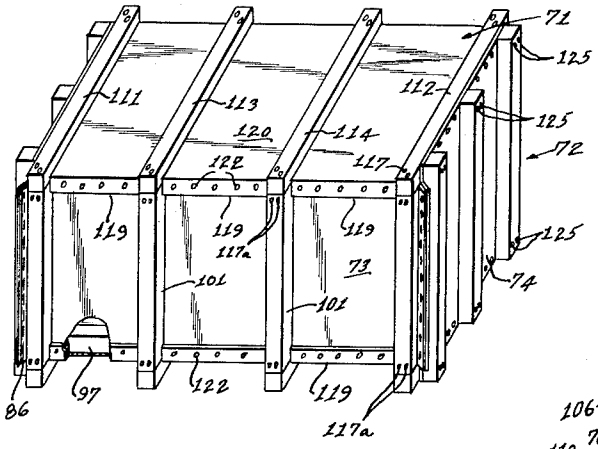


Fig. 5

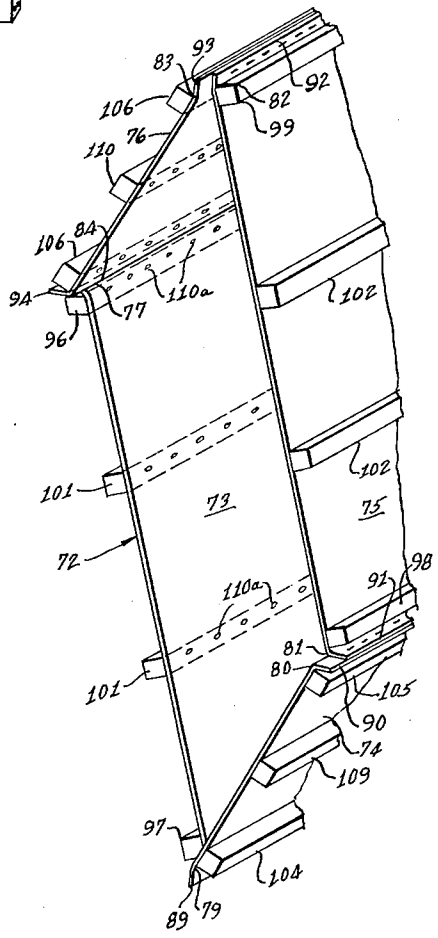
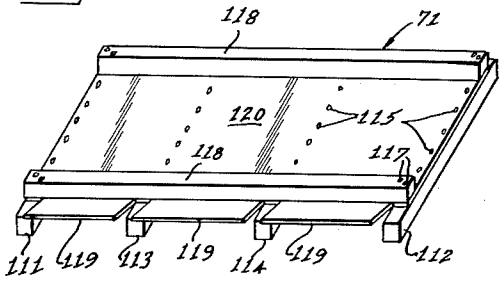


Fig. 6



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3,045,889

CONTAINER

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3 Claims. (Cl. 229—41)

This invention relates to the sealing and rigidifying of containers or boxes and more specifically cleated corrugated paper board boxes or crates fastened together and assembled by nails or other suitable drivable penetrating fasteners. More particularly, this invention also relates to the provision of sealing flaps on containers of the type that are shipped flat and readily and rapidly set up and assembled for use by opening up a flat, folded corner wood cleated paper board tube forming the four sidewalls of the container and having wood cleated paper board end closures, and more specifically where the open ends of said tube are unbraced or uncleated except by the braces and cleats of said end closures and where the end closures have wood inner braces at two edges and outer wood cleats at their other two edges together with paper board flaps to be folded over the tube and stapled through the paper board of the tube to the braces.

