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EXHAUST TIP PROTECTOR FOR VACUUM INSULATED VESSELS

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FIG. 1

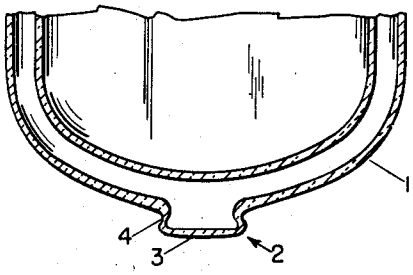

FIG. 2

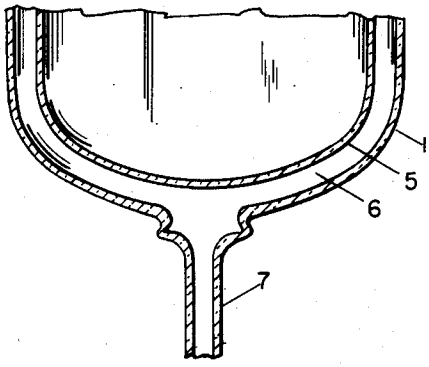

FIG. 3

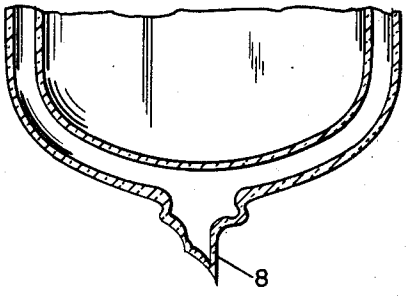

FIG. 4

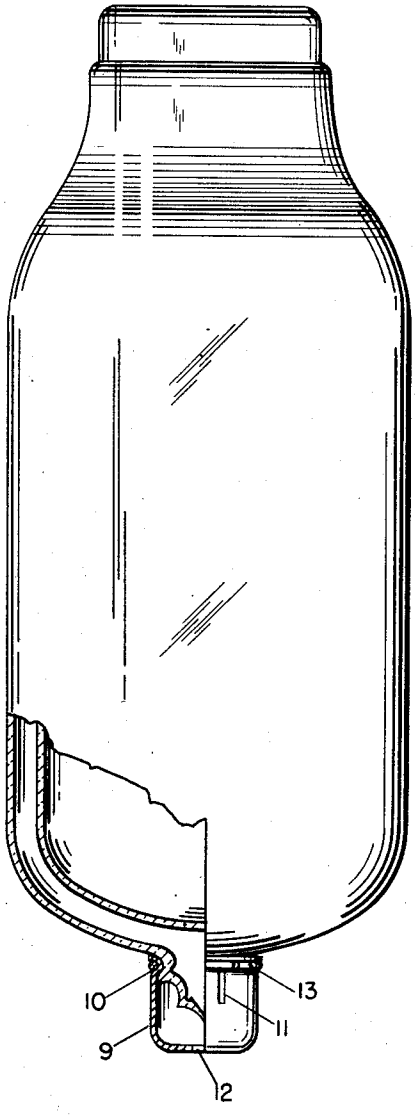

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FIG. 5

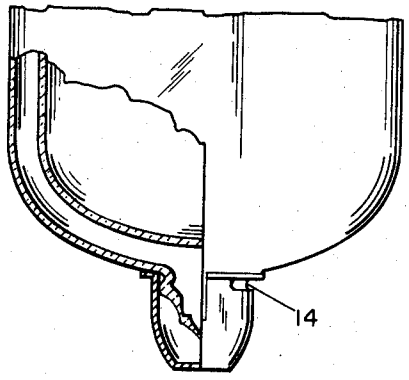


FIG. 6

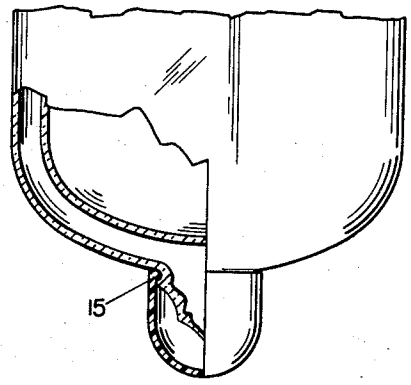


FIG. 7

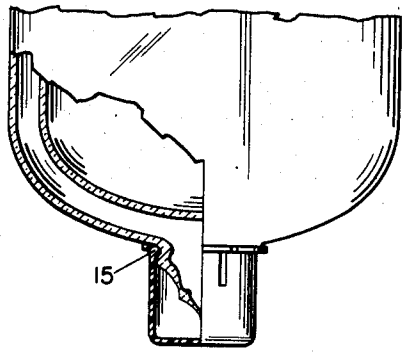
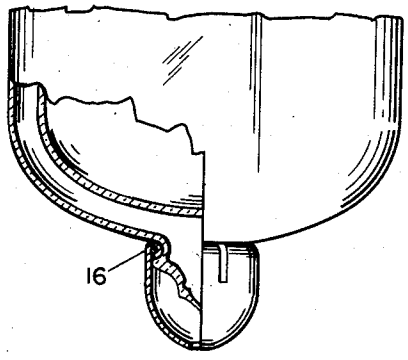


FIG. 8



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2,534,295

EXHAUST TIP PROTECTOR FOR VACUUM INSULATED VESSELS

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Application January 5, 1949, Serial No. 69,282

4 Claims. (Cl. 215—13)

1

This invention relates to means for protecting the fragile exhaust tips of vacuum insulated glass flasks, bottles or other vessels, against breakage in handling and shipping. In making such vessels the space between the inner and outer walls is evacuated, usually through the bottom, by means of a glass tube which pierces the outer wall and is sealed to it. After evacuation the tube itself is sealed by drawing it down to a fine fragile point. This point is easily broken in subsequent handling and when this happens the vacuum is destroyed and the vessel made useless for its intended purpose. Means have been provided in the assembly of complete vacuum insulated vessels to guard the exhaust tip against contact with the shock absorber or with the sides or bottom of the metal barrel or case in which it is ultimately housed for use, but these means have served only to protect the tip while the vessel proper, or filler, is within the case and are inadequate to protect it against breakage before assembly or when the filler has been removed for cleaning or inspection. Attempts have also been made to secure a protector directly upon the tip itself, but these have failed, first because of adhesive difficulties, and secondly because a cap making contact with the weakened tip, transfers physical shock or pressure directly to the tip, resulting in breakage, despite the ostensible protection of the cap.

