Feb. 6, 1962 F. MÜHLHOFF 3,019,956

CONTAINERS AND CLOSURE OR LIKE PARTS THEREOF

Filed Nov. 22, 1957 2 Sheets-Sheet 1

FIG. 1

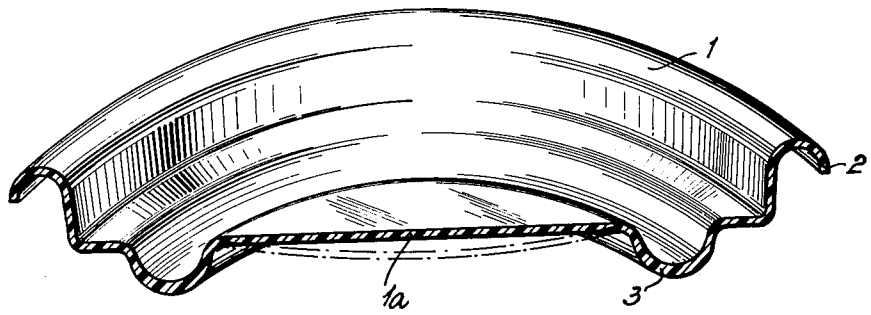


FIG. 2

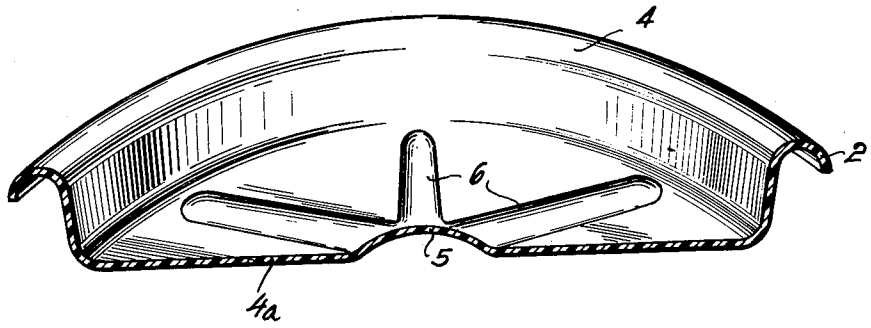


FIG. 3

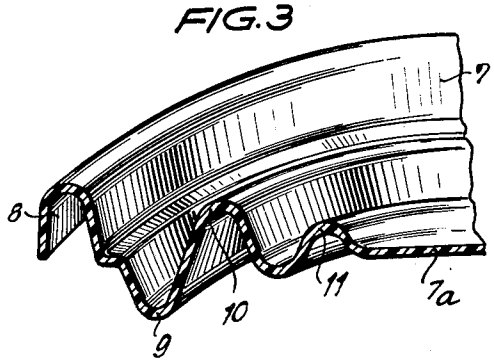
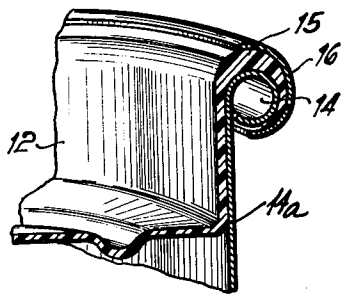


