May 30, 1944. H. E. BRALOFF 2,350,214

CONTAINER

Filed Dec. 29, 1942

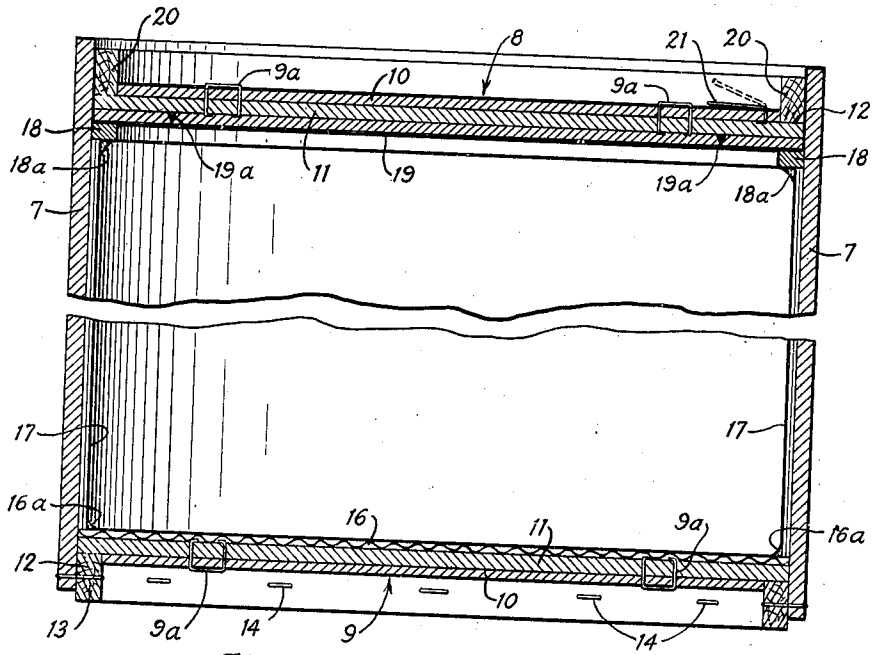


Fig. 1

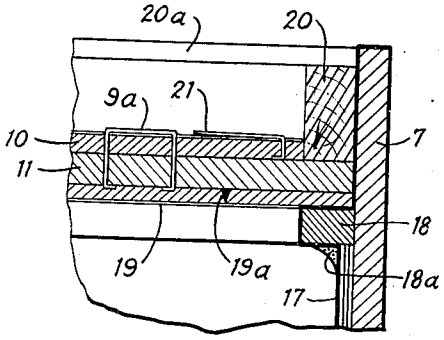


Fig. 2

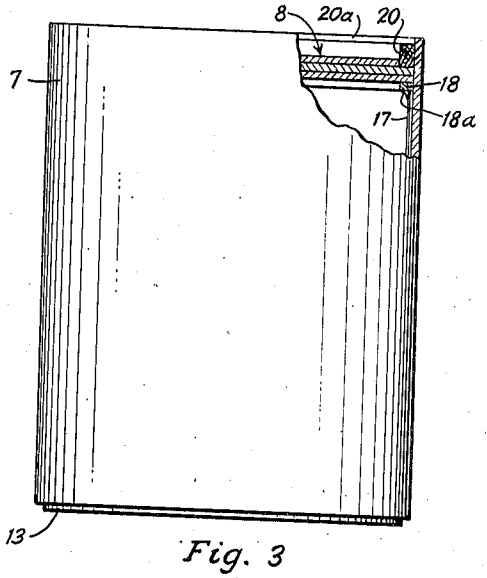


Fig. 3

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CONTAINER

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7 Claims. (Cl. 229—14)

This invention relates generally to containers and is more particularly directed to the manufacture of containers of fibrous material, of the type disclosed in my co-pending application, Serial No. 456,446, filed August 26, 1942, of which this application is a continuation in part.

As is well known, prior to the invention of my aforesaid application, the use of fibrous containers was largely limited to the distribution of those products that are not subject to more or less rapid deterioration if exposed to fluid penetration, because of the fact that it was not possible to manufacture a fiber container that would not only afford adequate protection to the contents, but would be of the requisite rugged and relatively light weight construction demanded by commercial requirements. Obviously, in the marketing of products in so-called bulk quantities, the gross weight of the package and its capacity to withstand rough handling in shipment and storage are important factors.

