Nov. 20, 1962 C. K. DUNLAP, JR., ET AL 3,064,870

COLLAPSIBLE CONTAINER

Filed Dec. 7, 1960 3 Sheets-Sheet 1

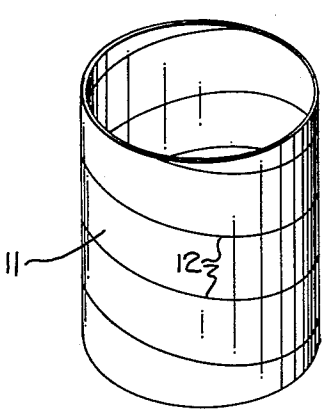


Fig-1

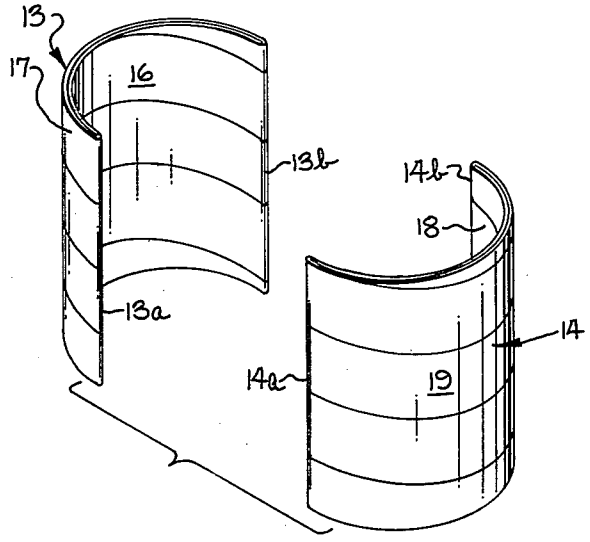


Fig-2

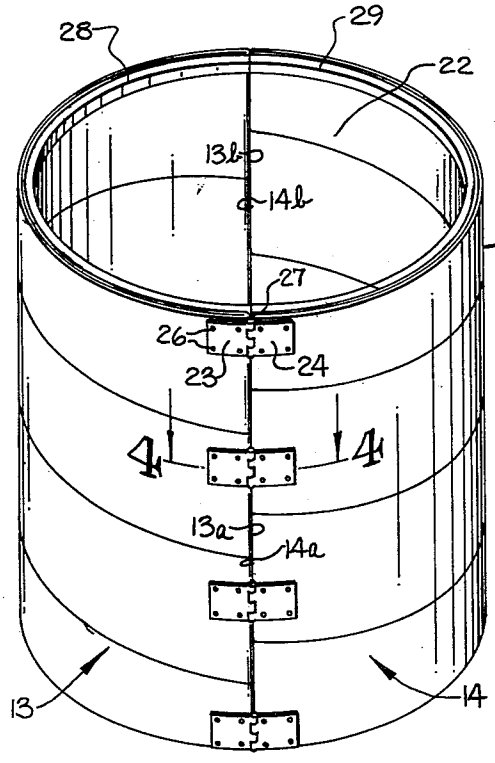


Fig-3

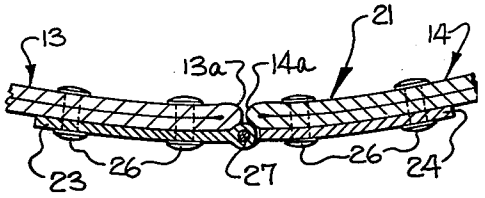


Fig-4

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COLLAPSIBLE CONTAINER

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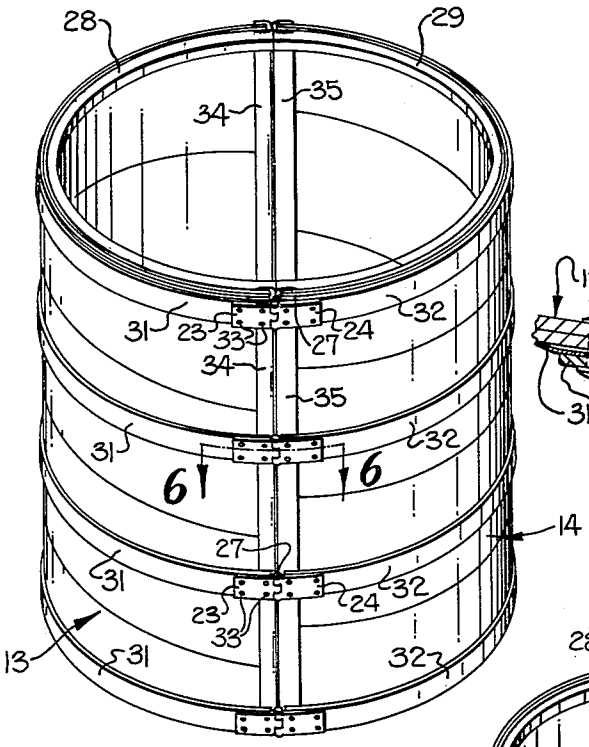