In the known commercial or practical forms of containers of these general types without the seal flaps of this invention, the outer reinforcing strips or wood cleats are suitably secured to the corrugated paper board of the open end closures (or tops and bottoms) usually by nailing or stitching or other types of drivable penetrating fasteners. They may also be glued. The inner wood braces at the other two edges of these rectangular tops and bottoms of corrugated paper board or the like are nailed, stapled or otherwise suitably secured by drivable penetrating fasteners through to the above referred to outer cleats. Thus, this securing occurs only at the ends of each brace if there are only two cleats per top or bottom and, in any case, only where the brace is crossed by, or is overlaid by, such an outer cleat. It is not desirable, practical, or economic to glue, cement, or otherwise secure the entire lengths of these subsequently attached inner wood braces to the top or bottom forming corrugated paper board pieces since the outer cleats already in place on the other or outer side (and at least at the other two edges) makes it difficult or impractical to obtain the practically required full length support or backup pressure for the proper gluing or cementing of the soft corrugated paper board or the like to the entire length of such an inner brace. Nailing, stapling or the like is similarly objectionable. In any case, such an extra operation adds material and undesired cost.

Thus, the non-cleated edges of such top and bottom pieces are normally unsupported or unconnected between adjacent and transverse cleats. If a top has only the two edge cleats, its other two edges are free or unconnected in between these two edge cleats. These unsupported lengths or edge areas are undesirably weak. Also, they often warp or buckle due to humidity or wetting and thus move away from their inner braces. This leaves opening which spoils the container's appearance, permits the entry of dirt or foreign substances, and in some cases, permits the loss of container contents. Also the forks of a normally used lift truck may easily be inserted into such buckling caused openings and tear such tops or bottoms upon removal of such forks. However, even if such edges of the top and bottom pieces are so secured along their complete lengths, there are other serious problems and difficulties.

Such containers normally have their tube or sidewall edges exposed at such non-cleated top or bottom edges.

This is so because the top or bottom corrugated paper board pieces and their inner braces are recessed in, or received in between the two sidewalls and also since the top or bottom pieces do not (and cannot normally) extend out beyond their inner brace pieces without serious danger of tearing off of such projecting portions in normal use. Put another way, these tube edges are free and exposed because the top and bottom piece edges must terminate flush with their inside braces, otherwise they will be apt to be torn off in loading or in normal use of such containers.

The exposed, unsupported or unconnected and free, weak, and openable top edges of the tube or of the sidewalls of known and conventional such containers give rise to still other and previously unsolved problems and difficulties. Such edges are normally rather rough and have a non-finished appearance. Also, as noted above, such rough edges are easily torn. Another problem and a serious practical disadvantage, is that the withdrawal of the forks of a lift truck (in the ordinary or normal use of such containers) tends to engage in and drag on these exposed, free, and rough tube edges and thus to tear them. This at least impairs the appearance of such a container. Often it ruins its strength or opens it up.

According to my invention an improved, stronger and always sealed or no free edge type of such container is provided at very little extra cost in material, operations, or labor in manufacture or in use and the foregoing problems and difficulties are solved and removed by providing certain suitably bent over flaps or the like. Preferably the above referred to and normally free or unconnected brace edges of the tops and bottoms (i.e. the intermediate portions resting on but not connected to their inner braces) are suitably scored. Preferably this scoring is slightly outwardly from where their otherwise free edges would be located. There are thus provided one or more flaps along each such brace edge of such tops and bottoms. Preferably but not necessarily, these flaps extend full length between adjacent upright cleats on the tube or sidewalls. By reason of the space provided by their slight outward spacing of their scoring or bends from their inner braces, such flaps are folded over the adjacent upper and lower sidewall edges to embrace or clamp them between such flaps and the inner braces of the top or bottom closure units. Such folded over flaps are then readily and suitably secured through to their underlying wooden braces. Preferably, such securing is substantially continuous and along their full lengths between adjacent transverse cleats. It will be apparent to those skilled in this art that such securing can economically and readily be done externally (and without the requirement for any internal support or pressure plates) by conventional nailing, stapling or other types of drivable penetrating fasteners. Conventional nailing or strapling machines can place a row or rows of nails, staples, stitches or the like substantially continuously along the length or lengths of such flaps and into such inner braces. This seals up or closes such corners or edges of such types of containers and practically removes the danger of openings forming at such corners as well as solving and removing the hereinabove noted problems, limitations and difficulties.

Accordingly, the general objects of this invention are to provide such types of containers or boxes of an improved, stronger, and edge or corner sealed type which are substantially or practically damage free and foolproof in their normal and intended use.

Another object of this invention is to provide such containers of a low cost in material, manufacture, assembly and use, yet which have substantially no free edges with their attendant problems and difficulties.

