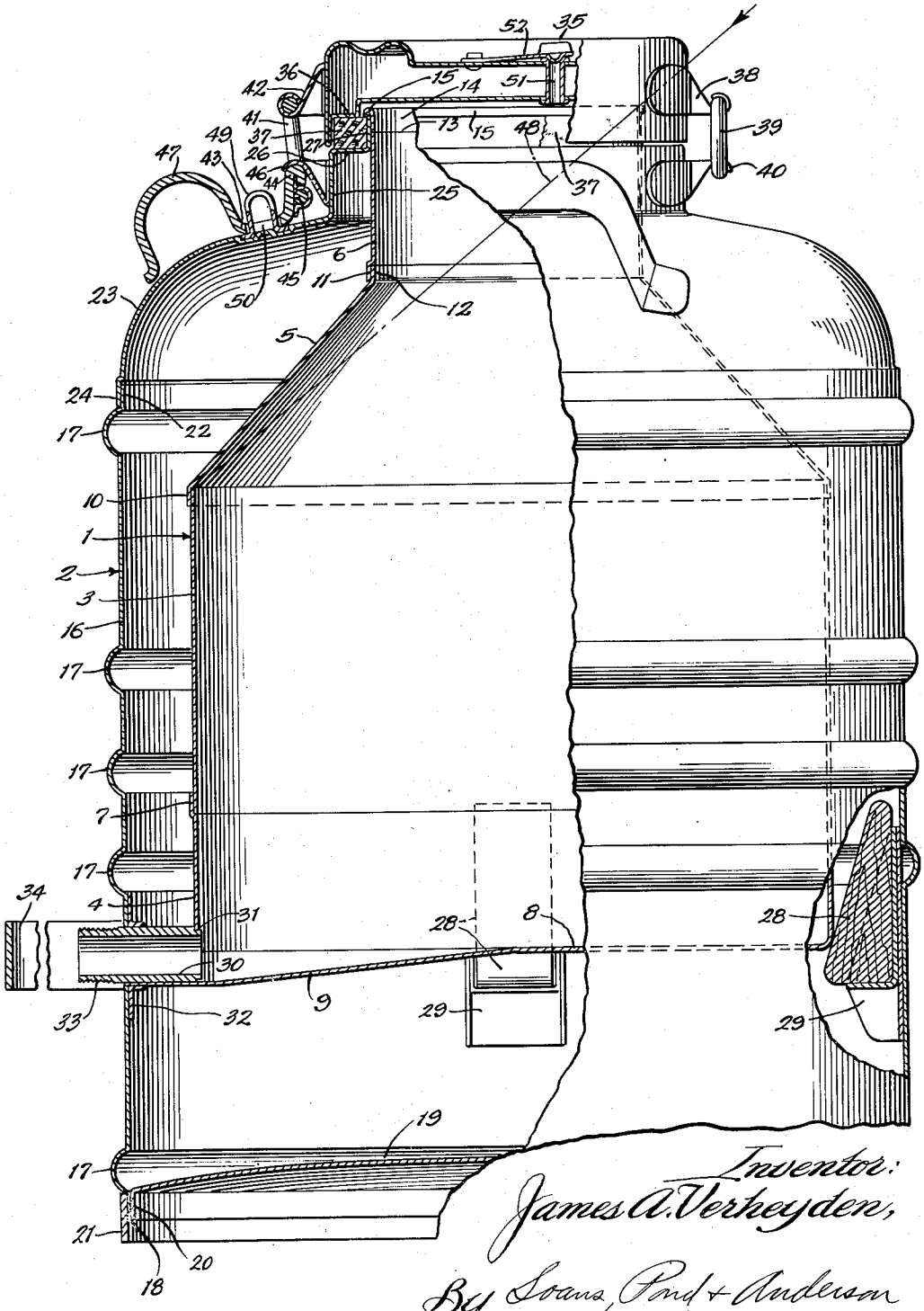
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INSULATED STORAGE CONTAINER

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Inventor:
James A. Verheyden,
By Soans, Pond & Anderson
Attorneys.