Fig-5

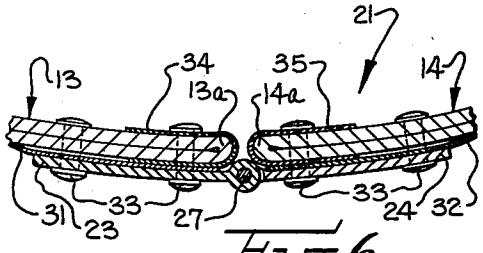


Fig-6

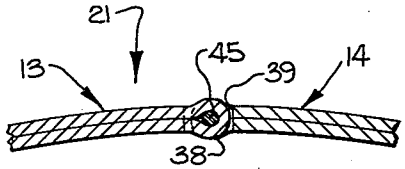


Fig-8

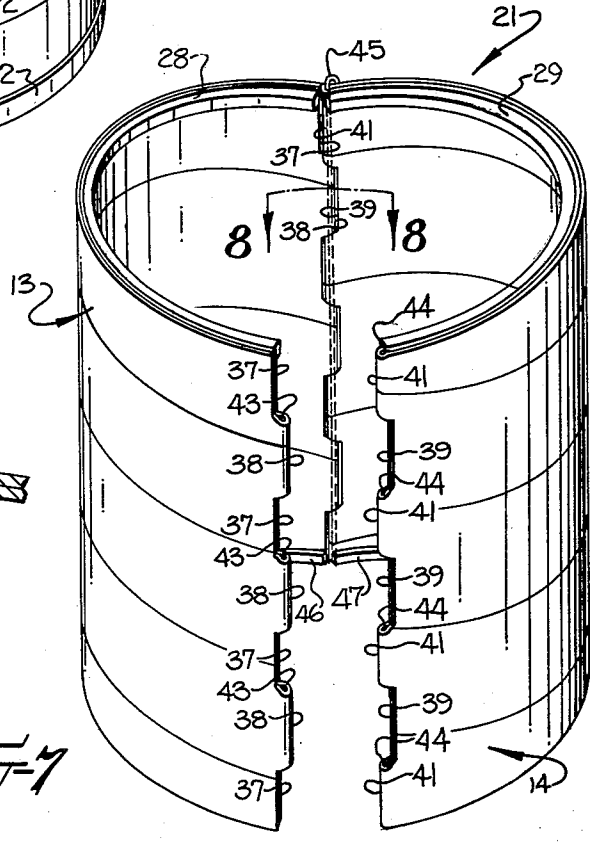


Fig-7

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COLLAPSIBLE CONTAINER

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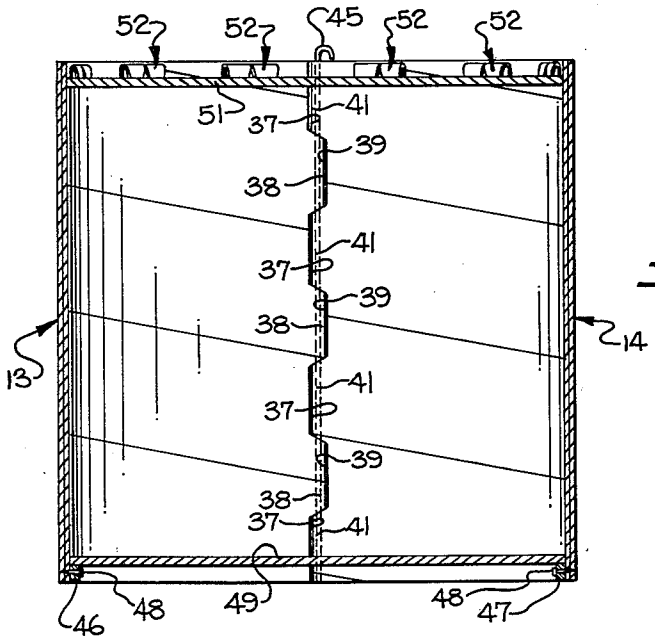