Another object hereof is the provision of such con-

tainers which may be economically manufactured to provide for the effective sealing or closing of openings at all (or substantially all) corners or edges, to increase the effective strength of such containers, particularly at their corners or edges, and to provide attractive, smooth, and opening resistant corners or edges for such containers.

Another and more detailed object hereof is the provision of practical and economic edge closure structure for such containers to provide a sealing, strengthening, and full length fastened overlapped or overlying region along and protecting such otherwise free edges.

Other objects, features, and advantages of this invention will be apparent to those skilled in this art from a consideration of the following and more detailed description of two exemplary embodiments of this invention, which are described in connection with the accompanying drawings.

In the drawings:

FIGURE 1 is a perspective view of an assembled container according to one embodiment of my invention with a portion broken away to show inner structure;

FIGURE 2 is a perspective view of the partially collapsed tube to form the sidewalls for the container of FIGURE 1;

FIGURE 3 is a perspective view of a bottom used in the container of FIGURE 1 and which is the same as its top;

FIGURE 4 is a perspective view of an assembled container according to another and second embodiment of my invention with a portion broken away to show inner structure;

FIGURE 5 is a perspective view of the partially collapsed tube or sidewalls for the container of FIGURE 4; and

FIGURE 6 is a perspective view of bottom for the container of FIGURE 4 which is the same as its top.

As shown in FIGURES 1, 2, and 3, the first exemplary embodiment of my invention comprises a collapsible and rectangular type of container or box, all of whose outer or enclosing walls are formed of a suitable fibrous sheet material as noted above and which is preferably here the well known corrugated paper board as commonly used in such containers. This collapsible container has outer and reinforcing cleats which are preferably elongated wood pieces. It also has certain inner braces of elongated wooden pieces, at least on the inner sides or surfaces of its separate enclosure pieces on its top and bottom.

Since its top and bottom pieces may be, and here are, identical, they carry these same reference numbers. Thus, each of these two enclosure pieces is designated as a whole by **1**. The remaining or main body of this collapsible container is designated as a whole by numeral **2** and comprises an elongated or upright tubular body of the four rectangular sidewalls **3**, **4**, **5**, and **6**.

These four sidewalls are interconnected in any known or suitable fashion into a closed or tubular body which can be folded flat and has the two open ends as indicated in FIGURE 2 showing this tubular body before the securing and assembly of the bottom and top thereon.

As illustrated in this embodiment, the four sidewalls of this tubular body are preferably integral, as shown. Thus the rectangular sidewall portion **3** and **6** have the unconnected or free edges **8** and **9** respectively which may be interconnected in any suitable fashion to close up and form the tubular body.

The suitably blanked out and one piece of corrugated paper board forming the four sides **3**, **4**, **5**, and **6** may be scored and bent in various known or suitable fashions to provide for its opening out into its desired rectangular cross-sectional shape. As illustrated, the scoring lines and bends at edges **8** and **9** respectively connect to bend stitching flaps **11** and **12** which are conventionally stitched together along their entire lengths, as shown.

Sidewall corner cleats are suitably secured to each of the four sidewalls by any desired or known securing means

including gluing, cementing, nailing or stapling as shown in full length rows **19** through from said fibrous sidewall into said outer cleats. Each of these cleats preferably extends throughout the length or height of its sidewall. Each of the two cleats for each of the four sidewalls is of a suitable cross-sectional shape and is here illustrated as being substantially square.

As shown, each of these corner cleats for each sidewall is located along, or very close to, the side or edge scores of its said sidewall. Thus as shown, the cleat **20** extends along and preferably at, or very close to the edge **8**. Cleats **21** and **22** are located along the entire length of and at, or very close to, and on each side of the bending score line **14**. Similarly, cleats **24** and **25** extend along each side of the bend **15** while cleats **26** and **27** extend along each side of bend **16**. Like cleat **20**, the other or matching cleat **23** extends along side of bend **9** and the stitching flap **12**.

After the tubular or main body portion **2** is opened out into its preferably square cross-sectional form, it is retained in its pen forming by the assembly and securing in place of the top and bottom pieces as hereinafter disclosed.