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INSULATED STORAGE CONTAINER

James A. Verheyden, Oak Lawn, Ill., assignor to Vacuum Can Company, a corporation of Illinois

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1 Claim. (Cl. 220—10)

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This invention relates to an insulated storage container and, more particularly, to a liquid container in which there is provided vacuum insulation for preserving the temperature of the liquid in the container.

The main objects of the invention are to provide an insulated container of the character indicated, in which inner and outer containers are arranged in an improved manner to increase the insulating efficiency of the vacuum jacket around the inner container; to provide a container of the character indicated, which is especially adapted for containing coffee and other liquids, which require that the interior of the inner container be capable of thorough visual inspection for cleanliness; and, in general, it is the object of the invention to provide an improved temperature maintaining container of the character indicated.

Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawing, wherein a container embodying the improved construction is shown, partially in elevation and partially in section.

The container structure shown, comprises an inner container 1 and an outer container 2. The inner container has a cylindrical main body portion 3, a cup-like cylindrical lower portion 4, a conical upper portion 5, and a cylindrical neck portion 6. The bottom portion 4 of the inner container is provided with an outwardly offset flange 7, which embraces the lower marginal portion of the body 3 for positioning the body and bottom portions in proper alignment. These parts are then welded together in the overlapping lower marginal portion of the body 3 and flange 7 of the bottom portion.

The bottom wall 8 of the inner container is, of course, formed integrally with the bottom portion 4 as shown, and it is equipped with a radially extending groove or channel 9, which extends from the center of the container bottom outwardly, the depth of the groove increasing gradually to the outer wall of the container as shown.

The conical upper portion 5 has a cylindrical lower end flange 10, which surrounds the upper marginal portion of the body 3, the parts being suitably welded together at this point so as to form a rigid structure. The neck part 6 is preferably cylindrical, as shown, and has its lower end provided with an outwardly offset marginal portion 11 for receiving a corresponding cylindrical end portion 12 formed on the conical member 5 for holding these parts in properly assembled relation. The conical part 5 and the neck part 6 are also united by welding the parts together in the areas of the overlapping flanges 11 and 12.

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The neck 6 terminates in a plain square-cut upper end, as shown at 13. A mouth portion 14 is provided in continuation of the upper end of the neck portion, said mouth portion being in the form of an annular band-like piece having its upper edge rolled outwardly, as shown at 15, to form a smooth, non-cutting end. The mouth portion 14 and neck portion 6 are, in effect, united together through the agency of a portion of the outer container, which will presently be described.

The outer container comprises a generally cylindrical main body part 16 having, in this instance, a series of outwardly pressed reinforcing ribs 17, two of such ribs being located respectively adjacent the upper and lower ends of said body part 16.

At the lower end of the body part 16, it is provided with a cylindrical flange portion 18, which is substantially a continuation of the main body part 16. A bottom member 19, preferably of inwardly arched form as shown, is provided, said bottom member being formed with a peripheral flange 20, which fits snugly against the flange 18 to position the parts. The bottom 19 and body 16 may be rigidly united by welding the mutually overlapping flange portions 18 and 20 to thereby provide an airtight seam. A bottom reinforcing band 21 of suitable material may also be secured to the bottom flange 18, spot welding of said band to the flanges 18 and 20 at circumferentially spaced points, being adequate for this purpose.

The upper end of the body part 16 has a cylindrical flange-like portion 22 which is, in effect, a continuation of the cylindrical body 16.

An outer container top member 23 is provided with a cylindrical lower end flange portion 24 which fits tightly over the flange 22. The flanged portions 22 and 24 are also preferably welded together to form airtight seams.

