

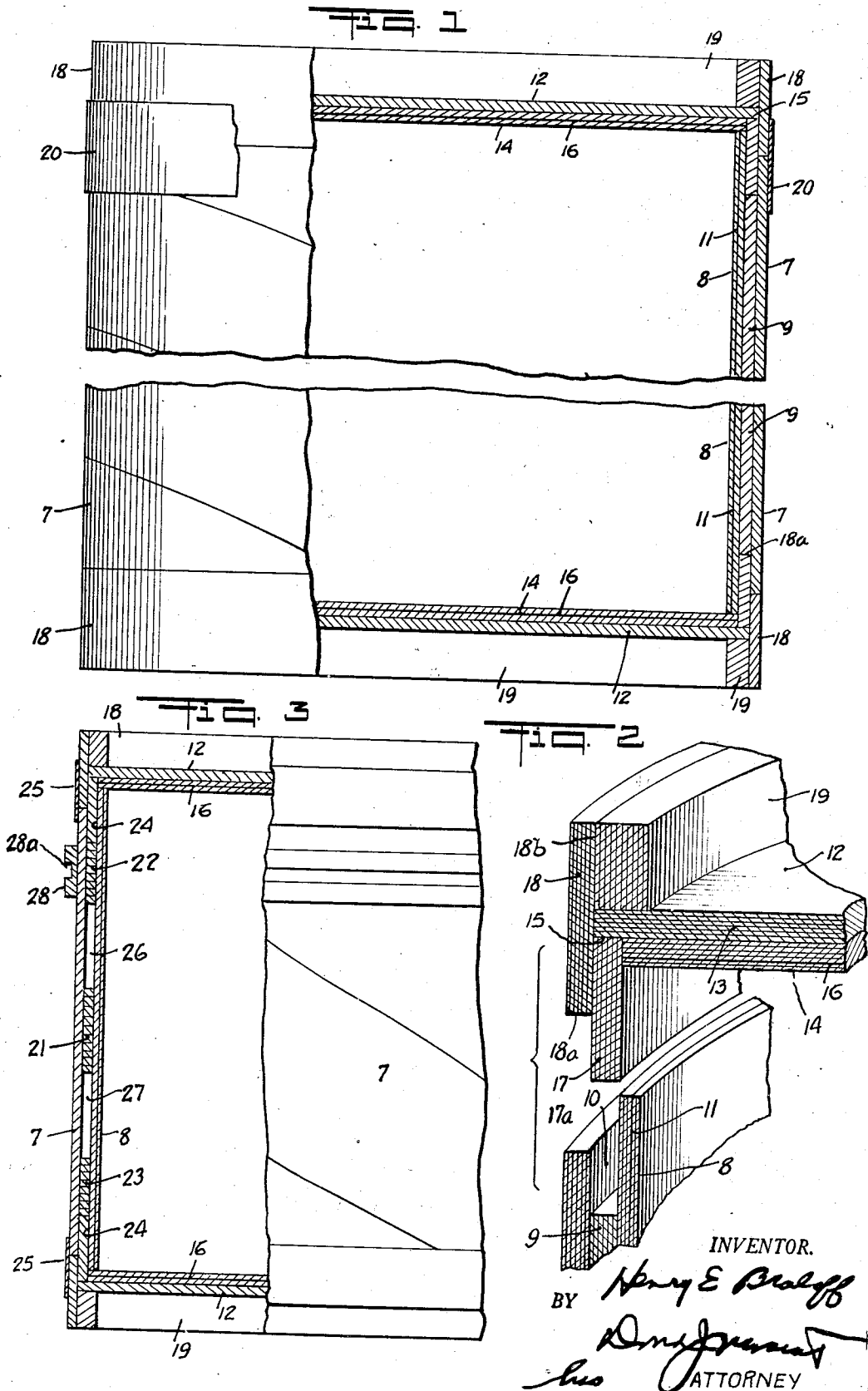
May 30, 1944.

