An insulator bottom disk of uniform size comprising a multi-sided prism with flat top and bottom surfaces that are parallel to each other, a lateral surface that alternates between angling inward and outward, and a small diameter, cylindrical-shaped hole through its geometric center. The insulator bottom disk of uniform size eliminates the need for: (i) manufacturing multiple sizes of insulator bottom disks, (ii) matching appropriately sized insulator bottom disks to insulator tubes and (iii) adhering insulator bottom disks to insulator tubes.
BOTTOM DISK FOR INSULATED BEVERAGE CONTAINER

FIELD

[0001] The present invention relates in general to insulated beverage containers, and in particular to a uniform sized bottom disk for such containers that eliminates the need for: (i) manufacturing multiple sizes of insulator bottom disks, (ii) matching appropriately sized insulator bottom disks to insulator tubes and (iii) adhering insulator bottom disks to insulator tubes.

BACKGROUND

[0002] Insulated containers for beverage cans and bottles ("Insulators") are manufactured in various sizes and shapes. Insulators are often placed around the outside of beverage containers in order to thermally insulate a hot or cold beverage and to allow a user to comfortably grasp the container regardless of the temperature of the beverage and container. Insulators are typically manufactured in various sizes in order to specifically fit beverage containers of a particular size and shape. A few examples of Insulators are disclosed in U.S. Pat. Nos. 5,381,922; 5,653,124; 4,577,474; 4,338,795; and 6,655,543 B2.

[0003] Insulators are generally tubular in shape with an open, circular top and closed, circular bottom (FIG. 1). Insulators are typically comprised of two separate components: a tube 1 and a conventional bottom disk 2. Both the tube 1 and the conventional bottom disk 2 are generally made out of an insulating foam material such as, for example, foamed polystyrene. The tube 1 is typically a round cylinder that is open on both ends with a thickness 3 of approximately 3 to 12 millimeters. A conventional bottom disk 2 is shaped as a round disk with a diameter 4 much greater than its width 5. A conventional bottom disk 2 is designed to fit into either of the open, circular ends of a tube 1. Placement of a conventional bottom disk 2 into one end of the tube 1 creates an Insulator with a generally closed, circular bottom and an open circular top.

[0004] A conventional bottom disk 2 contains a small diameter, cylindrical-shaped hole through its geometric center (the "Center Hole") 6. The Center Hole 6 allows air to pass out of an Insulator when, for example, a beverage container is placed into the Insulator and allows air to enter an Insulator when a container is removed from the Insulator. This air movement assists the movement of a beverage container into and out of an Insulator.

[0005] Tubes 1 are typically manufactured with one of several predetermined inside diameters. The inside diameter of the tube 4 is typically chosen to match a beverage container of a particular size and shape so that the container will snugly slip inside the Insulator through its open, circular top. Similarly, conventional Insulator bottom disks are manufactured so that the outside diameter of the bottom disk 4 corresponds to the choice of inside diameter of the corresponding tubes 4.

[0006] To assemble an Insulator, an appropriately-sized conventional bottom disk 2 must be pressed into one of the open ends of the tube 1. In addition, a glue-based adhesive is necessary to adhere the bottom disk 2 to the bottom of the tube 1. This assembly procedure is often cumbersome because of the difficulty in compressing the entire outer circumference of the bottom disk 2 at the same time so that it will fit into the bottom of the tube 1. Moreover, the glue-based adhesive will fail to adhere the bottom disk 2 to the entire bottom of the tube 1 unless a minimum amount of the adhesive is applied to the lateral surfaces of the bottom disk 2.

SUMMARY

[0007] The manufacturing of conventional Insulator bottom disks of several predetermined outside diameters also has a number of disadvantages. For example, manufacturers must adjust machinery and input materials to make bottom disks 2 of different diameters, manage the inventory of the various disk bottom sizes, and match the various disk bottom sizes to tube sizes in order to assemble Insulators. As a result, the manufacturing of conventional insulator bottom disks 2 of several predetermined outside diameters is both cumbersome and expensive. Thus, an insulator bottom disk of uniform size that will fit several tube diameters and is easy to assemble is desirable.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present invention provides an Insulator bottom disk of uniform size that eliminates the need for: (i) manufacturing multiple sizes of insulator bottom disks, (ii) matching appropriately sized Insulator bottom disks to Insulator tubes and (iii) adhering Insulator bottom disks to Insulator tubes. The bottom disk of the present invention has a lateral surface that alternates between angling inward and outward. This angle variation of the lateral surface allows the present invention to fit several Insulator tube diameters. As a result, the present invention can be manufactured in a uniform size that fits multiple sizes of Insulator tubes, is easy to assemble and has a reduced need for an adhesive.

