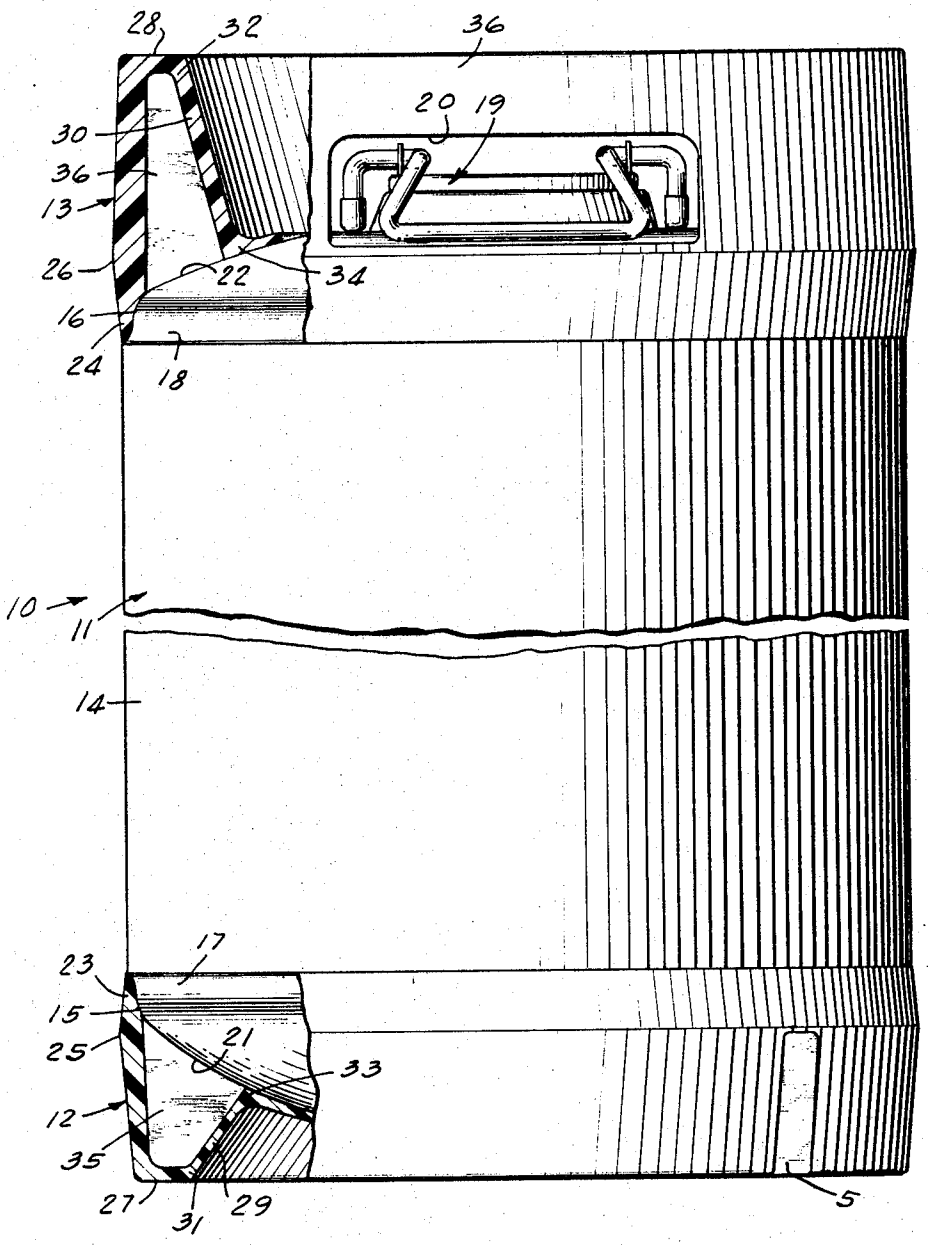
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BEVERAGE TANK ASSEMBLY

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BEVERAGE TANK ASSEMBLY

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1 Claim. (Cl. 220—66)

ABSTRACT OF THE DISCLOSURE

A beverage tank having elastomeric bases of skirts at its ends which have a maximum outside diameter larger than the tank, there being an air space behind such maximum diameter, each base or skirt terminating in a flange seated against a generally axially projecting annular tank shoulder without projecting radially from said tank at said shoulder, the bases or skirts being more yieldable to shocks than said tank.

This application is a division of my copending application, Ser. No. 421,423, filed Dec. 28, 1964, now U.S. Patent No. 3,349,940.

This invention relates generally to beverage tank assemblies, and more specifically to such a device that is resistant to handling shocks.

Although the principles of the present invention may be included in various tanks, a particularly useful application is made in a tank of the type employed to transport premixed carbonated beverages from a bottling plant to a point of sale. Such usage includes the transport of beverage syrup or concentrate to a geographical point where further dilution or mixing is to take place.

In devices of this general type known previously, during the handling thereof, on occasion severe shocks have been imparted to the tank assembly. It has been previously proposed to provide a shock absorbent foot or base, or to provide a shock absorbent foot and head to such tanks. However, such foot or base has oftentimes served to transmit the shock to the tank so that the tank has become dented. Further, a previous such foot or head has projected beyond the outside diameter of the tank in such a manner as to create a ridge which would prevent the tank from being dragged on its side horizontally across a rack without catching or without a risk of peeling the foot or base from the tank.