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2,350,271

CONTAINER

Filed May 22, 1942



UNITED STATES PATENT OFFICE

2,350,271

CONTAINER

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Application May 22, 1942, Serial No. 444,084

6 Claims. (Cl. 229-4.5)

This invention relates generally to containers and is more particularly directed to a container composed of fibrous material for packaging goods of various kinds, for marketing or other purposes.

As is well known, many types of containers produced of fibrous material are available for packaging goods of different properties. However, none of these has been found to be entirely satisfactory in the packing and distribution of many foodstuffs and other commodities, where their use would be economically advantageous. For instance, in the marketing of paints, oils and other semi-liquid and semi-plastic materials, as well as numerous dry products, which are subject to rapid deterioration if not properly protected against moisture, fiber containers have not been used to any appreciable extent, mainly because of the fact that it has been impossible to economically produce a fiber container that will be durably leak-proof and impervious to fluid penetration, while possessing the necessary strength without materially adding to the gross weight of the packaged product, which, obviously, is an important item in marketing many products, especially in the liquid and semi-liquid classifications.

Therefore, it is the primary object of this invention to provide a simple, strong and durable container, which is relatively light in weight and particularly responds to those requirements in packaging those materials which must be protected against fluid penetration to prevent deterioration while in storage and in transit, which are not satisfactorily met by existing types of fiber containers.

It is also an important object of this invention to provide a container possessing the aforesaid characteristics and advantages, which may be hermetically sealed by the packer of the contained product in a convenient manner, with a closure that may be subsequently readily removed for dispensing the product and replaced to protect the remaining container contents against loss by evaporation or otherwise.

Another object of the invention is to provide an all fiber container, as aforesaid, in which the end-forming portions thereof, when assembled on the body of the container, appreciably reinforce the entire structure and, at the same time, effect a jointure with the body-portion which is proof against leakage and effectively eliminates the possibility of fluid penetration.

A further object of my invention is to provide an all fiber container in which a moisture-resistant material may be incorporated in the wall of

the body-portion and the end-forming elements thereof, to become a virtual part of the same, the end-forming elements having end-forming surfaces of pressure diaphragm characteristics to augment the security of the hermetic seal effected by the mode of assembly of the end-forming elements upon the container body.

Still another important object of my invention is to provide an all fiber container having a cellular or hollow wall, whereby the insulating properties of such a construction may be advantageously utilized in packaging various products, or in which may be incorporated material having characteristics which are protective of the container itself or the product contained therein.

My invention also contemplates a container produced mainly from a plurality of spirally wound tubular chipboard elements, telescopically fitted in the necessary cooperative association for the attainment of the hereinbefore recited objectives, in a series of so-called force-fitting operations, whereby the inherent properties of the tubular spirally wound material, mated under such conditions, will durably resist separating forces and provide a virtually integral construction.

Other objects and advantages flowing from the practicing of my invention will become evident as the description proceeds.

Figure 1 is a view in elevation, partly in section, of a container conforming to my invention.

Figure 2 is a sectional elevation of a fragment of one of the end-forming assemblies, for forming an hermetic seal for the container, showing the manner in which it is associated with the container body; and

Figure 3 is a view in elevation of a portion of a container, partly in section, showing a modified wall construction.

Referring now to the drawing in detail, in which like characters of reference are employed to designate similar parts in the several views, and more particularly to the construction shown in Figures 1 and 2, the body of the container comprises an outer tubular section 7, an inner tubular sleeve 8 and an intermediate spacing sleeve 9, the relative diameters of these three tubular elements being such that their telescopic assembly must be effected under axially applied pressure, in a so-called force-fitting operation. In assembling the container body, the sleeve 9, preferably, is first forced into the outer wall-forming section 7, the length of the sleeve providing for its disposition within the surrounding section with its ends appreciably and equidistantly spaced inwardly