FIG. 4



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FIG. 5

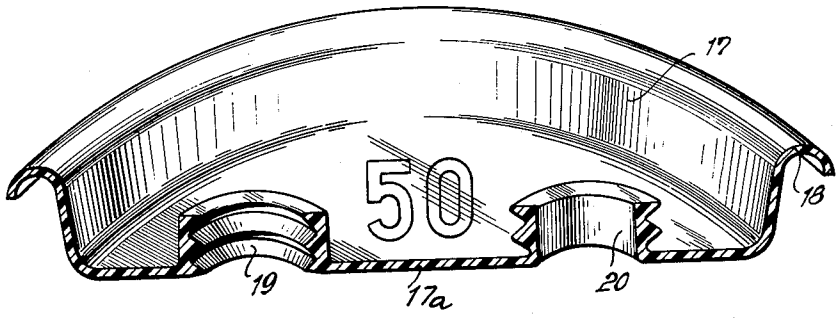


FIG. 7

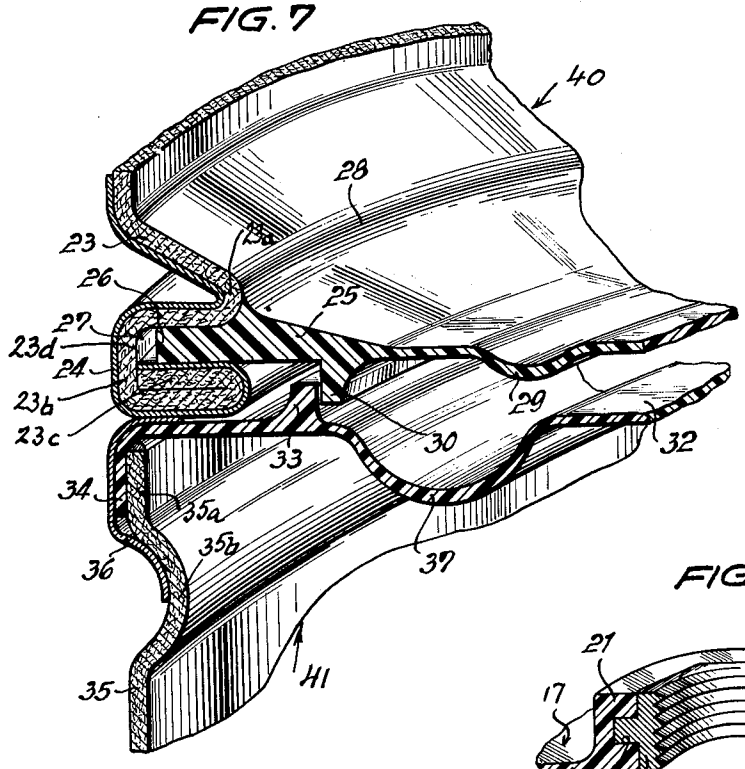
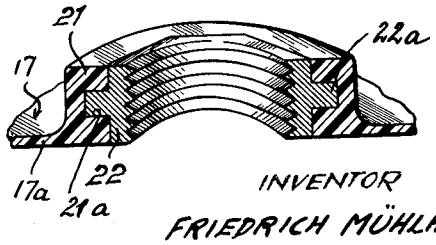


FIG. 6



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CONTAINERS AND CLOSURE OR LIKE PARTS THEREOF

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2 Claims. (Cl. 229—5.7)

The present invention relates, in general, to improvements in the construction of containers or receptacles and, in particular, to end closure members or like parts therefor.

In prior art containers having body members formed of fibrous sheet material, such as paperboard, cardboard or other inexpensive sheet material, the cover and bottom members are usually made of steel or sheet-metal, especially when they must be specifically shaped to provide for reinforcement of containers required for certain uses.

Since non-metallic containers are frequently used for materials having a delicate or sensitive flavor, or a strong taste, the metallic end members must be provided with suitable corrosion resistant or chemically inert coatings. These circumstances lead to quite expensive container structures since the additional cost of the coating must be added to the high cost of the metallic end or closure members. Where a non-metallic container is provided, the liners or coats provided for the metallic end members must also be provided for paperboard or fibrous end members, which results in another considerable increase in the cost of production. Furthermore, the production of fiber or paperboard end members with suitable rim shapes requires certain production techniques which are also relatively expensive. It is also quite difficult to attach simple flat end members of paperboard or fibre sheet material to the body member of the container and, consequently little use is therefore made of such end members.

Furthermore in both sheet metal end members and in paperboard or fiber end members, especially where provided with an inner lining, the provision of filling or dispensing spouts is expensive and presents great difficulties, and in the case of the last mentioned materials, the mounting of the required spouts thereon may not be possible or practical.