The primary object of this invention, therefore, is to further improve the capacity of a container of the type described in my co-pending application to resist fluid penetration and at the same time render its manufacture more economical, while retaining the advantages which are inherent to its rugged and light weight construction, so as to increase the field of utility of my invention.

More specifically, it is an important object of this invention to provide a relatively light and rugged fibrous container which will efficiently respond to commercial and other requirements for a container that is leak-proof and impervious to fluid penetration, so as to afford complete protection to the container contents; my improved construction possessing characteristics which facilitate storage and handling and materially increase the advantages of containers of the general type.

Another important object of this invention is to provide a container of fibrous material, as aforesaid, which, in addition to features of construction that afford a seal of positive hermetic characteristics, also provides for the virtual insulation of the contents within the container, thereby safeguarding them against possible detrimental effects which might follow from the exposure of the container to sudden fluctuations in temperature, in transportation or otherwise.

It is also an important object of my invention to provide an all-fiber container comprising an outer casing rendered impervious to moisture penetration and an inner lining resistant to fluid penetration, with end-forming members so assembled in the completion of the container that the entire structure is reinforced against bending forces, the end-forming elements being interlocked with the outer casing and with the inner lining in a fluid-proof jointure which is highly resistant to separation under constant and shifting loads.

My invention further contemplates an all-fiber container possessing the characteristics and advantages hereinbefore set forth. which may be conveniently hermetically sealed by the packer of the contained product, for the subsequent removal of the contents in bulk, or smaller quantities as may be desired. For this purpose, I have provided a removable and replaceable head-end-forming assembly, which, in the original packaging of the contents, overlies an inner closure having an area which is rupturable to afford access to the contents when the head assembly has been removed from the container.

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

In the accompanying drawing, I have shown a preferred form of container embodying my present improvements which may be readily and economically produced to attain the objectives to which my invention is directed.

In the drawing:

Figure 1 is a vertical cross-sectional view of a fibrous container conforming to my invention;

Figure 2 is an enlarged fragmentary sectional view of the head-end assembly of the structure of Figure 1; and

Figure 3 is a view in elevation, partly in section, of the structure shown in Figure 1.

Referring now to the drawing in detail, in which like characters of reference are employed to designate similar parts in the several views, 7 indicates the shell or body of the container which is tubular in shape and produced from pressed chipboard or other suitable material in the appropriate length. Preferably, in the production of the shell, the chipboard is spirally wound, the convolutions forming each of the constituent laminations mating in butt joints and being bonded by a suitable adhesive agent to the convolutions upon which they are superimposed, to build up a wall section of the requisite thickness.

Suitable external end-forming members 8 and 9, each of the so-called pressure diaphragm type, are frictionally insertable within the respective ends of the shell 7 in the completion of the outer casing, as will be described. Since both of these

end-forming members are identical structurally and in their mode of functioning, the description of one thereof will suffice for the purposes of this disclosure.

As will be noted, the end-forming member 8, for example, which is a part of the head assembly of the container, consists of two annular fiber discs of different diameters assembled in concentrically superimposed relation and mechanically connected, as by the staples 9a, or, if preferred, the discs may be cemented together throughout the area of their opposed surfaces. The disc 10 of minor diameter, as herein shown, is of a lesser thickness than the disc 11 of major diameter and is preferably built up of a series of laminations of impregnated paper or fiber-board, although the two discs, in some instances, may be of the same thickness and of similar or different composition, depending upon the specific use to which the container is to be applied. When the two discs are concentrically united, as explained, the disc 11, which is of the diameter of the interior of the shell 7, is adapted to be entered in the shell under axially applied pressure, in a so-called force-fitting operation, with the disc 10 of minor diameter in outermost position, the stepped marginal portion 12 of the end-forming member forming a seat for a cooperating retaining ring, as will be described.

In the production of the container, the end-forming member 9, which corresponds generally to the end-forming member 8, as just described, may be entered in one end of the shell 7, in a force-fitting operation, to function as the bottom of the outer casing, a retaining ring 13 of the requisite diameter being pressed into the end of the shell and onto the seat provided by the marginal portion 12 of said member, the wall section of the ring being such as to provide for a tight fit of the ring in engagement with the opposed surfaces of the shell and disc 10, the ring when seated being interlocked with the surrounding shell wall by staples, as indicated at 14. If desired, or found necessary, an adhesive agent may be applied to the abutting surfaces of the shell and disc 11 and to the surfaces of the ring which contact with the shell wall and the peripheral edge of the disc 10 and the marginal seat 12, it being apparent that the height of the retaining ring 13 provides for its projection beyond the adjacent end of the shell to form the base of the container when the assembly is completed, as just described, and take the vertical load as directly transmitted from the filled receptacle to such base-forming end assembly.