Fig-9

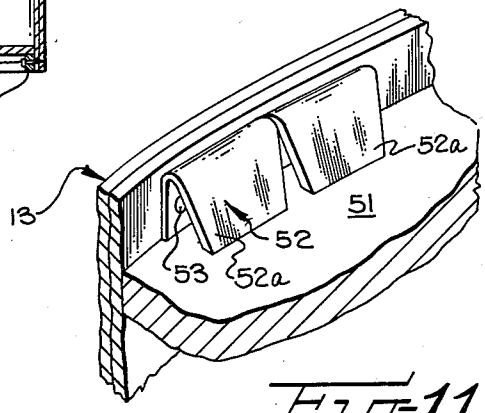


Fig-11

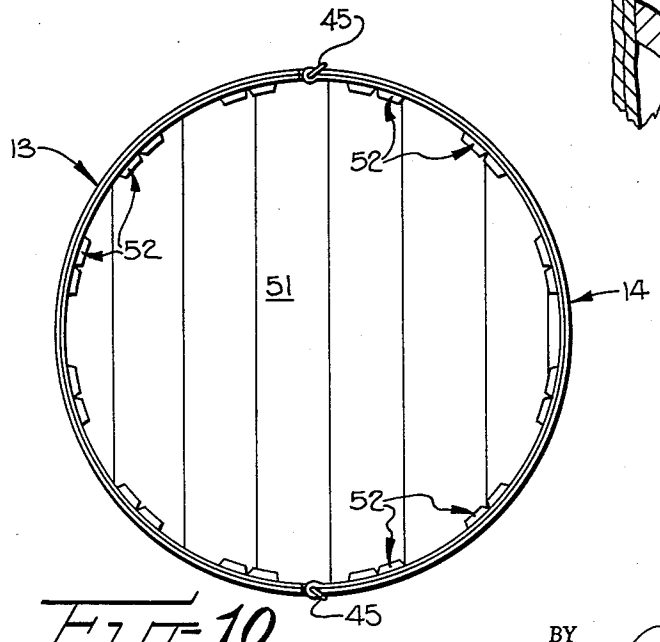


Fig-10

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COLLAPSIBLE CONTAINER

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Filed Dec. 7, 1960, Ser. No. 74,255
9 Claims. (Cl. 229—4.5)

This invention relates to collapsible containers and more particularly to a collapsible container assembled from a pair of semi-circular half-sections each of which are formed from a folded paper tube.

In the shipping and storing of empty containers, particularly containers of relatively large size, unless some provision is made for collapsing or "knocking down" these containers, the unoccupied container interior represents a significant waste of space. The storing of assembled or "setup" containers requires a relatively large space to store only a few containers and the shipping cost of empty "setup" containers would be prohibitive due to the small number of containers which could be accommodated within conventional transportation units. Furthermore, large size assembled containers are difficult to handle because of their awkward size and weight.

In present day practice, containers of relatively large size, such as barrels, tobacco hogsheads, and the like, are arranged to be knocked down or collapsed in various ways for maximum utilization of shipping and storage space. By way of example, one type of present day container is formed of wooden strips or staves which are held in an assembled relationship by means of circular metal bands or the like. This type of container is heavy, expensive and difficult to assemble and disassemble.

Another type of large container frequently used is made of flexible or foldable paperboard and the like to permit folding when empty. To this end, the paperboard body of such containers is frequently scored for ease of folding. However, when flexible material such as paperboard, either scored or unscored is utilized for such containers, the wall strength required for such containers is somewhat less than that desired and these containers are easily damaged so that they must often be discarded after a single use. For instance, tobacco hogsheads constructed from flexible or foldable paperboard must not only withstand the forces produced during ramming of the tobacco into the hogshead but also the strain on the loaded hogshead imposed by the weight of tobacco contained therein during handling including dropping and the like.

Accordingly, the primary object of this invention is to provide a new and novel collapsible container formed of paperboard or similar fibrous material which is extremely simple in construction and which is of such strength as to be capable of withstanding severe strain without damage such as occurs during rugged handling, high internal pressures, dropping while loaded, and the like.