It is a primary object of the present invention to provide means obviating the difficulties encountered in the manufacture of end members, whether made of sheet metal or fibrous sheet material, as the latter must be provided with inner liners or coats.

It is another object of the present invention to provide means conducive to effective and highly economical structures of end members which may be used without liners or coatings proper.

Another object of the present invention is to provide means affording the employment of end members formed of a material which requires no liners or coats and which can be readily formed into various desired shapes by simple and inexpensive process steps.

Another object of the present invention is to provide means ensuring sturdy and simplified structures of end members construction in which the filling or dispensing spouts may be formed directly therein or therewith.

Another object of the present invention is to provide relatively inexpensive end members which are resistant to corrosion and are chemically inert.

A further object of the invention is to provide means contributing to highly desirable end members which can be formed of relatively inexpensive base material.

Still a further object of the invention is to provide means facilitating the treatment of a container and/or its cover

and bottom made of cardboard, paperboard or like fibrous material for the dual purpose of obtaining strong and sturdy receptacle parts which will not only withstand strains, stresses and impact, but which distinguish also from other containers in that its resistance to corrosion is simultaneously greatly enhanced.

It is also another object of the present invention to provide means ensuring the creation of a container with a corrosion-resistant coating with which the container is imbued, treated or otherwise processed for packing and storing edible goods of highly sensitive flavor, or other types of liquids and materials, which may be easily spoiled which are subject to corrosion.

It is a further object of the present invention to provide means affording a substantially inert lining for application to a container which contributes to a reduction in the cost of manufacturing the container with filling and/or pouring fittings without involving corrosion thereof.

Still a further object of the present invention is to provide means redounding to relatively simple shaping measures for forming packing and shipping containers with a minimum number of operational steps.

Another object of the present invention is to provide means permitting efficacious and inexpensive utilization of additives or like substances while forming the container from cardboard or like fibrous or cellulosic materials whereby to the latter a high degree of elasticity or rigidity may be imparted.

Other and further objects and advantages of the present invention will becomes apparent from a reading of the following description taken in connection with the annexed drawings which are illustrative of the presently preferred embodiments of the invention.

In the drawings:

FIG. 1 is a cross-section through an end member pursuant to the present invention;

FIG. 2 is a view similar to FIG. 1 and illustrates another embodiment of the invention;

FIG. 3 is a fragmentary cross-section taken through an end member pursuant to another embodiment of the invention;

FIG. 4 is a view similar to FIG. 3 and illustrates still another embodiment of the invention;

FIG. 5 is a view similar to FIG. 1 and illustrates an additional embodiment;

FIG. 6 is a fragmentary sectional view which illustrates a modification in the embodiment of FIG. 5, and

FIG. 7 is a fragmentary sectional view through a pair of superposed containers constructed according to the present invention.

Referring now to FIG. 1 of the drawings in detail, there is shown an end member 1, pursuant to the present invention for a packing container or receptacle (not illustrated). The end member 1 may be utilized as the upper closure member or cover, as well as the lower closure member or bottom, for a hollow body member forming a container. Such a body member is built up from relatively inexpensive material, such as, for example, and not by way of limitation, paperboard, fiberboard or other similar fibrous sheet material.

Where the containers are used for holding materials or products which have a delicate or sensitive flavor, or a rather strong taste, or where the materials are chemically active and may cause corrosion of the container, the body is provided with a special lining of chemically inert material to protect such flavor or taste or to prevent corrosion, as the case may be. Pursuant to the present invention, the opposite end members for such a container also protect such delicate flavors of the contents and are resistive to corrosion.

The end member 1 is formed of a suitable inert mate-

rial, such as a plastic composition stabilized with a suitable filler, so that the necessity for a special lining on the inner surface thereof is obviated. The end member may, for example, and not by way of limitation, be formed of polyester resin reinforced with a glass fiber or with another known synthetic fiber. Since such materials are resistant to corrosion and chemically insensitive to the flavors of the contents of the container, no special lining is required.