Following the application of the base assembly to the shell 7, a disc 16 of the diameter of the interior of the shell, composed of corrugated fibrous material, preferably asphalt impregnated, is disposed upon the inner surface of the end-forming member 9 and a liner 17 of similar material is then introduced into the shell in a pressure fit, with its lower edge abutting upon the aforesaid corrugated disc 16. This inner liner 17 may be variously produced to conform to the inner wall of the shell 7. For instance, a sheet of material of the appropriate length may have its opposed edges mated and cemented in a butt jointure to present a continuous surface when installed within the shell, with its upper edge spaced inwardly of the head end of the shell 7, to provide for the assembly of the head-forming closure within the shell, as will be explained.

An annulus 18 of heavy fiber having an outer circumference corresponding to the inner circumference of the shell 7, is next pressed into the open end of the shell in abutting engagement with the upper edge of the liner 17 to function as a ledge or shoulder to locate and positively support the closure-forming elements of the head assembly, it being understood, that, if desired, the opposed surfaces of the annulus and shell may be adhesively united. When the annulus has been installed, a suitable compound which will quickly set and form a non-soluble material proofed for oleoresinous and aqueous products is introduced to the interior of the head-end of the container in the zone in which the ledge or annulus 18 is joined to the liner 17 and the container immediately inverted to cause the introduced compound to flow or expand upon the adjacent inner surfaces of the ledge and shell and form an overlying fillet indicated at 18a, as it sets or hardens, which hermetically seals the jointure of the ledge with the liner 17. The liner 17 and the corrugated inner disc 16 are then coated or treated with a suitable material, preferably the compound above specified or any other material which is flexible when set and serves to render them impervious to fluid penetration, the material building up at the jointure of the liner with the disc 16 defining fillet 16a to provide an hermetic seal therebetween, it being manifest that by this treatment, the disc 16 and the ledge 18 virtually become integral with the liner 17.

The head-forming assembly includes an annular disc 19 of a diameter corresponding to the internal diameter of the shell 17 in which it is adapted to be entered under pressure to abut upon the opposed surface of ledge-forming annulus 18, the latter defining the seat for the head-forming assembly. This disc 19, which functions as the inner head seal, may be composed of laminations of paper or light fiber board treated to possess non-permeable characteristics, or the inner surface may be coated similarly to the liner 17. Preferably, the said disc is scored or weakened, along a line circumscribed inwardly of its outer edge, as indicated at 19a, to facilitate the rupturing or breaking of the seal provided by such disc in the separation and removal of the portion thereof within the area of the scoring 19a, for obtaining access to the contents of the container.

To complete the head-forming assembly, the end-forming member 8, previously described, is pressed into the end of the shell with its disc 11 foremost, to bear upon the opposed surface of the closure or sealing disc 19 and a retaining ring 20 which may be of wood, pressed chipboard or other suitable material, having an external diameter corresponding to the internal diameter of the end of the shell, is then forced into seated position in abutting engagement with the several opposed surfaces of the end-forming member 8 and the wall of the shell, similarly to the ring 13, as explained. As will be observed, the height of the retaining ring 20 of the head-forming assembly is such that when it is entered in functioning position within the shell, its upper surface will be disposed below the adjacent end of the shell, as indicated at 20a, and cooperate therewith in providing a flange-like formation for the reception of the base ring 13 of another container superimposed thereon in nesting a series of containers for storage or shipment.

For opening the container, the end-forming member 8 may be displaced in an upward movement, to likewise displace the retaining ring 20 from its functioning position, by means of the

pull-tab 21 which is firmly united to said member between the superimposed discs 10 and 11, as clearly shown in Figure 1, the free end of the tab normally being disposed upon the upper surface of the disc 10 of the head assembly. When the ring 20 and head-forming member 8 have been removed, the inner section of the sealing disc 19 may be readily cut away, in the manner heretofore described, so that the contents may be poured or ladled from the container. Where only a portion of the contents is to be extracted, it will be evident that the container may be resealed to afford an adequate degree of protection to the contained material, by replacing the end-forming member 8 in closure-forming position and pressing it into abutting engagement with the opposed surface of the remaining section of the sealing disc 19 by seating the retaining ring 20, the frictional engagement of the opposed surfaces of the end-forming member with the ring and shell and of the ring with the shell providing an effective seal.