Another object of this invention is to provide a new and novel tobacco hogshead which is constructed of a minimum of inexpensive parts, which is capable of repeated reuse, and which may be readily knocked down and set up by relatively unskilled operators.

Still another object of this invention is to provide a new and novel tobacco hogshead having a tubular body of high strength which is formed from a pair of complementary folded paper tubes.

A further object of this invention is to provide a new and novel collapsible container suitable for use as a tobacco hogshead which utilizes a pair of semi-circular complementary half-sections which may be readily nested for shipment, storage and the like, and which are constructed so as to provide an accurate fit when assembled into a tubular form.

A still further object of this invention is to provide new and novel connecting means for the interfitting component parts of a collapsible container suitable for use as a tobacco hogshead which not only adds to the strength of the container but permits it to be easily opened for inspection of the container contents.

This invention further contemplates the provision of a new and novel collapsible container suitable for use as a tobacco hogshead and formed of paperboard or other fibrous material having novel restraining means for dimensionally stabilizing the component paperboard parts so as to provide an accurate fit when the parts are assembled.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawings.

The objects stated above and other related objects in this invention are accomplished by providing a tubular body which is formed from a pair of semi-circular complementary half-sections. Each of these half-sections is formed by folding or collapsing a paper tube, preferably a spirally wound paper tube, so that the paper tube is doubled upon itself into semi-circular cross-sectional shape. Novel connecting means are provided for interconnecting the opposed longitudinally extending side edges of a pair of these half-sections to form the container tubular body which is circular in cross section. In one form of the invention, restraining means are provided along each of the side edges of the half-sections to prevent dimensional changes in the side edge which would create an improper fit. A closure disc or "head" is positioned in one end of this tubular body to permit filling and the container may be closed with a similar head in the other end of the tubular body.

The novel features which are believed to be characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation may be best understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a perspective view of a paper tube of the type employed in the container of the invention;

FIGURE 2 is a perspective view of a pair of the paper tubes of FIGURE 1 each of which has been folded for use as half-sections in the container of the invention;

FIGURE 3 is a perspective view of the container of the invention formed from the half-sections of FIGURE 2;

FIGURE 4 is an enlarged sectional view taken substantially along line 4—4 of FIGURE 3 in the direction of the arrows;

FIGURE 5 is a perspective view of a modification of the container of FIGURE 3;

FIGURE 6 is an enlarged sectional view taken substantially along line 6—6 of FIGURE 5 in the direction of the arrows;

FIGURE 7 is a perspective view of another modification of the container of the invention showing the container in a partially assembled condition;

FIGURE 8 is a sectional view taken substantially along line 8—8 of FIGURE 7 in the direction of the arrows;

FIGURE 9 is a vertical sectional view of the container of FIGURE 7 slightly modified and illustrated in an assembled condition;

FIGURE 10 is a plan view of the container of FIGURE 9; and

FIGURE 11 is an enlarged perspective view of a portion of the container of FIGURE 9 illustrating a novel end closure securing means.

For the purposes of illustration, the present invention is shown and described as embodied in a container intended for use as a tobacco hogshead. However, it is to be understood that the present invention is not intended to be limited to this type of container but is applicable as well to any other type of container where the features of the present invention would be of advantage.

Referring now to the drawings and to FIGURES 1, 2 in particular, there is shown in FIGURE 1 a paper tube **11** which is employed in the construction of the container of the invention. In the preferred embodiment, the paper tube **11** is of a conventional multi-ply spirally wound paper construction for a purpose to be explained hereinafter. The tube **11** contains helical seams **12** defined by the adjacent side edges of the paper strips employed in the spiral winding of the tube.

In accordance with the invention, a pair of paper tubes **11** which have been cut to an appropriate length are collapsed or folded longitudinally to form a pair of substantially identical half-sections **13, 14** which are semi-circular in cross-section as shown in FIGURE 2.

