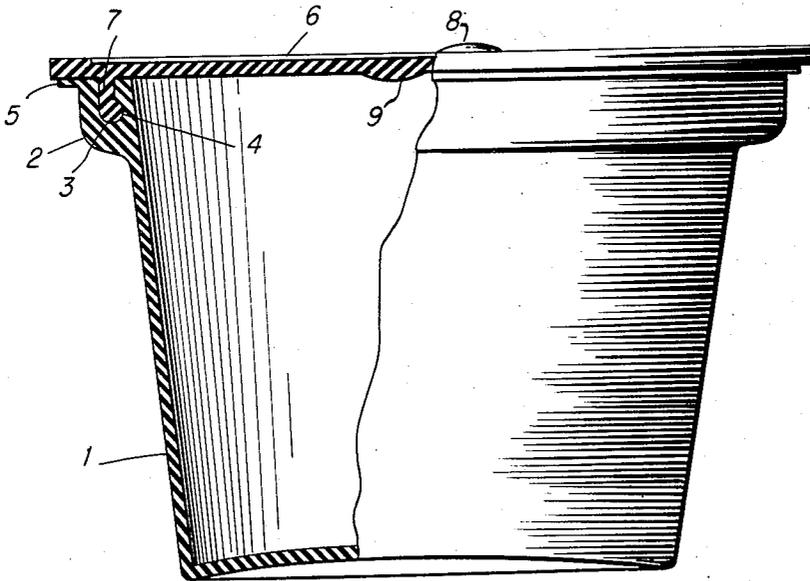


April 1, 1958

J. G. GROENDYK ET AL
CONTAINERS

2,828,789

Filed Aug. 12, 1955



INVENTORS
James G. Groendyk
William Geisler
By
Pemie, Edmonds, Norton, Bennett & Taylor
Attorneys

1

2,828,789

CONTAINERS

James G. Groendyk, Allendale, and William Geisler, Tenafly, N. J., assignors to Wilbro Corporation, Maywood, N. J., a corporation of New Jersey

Application August 12, 1955, Serial No. 528,095

1 Claim. (Cl. 150—5)

This invention relates to containers and has for its object to provide a shipping container for liquids and solids which is practically indestructible so that it can be used repeatedly for a long period of time without damage or impairment.

A further object of the invention is to provide a container which is readily closed and opened by hand or by simple machinery, which is self-sealing and when closed is both liquid tight and gas tight to the extent of maintaining a partial vacuum or a super atmospheric pressure during shipment and storage even though subjected to rough handling.

A further object of the invention is to provide a container of the class described which may be readily cleaned and sterilized for re-use.

A further object of the invention is to provide a container of the class described which when empty may be packed together in a greatly reduced space to facilitate return shipment.

Further objects of the invention will be apparent from the following description, taken in connection with the accompanying drawing wherein the container is shown in side elevation, partly in section.

Referring to the drawing, 1 indicates the body portion of the container which is a round vessel of larger diameter at the top than the bottom so that when empty the vessels may be nested together. The body portion of the container is preferably molded in a single piece of suitable material, preferably rubber, either natural or synthetic, of the character used for automobile tires, but somewhat harder, for example a durometer of approximately 95 has been found suitable for containers of one gallon capacity and a wall thickness of one-eighth of an inch. Around the top of the container there is a heavy collar 2 in which is formed a groove 3 opening in the upper face of the collar and of the shape shown. That is to say, the groove at its bottom portion is of greater width, being undercut on the inner wall to provide a rounded recess 4. The collar is also provided with an outer flange 5 to form an extended seat for the lid 6.

The lid 6 is also molded in a single piece of rubber of the same character as the body portion 1 but considerably softer, for example, of a durometer of substantially 65. The lid projects somewhat beyond the flange 5 on the body portion to facilitate its removal and is formed with a rib 7 of a shape and dimensions to completely fill the groove 3 when the lid is pressed into place with the rubber forming the rib under compression. By this construction the container is hermetically sealed and will remain so during shipment and storage even though subjected to rough handling. In fact, containers of the construction shown will maintain a partial vacuum in the order of 18 inches of mercury and will also retain a pressure charge of several pounds.