The intermediate portion of the member 23 extends upwardly and inwardly from its lower flange 24, said intermediate portion being preferably of arcuate form approaching a parabolic curve which has an axis adjacent to the conical wall portion 5 of the inner container. As a practical matter, the curved intermediate portion may have its central portion formed about an axis which is adjacent the inclined inner container wall portion 5 and approximately midway

of its width. Such curved portion extends inwardly and upwardly and is then bent upwardly to form a cylindrical collar portion 25, which is spaced outwardly from the neck portion 6 of the inner container. The top member 23 is continued inwardly from the upper end of the collar 25 to form a horizontal shoulder or seat 26 extending inwardly from the collar 25 into engagement with the inner container neck 6 where it is turned upwardly to form a cylindrical flange 27 surrounding the upper marginal portion of the neck 6 and the cylindrical portion of the mouth 14 below the bead 15 of the latter.

The flange 27 and the portions of the neck 6 and mouth 14 which it engages, are rigidly united, preferably by welding around the entire circumference of said parts. The inter-attachment of the outer and inner containers thus produced at the mouth end of the container serves to effectively hold the containers in substantially coaxial, properly spaced relationship at the upper end of the container. To hold the lower end portions of the containers in substantially coaxial, properly spaced relation there are provided a plurality of circumferentially spaced supports comprising wedge-shaped blocks 28 of suitable wood positioned in metal holders 29. The holders 29 with the blocks 28 seated therein are positioned after the mouth end of the container is welded as above explained, and before the bottom member 19 of the outer container is inserted. By properly adjusting the blocks 28 and holders 29 the inner container is accurately positioned in coaxial relation to the outer container, the holders 29 being spot welded to the outer container to permanently secure the positioning devices in place.

To facilitate the dispensing of coffee or other liquids which may be in the container, there is provided a short nipple 30 having its inner end seated as indicated at 31 in an aperture provided in the side wall of the bottom member 4 of the inner container adjacent the outer end and the deepest portion of the channel 9.

Near its outer end, the nipple 30 is seated in an opening provided in the wall 16 of the outer container, a flanged reinforcing member 32 being preferably provided on the inside of the outer container wall 16. The joints between the nipple and the inner and outer containers are preferably welded around their entire circumference so as to provide airtight connections at these points. The outer end of the nipple 30 may be provided with screw threading as indicated at 33, or other means, for detachably receiving a suitable faucet and a rigid guard member 34 may be welded or otherwise secured to the outer container wall for the purpose of protecting the faucet from accidental manipulation or damage.

The space between the inner and outer containers is evacuated to the extent of about 29½ inches of mercury. Such a vacuum has been found to constitute effective thermal insulation which resists the transmission of heat from the outside of the outer container 2 to the inner container 1, and of heat from the inner container 3 to the outer container 2. It will be observed that there is only a very limited metal-to-metal contact between the inner and outer containers at the mouth end thereof, and that the wood block positioning devices at the lower end of the structure provide a very poor medium for transmission of heat in either direction.

In containers of the character described, it has been found, especially in respect of the maintenance of high temperature in the inner container, that heat losses are generally greatest at the upper end of the container. This is perhaps due to the normal tendency of heat to rise. By providing the inner and outer containers with more widely spaced upper portions, such as 5 and 23, the over-all efficiency of the container has been increased considerably over the efficiency of a vacuumized container wherein the walls of the inner and outer units are maintained in parallel or uniformly spaced relation at all points. The heat losses in a container structure, such as described, are generally understood to be due largely through radiation since precautions are usually taken to provide a minimum passage for heat by conduction.

In this instance, the containers 1 and 2 are preferably made of polished, stainless steel, all surfaces being polished so that heat radiated from the inner container to the outer container will be reflected back to the inner container, and heat reflected from the outer container to the inner container will likewise be reflected back to the outer container whereby any change of temperature in the content of the inner container is effectively resisted. The enlargement of the space through which heat must be radiated around the upper portions of the containers greatly reduces the amount of heat which can be transmitted by radiation from one container to the other in the more widely spaced portions. The employment of a curved outer member, such as described in opposition to the conical inner member, may also have an important bearing on the increase in efficiency obtained by the described structure.