By providing an inner liner of corrugated material and forming the sealing disc 19 of the same material, similarly to the disc 16 of the base assembly, it will be manifest that I may provide a container in which the contents are contained in a chamber insulated from the outer rigid protective casing of the structure and are thereby protected against possible detrimental effects of fluctuating temperatures in the shipment and storage of various materials.

For certain uses, the outer shell or casing may be treated to render it water-resistant and the liner 17 may include or be faced with a nonporous or other material, in addition to or in lieu of the previously described coating to further enhance the protective characteristics thereof or to meet specific requirements in packaging dry and liquid products.

While I have described my invention more or less specifically in connection with the embodiment shown, it will be understood that changes in structural details may be effected to meet manufacturing or other requirements; also that the sequence of the steps of assembly may be varied for convenience in performing production and packaging operations, within the spirit and scope of this disclosure.

I claim:

1. A container comprising a rigid outer casing, including a tubular shell, a base-forming member frictionally entered in one end thereof, an inner liner of corrugated material in frictional conforming engagement with the inner wall of said shell having its ends disposed in inwardly spaced relation to the adjacent ends of said shell, an annular ledge abutting upon the end of said liner remote from said base-forming member in frictional engagement therewith, means coacting with portions of said liner and said ledge to reinforce the frictional jointure of said liner and said ledge and hermetically seal such jointure, a closure insertable within said shell in frictional engagement therewith and abutting upon said ledge, and a head-forming member disposable upon said closure in frictional engagement with said shell, said head-forming member functioning to maintain said closure in positive engagement with said ledge and cooperating therewith in forming an hermetically sealed head for said container.

2. A container comprising a rigid outer casing, including a tubular shell, a base-forming member frictionally entered in one end of said shell, an inner liner of corrugated material in frictional conforming engagement with the inner wall of said shell, the ends of said liner being disposed inwardly of the adjacent ends of said shell, an inner base element superimposed upon said base-forming member and united to said liner in an hermetic jointure therewith, an annular ledge in frictional engagement with the inner wall of said shell adjacent the opposite end thereof and abutting upon the juxtaposed end of said liner in frictional jointure therewith, means coacting with portions of said liner and said ledge to reinforce the frictional jointure of said liner and said ledge inwardly of said ledge and hermetically seal such jointure, a closure insertable within said shell in frictional engagement therewith and abutting upon said ledge throughout the area of the opposed surfaces of said closure and said ledge and a head-forming member insertable in said shell in frictional engagement with the inner wall thereof in superimposed relation to said closure to maintain said closure in positive engagement with said ledge and cooperate therewith in the formation of an hermetic seal for said container.

3. A container comprising a rigid outer casing, including a tubular shell, a base forming member frictionally entered in one end of said shell, an inner liner of corrugated material in frictional conforming engagement with the inner wall of said shell, the ends of said liner being disposed inwardly of the adjacent ends of said shell, an inner base element superimposed upon said base-forming member and united to said liner in an hermetic jointure therewith, an annular ledge in frictional engagement with the inner wall of said shell adjacent the opposite end thereof and abutting upon the juxtaposed end of said liner in frictional jointure therewith, means coacting with portions of said liner and said ledge to reinforce the frictional jointure of said liner and said ledge inwardly of said ledge and hermetically seal such jointure, a closure insertable within said shell in frictional engagement therewith and abutting upon said ledge throughout the area of the opposed surfaces of said closure and said ledge, a head-forming member insertable within said shell in frictional engagement with the inner surface thereof and in abutting engagement with the opposed surface of said closure throughout its area and means adapted to be entered in said shell in superimposed relation to said head-forming member in frictional engagement with said shell and with said member to maintain said closure in positive engagement with said ledge and form an hermetic seal for said container.