The tubes **11** may be folded or collapsed in the manner disclosed in U.S. Patent No. 2,679,989, issued June 1, 1954, to Charles K. Dunlap for Textile Bobbin and Method of Forming Same. In this method a cylindrical tube is placed in a cavity in a die block in line with a cooperating punch and the punch is advanced into the cavity to collapse or fold the tube into a semi-circular cross-section such as the container half-sections **13, 14** of the present invention. In the instant application, the pressure of the punch may be varied as desired to compress the walls of the tubes in addition to folding the tubes to increase the density and thus strengthen the container walls. The half-section **13** is therefore provided with overlying inner and outer walls **16, 17** and half-section **14** is provided with overlying inner and outer walls **18, 19.**

Although the paper tubes **11** may be convolutely wound in the conventional manner, a spirally wound tube is preferably employed as the folding of the tube positions the spiral seams on the inner wall **16** of the half-section **13** in an oppositely inclined direction from the spiral seams on the outer wall **17** so that these inner and outer wall seams criss-cross and reinforce each other. The same is also true of the half-section **14.**

It should be noted that the exposed surface of the inner walls **16, 18** of the half-sections **13, 14** respectively were actually parts of the outer surface of the tube **11** prior to folding. Thus the outer surface of the tube **11** can be treated when winding the tube to provide a suitable inner surface on the container for contact with the contents of a filled container.

The complementary half-sections **13, 14** of FIGURE 2 are thus arranged to be positioned together to form a cylindrical tubular body for the container of the invention as shown in FIGURE 3. To this end, the folded vertically extending side edges **13*a*, 13*b*** of half-section **13** are positioned in abutting relationship with the folded vertically extending side edges **14*a*, 14*b*** respectively of half-section **14** as shown in FIGURE 3 to form a tubular body designated generally in FIGURE 3 by the numeral **21.** The tubular body **21** is therefore provided with an interior **22** and is open at each end.

Means are provided for connecting the two half-sections **13, 14** together to secure the tubular body **21** in assembled condition. In the embodiment of FIGURE 3 a plurality of pairs of connecting elements **23, 24** are shown positioned across the abutting side edges **13*a*, 14*a*** with one of the elements secured to one of the half-sections and the other element to the other half section. As shown in FIGURE 3, the pairs of elements **23, 24** are hinges which are spaced vertically along the abutting side edges with element **23** secured to half-section **13** and element **24** to half-section **14** by suitable means such as rivets **26** or the like as shown best in FIGURE 4. Similar pairs of elements **23, 24** are arranged in a similar manner across the abutting side edges **13*b*, 14*b*** which are not shown in FIGURE 3. Means are provided for securing the elements **23, 24** together which in the specific embodiment comprises a removable hinge pin **27.**

The container of FIGURE 3 includes a bottom closure retaining means secured to the tubular body **21** and a bottom closure such as a wooden disc which is positioned within the bottom end of the container as described hereinafter with respect to the embodiment of FIGURES 9–11. After filling the container of FIGURE 3 with tobacco or the like, a top closure is positioned in the top open end of the container and held therein by top closure retaining means. In the container shown in FIGURE 3 the top closure retaining means comprise semi-circular half-rings **28, 29** which are secured by suitable means to the half-sections **13, 14** respectively adjacent their upper ends. In the assembled relationship of FIGURE 3, the half-rings **28, 29** produce an annular retaining member or ring which when the closure disc is inserted thereunder prevent the closure from moving out of the container end under the pressure of the tobacco packed within the hogshead or container.

Referring now to FIGURES 5, 6, there is shown a modification of the container of FIGURE 3 wherein container reinforcing means are provided in the form of a plurality of vertically spaced straps **31, 32** positioned on the half-sections **13, 14** respectively. As shown in FIGURES 5, 6 the terminal ends of the straps **31** are secured to the elements **23** adjacent each of the half-section side edges **13*a*, 13*b***, preferably utilizing means such as rivets **33** shown in FIGURE 6, rivets **33** being somewhat longer than the rivets **26** of FIGURE 4 to accommodate the straps. The straps **32** which extend around the half-section **14** are similarly secured by means of rivets **33** to the other elements **24** adjacent the half-section side edges **14*a*, 14*b***.

In order to maintain the vertical spacing constant between the elements **23, 24** and, therefore, enable randomly selected self-sections to be properly joined in an accurate fit restraining means are secured to the half-sections **13, 14** and to the pairs of elements **23, 24.** In the specific embodiment illustrated, these restraining means comprise elongated strips **34, 35** of rigid material such as metal which are substantially U-shaped in cross-section as shown in FIGURE 6. Strips **34** are positioned around the folded side edges **13*a*, 13*b*** of half-section **13** and strips **35** around the side edges **14*a*, 14*b*** of the half-section **14.** As shown best in FIGURE 6, these strips **34, 35** are secured to the half-sections **13, 14,** the elements **23, 24,** and the straps **31, 32** respectively by means of the rivets **33.**

With the use of the strips **34, 35,** the substantial changes which occur in the paper half-sections **13, 14** as a result of changes in humidity are prevented from effecting the side edge portions of the half sections so that the elements **23, 24** are maintained in the proper spacing and proper connection of the half-sections is always obtained. It has been found in practice that while the side edges of the half-section are virtually unchanged dimensionally during humidity changes as a result of the strips **34, 35,** substantial changes in length will often occur in the portion of the half-sections remote from the strip which, of course, do not affect the fitting together of the half-sections.