Where the covers or bottoms can be of a relatively simple shape, or where pouring or filling spouts are not required, a cheaper base-material may be used, which material is saturated or coated with a suitable plastic. For example, porous paperboard may be immersed in and saturated with a suitable plastic before it is shaped into the desired form. During the subsequent pressing or molding operation, the paperboard, treated in such manner, will produce a rigid or flexible workpiece, depending upon the type of plastic with which it was treated. Pursuant to another method of forming the end members, thin unfinished sheets of paper are backed on both surfaces with a plastic film, which may be of the hot or cold setting type. For example, the paper sheets may be coated by a calender process. Several sheets, the number corresponding to the desired thickness of the end member, may then be pressed together. The coatings on the opposite surfaces of the individual sheets of paper cause a complete saturation thereof with the plastic by penetration of the plastic into the individual sheets, so as to substantially promote the workability of the resultant laminated member. Said member may be formed into various different shapes or conformations, as may be required for use thereof as end members for containers.

The end member **1**, formed as described from a stabilized plastic, is provided with a raised circumferential arcuate flange **2** which is shaped to overlap the upper or lower end rim (not illustrated), as the case may be, of the container body which is formed of paperboard, fiberboard or other similar inexpensive non-metallic sheet material.

A packing ring (not shown) may be interposed between the flange **2** and the adjacent body rim. A clamping ring (not illustrated) is utilized to clamp the flange **2** against the adjacent body rim. The flat central portion **1***a*, inwardly of and below the raised flange **2**, is provided with an annular integral bead or indentation **3**, which serves as a reinforcement for the end member **1**. The bead **3** is preferably thicker than the balance of the member, as illustrated, so as to stabilize or rigidify the central bottom portion **1***a*. The central bottom portion may be planar, or shown in full line, or convex, or shown in broken line, or it may be concave, to increase the rigidity or reinforcement thereof.

Referring now to FIG. 2 in detail, there is shown an end member **4** pursuant to the present invention, which may be formed of the material and by the previously described processes, the member **4** is also provided with a raised arcuate circumferential depending flange or sheet **2**. However, in the present embodiment, the lower flat bottom **4***a* inwardly of the raised skirt, is reinforced at its center with a concave portion **5**, and by the convex beads **6** which extend or radiate in the form of a star from said concave portion.

Referring now to FIG. 3 in detail, there is shown another embodiment of an end closure member **7** for a container or the like. Pursuant to the present embodiment, it is possible to meet the requirements for a specialized reinforcement construction of the bottom of the closure member as well as to provide the requirements for a closure device.

In addition to the raised depending arcuate circumferential flange or skirt **8**, which serves the same functions as the skirts **2** in FIGS. 1 and 2, there are provided the three concentric beads **9**, **10** and **11**, inwardly of the skirt **7**, in the bottom **7***a* of the end member. Said beads are integral with and formed out of the material of the end member, as in the prior embodiments. The outermost bead **9** is directed inwardly of the end member, and the intermediate bead **10** and innermost bead **11** are each directed outwardly of the end member. The beads **9** and **10** each have a depth which is greater than the innermost bead **11**. Furthermore, each bead is thicker than the flat central portion of the bottom **7***a* within the inner bead **11** to further strengthen the end member.

Referring now to FIG. 4 in detail, there is shown another embodiment of the present invention. As here shown the end member or cover **12** is mounted in position on one end of a container body **14***a* which is provided with the circular rim **14**, said body being formed of the relatively inexpensive sheet material, as previously described.

The end member **12** is formed of a stabilized plastic and is provided with a circumferential raised flange **15** in the form of a hollow circular bead which encompasses the circular rim **14**. A clamping ring **16** overlies the bead flange **15** and clamps it against the rim **14** enclosed thereby. The flange **15** is thicker than the balance of the end member **12** and since it encloses the rim **14** is self-tightened and tensioned thereon and eliminates the need for a special packing ring between the flange and the rim **14**.