of the contiguous ends of the latter, the reason for which will become apparent. Following the entry of the sleeve 9 in the outer section 7, the inner sleeve 8 which is of greater length than the said section is forced into position within the intermediate sleeve 9, to locate it therein with its respective ends projecting outwardly of the adjacent ends of the section 7. The terminal portions of the inner sleeve, which is also longer than the intermediate spacing sleeve 9, as is clearly shown, extend beyond the respective ends of the latter sleeve in the formation of a deep annular internal groove 10 at each end of the container body, defined by the opposed spaced surfaces of the outer section 7 and the inner sleeve 8 and the end edges of the intermediate sleeve 9, for the reception of a complemental flange of the end-forming assembly, as hereinafter described.

The three tubular body-forming elements are preferably composed of spirally wound pressed chipboard, the convolutions or windings of each of the constituent laminations thereof mating in butt joints and being bonded to the convolutions upon which they are superimposed by an adhesive, as silicate of soda, to produce a section of the required thickness. In producing the inner tubular sleeve 8, a layer of metal foil 11 is introduced at a predetermined stage of the winding operation and spirally superimposed thereon, with the edges of its convolutions in overlapping engagement, the subsequent windings of chipboard being, in turn, superimposed upon the metal foil, in attaining the desired wall thickness, as described. A permanent bond between the metal foil and the fiber surfaces and the union of the overlapped portions of the metal foil windings is formed by coating the foil with a cementitious material, as a casein adhesive, the metal foil, as thus embedded in the fiber tube and the bonding of the chipboard lamina, producing a sleeve having all of the attributes of a homogenous structure, similarly to the outer and intermediate tubular elements, in resisting disintegration, together with the strength and rigidity that are inherent to a spirally wound construction. Preferably, the metal foil is introduced when the sleeve 8 has been built up to approximately one-half of its ultimate thickness, the metal foil with its overlapped convolutions presenting an uninterrupted surface interposed between the inner and outer faces of the sleeve, which extends from end to end thereof, and is impervious to fluid penetration, as would obtain in an all-metal wall. The overlying and concealing chipboard windings effectively protect the thin metal foil against damage that is common in those containers in which the moisture-proof coating or material is applied directly to the inside thereof.

In the production of the container body, tubing of the required three diameters may be formed in any desired lengths, as described, and then cut in the sizes appropriate for forming the three components of the assembly, the contacting surfaces of the outer section 7 and the intermediate spacer sleeve 9 and of the latter and the inner sleeve 8, preferably, being united by an adhesive agent, supplementing the frictional engagement of these elements in providing a body-portion having the characteristics of a unitary structure, in resisting separating forces.

The two end-forming assemblies, as herein shown, are generally identical, and it will be understood that the description of the head seal-

ing means, except as otherwise noted, will apply also to the formation of the base of the container.

The head-end seal includes a closure 12, comprising two concentric pressed fiber discs 13 and 14, of different diameters, cemented together to form a stepped edge annular unit having the characteristics of a pressure diaphragm, the smaller disc 14, which is designed to function as the inner end surface of the container having embedded therein a layer or sheet of metal foil, or other material impervious to moisture, in interposed relation to the fiber laminations, as shown at 16.

As will be observed, the disc 14 of the closure is entered in a ring 17 of approximately the same diameter, under pressure, in peripheral engagement therewith, the marginal surface of the larger disc abutting upon the contiguous end of said ring when the closure is in its seated position, the external diameter of the ring corresponding to the diameter of the latter disc. A second tubular section 18, which may be termed a collar, having an internal diameter corresponding substantially to the external diameter of the ring 17 is pressed into circumferential engagement with the latter and the peripheral edge of the closure disc 13. This collar 18 is of greater length than the ring 17 and is urged thereover to an ultimate position in which the lower end of said collar is spaced inwardly of the adjacent end 17a of said ring 17, as at 18a, while its upper terminal portion projects appreciably beyond the plane of the outer surface of the closure 12, as indicated at 18b.