As shown in FIGURES 1 and 2, the main body **2** has an opposed pair of its sidewalls **3** and **5** which are longer, and extend outwardly at each tubular end such as **3***a* beyond the ends of the other two sidewalls **4** and **6**. The two cleats for each flap sidewall preferably have the same lengths or heights as their corresponding sidewall to which they are secured as noted above. This difference in heights or lengths or the opposed pairs of sidewalls of the tubular main body **2** provides for the reception of the enclosures or top and bottom pieces **1** between these extended lengths at each end of side faces **3** and **5**.

Each of the identical top and bottom closure units or pieces **1** (which are here illustrated as being square and identical) comprises a rectangular flat body portion **37** of preferably the same fibrous sheet material as that used for the enclosing walls of the tubular member **2**. In this first embodiment, each end closure **1** has only two outer cleats **39** and **40** located as shown at, or immediately adjacent, its cleat edges **41** and **42** respectively. These edge cleats may, if desired, be similar, except for their length, to the outer cleats for the main body **2**. In like manner they are suitably secured to the body portion **37** by suitable means such as the rows **38** of nails, staples or the like extending through the inside as shown. They may also be glued to the portions **37**.

The outer two edges or sides of flat body portions **37** have the suitably secured and inner wood braces extending along their lengths as shown. These wood braces **46** and **47** are, as noted in the preliminary description of this invention above, preferably only secured by being clamped between the crossed ends of cleats **39** and **40** and braces **46** and **47**, which ends are secured together as illustrated by the nails **49**, which may enter from either direction or from both. Thus, for the reasons as explained above, it is generally more practical and desirable not to attempt to secure the ends of sides **4** and **6** to their underlying braces by gluing, cementing or the like. It will also be apparent that nailing or stapling is not easy and is costly for the slight gain achieved.

In the assembly of parts **1** and **2**, end closures **1** are engaged between the longer ends of walls **3** and **5** and then longer cleats with end cleats **39** and **40** flush with the ends of cleats **20**, **21**, **25** and **26**. The ends of walls **3** and **5** may be secured as by rows **44** of nails, stables or the like to the top and bottom cleats as shown.

As shown, the ends of braces **46** and **47** extend to the edges of pieces **37**. Cleats **39** and **40**, however, extend out beyond braces **46** and **47** so that they overlie the ends of sidewall cleats **28** and **22** and cleats **27** and **24** as shown. In securing the end closures, side cleats **22** and **24** are laterally nailed through to the inner brace

47 by nails 49*a* and similarly for cleats 27 and 28 into brace 46. Also if desired, side cleats 20 and 21 may be nailed as at 50 through to end cleat 39 and similarly for cleats 25 and 26 to cleat 40. It will, of course, be understood by those skilled in this art that various other known, desired, or useful arrangements, attaching means, and the like may be employed in this or in other embodiments for the foregoing structure within the teachings of this invention and as will hereinafter become more fully apparent.

As generally described above, the main feature of this invention is provided by sealing, overlapping, and edge and corner strengthening means which are here exemplified by the flaps 54 and 55. As also explained above, these flaps of preferably integral width remain flat body portion 37 of each of the enclosure pieces 1. As shown these flaps 54 and 55 are bent in the same direction from each body 37 along the suitably scored lines 57 and 58 respectively, which last correspond to the brace edges or sides of the square body portion 47.

As shown, these flaps 54 and 55 extend continuously along edges 57 and 58 between the inwardly facing edges of the corresponding corner cleats 39 and 40 for shorter side 6 of the main body 2 and similarly between the inner edges of the corner cleats 22 and 24 for shorter side face 4 of main body 2. These flaps 54 and 55 are preferably bent over to tightly engage and cover the edge portions at each end of shorter sidewalls 4 and 6. They also extend between top and bottom cleats 39 and 40. As explained above in the general description of this invention, these flaps are easily externally secured to the ends of such sidewall portions 4 and 6 and through to the underlying braces. Preferably, such securing means extend throughout the lengths of these flaps and thus between the above noted corner cleats of side faces 4 and 6. Preferably, the securing of these flaps also extends into their underlying braces and this securing throughout their lengths is done by rows 59 of nails, staples or the like. As will be well understood by those skilled in this art, such nailing or the like may be readily and economically achieved by use of conventional nailing or stapling machines or the like since no internal bracing, pressure plates or other such means is required for this externally applied securing.