Referring now to FIG. 5 in detail, there is shown another end member or cover **17** formed of a suitable plastic, and provided with an outer raised circumferential flange or skirt **18**, similar to the previously described skirt **2**. The lower flat bottom portion **17***a* is provided with the filling or dispensing spouts **19** and **20** which extend to a level lower than that of the raised skirt **18**. The spouts are integral with the cover **17**. The raised spout **19** is threaded internally thereof and the raised spout **20** is threaded externally thereof, said threads being of any desired formation. In addition, the bottom portion **17***a*, as here shown, is provided with an indicia, in the form of the numeral **50**, which is inscribed or formed directly into the material of which the cover **17** is fabricated, during the molding or pressing of the cover.

Referring now to FIG. 6, there is shown a modified form of filling or dispensing spout. As here shown, a raised spout **21** is formed in the material of the cover **17** at the bottom **17***a* thereof. The spout **21** is provided with an internal recess **21***a*. A metal plug **22** having a projecting peripheral flange **22***a* is inserted into the spout **21** with the flange **22***a* engaged in the recess **21***a*. The plug or insert is internally threaded, as shown, and has a preferably polygonal external surface. The plug is inserted into the spout **21** during the molding of the cover **17**. While the spouts or sockets shown in FIGS. 5 and 6 are each adapted to receive a threaded closure device, that is an externally threaded plug in the case of the spouts **19** and **21**, and an internally threaded cap in the case of the spout **20**, it will be understood that other forms of spouts may be utilized to receive complementary closure devices. In cases which require particularly complicated fittings at the filling or dispensing openings, the apertures and the complementary closures may also be connected to each other by a simple bonding of similar pieces of material.

Referring now to FIG. 7 in detail, there are shown a pair of superposed stacked containers **40** and **41**. The upper container **40** has a body member **23** formed of fiber or similar inexpensive material. The body member **23** is provided with a peripheral indentation **23***a* above a bottom rim **23***b* which terminates in the folded over edge **23***c*, and which defines a recess **23***d* between the indentation **23***a* and the edge **23***c*. A metal ring **24** which extends into the recess **23***d* and the area defined by the indentation **23***a* reinforces the lower end of the body member **23**.

The plastic end member **25** forms the bottom closure for the upper container or receptacle **40**. The bottom member **25** has a thickened outer rim or edge **26** which is inserted into the recess **23***d* and a packing ring **27** is disposed on the periphery of the rim **26** and fills the re-

maining space within the recess 23*d*. The rim or flange 26 is adhesively secured to the adjacent portions of the body number 23.

The flange 26 is provided also with a transition packing edge 28 which abuts the inner surface of the indentation 23*a* so as to provide a transition smooth surface between the body member 23 and the bottom member 25. In addition, the edge 28 may be secured to the body member 23, as by cementing and preferably by being heat bonded thereto. The bottom closure member 25 is also provided, inwardly of the flange 26, with a concave thickened reinforcement bead 29. In addition, the bottom closure member is provided with a continuous depending projection or flange 30 between the bead 29 and the lateral flange 26, the function of which will be presently described. It will be noted that the flange 30 is inwardly of the reinforcing ring 24 on the body member 23 and terminates upwardly of the bottom of said ring so as not to project therebeyond. The depending projection 30 may be provided with perforations, if desired.

The lower container or receptacle 41 is provided with a body member 35 formed of fiber sheet material or other inexpensive sheet material, as previously described, and terminates in an upper edge or rim 35*a* which is provided with a peripheral indentation 35*b*. The upper end member, a cover 32 of the lower container is formed of the same material and in the same manner, as the previously described end members. Said member 32 is provided with an outer depending flange or skirt 34 which overlies and encompasses the upper rim 35*a* of the body member 35. A metal clamping ring 36, which overlies the flange 34 and extends into the indentation 35*b*, presses the flange 34 against the rim 35*a*. The cover 32 is provided with a concave reinforcing bead 37 which is thicker than the balance of the cover. A continuous projection or flange 33 extends upwardly from the cover 32, between the outer flange 34 and the bead 37 thereof. It will be noted from FIG. 7 that the projections 30 and 33 cooperate in centering the containers for stacking or superimposing the latter, the depending flange 30 being inwardly of and abutting the upwardly extending flange 33, so as to secure the cans in stacked relationship.

