LEWIS VAN DEVENTER BLAIR.
HEAT INSULATED RECEPTACLE.
APPLICATION FILED OCT. 29, 1919.

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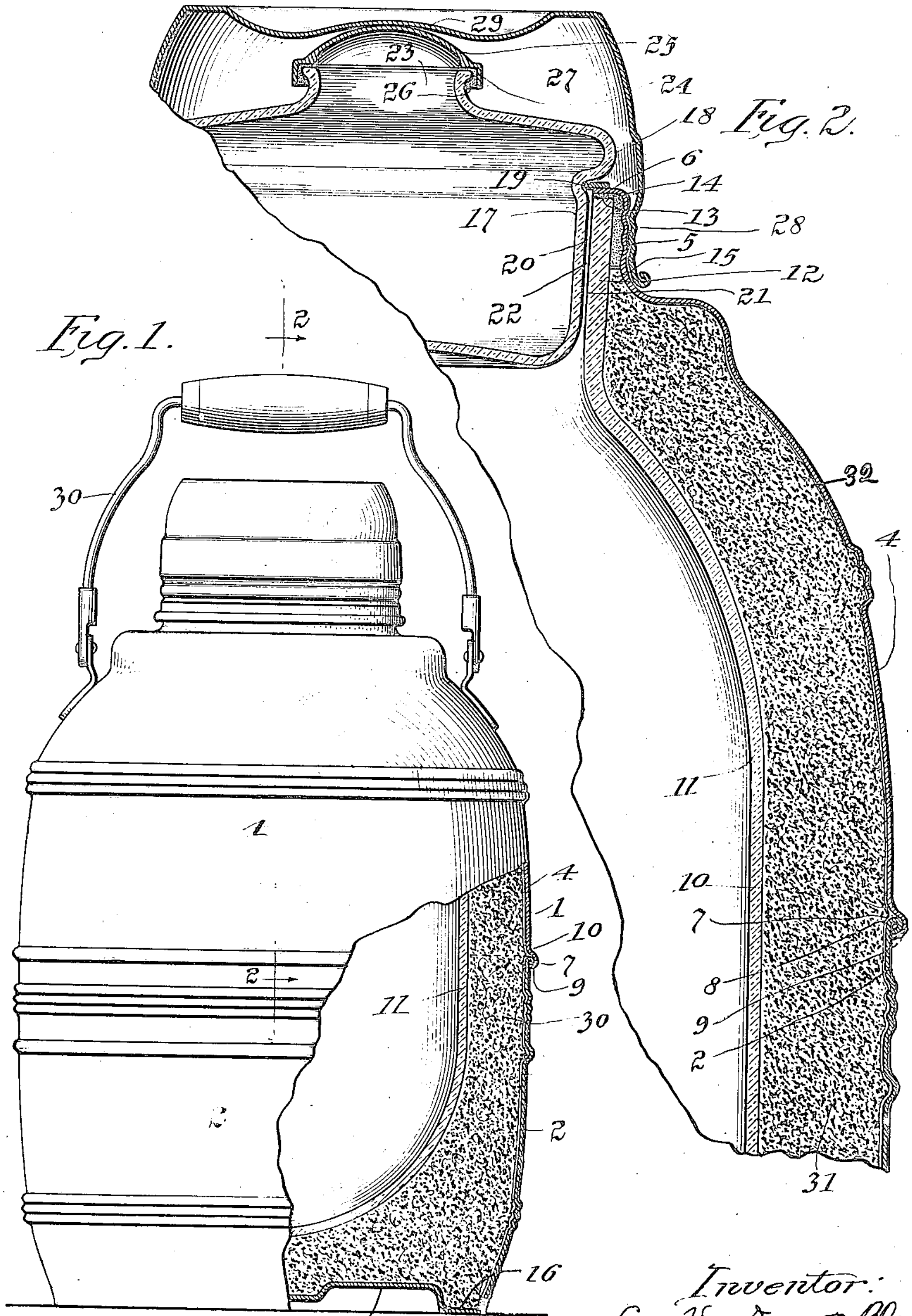

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HEAT-INSULATED RECEPTACLE.

Application filed October 29, 1919. Serial No. 334,212.

To all whom it may concern:

Be it known that I, LEWIS VAN DEVENTER BLAIR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heat-Insulated Receptacles, of which the following is a specification.

The invention relates to receptacles of the heat-insulated non-vacuum type, objects thereof being to economically produce relatively large receptacles, to render such receptacles sanitary and easy to clean, to improve the insulation, to provide means for easily and permanently assembling and uniting the component parts, and to minimize the transmission of shocks to the inner vessel or container which, being preferably composed of glass or other frangible substance, is likely to be broken if means for its protection from extraneous shocks are not utilized.