A retaining ring 19 of a relatively thick wall section, is then entered in the projecting flange-like portion 18b of the collar, under pressure, in bearing engagement with the outer surface of the closure 12. The height of the retaining ring corresponds to the length of the flange-forming portion of the collar 18, so that when said ring is superimposed upon the outer surface of the closure disc 13 to urge the under marginal surface thereof into close frictional engagement with the end of the ring 17, the top edges of said collar and said retaining ring will be disposed in the same horizontal plane. Since the cross-sectional area of the retaining ring is appreciably greater than that of the ring 17, upon which the marginal surface of the closure disc 13 abuts, with a proportionate increase in the area of the zone of contact between the retaining ring and the closure, the pressure exerted by the retaining ring upon the closure is effective not only vertically to press the marginal surface of the disc 13 into engagement with the end of the ring 17, as recited, but also along lines at an angle to the vertical, and tends to urge the vertical peripheral surfaces of the two closure discs into closer contact with the surrounding ring and collar surfaces upon which they abut, the diaphragm qualities of the closure supplementing the intensive counter pressure-induced frictional engagement of the opposed surfaces of the several components of the assembly, in producing a jointure of tortuous characteristics, in controlling the escape of gases from the container.

The end-forming assembly just described is applied to the body-portion of the container by entering the dependent portion of the ring 17 within the annular groove 10, the tolerance between the ring 17 and the cooperating surfaces of the body section 7 and inner sleeve 8 being just sufficient to accomplish this under vertically applied pressure in a force-fitting operation, as in the

assembly of the body components and the elements of the end-forming means. When the end of the dependent flange portion 17a of the ring 17 is seated in engagement with the base of the groove 10, the end of the inner sleeve 8 of the container body will be pressed against the opposed marginal surface of the closure disc 14, with the end 18a of the collar 18 abutting upon the opposed end of the outer wall section 7 of said body, it being obvious that the transverse area of the groove 10 corresponds to the thickness of the wall of the ring 17 entered therein, as indicated. Likewise, the cross-sectional dimensions of the walls of the collar 18 and tubular body section 7 correspond to provide an external wall in the completed structure of uniform diameter throughout its length. Manifestly, this facilitates storage and packing of the containers for shipment.

Following the application of the end-forming assembly to the body of the container, as explained, the line of jointure of the mated ends of the body section 7 and the collar 18 may be sealed by an overlying and surrounding strip of adhesive tape, indicated at 20, or other material cemented to the outer surfaces of these components of the container structure.

In addition to telescopically assembling the three tubular elements constituting the body-portion of the container in frictional engagement, under pressure, as described, to provide a virtually unitary wall structure, the engaged portions of the opposed surfaces thereof may be cemented together by any suitable adhesive agent. Likewise, the engaged surfaces of all of the elements constituting the end-forming assembly may be bonded together by an adhesive, to augment the frictional jointure thereof, in providing a strong and permanent assembly, it being manifest that by utilizing an adhesive that possesses moisture resistant or repellant properties in producing both the body and end-forming assemblies, the utility and durability of the container may be enhanced.

In the application of the end-forming assembly which is designed to function as the base of the container, the outer and inner surfaces of the ring 17 are cemented by any suitable adhesive to the surfaces of the two body members 7 and 8 with which the ring is frictionally engaged, the abutting ends of the body section 7 and the collar 18 and of the ring 17 and the spacer ring 9 of the body of the container also having an adhesive applied thereto to supplement their frictional jointures while the end of the inner sleeve 8 may be similarly bonded to the surface of the closure disc 14 with which it is engaged. If desired, a strip of material, as the aforementioned tape 20, may be employed as a further seal for the joint between the ends of the body section 7 and the collar 18, in the manner described, although this is not as essential as in the application of the head-forming assembly to the container in which instance the adhesive between the engaging surfaces of the body and head assembly is omitted, for venting purposes and so that the head assembly may be removed to attain access to the contents of the container, by rupturing the sealing tape 20 along the line of cleavage between the body section 7 and the collar 18, to withdraw the assembly vertically from its seated position.