As in the case of FIG. 5, an indicia or inscription may be molded or formed into the plastic end members of any of the described embodiments, at relatively little cost.

The previously described and illustrated embodiments are merely illustrative of various possibilities of shaping both bottoms and covers for receptacles or containers to suit every purpose for which they may be utilized. The end members are all chemically inert or stable and are practically unbreakable so that they can take the various stresses to which the containers are subjected. Depending upon the particular uses to which the containers may be put, it is possible to add a smaller or a greater amount of stabilizer to the plastic so as to make the end members flexible, elastic or rigid, as may be required.

While the end members have been illustrated and described in connection with container body members formed of fibrous sheet material, it will be understood that they are not limited to use with such material but that they can be used with body members formed of other materials, such as, for example, and not by way of limitation, steel, wool or metal.

In this connection, it will be noted that by the additional use of adhesives or by heat treatment, and hence by direct connection with the container jacket, the plastic end members will provide a stable, inert and tight sealing means for the containers.

As an example of an embodiment of the invention about 40 component parts of glass fiber are added to 60 component parts of polyester resin in order to impart the necessary stability to the cover and bottom members of the container. The quantity of glass fiber added may be reduced or increased according to the degree of flexibility or rigidity it is desired to obtain. Instead of

polyester resin, a selection can be made from the group of condensation and poly-addition resins as well as phenol-formaldehyde resins including melamine resins, polyamides and silicons.

A sufficient degree of stability is obtained, for example by the addition of textile fiber or wood shavings. The ratio of the admixture is then approximately the same as when glass fiber is added, that is 40%. In many cases good flexibility is desired for the cover and bottom members, it is then advisable to employ polymerization resins selected from the group including polyethylene, polystyrol, polyvinylchloride and polyvinyl-acetate, and in a similar way stability can be attained by the addition of organic substances, such as, for example, glass or mineral fiber, textile fibers, wood shavings and the like.

The invention which includes primarily the combination of the cover and body members of the container with the container walls made from cardboard or fiber, enables the cover and bottom members of the container composed of thermoplastics, to be hardened or rendered flexible according to actual requirements.

This is attained by varying the quantities of organic or synthetic substances added to the thermoplastics, as indicated above.

While there is shown and described the preferred embodiments of the invention, it will be understood that various changes may be made in the present invention without departing from the underlying idea or principles of the invention within the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. An end closure for a container including a body member formed of fibrous sheet material, a bottom rim provided at the lower end of said body member, a reinforcing ring encompassing said rim, said end closure comprising a bottom closure member mounted by said body member at the lower end thereof, said bottom closure member being formed of chemically inert corrosion resistant material and being provided with a continuous peripheral flange mounted by said rim, said bottom closure member having a continuous projection depending therefrom and terminating inwardly of said reinforcing ring for engagement with a complementary upward projection on the cover member of an underlying container, and a reinforcing bead defined in said bottom closure member inwardly of said projection thereof, said reinforcing bead being thicker than the remainder of said bottom closure member.

2. An end closure for a container including a body member formed of fibrous sheet material having a peripheral indentation and a bottom rim provided at the lower end thereof below the indentation including a folded over lower end defining with the upper wall of the rim an in-turned annular recess, a reinforcing ring encompassing said rim, said bottom closure member being formed of chemically inert corrosion resistant material of the general characteristics of plastic, and being provided with a continuous peripheral flange extending into the internal recess of said rim, said bottom closure having a continuous annular projection extending therefrom and terminating short of the bottom of said reinforcing ring, said projection having one substantially straight side face for engagement with a complementary upward projection on the cover member of an underlying container, said bottom closure further including a portion extending flush with the interior top face of said peripheral indentation, and a reinforcing bead defined in said bottom closure member inwardly of said projection thereof, said reinforcing bead being thicker than the remainder of said bottom closure member.

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