The invention will be best understood by referring to the drawing constituting a part of this specification in which Figure 1 is a view in elevation with portions broken away to show the lower parts of the outer jacket and the container with which a receptacle made in accordance with the invention is to be provided; and Figure 2 is a sectional view of a portion of such a receptacle showing the construction of the upper parts thereof on a larger scale.

The outer jacket, 1, is made of at least two parts, a lower cylindrical section, 2, having a bottom, 3, and an upper cylindrical section, 4, which terminates in a threaded neck, 5, having an inturned flange, 6. These two sections, 2 and 4, which are preferably of metal or other non-frangible substance, are united by a substantially air-tight and water-tight spun joint, 7, consisting of an outwardly-turned bead, 8, on one section and an inwardly turned lip, 9, on the other section, said lip being spun over said bead and being a continuation of a deflected portion, 10, of the upper section which constitutes a shoulder against which said bead rests.

The inner container, 11, may be made of glass or some other vitreous substance, which, despite its fragility is employed because it is a poor conductor of heat and in order that the interior of the container may tions avoided. The container is provided with a neck, 12, the upper edge, 13, of which terminates under the inturned flange, 6, of the threaded neck, 5, to which it is bonded by a substantially infusible substance 14, of low heat conductivity. The bond may be in part disposed between the necks 5 and 12, of the jacket and the container which are separated to leave a space, 15, whereby their only physical connection is through the bond, 14, which on account of its low heat conductivity and its consequent disability as a heat conductor is incapable of transferring much heat from the container to the jacket if the contents be hot, or from the jacket to the container if the contents be cold. The container should be silvered to intercept radiant heat, and, for convenience of manufacture, is made of one piece of glass. The bottom of the container is devoid of angles and is approximately of semi-spherical form, the object being to avoid fractures which are caused by unequal expansion of parts of vessels of irregular shapes.

The bottom, 3, of the jacket is provided with a support, 16, of limited area to enable the receptacle to rest upon irregular surfaces without tilting and for reducing conduction of heat to objects on which the receptacle may be placed.

The stopper, 17, for the container, 11, is hollow and preferably made of glass, and it is provided with a rib, 18, from which it may be sustained. The air may be exhausted from the space within the stopper, or rarefied by expansion before the stopper is closed. A gasket, 19, which may be of rubber, is interposed between the rib, 18, and the edge, 6, of the container to make a tight joint, to cushion the surface thereof and to prevent any considerable heat from being conducted to the stopper, 17. The cylindrical outer wall, 20, of the stopper and the inner cylindrical wall, 21, of the neck, 12, are separated by an annular space, 22, to limit heat conduction and are ground to remove any protuberances or irregularities which might, if present, interrupt the continuity of said annular space, 22, and establish undesirable and excessive paths of heat conductivity. The stopper, 17, is normally out of contact with the contents of the container, 11, and hence all of the heat which mitted through the glass neck, 12, of the container which is of relatively small cross-section and a poor conductor of heat. If the stopper were not spaced from said neck, the insulation would be appreciably impaired and the period of heat retention would be somewhat shortened.

The stopper has a relatively small mouth, 23, which is provided with an external bead, 24, and this mouth is closed by a convex cap, 25, that is secured in position by a hermetical adherent seal, 26, extending over the edge of said mouth, and, if desired, over said external bead.

A cover, 27, having a threaded lower edge, 28, which engages the threads of the neck, 5, of the jacket, 1, is provided with a centrally disposed cavity, 29, in its top wall which cavity coincides with the convex cap, 25, of the stopper, 17, to thereby center said stopper and compel a concentric disposition of said stopper and the neck, 12, of the container, as well as to maintain the separation of their adjacent surfaces.

The receptacle is provided with a bale, 30, to facilitate its handling.

The space between the jacket, and the container, 11, is filled with a comminuted substance 31, of poor heat conducting properties, such as cork, and this substance is packed with sufficient density to prevent violent pendulous movements of the container occasioned by shocks administered from without the receptacle, while permitting the expansion and contraction and the slight bodily movements of the container which are produced by changes of temperature. The walls of the jacket, 1, and the container, 11, are spaced apart a sufficient distance to prevent indented portions of the jacket from exerting pressure upon or transmitting shocks to the frangible wall of the container, and to admit of the dispersion of the force of external blows into the relatively thick protective packing, 31, in order that said frangible wall may not be broken. The distance between the walls of a vessel having substantially a capacity of one gallon should be one inch or more, and the packing should be such as to readily disperse shocks.