Of course, for some purposes, the head-forming assembly may be cemented to the body-portion, similarly to the base assembly, as just de-

scribed, with the exception that no adhesive bond would be provided between the end of the inner sleeve 8 of the body and the disc 14 of the closure. Thus, the retaining ring 19, which may be of a split type and cemented to the flange-portion 18b of the collar 18 at spaced circumferential points only, may be readily separated from the collar in a contracting movement to be withdrawn from engagement with the closure 12 in a concurrent or succeeding upward movement, it being understood that to permit of the opening of the container in this manner, the adhesive bond between the horizontal and vertical surfaces of the closure and the ring 17 and collar 18 would also be omitted. Alternatively, the retaining ring 19 and the closure 12, adhesively bonded thereto, may be removed as a unit from within the surrounding collar, the retaining ring in lieu of being cemented to the collar 18 along its circumference being detachably united thereto by rupturable adhesive material connecting the registering top edges of the two elements.

While I have described the end-forming assemblies as they may be produced as units to be applied to the body-portion of the container, if preferred, or found desirable, they may be built-up on the container body, the ring 17 first being entered in the receiving groove 10, after which the closure 12 and the collar 18 and retaining ring 19 may be assembled in cooperating relationship with the container body elements, as previously set forth.

In the modified form of container shown in Figure 3, in lieu of a single intermediate spacer ring between the outer wall section 7 and the inner sleeve 8, I utilize three relatively narrow intermediate rings in axially spaced relation, the body structure, otherwise, conforming to that of the container of Figures 1 and 2.

One of the aforesaid intermediate rings, indicated at 21, is pressed onto the periphery of the inner sleeve 8 to a position midway between the ends thereof, while similar rings 22 and 23 are forced upon said sleeve, in spaced relation to the respective ends thereof, to cooperate with the subsequently positioned body section 7 in surrounding engagement therewith, in the formation of the annular grooves 24, corresponding to the grooves 10, between the opposed surfaces of the body section 7 and the inner sleeve 8, as in the structure of Figures 1 and 2, within which the dependent flange-forming portions of the rings 17 of the respective end-forming assemblies are adapted to be seated, in the manner heretofore described. The seam between the collars 18 of the end assemblies and the body section 7 is sealed by a tape or other strip material adhesively secured to the body section and the rings, as at 25, or otherwise, as pointed out in the description of the container of the preceding figures.

By utilizing three intermediate rings in longitudinally spaced relation, as shown, I am enabled to provide a container body of an insulated type, it being evident that the length of the air spaces 26 and 27 may be increased or decreased by using a narrower or wider central ring 21 or similarly changing the width of all of the rings, as may be desired. Obviously, in lieu of the three rings shown, a greater number, appropriately spaced may be employed in the production of containers of various heights and the number of air spaces likewise increased. In the production of the container, insulating material of any preferred characteristics may be intro-

duced in the chambers provided by the ring spacing, to meet specific packaging requirements.

Suitably spaced from the head-end of the container, on the outer circumference of the body section 7 thereof, I force-fit a narrow rib-forming band 26, which may be gripped to lift the container. This band may be indented at diametrically opposite points on its periphery, as at 26a, for the reception of the ends of an appropriately shaped detachable wire or other handle or bail, it being obvious that a similar rib-forming band may be incorporated in the container structure of Figures 1 and 2, in the smaller sized containers.

From the foregoing, it will be manifest that I have devised an all fiber container which may be economically and rapidly produced and which, at the same time, is particularly responsive to the requirements in packaging many kinds of goods, especially those which are detrimentally affected by exposure to moisture penetration, for which previous types of fiber containers have not proven entirely satisfactory.