Referring now to FIGURE 7, there is shown still another modification of the container of the invention wherein the half-sections **13, 14** are provided with a modified means for connecting the half-sections together. In the embodiment of FIGURE 7, the side edges of half-section **13** are cut away at uniformly spaced intervals so as to provide a plurality of spaced recesses **37** and tabs **38.** Similarly the side edges of half-section **14** are cut away to provide spaced recesses **39** and tabs **41** with the recesses and tabs staggered on the opposed side edges so that when the side edges of the half-sections are

brought together tabs 38 will nest within recesses 39 and tabs 41 will nest in recesses 37. The depth of the recesses 37, 39 is selected so that the vertically extending passages 43, 44 formed by the folded edges of half-sections 13, 14 respectively will be in vertical alignment when the side edges are brought together.

In order to secure the abutting side edges together in this nested relationship, an elongated rod 45 is inserted through the vertically aligned passages 43, 44 in tabs 38, 41 respectively on each pair of opposed side edges. In FIGURE 7, one of the rods 45 has been positioned through one pair of nested side edges. Thus, the rods 45 hold the half-sections 13, 14 together to form the container of the invention and one of the rods may be easily removed when desired as shown in FIGURE 7 to permit the container to be opened on one side.

Referring now to FIGURE 9, there is shown a container similar to the container of FIGURE 7 which has been completely set up or assembled and which utilizes a novel retaining means for the top closure.

In the embodiment of FIGURES 9–11, semi-circular retaining rings 46, 47 are secured by means such as nails 48 to the interior of the half-sections 13, 14 respectively at the bottom end and an end closure of disc 49 as positioned in supported relationship with the rings 46, 27 as shown. This type of bottom end closure and retaining means is preferably used on all of the illustrated embodiments of the container of the invention. The container may then be filled with material such as tobacco or the like.

At the top end of the container of FIGURES 9–11 and as shown best in FIGURE 11, retaining means are provided for a top closure or disc 51 which comprise a plurality of spaced pairs of V-shaped resilient members 52 formed of spring steel or the like. The members 52 are secured by suitable means such as rivets 53 to the inner wall of the container adjacent to the top end as shown. When the container has been filled with tobacco or the like, the top end closure 51 is then pushed inwardly to move the inwardly extending portions 52*a* of the members 52 towards the inner wall of the container and slightly compressing the material in the container. The top disc 51 is moved past the members whereby the portions 52*a* are released so that they spring back to their expanded position shown in FIGURE 11 and extend over the marginal edge portions of the disc 51. The top closure disc 51 is thereby prevented from moving out of the top end of the container.

With the novel construction of this invention, there has been provided a container suitable for use as a tobacco hogshead which may be assembled and disassembled in a simple and easy manner and which has component parts that may be shipped or stored in a nested or stacked relationship with a minimum waste of space and an attendant reduction in shipping and storage costs. These component parts may be constructed from readily available inexpensive materials including wound paper tubes so that a container of low initial cost results and a container of great strength is obtained which resists rugged treatment occurring during filling, handling and the like. With the provision of novel means, selected portions of the container are restrained against dimensional changes common to paper under changing humidity conditions so that the interfitting component parts of the container may be selected at random and a proper fit is always obtained.

While there has been described what is presently considered to be the preferred embodiments of the invention, it will be understood by those skilled in the art that various changes and modifications may be made therein without departing from the invention and, therefore, it is the aim of the appended claims to cover all such changes and modifications as fall within the true sphere and scope of the invention.

Having thus described the invention, what is claimed is:

1. A collapsible container comprising, in combination, a pair of complementary half-sections semi-circular in cross-section, each of said half-sections comprising a longitudinally folded paper tube having a pair of longitudinally extending side edges, said half-sections arranged with their longitudinally extending side edges in abutting relationship to form a tubular body, means secured to each of said half-sections for connecting said half-sections in said tubular body forming relationship, and a closure member positioned in at least one end of said tubular body.