4. A container comprising a rigid outer casing, including a tubular shell, a base-forming member frictionally entered in one end of said shell, an inner liner of corrugated material in frictional conforming engagement with the inner wall of said shell, the ends of said liner being disposed inwardly of the adjacent ends of said shell, an inner base element superimposed upon said base-forming member and united to said liner in an hermetic jointure therewith, an annular ledge in frictional engagement with the inner wall of said shell adjacent the opposite end thereof and abutting upon the juxtaposed end of said liner in frictional jointure therewith, means coacting with portions of said liner and said ledge to reinforce the frictional jointure of said liner and said ledge inwardly of said ledge and hermetically seal such jointure, and a head-forming assembly cooperating with said ledge in the formation of an hermetic seal for said container, said head-forming assembly including a closure insertable within said

shell in frictional engagement therewith and abutting upon said ledge throughout the area of the opposed surfaces of said closure and said ledge, an outer head-forming member insertable within said shell in frictional engagement with the inner wall thereof and in abutting engagement with the opposed surface of said closure throughout its area and means adapted to be entered in said shell in superimposed relation to said outer head-forming member in frictional engagement with said shell and with said member to maintain said closure in positive engagement with said ledge, the lines of jointure of the components of said head-forming assembly relative to one another and relative to said shell and said ledge, contributing to the formation of an hermetic seal for the head end of said container.

5. A container comprising a rigid outer casing, including a tubular shell, a base-forming member frictionally entered in one end thereof, an inner liner of corrugated material in frictional conforming engagement with the inner wall of said shell having its ends disposed in inwardly spaced relation to the adjacent ends of said shell, an annular ledge abutting upon the end of said liner remote from said base-forming member in frictional engagement therewith, means coacting with portions of said liner and said ledge to reinforce the frictional jointure of said liner and said ledge and hermetically seal such jointure, a closure insertable within said shell in frictional engagement therewith and abutting upon said ledge, and a head-forming member disposable upon said closure in frictional engagement with said shell, said head-forming member functioning to maintain said closure in positive engagement with said ledge and cooperating therewith in forming an hermetically sealed head for said container, said closure embodying a weakened portion for effecting the bodily separation of a part therefrom, to attain access to the contents of the container, subsequent to the displacement of said head-forming member from functioning position relative to said closure.

6. A container comprising a rigid outer casing, including a tubular shell and end-forming members, each of said end-forming members comprising a pair of discs of different diameters concentrically united to form a member of pressure diaphragm characteristics, said members being adapted to be entered in opposite ends of the shell with their discs of major diameter in frictional engagement with the inner wall thereof and the discs of minor diameter disposed in the direction of the adjacent ends of the shell, an inner liner of corrugated material in frictional conforming engagement with the inner wall of said shell having its ends disposed in inwardly spaced relation to the adjacent ends of the shell, an inner base-forming element hermetically joined to said liner, one of said end-forming members being entered in said shell in juxtaposition to said inner base-forming element to form the bottom of said container, a ledge disposed internally of said shell adjacent the opposite end thereof in frictional engagement with said shell and with the juxtaposed edge of said liner, means coacting with said liner and with said ledge inwardly of said ledge to reinforce and hermetically seal the jointure of said ledge with said liner, an inner closure locatable upon said ledge in frictional engagement with the surrounding wall of said shell, the other of said end-forming members being insertable in said shell with its disc of major diameter in superimposed frictional engagement with the outer surface of said closure and in peripheral frictional engagement with said shell to maintain said closure in positive engagement with said ledge, and means frictionally insertable in each end of said shell formed to coact with the opposed surfaces of the respective end-forming members and with said shell to interlock said end-forming members in frictional engagement with said shell and seal the ends of the container against fluid penetration.

7. A container comprising a rigid outer casing, including a tubular shell, a base-forming member frictionally entered in one end thereof, an inner liner of corrugated material in frictional conforming engagement with the inner wall of said shell having its ends disposed in inwardly spaced relation to the adjacent ends of said shell, an annular ledge abutting upon the end of said liner remote from said base-forming member in frictional engagement therewith, means coacting with portions of said liner and said ledge to reinforce the frictional jointure of said liner and said ledge and hermetically seal such jointure, a closure insertable within said shell in frictional engagement therewith and abutting upon said ledge, and a head-forming member disposable upon said closure in frictional engagement with said shell, said head-forming member functioning to maintain said closure in positive engagement with said ledge and cooperating therewith in forming an hermetically sealed head for said container, said outer casing and said liner and cooperating closure being rendered impervious to fluid penetration to protect the contents of the container as confined within the area of said liner and the closure abutting upon said ledge hermetically sealed to said liner.

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