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Hata

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[54] **VACUUM RETAINING JAR**

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[52] **U.S. Cl.** .... **215/13,** 220/9 C

[51] **Int. Cl.** **A47j 41/02**

[58] **Field of Search** .... 215/12 R, 13 R; 220/9 C, 220/9 F, 10

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Primary Examiner—Herbert F. Ross

[57] **ABSTRACT**

A vacuum retaining jar constructed of synthetic plastic material having an inner shell and an outer shell with adjoining metal rings imbedded in respective shells and connecting the upper terminal ends of the shells in a permanent air-tight relationship. The outer wall of the inner shell and the inner wall of the outer shell are provided with a metallic insulating coating. A cover is positioned over the joint of the upper ends of the shells.

5 Claims, 3 Drawing Figures

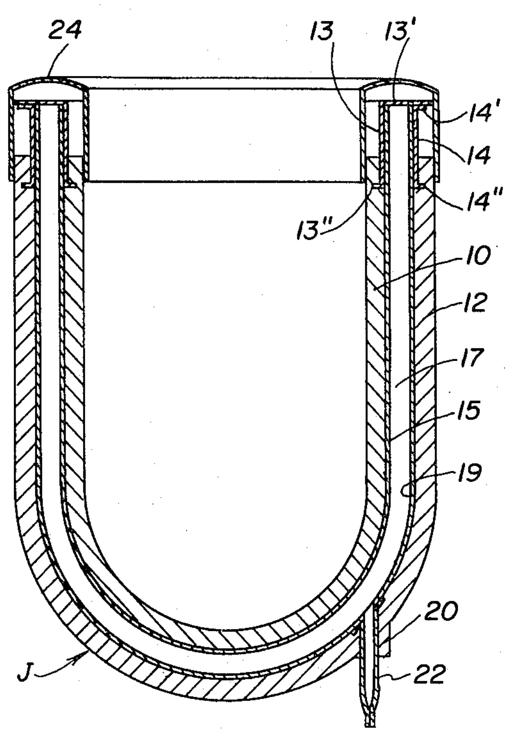


FIG. 3

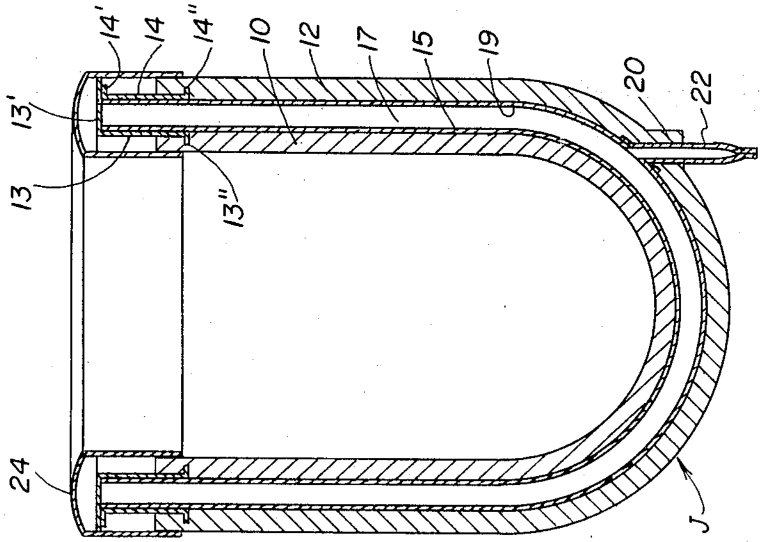


FIG. 2

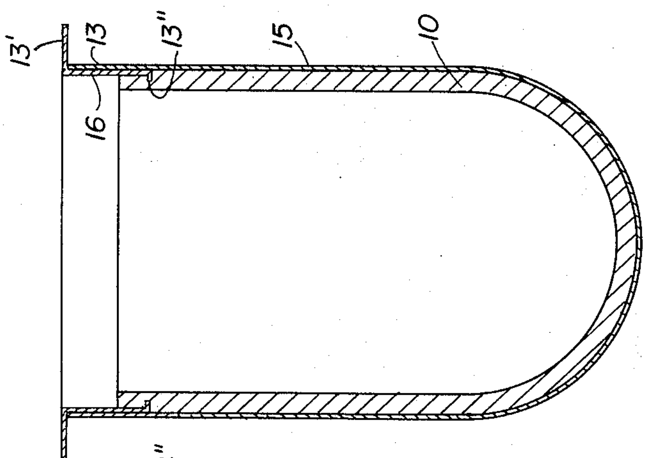
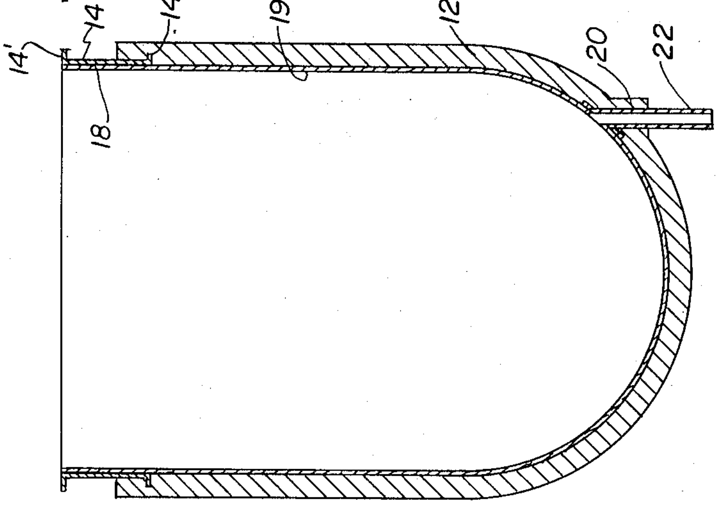


FIG. 1



VACUUM RETAINING JAR

BACKGROUND OF THE INVENTION

This invention relates generally to vacuum jars, and more particularly, to an improved synthetic plastic or non-glass dual-shell vacuum jar capable of maintaining a high vacuum over prolonged periods of time.

Many problems are inherent in the construction of vacuum jars intended to retain a fluid in as near constant state with as minimum degree of heat transfer as possible. The most critical of such problems relates to the construction of the seal between the two vacuum-retaining shell members most commonly used in such jars. It is known to construct the shells of glass and to seal the shells by heat-fusing them together while applying a vacuum therebetween. Such glass member jars are extremely fragile and subject to breakage and damage and therefore, while the manner of providing the vacuum seal produces a satisfactory vacuum, it is applicable to glass jars only.