DETAILED DESCRIPTION OF THE INVENTION

[0009] A better understanding of the present invention may be had by reference to the drawing figures, wherein:

[0010] FIG. 1 is a bottom view of a beverage container insulator with a conventional bottom disk;

[0011] FIG. 2 is a top view of a schematic drawing of the preferred embodiment of the present invention; and

[0012] FIG. 3 is a bottom view of a beverage container insulator with a conventional bottom disk.

[0013] Referring now to the drawings, wherein like reference numerals designate identical or corresponding parts throughout the several views, and more particularly to FIG. 1, wherein a conventional bottom disk 2 is partially pressed into a tube 1 to form the bottom of an Insulator. Both the tube 1 and the conventional bottom disk 2 are comprised of an insulating foam material. The tube 1 is a round cylinder with a thickness 3 of approximately 4 to 15 millimeters, although greater thicknesses may be used as well, and an inside diameter 4 that matches the outside diameter of the conventional bottom disk 2. The conventional bottom disk 2 is shaped as a round disk with a diameter 4 much greater than its width 5. Every point on the edge of the lateral surface of the conventional bottom disk 7 is the same distance from the geometric center of the conventional...
bottom disk. The conventional bottom disk 2 may also contain a small diameter, cylindrical-shaped hole through its geometric center 6.

[0014] As can be seen in FIG. 1, a portion of the conventional bottom disk buckles upward where it has not been sufficiently pressed into the tube 8. This buckled area 5 often results from the difficulty in compressing the entire outer circumference of the bottom disk 7 at the same time so that it will fit into the bottom of the tube 1.

[0015] Referring now to FIG. 2, the preferred embodiment of the present invention is an insulator bottom disk having top and bottom surfaces parallel to one another. The disk is generally round with one or more cutouts removed from the disk at the outer edge of the disk. More specifically, the present invention has a lateral surface that alternates between angling inward 9, 10, 11, and 12 and angling outward 13, 14, 15, and 16 such that points on the lateral surface area that angle inward 18 are closer to the geometric center of the bottom disk 6 than points on the lateral surface area that angle outward 17. Also, the lateral surface alternates between angling inward and outward such that the lateral surface area that angles outward is adjacent to two lateral surface areas that angle inward and a lateral surface area that angles inward is adjacent to two lateral surface areas that angle outward.

[0016] FIG. 2 shows the present invention with a lateral surface that angles inward in four places 9, 10, 11 and 12 and angles outward in four places 13, 14, 15 and 16. Alternately, however, the lateral surface of the present invention may angle inward or outward in more or less than four places. In addition, even though FIG. 2 shows the angle variation in the lateral surface to be smoothly curved inward and outward, the angle variation may alternatively include discrete angle changes. The present invention may be formed out of an insulating material, including a flexible insulating material.

[0017] Referring now to FIG. 3, the present invention is designed to fit into either of the open, circular ends of an Insulator tube. Placement of the bottom disk into one end of the tube creates an Insulator with a closed, circular bottom and an open circular top (FIG. 3). Like a conventional bottom disk 2, the present invention contains a Center Hole through its geometric center 6 although such a hole is not an integral part of the present invention. The present invention allows for additional openings in an Insulator's bottom where the invention's lateral surface area angles inward 9, 10, 11, and 12. These additional openings further assist movement of a beverage container into and out of an Insulator by allowing air to pass out of the Insulator when a container is placed into the Insulator and allowing air to enter the Insulator when a container is removed from the Insulator. In those cases where the Center Hole is present, this air movement through the openings is in addition to the air movement through the Center Hole 6. As a result, a beverage container can more easily be placed into or taken out of an Insulator with the present invention as its bottom than with a conventional bottom disk as its bottom.

[0018] Unlike a conventional bottom disk 2, the present invention fits tubes 8 with different inside diameters. In the preferred embodiment, only the outward angled sides 13, 14, 15, and 16 must be compressed to allow the present invention to fit into one of the open ends of a tube 1. As the outward angled sides 13, 14, 15, and 16 are compressed, the inward angled sides 9, 10, 11, and 12 will contract slightly. This contraction of the inward angled sides prevents the creation of shear stresses that are created through the compression of the entire outer circumference of a conventional bottom disk 7. As a result, the present invention fits into multiple sized tubes 8 through the simple application of different amounts of pressure to the outward angled sides. In addition, the present invention fits more securely into a tube bottom than a conventional bottom disk 2 without buckling.