By employing a two-part jacket the manufacture of the receptacle is greatly facilitated. The various parts are separately produced ready for assembling, whereupon the container is inserted into the top portion of the jacket from below and bonded thereto. The container is then silvered by a well-known process and the coating of silver covered by a film of protective paint. The packing is next introduced, and this part of the assembling operation is accomplished by telescoping a cylinder, 32, of paper or other non-conducting filling, 31, is then placed within said cylinder and packed in the desired degree, whereupon the section, 2, of the jacket is slid over said cylinder and secured in position by spinning the lip, 9, over the bead, 8.

The substance of which the bond is composed is, preferably, a prepared shellac which is fully described in United States Letters Patent #1,309,967, granted to Simonson and Blair on July 15, 1919. This substance is of especial utility as a bond inasmuch as it may be fused in situ at a temperature which is lower than the temperature at which glass fuses and, by sufficient heat treatment at normal pressures, becomes, exceedingly tenacious and permanently adherent to the neck of the jacket and the container. The substance is ground before it is applied, and when heated it fuses and becomes sticky and immediately attaches itself to the adjacent parts. Prolonged heating hardens it, renders it substantially insoluble in alcohol, and materially raises or eliminates its melting point, so that its durability as a bond is ensured. The tenacity of this bond is such that it is capable of supporting the container in its pendent position with the jacket without the aid of adjunctive supporting devices. The filling between the jacket and the container is primarily employed as a shock-absorber and an insulator, and for the purpose of preventing the container from responding to external shocks which, if of sufficient intensity, would cause the container to oscillate to such extent, relatively to the jacket, as to fracture its neck. Experiments have shown that the bond will remain intact and adherent to the parts even when contiguous portions of the glass of the container are broken by a shock.

It is important that the inner container be composed of a substance which is a poor conductor of heat, so that heat will not be readily transmitted upward through the body of the container to the outer jacket from which it is suspended. Although the bonding material constituting the seal is itself a poor conductor of heat, it is desirable to supplement its non-heat transmitting properties as much as possible.

Having thus described my invention, what I claim is:

1. A heat-insulated vessel of the non-vacuum type having an outer jacket of non-frangible material, an inner container of frangible material, said inner container being bonded to and pendently supported from said jacket, and heat-insulating and shock-absorbing means surrounding said container for limiting oscillations of said container

versely divided outer jacket of non-frangible material, an inner container of frangible material bonded to the upper portion of said jacket and pendently supported thereby, a lining disposed within and substantially coextensive with said jacket, and a comminuted body of heat insulating and shock-absorbing material disposed between said container and said lining for limiting oscillations of said container while permitting expansion thereof by changes of temperature.

3. A heat-insulated vessel of the non-vacuum type, having an outer non-frangible jacket provided with a neck and consisting of a plurality of parts united by a circumferential spun seam, a strong inner frangible container having a neck which is sealed to the neck of said jacket, and a packing of shock-dispersing and heat-insulating material enveloping said container and of sufficient thickness to prevent indentations or distortions of said jacket from exerting a breaking pressure on said container, whereby oscillation of said container is limited and expansion thereof by changes of temperature permitted.

4. A heat-insulated vessel of the non-vacuum type having a non-frangible outer jacket, an inner frangible container, and a bond uniting said jacket and said container at their upper ends and sustaining said container in a pendent position within said jacket, said jacket and said container being sufficiently spaced to prevent indented or distorted portions of said jacket from touching said container.

5. A heat-insulated vessel of the non-vacuum type having a two-part outer jacket, an inner container of non-corrosive material bonded directly to and pendently sustained by said outer jacket, and a comminuted packing, disposed around said container to limit pendulous movements of said container while permitting expansion and contraction thereof by changes of temperature.

6. A heat-insulated vessel having a non-frangible outer jacket provided with a top portion and a bottom portion each formed with a cylindrical wall and united by a circumferential joint, and an integral non-corrosive inner container united to said top portion by an adherent bond, and supported by said bond in a pendent position.

7. A heat-insulated vessel consisting of a divided outer jacket, a single-wall container, a bond directly uniting the tops of said jacket and said container and sealing the space within said jacket, and cushioning means, said cushioning means substantially filling the space between said jacket and said container and having low heat conductivity for insulating said container and for limiting pendulous movements thereof.

8. A heat-insulated vessel having an outer jacket and an inner container provided with a neck, a body of heat-insulating material surrounding said container and a closure for and engaging the neck of said container and separated from the inner wall of said neck by a heat-insulating air space.

9. A heat-insulated vessel having an outer jacket and an inner single-wall container provided with a neck, a body of heat-insulating material surrounding said container, a closure for the neck of said container separated from the inner wall of said neck, by a heat-insulating air space and a heat-insulating gasket disposed between said neck and said closure.