It will be apparent that the otherwise open or loose edges at 57 and 58 are effectively and permanently sealed and closed. It will also be seen that the entire container or box is materially strengthened by these elongated bent portions or their dihedral angles or fibrous sheet material. Also warping, buckling, tearing of either of the edges of the enclosures or the edges of the main body portion 2, and the unwanted or improper entry of lift forks are all effectively and economically prevented by this flap means or its equivalents.

The second exemplary embodiment of my invention is shown in FIGURES 4, 5, and 6. It differs from the first embodiment mainly by reason of the extra or intermediately and parallel cleats between the corner cleats of each of the four side faces of the main and tubular body portions, which is designated as a whole by 72 and similarly by the extra parallel cleats intermediate the edge cleats of the end closures or top and bottom pieces, which are each designated as a whole by 71. Thus, the flaps, which extend down in between the cleats of the overlocked sidewall are divided into a plurality of parts or are separate and shorter flaps of appropriate lengths to be engaged between the sidewall cleats.

The container as a whole is of a shorter and wider rectangular shape and its tubular and main body portion 72 is here illustrated as being formed of four separate pieces suitably stitched together to form the four corners of this tubular portion 72. Otherwise, the various securing means, their lengths, and their arrangements may be considered as being essentially the same as those disclosed for my first embodiment.

In FIGURES 4, 5, and 6, the tubular, foldable and main body portion 72 is assembled and fabricated into its closed tubular form from the four separate sidewall pieces of fibrous material 73, 74, 75, and 76. Each of these main side wall pieces has its upright edges interconnected like the open edges between side faces 3 and 6 of FIGURES 1 to 3. Thus, there need be only a single scored or bend line at each edge of each of the four sides of the unit 72. These upright bends are supplied by the score or bend lines 77, 78, 79, 80, 81, 82, 83 and 84 to provide bendable flaps or integral strips 86, 87, 88, 89, 90, 91, 92, 93, and 94 respectively. As shown, these flaps stitched together in the same fashion as the stitched flaps 11 and 12 of FIGURE 2.

Like FIGURES 1 to 3, the tubular side faces 73 and 75 are shorter at each end than the other two side faces 74 and 76 to provide for the embraced reception of the enclosures or top and bottom pieces 71 between the longer or extended ends of the side pieces 74 and 76 as shown. The shorter side faces 73 and 75 have correspondingly shorter corner cleats 96, 97, 98 and 99 respectively which extend to the upper and lower ends of tube 72. These shorter side faces 73 and 75 also have a plurality, or here two, of intermediate and parallel bracing cleats 101 and 102 respectively which are here illustrated as being uniformly spaced between the corner cleats and similarly secured and having the same lengths, as the corner cleats.

In like fashion the narrower but higher side faces 74 and 76 have similar corner cleats 104, 105, 106, and 107 respectively thereon. These side faces 74 and 76 are shown as each having only one intermediate and reinforcing cleat between and parallel with the corner cleats and having the same lengths as the corner cleat 91. These intermediate cleats 109 and 110 respectively also have the same lengths or heights as the side faces 74 and 76 as do the corner cleats. All of these cleats may be secured as by securing means 110*a* and as disclosed in connection with my first embodiment.

As in my first embodiment, the adjacent corner cleats are intersecured by rows of nails such as 96 and all of the cleats for the tubular member are secured thereto by nails such as 98 arranged in rows along the length of said cleats as described above.

The top and bottom or end closures 71 have braces 118 and cleat arrangements to match the corresponding and short height sides 73 and 75. Thus, the top and bottom edge cleats 111 and 112 are separated by the two parallel, intermediate, uniformly spaced cleats 113 and 114. All of these top and bottom cleats are secured as by means 115 and as described above in connection with my first embodiment. The edge cleats 111 and 112 of members 71 are secured to the braces 118 by nails 117 as in my first embodiment. The end closures are secured in essentially the same fashion as in my first embodiment. Thus, the end cleats, such as 96 and 97, and the intermediate cleats 101 and 102, of the tubular body are laterally nailed through to the braces 118 of top and bottom 72 by nails 117*a*. Also nails 125 extend laterally in from the ends of the shorter side wall cleats, such as 104, 105 and 109 into top and bottom cleats 112 and similarly at the other end into cleats 111 of the top and bottom. Braces 118 are secured along and under the edge portions of top and bottom members 71 adjacent the shorter side walls 73 and 75 as shown and in a fashion similar to that disclosed in connection with my first embodiment. These braces are secured as disclosed in connection with FIGURES 1 to 3. They are similarly secured to the intermediate cleats 109 and 110 of the short tubular side walls 73 and 75 so that they have the three shorter and intermediate unsupported portions between the cleats of the shorter sidewalls 73 and 75.