Manifestly, the inner and outer surfaces of the container body and of the closures may be variously coated or treated with fluid-proof and erosion-resisting material, as may be found expedient in packaging different commodities and the like, all of such variations from the specific showing of my invention, as herein set forth, coming within the spirit and scope of my invention.

I claim:

1. A container comprising a fiber body formed of inner and outer tubular sections, associated in circumferentially spaced relationship, the ends of said outer section being spaced inwardly of the contiguous ends of the inner section, annular means intermediate said inner and outer sections in engagement with the opposed surfaces thereof, for maintaining said sections in circumferentially spaced relationship, the terminal surfaces of said spacing means being located inwardly of the respective ends of said outer sections, whereby the spaced surfaces of said inner and outer sections beyond said spacing means cooperate to define the side walls of an annular groove at each end of the container body, the base of the groove being formed by the adjacent terminal surface of said spacing means, and an end-forming member for said container, including a closure comprising concentric discs of different diameters united to form a unit having a stepped peripheral edge, an annular ring engaged at one end with the vertical surface of the smaller disc and the marginal surface of the larger disc, a collar embracing a portion of said ring and extending thereabove in engagement with the vertical peripheral surface of the larger disc of said closure and a retaining ring entered in frictional engagement with said collar above said closure and bearing upon the outer surface of said larger disc, said ring being adapted to be entered in said groove, in frictional engagement with the defining surfaces thereof to locate said collar in end abutting engagement with said outer body section, to form a continuation thereof.

2. A container comprising a fiber body formed of inner and outer tubular sections, associated in circumferentially spaced relationship, the ends of said outer section being spaced inwardly of the contiguous ends of the inner section, annular means intermediate said inner and outer sec-

tions in engagement with the opposed surfaces thereof, for maintaining said sections in circumferentially spaced relationship, the terminal surfaces of said spacing means being located inwardly of the respective ends of said outer sections, whereby the spaced surfaces of said inner and outer sections beyond said spacing means cooperate to define the side walls of an annular groove at each end of the container body, the base of the groove being formed by the adjacent terminal surface of said spacing means, and an end-forming member for said container, including an annular closure having a stepped peripheral edge, a ring engaged at one end with the vertical surface of the closure portion of minor diameter and the projecting marginal surface of the closure portion of major diameter, a collar surrounding said ring in spaced relation to the free end thereof, said collar extending above said ring in engagement with the vertical surface of the closure portion of major diameter and a retaining ring embraced by said collar superimposed upon said closure portion of major diameter, the free end of said ring being adapted for entry within said groove in frictional engagement with the defining surfaces thereof to locate said collar in end abutting engagement with said outer body section to form a continuation thereof.

3. A container comprising a body formed of inner and outer sections of spirally wound fiber tubing, associated in circumferentially spaced relationship, said inner section embodying a co-extensive layer of material impervious to moisture, the ends of said outer section being spaced inwardly of the adjacent ends of the inner section, annular means interposed between said inner and outer sections in engagement therewith for maintaining said sections in circumferentially spaced relationship, the respective ends of said interposed spacing means being located inwardly of the contiguous ends of said outer section, whereby the spaced surfaces of said inner and outer sections beyond the ends of said interposed means cooperate to define the side walls of an annular groove at each end of the container body, the base of each groove being formed by the adjacent end of the interposed spacing means, and an end-forming member for said container, including an annular closure having a stepped peripheral edge, a ring engaged at one end with the vertical surface of the closure portion of minor diameter and the projecting marginal surface of the closure portion of major diameter, a collar surrounding said ring in spaced relation to the free end thereof, said collar extending above said ring in engagement with the vertical surface of the closure portion of major diameter and a retaining ring embraced by said collar superimposed upon said closure portion of major diameter, the free end of said ring being adapted for entry within said groove in frictional engagement with the defining surfaces thereof to locate said collar in end abutting engagement with said outer body section to form a continuation thereof.