Vacuum jars constructed of material other than glass are resistant to breakage and damage and therefore are preferred to glass jars. Such non-glass jars do not, however, lend themselves to formation of the vacuum seal by the heat-fusing method useable with glass. The provision of a non-glass jar constructed of two shells which are tightly sealed together to maintain a highly effective vacuum therebetween has long been desired but not achieved in the art.

Accordingly, the primary object of this invention is to provide a damage resistant vacuum jar constructed of non-glass material in which the vacuum retaining shell members thereof are connected in tight highly effective sealing arrangement so as to maintain the vacuum therebetween with a minimum degree of leakage.

Other objects and advantages of the invention will occur to those skilled in the art from the ensuing description.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a longitudinal sectional view taken through the outer shell of the vacuum retaining jar of the invention.

FIG. 2 is a similar view taken through the inner shell of the jar.

FIG. 3 is a similar view taken through the assembled vacuum retaining jar of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in FIG. 3, the vacuum retaining jar constructed in accordance with the invention is designated J. There is an inner shell member 10 and an outer shell member 12 which are formed from a suitable synthetic plastic or thermosetting or non-glass material such as a thermoplastic resin which is damage resistant and capable of being worked per this invention. Each shell member 10, 12 is of generally U-shaped cross-sectional configuration and is provided at the upper open end thereof with a ring 13, 14, respectively. The rings 13 and 14 preferably are formed of stainless steel, but other metals may be used.