The object of the present invention is to devise means for protecting the tips of vacuum insulated vessels which will be free of the foregoing objectionable features. In attaining this object we have provided a protector which is mechanically attached to the outer wall of the filler, and envelops the fragile tip without touching any part of it. We have attained this object by providing the outer wall of the filler with an undercut button or base portion through which evacuation takes place and from which the fragile tip projects afterwards. Over this button or base portion with its undercut peripheral edge we place a cap having a resilient lip which snaps into the recess of the undercut where it holds the cap firmly in place over but not touching the tip, either by its own resiliency, or by means of an encircling ring.

In the accompanying drawing we have illustrated certain preferred embodiments of our invention. In these drawings

Figure 1 is a transverse, vertical section through the bottom of the outer wall of a vacuum insulated bottle before assembly, showing the undercut button;

Figure 2 is a vertical section through the bottom of the glass filler of a vacuum insulated bottle after tubulation, showing the inner and outer walls assembled;

Figure 3 is a view similar to Figure 2 but after the space between the walls has been evacuated and the tube sealed off, thereby leaving a fine fragile tip;

Figure 4 is an elevation, partly in section, of a vacuum-insulated bottle showing a protector cap in position over the tip, and

Figures 5, 6, 7 and 8 are fragmentary views of the bottom of the bottle shown in Figure 4 but with different forms of tip protectors mounted upon the button.

In these drawings 1 represents the outer member or wall of a double-walled vacuum insulated glass bottle commonly called a filler. At the bottom of this member a button or base portion 2 is pressed outward and provided with a flat face 3, which may be made thin to facilitate tubulation, and an undercut groove 4. In Figure 2 the inner member or wall 5 is shown in assembled position, the inner and outer members being joined together at their mouths in the usual way to form, between them, a space 6. A glass tube 7 pierces the flat face 3 of the button and is sealed to it, the parts being now in readiness for evacuation. The air between the space 6 is withdrawn through the tube 7 and when the required degree of vacuum has been attained the tube is sealed off, as shown in Figure 3, and this produces a fine fragile tip 8. This tip, because of its fragility, constitutes the most vulnerable part of the bottle and it is to shield it from blows and pressure that the present invention has been made.

In Figure 4 we have shown one form of tip protector. This is a metal cap 9 provided externally, just below its lip, with an annular groove 10 which, interiorly, becomes an annular bead, and a plurality of vertical slots 11 extending from the lip downward about half way. A central hole 12 is provided in the bottom of the cap through which the interior may be viewed, if necessary. This cap is mounted upon the button by snapping it into place, the annular bead 10 extending into the undercut 4. The cap can be held in place by its own resiliency, but to insure that it shall not be accidentally removed we can secure it permanently in place by means of a split, pressed wire ring 13 which encircles and lies within the groove 10. This ring prevents the cap from being withdrawn over the edge of the button and to all intents and purposes makes it a permanent fixture.

In Figure 5 we have shown a somewhat simi-

lar cap but with three spaced indentations 14 instead of the groove 10. With this form of cap a split ring cannot well be used and this cap can, therefore, be removed, but is not likely to be accidentally dislodged.

In Figures 6 and 7 we have illustrated two different forms of plastic protectors, an internal annular bead 15 being molded just below the lip of each and snapped in place within the undercut of the button.

In Figure 8 we have shown a modified form of metal protector, the lip of which is provided with an inwardly rolled edge 16 which snaps into place within the undercut of the button.

In all the forms of protectors shown, except that of Figure 4, the protector is held in position by its own resiliency and for most purposes this is enough, but the split ring shown in Figure 4 is additional insurance against accidental removal.

The protector cap of our invention completely envelops the fragile tip and shields it from blows or pressure at all times thereby prolonging the useful life of the bottle.

We claim:

1. A vacuum insulated vessel comprising spaced inner and outer walls, an exhaust portion protruding from the outer wall, said exhaust portion having a base part with a circumferentially-extending groove and a tip beyind the base part, and a protector for the tip spaced from the tip and having an inwardly-extending portion engaging the groove to retain the protector in place on the base.

2. A vacuum insulated vessel comprising spaced inner and outer walls, an exhaust portion protruding from the outer wall, said exhaust portion having a base part with a circumferentially-extending groove and a tip beyond the base part, and a protector for the tip spaced from the tip and having a resilient edge portion lying within the groove and retaining the protector in place on the base.

3. A vacuum insulated vessel comprising spaced inner and outer walls, a button protruding from the outer wall having a circumferentially-extending groove and also having an exhaust tip projecting from it, and a protector for the tip spaced from the tip and having an inwardly-extending portion engaging the groove to retain the protector in place on the button.

4. A vacuum insulated vessel comprising spaced inner and outer walls, an exhaust portion protruding from the outer wall, said exhaust portion having a base part with a circumferentially-extending groove and a tip beyond the base portion, a protector for the tip spaced from and embracing the tip, and a wire ring permanently holding a portion of the protector within the groove.

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