4. A container comprising a body formed of inner and outer sections of spirally wound fiber tubing, associated in circumferentially spaced relationship, said inner section embodying a co-extensive layer of material impervious to moisture, the ends of said outer section being spaced inwardly of the adjacent ends of the inner section, annular means interposed between said inner and outer sections in engagement therewith for maintaining said sections in circumferentially spaced relationship, the respective ends of said

interposed spacing means being located inwardly of the contiguous ends of said outer section, whereby the spaced surfaces of said inner and outer sections beyond the ends of said interposed means cooperate to define the side walls of an annular groove at each end of the container body, the base of each groove being formed by the adjacent end of the interposed spacing means, and an end-forming member for said container, including an annular closure having a stepped peripheral edge, a ring engaged at one end with the vertical surface of the closure portion of minor diameter and the projecting marginal surface of the closure portion of major diameter, a collar surrounding said ring in spaced relation to the free end thereof, said collar extending above said ring in engagement with the vertical surface of the closure portion of major diameter and a retaining ring embraced by said collar superimposed upon said closure portion of major diameter, the free end of said ring being adapted for entry within said groove in frictional engagement with the defining surfaces thereof to locate said collar in end abutting engagement with said outer body section to form a continuation thereof, the end of said inner body section abutting upon the opposed marginal surface of the portion of said closure of minor diameter.

5. A container comprising a body formed of inner and outer sections of spirally wound fiber tubing, associated in circumferentially spaced relationship, said inner section embodying a co-extensive layer of material impervious to moisture, the ends of said outer section being spaced inwardly of the adjacent ends of the inner section, annular means interposed between said inner and outer sections in engagement therewith for maintaining said sections in circumferentially spaced relationship, the respective ends of said interposed spacing means being located inwardly of the contiguous ends of said outer section, whereby the spaced surfaces of said inner and outer sections beyond the ends of said interposed means cooperate to define the side walls of an annular groove at each end of the container body, the base of each groove being formed by the adjacent end of the interposed spacing means, and an end-forming member for said container, including an annular closure having a stepped peripheral edge, a ring engaged at one end with the vertical surface of the closure portion of

minor diameter and the projecting marginal surface of the closure portion of minor diameter and the projecting marginal surface of the closure portion of major diameter, a collar surrounding said ring in spaced relation to the free end thereof, said collar extending above said ring in engagement with the vertical surface of the closure portion of major diameter and a retaining ring embraced by said collar superimposed upon said closure portion of major diameter, the free end of said ring being adapted for entry within said groove in frictional engagement with the defining surfaces thereof to locate said collar in end abutting engagement with said outer body section to form a continuation thereof, the end of said inner body section abutting upon the opposed marginal surface of the portion of said closure of minor diameter; all of said annular elements of the container body entered in the outer section thereof and to each other, solely in response to the frictional pressure between the opposed surfaces of such elements and said outer section, the annular elements of said end-forming member being entered within said collar in frictional engagement therewith, said ring and said retaining ring being frictionally engaged with said closure within the area of and independently of said collar.

6. An all fiber container comprising a body portion composed of two tubular sections of different diameters concentrically disposed in circumferentially spaced relationship, the ends of the outer section being spaced inwardly of the contiguous ends of the inner section, a plurality of rings interposed between said two tubular sections in engagement with the opposed surfaces thereof, for maintaining said sections in circumferentially spaced relationship, said rings being relatively longitudinally spaced to cooperate with the opposed surfaces of said sections to form a plurality of air chambers within the wall of the container body, certain of said rings being located in juxtaposition to the ends of the wall, and a closure for said container having portions for respectively abutting the outer and inner sections and an annular flange adapted to be entered between said two sections to locate said portions of said closure interior and anterior of said flange in engagement with the ends of the circumferentially spaced wall sections, to form a seal between said closure and the container body.

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