The upper portion of the groove 3 and the neck of the rib may be slightly tapered with the widest portions at the base of the rib and top of the groove so that when the lid is pushed into place the expansion of the thicker

2

portion of the rib into the undercut part 4 of the groove will hold the lid against upward displacement and with the tapered portion of the rib slightly compressed in the groove. By this construction somewhat greater manufacturing tolerances are permissible.

For vacuum or pressure packing the containers are preferably made in sizes not exceeding two gallons cubic content, but as a leak-proof package for liquids and solids which do not require either pressure or vacuum packing, the containers may be made in larger sizes.

In order to facilitate the pressure and vacuum packing the lid of the container is provided near its center with two thickened portions 8 and 9, respectively, the portion 8 having its convex face on the upper surface of the lid, while the portion 9 has its convex face on the inner surface of the lid. By means of these two thickened portions the container may be either pressure packed or vacuum packed by the simple expedient of projecting a double hollow needle through the appropriate thickened portion. If the containers are to be vacuum packed the needle is thrust through the portion 8 and steam is blown through the needle to sweep out the air and leave the space above the contents of the container filled with steam which on condensation will produce a vacuum in the container above the contents. If the contents are being pressure packed the needle is thrust through the thickened portion 9 and the air swept out by nitrogen under pressure.

Our improved container is particularly suitable for the shipment of partially prepared materials from the location of production to the places of final processing. For example, fruit concentrates such as used in the preparation of soft drinks can be prepared where the fruit is grown and shipped in concentrated form to the plants where the soft drinks are processed. The containers are easily handled by their rims. They require no crating and the joint provided between the lid and the body of the container is leak-proof and water-tight even though the container may be dropped from a substantial height or otherwise subjected to rough handling.

The containers may be readily closed by hand or the closing may be facilitated by placing the container with the assembled lid under a reciprocating vertical plunger. In production line operations the container bodies are placed on a conveyor which carries them past a filling station and a lid receiving station where the lid is placed on the container by hand on suitable mechanism.

The conveyor then carries the container to the lid-applying plunger and thence onto the shipping platform. The containers require no crating and will withstand a stacking load sufficient for a truck or freight car to be filled to the roof with the filled containers.

After the containers are emptied they are very readily cleaned and sterilized, for example with superheated steam and the container bodies may then be nested for return. The nested containers and the interchangeable lids which can be shipped in ordinary sacks occupy about one-sixth the bulk of the filled containers, thus greatly reducing the handling cost. The containers may be used one hundred or more times without damage from the ordinary wear or tear of shipment and handling.

In the foregoing description and accompanying drawing we have described a preferred form of our container in which it is now used in commercial operations. It will be understood, however, that the invention is not limited to the specific structure herein disclosed but may be variously modified within the scope of the appended claim. It will also be understood that while we have found rubber of the character described to be by far the most suitable material for the container, our invention is not limited to rubber but other molding compositions having equivalent properties may be employed and that

3
 the term "rubber" as used in the appended claim includes natural rubber and synthetic compositions having equivalent physical properties regardless of their chemical composition. It will also be understood that the containers may be made in various shapes, e. g., square or hexagonal, which is sometimes desirable for storage and packing. 5

We claim:

A container comprising an open vessel of molded rubber, a lid of rubber adapted to close said vessel with said lid in contact with the upper edge of the wall of said vessel throughout its perimeter, the contacting portions of said vessel comprising an integral rim of molded rubber around the upper portion of the vessel with a continuous upwardly open groove formed therein, said 10
 groove having its bottom portion of greater radial dimension than the overlying part with a wall of the groove between the two portions inclined with respect to the 15

4
 axial plane of the groove and a continuously downwardly extending flange around the rim of the lid, said flange being positioned and shaped to substantially fill said groove when the lid is placed on the vessel with the bottom portion of the rim on the lid under compression and its intermediate portion under tension.

References Cited in the file of this patent

UNITED STATES PATENTS

119,603	Gunning -----	Oct. 3, 1871
842,831	Eagelman -----	Jan. 29, 1907
1,531,651	Geiger -----	Mar. 31, 1925
2,606,586	Hill -----	Aug. 12, 1952
2,679,878	Stine -----	June 1, 1954
2,695,645	Tupper -----	Nov. 30, 1954
2,726,517	Pruett -----	Dec. 13, 1955
2,754,866	Coltman -----	July 17, 1956