2. A collapsible container comprising, in combination, a pair of complementary half-sections semi-circular in cross-section, each of said half-sections comprising a longitudinally folded spirally wound paper tube having a pair of longitudinally extending side edges with the spiral winding on the overlying portions of each of said half-sections extending in oppositely inclined directions to reinforce said half-section, said half-sections arranged with their longitudinally extending side edges in abutting relationship to form a tubular body, means secured to each of said half-sections for connecting said half-sections in said tubular body forming relationship, and a closure member positioned in at least one end of said tubular body.

3. A tubular body for a collapsible container comprising, in combination, a pair of complementary half-sections semi-circular in cross-section, each of said half-sections comprising a longitudinally folded paper tube having a pair of longitudinally extending side edges, said half-sections arranged with their longitudinally extending side edges in abutting relationship to form said tubular body, and means secured to each of said half-sections for connecting said half-sections in said tubular body forming relationship.

4. A tubular body in accordance with claim 3 wherein each of said half-sections comprises a longitudinally folded spirally wound paper tube with the spiral winding on the overlying portions of each of said half-sections extending in oppositely inclined directions to reinforce said half-section.

5. A collapsible container comprising, in combination, a pair of complementary half-sections semi-circular in cross-section, each of said half-sections comprising a longitudinally folded paper tube having a pair of longitudinally extending side edges, said half-sections arranged with their longitudinally extending side edges in abutting relationship to form a tubular body, means secured to each of said half-sections for connecting said half-sections in said tubular body forming relationship, means secured to each of said half-sections adjacent said side edges and to said connecting means for restraining said side edges against dimensional change and thereby prevent misalignment of said connecting means, and a closure member positioned in at least one end of said tubular body.

6. A collapsible container comprising, in combination, a pair of complementary half-sections semi-circular in cross-section, each of said half-sections comprising a longitudinally folded paper tube having a pair of longitudinally extending side edges, said half-sections arranged with their longitudinally extending side edges in abutting relationship to form a tubular body, a plurality of vertically spaced pairs of connecting elements mounted across said abutting side edges for connecting said half-sections in said tubular body forming relationship, said pairs of connecting elements having one element mounted on one of said half-sections and the other element mounted on the other of said half-sections, and means for releasably securing the elements of each pair together, and a closure member positioned in at least one end of said tubular body.

7. A collapsible container in accordance with claim 6 including a plurality of vertically spaced reinforcing straps extending around the outer wall of each of said half-sec-

tions and terminating at said side edges, said reinforcing straps secured at their terminal ends to one of said pair of connecting elements at each of said side edges.

8. A collapsible container comprising, in combination, a pair of complementary half-sections semi-circular in cross-section, each of said half-sections comprising a longitudinally folded paper tube having a pair of longitudinally extending side edges, said half-sections arranged with their longitudinally extending side edges in abutting relationship to form a tubular body, a plurality of vertically spaced pairs of connecting elements mounted across said abutting edges for connecting said half-sections in said tubular body forming relationship, said pairs of connecting elements having one element mounted on one of said half-sections and the other element mounted on the other of said half-sections, and means for releasably securing elements of each of said pairs together, a strip of rigid material extending along each of said longitudinally extending side edges and secured to said elements along the respective side edge to thereby restrain said side edges against dimensional changes and maintain the vertical spacing between said elements, a plurality of vertically spaced reinforcing straps extending around the outer wall of each of said half-sections and terminating at said side edges, said reinforcing straps secured at their terminal ends to one of said pair of connecting elements at each of said side edges, and a closure member positioned in at least one end of said tubular body.

9. A collapsible container comprising, in combination, a pair of complementary half-sections semi-circular in cross section, each of said half-sections comprising a longitudinally folded paper tube having a pair of longitudinally extending side edges, each of said longitudinally extending side edges having a centrally arranged passage formed by said folded tube and a plurality of longitudinally spaced recesses formed therein to provide alternating recesses and tabs along said side edges, said half-sections having said alternating recesses and tabs arranged in staggering relationship along corresponding side edges and arranged together with said recesses and tabs in corresponding side edges in nested relationship with said edge passages in vertical alignment to form a tubular body, an elongated rod member extending vertically through said aligned longitudinally extending edge passages to retain said side edges in said nested relationship, and a closure member positioned in at least one end of said tubular body.

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