In this different combination of my second embodiment, the important overlying fibrous sheet portions or the flaps are provided by the plurality of flaps 119 are

here shown as integral with the edges of the top and bottom sheet material portions or bodies **120** of the top and bottom **71**. As shown, these three shorter flaps **109** of each such edge have their lengths extending between the corner cleats and the intermediate or reinforcing cleats of the shorter tubular sidewalls **73** and **75**. As shown at **122**, these three flaps **109** may be each secured along their entire lengths to the underlying tubular side wall edges of **73** and **75** and to the underlying tubular sidewall edges of **73** and **75** and to the underlying braces by rows of nails or the like applied in the fashion disclosed in connection with FIGURES 1 to 3 above.

Here again the desirable features and advantages disclosed in connection with the construction of FIGURES 1 to 3 are obtained by the sealing and strengthening flaps **109**.

It is to be noted that while the flaps **55** or the flaps **119** may be of a narrower width, yet I prefer the width illustrated in which they extend out slightly beyond the ends of the top and bottom cleats when these flaps are flush with the top and bottom fibrous sheets. It will also be noted that the cleats of **71** extend out beyond the braces like those of FIGURE 3.

It will, of course, be understood that the various specific features, such as the different lengths of their side cleats and the construction of the tubular sidewalls and the specific arrangement and formation of the corners of the tubular main body, may if desired be changed and other known or desired arrangements and constructions employed in lieu thereof.

It will also be understood that while I have specifically described only two exemplary embodiments of my invention, yet various other known or desired arrangements and construction features may be employed or, alternatively, the features of this invention may be used to advantage in different types of containers or boxes other than those described herein, all within the spirit and scope of this invention and as set forth in the appended claims.

I claim as my invention:

1. A collapsible and drivable fastener assembled container comprising,

a fibrous sheet material, tubular and collapsible main body having a rectangular open end with two opposed side walls having ends which are longer and project beyond the ends of the other and shorter two side walls at said open end,

a rectangular fibrous sheet material end closure having two outer cleats adjacent two opposed edges thereof,

said outer cleats being adapted to be embraced by, and secured by drivable fasteners through,

the longer two ends of said tubular main body,

said end closure having two inner braces adjacent its other two edges,

and integral flaps along only two opposed edges thereof,

said flaps being bent over along lines parallel to and close to the outer sides of said inner braces to be adapted to directly engage and cover the otherwise exposed and tearable shorter free ends of said tubular main body and to be secured by drivable fasteners penetrating through said flaps, then through the shorter ends of said tubular body and then into said inner braces of said end closure.

2. The container of claim 1 wherein said tubular main body has two similar rectangular open ends,

and only two outer cleats secured to each of its four side walls adjacent its corners and extending substantially throughout the length of its side walls and wherein there are two similar end closures each having only two outer cleats and only two integral flaps.

3. The container of claim 1 wherein said tubular main body has two similar rectangular open ends,

and at least one outer cleat on each face intermediate its said corner cleats,

and wherein there are two similar end closures each having at least one intermediate outer cleat between the two outer cleats adjacent its two opposed edges,

and each end closure has a plurality of integral flaps along its said inner braces with each flap being adapted to extend between the outer cleats on the side walls of the tubular main body.

References Cited in the file of this patent

UNITED STATES PATENTS

2,141,497	Watkins	Dec. 27, 1938
2,229,355	Watkins	Jan. 21, 1941
2,442,651	Johnson	June 1, 1948
2,520,303	Bauer	Aug. 29, 1950
2,887,241	MacKenzie	May 19, 1959