10. A heat-insulated receptacle of the non-vacuum type, including a multi-part outer jacket having an inturned portion at its upper end, a single-walled strong inner frangible container having a neck surrounded and laterally sustained by said jacket, and resilient heat-insulating material disposed between said jacket and said container and extending from the inner wall of said jacket to the outer wall of said container for limiting the oscillation of said container while permitting expansion thereof by changes of temperature.

11. A heat-insulated vessel of the non-vacuum type, having a non-frangible multi-part outer jacket, an inner strong single-walled container of low heat conductivity pendently sustained in and separated at all points from said outer jacket by heat-insulating material which limits oscillation of said container while permitting expansion thereof by changes of temperature.

12. A heat-insulated vessel of the non-vacuum type, having a non-frangible outer jacket, a strong inner single-walled frangible container of low heat conductivity pendently sustained in said jacket and separated at all points below the point of suspension in said outer jacket by heat insulating material for limiting oscillation of said container while permitting expansion thereof by changes of temperature.

13. A heat-insulated receptacle of the non-vacuum type, including a non-frangible outer jacket, a strong inner vitreous container supported in the upper portion of said outer jacket, and a comminuted heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, said container having sufficient opacity, to substantially conceal said insulating material.

14. A heat-insulated receptacle of the non-vacuum type, having a non-frangible outer jacket, a strong inner single-walled container of frangible material, said inner container being pendently sustained in said

jacket, and heat-insulating and shock-absorbing means surrounding said container for limiting its oscillation while permitting expansion thereof by changes of temperature.

15. A heat-insulated receptacle including an inner vitreous container, a sectional outer jacket, heat insulating material disposed between said container and jacket, and a retainer for holding said insulating material in place pending the placing in position of a section of the outer jacket.

16. A heat-insulated receptacle of the non-vacuum type, including an outer non-frangible jacket, a strong inner vitreous container supported in the upper portion of said jacket, and heat insulating material disposed between said container and said jacket for limiting oscillation of said container while permitting expansion thereof by changes of temperature, said container having an outside coating of silver to render it opaque and reflective of heat rays.

17. A heat-insulated receptacle of the non-vacuum type, including a multi-section outer jacket, a strong vitreous single-walled inner container sustained in the upper portion of said outer jacket, resilient heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, one section holding a cover, and a seal to prevent moisture from reaching said insulating material.

18. A heat-insulated receptacle of the non-vacuum type, including a multi-section outer jacket, a strong vitreous single-walled inner container sustained in the upper portion of said outer jacket, resilient heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, a screw-threaded section for holding a cover, and a seal for preventing moisture from reaching said insulating material.

19. A heat-insulated receptacle including a multi-section outer metallic jacket, a vitreous inner container, heat-insulating material disposed between said jacket and said container, and a vitreous stopper carrying a resilient gasket, said stopper being retained in position by a cup engaged with a section of said outer jacket.

20. A heat-insulated receptacle including a multi-section outer metallic jacket, an opaque vitreous inner container, heat-insulating material disposed between said jacket and said container, and a vitreous stopper having a recess carrying a resilient gasket, said stopper being retained in position by a cup engaged with a section of said outer jacket.

21. A heat-insulated receptacle of the non-vacuum type, including a multi-section outer jacket, a vitreous open-mouth single-walled inner container sustained in the upper portion of said outer jacket, resilient heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, and an insulated stopper for closing the mouth of said container, a section of said outer jacket having means for holding and vertically adjusting a cover.

22. A heat-insulated receptacle of the non-vacuum type, including a non-frangible outer jacket, a strong inner frangible container having a body portion and a neck, said neck being held laterally by an upper part of said receptacle, and additional means for laterally holding said body portion and for restricting convective air currents around said container, said means consisting of comminuted heat-insulating material surrounding said body portion to thereby substantially prevent lateral movements of said body portion.

23. A heat-insulated receptacle of the non vacuum type, including a non-frangible outer jacket, an inner frangible container having a neck, the neck of said container being laterally positioned by an adjacent part of said jacket, and the body of said container being laterally sustained in the body of said receptacle by a mass of comminuted heat-insulating material disposed in the space between said bodies to restrict convective currents of air therein and to limit the amplitude of pendulous movement of the body of said container.

24. A heat-insulated receptacle of the non-vacuum type, including a non-frangible outer jacket, a strong inner frangible container positioned at its upper end by an adjacent part of said jacket, and heat insulating material disposed within said jacket, filling the space between said jacket and said container and of sufficient density to substantially prevent said container from whipping, vibrating or oscillating at its lower end.

In testimony whereof he affixes his signature in the presence of two witnesses.

LEWIS VAN DEVENTER BLAIR.

Witnesses:

CARL J. POWERS,

B. E. FACTOR.