[0019] In the present invention, only the lateral surface areas that angle outward contact the tube wall when the present invention is pressed into the tube bottom to create an Insulator. For this reason, the area of contact between the present invention and the tube 1 is less than the area of contact between a conventional bottom disk 2 and the tube 1. This reduction in contact area reduces the amount of glue-based adhesive that is needed to adhere the present invention to a tube. At the same time, the need for a glue-based adhesive is further reduced, or eliminated, by the fact that the present invention fits more securely into a tube bottom than a conventional bottom disk 2 due to shear stress reduction.

[0020] The manufacturing and assembly of Insulators with the present invention has a number of advantages over the manufacturing and assembly of Insulators with conventional bottom disks. For example, with the present invention, manufacturers do not have to adjust machinery or adjust input materials to make bottom disks of different diameters, manage the inventory of the various bottom disk sizes, and match the various bottom disk sizes to tube sizes in order to assemble Insulators. As a result, the manufacturing and assembly of Insulators with the present invention is less cumbersome and less expensive than with conventional bottom disks 2.

[0021] Numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein. In particular, it is understood that the present invention may be practiced by adoption of aspects of the present invention without adoption of the invention as a whole.

What is claimed is:
1. A bottom disk for an insulated beverage container, comprising:
   a disk having a top surface, a bottom surface and a lateral surface, wherein said lateral surface alternates between angling toward the center axis of said disk and angling away from said center axis of said disk.
2. The disk of claim 1, wherein said disk is formed from an insulating material.
3. The disk of claim 1, wherein said disk is between 3 millimeters and 12 millimeters in thickness.
4. The disk of claim 1, wherein said disk includes a hole along said center axis.
5. A bottom disk for an insulated beverage container, comprising:
a disk having a top surface and a bottom surface, wherein said top surface and said bottom surface are parallel to one another and are generally circular in shape around a center axis,
said disk further having a lateral surface around the circumference of said center axis wherein said lateral surface alternates between angling toward the center axis of said disk and angling away from said center axis of said disk.

6. The disk of claim 5, wherein said disk is formed from an insulating material.
7. The disk of claim 5, wherein said disk is between 3 millimeters and 12 millimeters in thickness.
8. The disk of claim 5, wherein said disk includes a hole along said center axis.
9. A bottom disk for an insulated beverage container, comprising:
a disk having a top surface and a similarly shaped bottom surface, wherein said top surface and said bottom surface are located in parallel planes and are generally circumscribed around a central axis, said disk further having a lateral surface located between the outermost circumference of said top surface and the outermost circumference of said bottom surface, wherein said lateral surface alternates between angling toward the center axis of said disk and angling away from said center axis of said disk.

10. The disk of claim 9, wherein said disk is formed from an insulating material.
11. The disk of claim 9, wherein said disk is between 3 millimeters and 12 millimeters in thickness.
12. The disk of claim 9, wherein said disk includes a hole along said center axis.
13. An insulated beverage container, comprising:
a disk having a top surface, a bottom surface and a lateral surface, wherein said lateral surface alternates between angling toward the center axis of said disk and angling away from said center axis of said disk, and
a tube coupled with said disk.
14. The disk of claim 13, wherein said disk is formed from an insulating material.

15. The disk of claim 13, wherein said disk is between 3 millimeters and 12 millimeters in thickness.
16. The disk of claim 13, wherein said disk includes a hole along said center axis.
17. An insulated beverage container, comprising:
a disk having a top surface and a bottom surface, wherein said top surface and said bottom surface are parallel to one another and are generally circular in shape around a center axis, said disk further having a lateral surface around the circumference of said center axis wherein said lateral surface alternates between angling toward the center axis of said disk and angling away from said center axis of said disk, and
a tube coupled with said disk.
18. The disk of claim 17, wherein said disk is formed from an insulating material.
19. The disk of claim 17, wherein said disk is between 3 millimeters and 12 millimeters in thickness.
20. The disk of claim 17, wherein said disk includes a hole along said center axis.
21. An insulated beverage container, comprising:
a disk having a top surface and a similarly shaped bottom surface, wherein said top surface and said bottom surface are located in parallel planes and are generally circumscribed around a central axis, said disk further having a lateral surface located between the outermost circumference of said top surface and the outermost circumference of said bottom surface, wherein said lateral surface alternates between angling toward the center axis of said disk and angling away from said center axis of said disk, and
a tube coupled with said disk.
22. The disk of claim 21, wherein said disk is formed from an insulating material.
23. The disk of claim 21, wherein said disk is between 3 millimeters and 12 millimeters in thickness.
24. The disk of claim 21, wherein said disk includes a hole along said center axis.

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