Any suitable form of cap or cover may be provided for the container. In this instance, a cap 35 is shown of hollow construction and provided with a recessed seat 36 which is adapted to rest on a rubber or similar gasket 37 seated on the shoulder 26 at the mouth end of the outer container member. The gasket 37 is retained on the seat 36 by means of the outwardly rolled bead 15. As shown, the arrangement is such that there is no direct metal to metal contact between the cap and the container, thereby holding to a minimum heat transmission through the cap. For locking the cap on the container, the cap may be provided with a bracket member 38 which carries a suitable chain-like link 39 adapted to engage a hook 40 secured to the portion 25 of the outer container. Diametrically opposed to the described link connection between the cap and the container there may be provided a similar link 41 pivotally carried by a bracket 42 which is secured to the cap 35. The lower portion of the link 41 may have pivoted to it an arm or lever 43. The lever 43 is provided with an inner end portion 44 which extends beyond the portion 45 of the link 41 and is adapted to engage a hook-like member 46 secured to the wall portion 25 of the outer container. It will be seen that by lifting the outer arm portion 47 of the locking member 43, the portion 44 thereof will be lowered so that it may be disengaged from the hook 46, whereupon the cap may be removed from the container. The link 39 may, of course, be readily disengaged from the hook 40 when the opposite side of the cap is elevated sufficiently. A loop 49 may be secured to the top member 23 in position to project through a slot 50 in the member 43. A suitable padlock (not shown) may be

engaged with the loop to prevent unauthorized removal of the cap. The cap is preferably provided with a small vent opening 51 to permit air to enter the container when liquid is drawn therefrom. A lever 52 pivoted on the cap and movable to and from closing relation to the vent opening 51 is also provided.

In addition to the improved insulation characteristics already explained, the described construction is advantageous in that the entire inside surface of the inner container may be visibly inspected through the mouth and neck opening of the inner container.

In most insulating container constructions, an upper portion generally corresponding to the upper portion 5 of the described inner container, is curved or arched outwardly in such a manner that certain portions of the inside surface of such curved section cannot be visibly inspected through the mouth of the container, wherefore reliance must be placed on the sense of touch, which may be employed by placing the hand through the mouth of the container and feeling the inside surface with the fingers. This, of course, is in itself objectionable as tending to contaminate an otherwise clean interior. As shown in the drawing, it is possible by a line of vision indicated at 48, to look past the mouth end of the container and to examine all portions of the frusto-conical top 5. It is, of course, to be understood that the mouth opening in a container of the class herein contemplated, is of such size that a person's hand may be easily inserted into the container.

Another feature of the described construction is the manner in which the gasket 37 is retained on its seat 26, this being accomplished by the outwardly rolled bead 15 which not only covers the raw edge of the neck 27 of the outer container but also overhangs the gasket seat 26 to cooperate with the latter in holding the gasket in place.

It is to be understood that all of the joints between the various parts of the inner and outer containers are welded or otherwise so made as to be airtight so that once the space between the inner and outer containers is vacuumized it will remain so. Vacuumizing may be effected through an opening in a suitable portion of the side wall 16 of the outer container which may be sealed upon completion of the drawing of the vacuum.

The location of such a sealed opening may be covered and protected by a name plate or the like, which may be secured to the outside of the container.

Changes in the described structure may be made without departing from the principles of the invention.

I claim:

In an insulated storage container, the combination of inner and outer containers having interengaging, axially extending neck portions secured together, said outer container having a portion extending outwardly from the lower end of its neck portion to provide a shoulder constituting a gasket seat, and a continuation of said inner container neck portion having an outwardly turned bead overlying the outer end of the outer container neck portion in such contiguity thereto as to constitute a finishing trim therefor, the bead end of said inner container neck portion constituting the mouth of the container, a gasket seated on said shoulder and snugly fitting around said outer container neck portion, and a cap for closing said mouth, said cap having a peripheral flange portion closely encircling said gasket and spaced from said outer container, an intermediate portion adapted to be seated on said gasket, and a central portion adapted to overlie said mouth in axially spaced relation thereto.

JAMES A. VERHEYDEN.

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