The ring 13 positioned on inner shell 10 has a vertical portion 16 extending above the terminal end of the shell 10 and a horizontally-turned flange 13'' on the lower part of the ring 13 which is embedded within the shell around the outer surface thereof. Similarly, ring 14 has a vertical portion 18 extending above the terminal end of shell 12 and a horizontally-turned flange 14'' on the lower part of ring 14 is embedded within the shell around the inner surface thereof. Ring 13 is formed with a horizontally-disposed rim 13' at the upper end of the vertical portion 16. Ring 14 is formed with a horizontally-disposed rim 14' at the upper end of the vertical portion 18. At least part of the vertical portion 16 also is embedded around the outer upper terminal end of shell 10, and at least part of the vertical portion 18 also is embedded around the inner upper terminal end of shell 12.

The outer wall of shell 10 and metal ring 13, and the inner wall of shell 12 and metal ring 14 are coated with a metallic layer of approximately 15 microns thickness to provide continuous insulating layers 15 and 19 respectively which are impermeable to air.

Shell member 10 is positioned within shell member 12 to form the vacuum jar J of FIG. 3. When the inner shell 10 is positioned within outer shell 12, rim 13' of ring 13 rests upon rim 14' of ring 14. Having been so positioned, the juxtaposed surfaces of rims 13', 14' are sealed together by weldment, for example, to maintain the two shells 10, 12 in the position shown in FIG. 3. In the assembled position, inner shell 10 and outer shell 12 combine to form a vacuum retaining body J having a space 17 therebetween enclosed by the insulating layers 15, 19 which continuously extend over the entire facing surfaces of the shells.

For the purpose of enabling the space 17 to be evacuated to form a vacuum therein, a protrusion 20 is formed in the outer lower surface of shell 12 and a nozzle 22 is inserted within the protrusion connecting space 17 to atmosphere. A vacuum pump may then be connected to the nozzle to withdraw the air from space 17, and this having been done, the tip of nozzle 22 may be sealed in a known manner.

After shells 10, 12 are assembled as shown in FIG. 3, the upper ends thereof are fitted with a cover member 24 to protect the co-joined rings 13, 14 from damage.

The construction of the assembled vacuum retaining jar J is such that no part of the plastic surfaces of the opposing walls of inner shell 10 and outer shell 12 are exposed to air. This is so because the outer walls of shell 10 and adjoining ring 13, and the inner walls of shell 12 and adjoining ring 14 are completely covered with a metallic coating in the form of insulating layers 15, 19. The construction is such that extraneous gas completely is prevented from developing within the space 17 thus ensuring a good inner vacuum retaining body which can maintain a high vacuum over prolonged periods of time. Further, by reason of the weldment between rims 13', 14', the seal at the upper ends of shells 10 and 12 is air impermeable which ensures against loss of vacuum between the shells.

Since shells 10 and 12 are constructed of a strong, resistant synthetic plastic resin the vacuum jar J is breakage resistant, unlike conventional glass jars.

I claim:

1. A vacuum retaining jar comprising:

a. a thermoplastic outer shell;

b. a thermoplastic inner shell positioned therewithin to provide a space between the facing surfaces of the shells, said shells being of generally U-shaped cross-sectional configuration with open upper ends;

c. an annular metal ring provided on the outer surface of the inner shell and on the inner surface of the outer shell respectively at the upper ends thereof, said metal rings being partially embedded within the respective shell surfaces so that their outer faces are substantially flush with the shell surfaces;

d. the facing surfaces of the shells and rings being coated with a metallic insulating layer; and

e. said rings having flange means, said flange means being secured together to seal the upper ends of the shells and the space therebetween.

2. A jar as claimed in claim **1** in which a cover member is positioned over the upper ends of the shells, said cover member being of generally U-shaped crosssectional configuration.

3. A jar as claimed in claim **1** in which each ring has a vertical portion extending above the terminal open end of the shells and a horizontally-turned flange on the lower part of each ring extending radially within the respective shell facing surface.

4. A jar as claimed in claim **3** in which each ring has a horizontally-turned rim formed on the upper part thereof and the surfaces of the rims are juxtaposed to provide the seal between the shells.

5. A jar as claimed in claim **4** in which the rims are welded together.

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