The present invention contemplates the utilization of a structure by which these problems are avoided, and for that purpose, the tank is provided, in a preferred embodiment, with a pair of skirts, each of which has a portion that extends beyond the tank both axially and radially, and especially the lower skirt has a collapsible portion which will yield before the tank will. Further, the means by which each of the skirts is attached to the tank is placed in shear. The foregoing has been obtained (1) without creating a ridge that prevents sliding of the tank on a truck rack, (2) while maintaining good cleaning and washability of the interior of the tank, and (3) while structure is provided that resists sag due to the stacking.

Accordingly, it is an object of the present invention to provide a shock resistant beverage tank assembly.

Another object of the present invention is to provide a tank assembly which may be subjected to shocks without such shock being transmitted to the tank in such a way as to dent the same.

A still further object of the present invention is to provide a beverage tank assembly of such construction that the means by which a skirt is attached to the tank is placed in shear as a result of shocks.

Yet another object of the present invention is to provide a beverage tank assembly wherein the tank may be slid horizontally on a rack without any resulting binding, obstruction, or risk of peeling.

A still further object of the present invention is to provide the foregoing while maintaining cleaning and washability of the interior, and resistance to sag due to stacking of a number of such tanks on top of each other.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheet of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

The single figure is a side elevational view of the ends of a beverage tank assembly provided in accordance with the principles of the present invention, in which figure the upper and lower skirts are partially broken away and shown in cross section.

As shown on the drawings:

The principles of this invention are particularly useful when embodied in a beverage tank assembly such as illustrated in the drawing, generally indicated by the numeral **10**. The tank assembly **10** includes a tank **11**, at least one lower elastomeric skirt **12**, and preferably a second upper elastomeric skirt **13**.

The tank **11** includes an elongated cylindrical central portion **14**, part of which is broken away in the drawing, a somewhat shorter lower cylindrical section **15**, an upper cylindrical section **16** of reduced diameter, and a substantially axially facing lower shoulder **17** and a substantially axially facing upper shoulder **18**. The lower shoulder **17** is directed in a generally downward direction while the upper shoulder **18** is directed in a generally upward direction. The shoulders **17** and **18** smoothly coaxially connect the cylindrical sections **15, 16** with the elongated cylindrical central portion **14** to provide a smooth interior. The tank **11** comprises a relatively thin wall of stainless steel and thus may be internally cleaned and washed, access to the interior being had by means of a removable cover assembly **19** which is visible through a hand hole **20** in the upper skirt **13**. The short generally cylindrical sections **15, 16** blend smoothly with a lower dome end **21** and an upper dome end **22** which are also of quite thin section so as to be susceptible of denting.

The elastomeric skirt **12** includes a annular flange **23**, and the elastomeric skirt **13** includes an annular flange **24**, the flanges **23** and **24** being respectively seated against the shoulders **17** and **18**. The interface between the flanges **23, 24** and the cylindrical sections **15, 16** comprises a bond such as of cement by which the skirts **12** and **13** are secured to the tank **11**. When a shock is applied to the skirt **12** or the skirt **13** in a generally axial direction, such shock is transmitted by the flanges **23, 24** to the shoulders **17, 18**, and any force tending to separate the bond of the flanges **23, 24** with the cylindrical sections **15, 16** acts in shear on such bonds without tending to peel any portion of the skirt **12, 13** from the tank **11**.

It is impractical to mold a device to a feather-edge, but the construction of the flanges **23, 24** is such that there is a definite substantial thickness of material at the shoulders **17, 18**, the radial thickness of such flanges **23, 24** being such as to make the outer surface of the flanges **23, 24** flush with the adjacent surface of the tank **11**. When the assembly **10** is laid on its side and dragged across a truck rack, there is thus provided no ridge to engage any transversely extending obstruction on such truck rack, whereby the tank may be easily slid in a horizontal direction when lying on its side, and without risk that the end

of the trailing flange **23** or **24** might be snagged and possibly peeled from the tank **11**.

One of the most important features of the present invention is that the outer wall of the skirts **12, 13** includes a portion **25, 26** which has a radius greater than the central portion **14** of the tank **11**, such outer wall portions **25, 26** lying axially beyond the adjacent end of the tank to provide an air space between such outer wall portions **25, 26** and the tank.

The annular flanges **23, 24** extend axially to provide a pair of end support surfaces **27, 28**, the support surface **27** serving to support the tank assembly **10** on a horizontal surface in an upright manner, and the support surface **28** serving to support like assemblies resting on their surfaces **27** on such surface **28**.

The skirt **12** includes bracing means **29** and the skirt **13** includes bracing means **30** which are respectively integral with the annular flanges **23, 24**, and the bracing means **29, 30** are less resistant to collapse than the ends **21, 22** of the tank **11** are to indentation. In this embodiment, the bracing means **29, 30** comprises a frusto-conical web secured at its larger diameter **31, 32** to the axially outer end of the annular flanges **23, 24**, and at its smaller diameter **33, 34** to the ends **21, 22** of the tank **11**. If desired, a number of radially extending webs **35, 36** are provided to interconnect the bracing means **29, 30** with the annular flanges **23, 24**. These webs are disposed about the tank axis, extend in a radial direction, and there typically would be 20 such webs per skirt spaced uniformly, there being a drain groove **5** provided as needed in lieu of handle openings such as **20**. The webs **35, 36** make the skirts **12, 13** resistant to sagging as a result of stacking, while they do not adversely affect the ability of the bracing means **29, 30** to collapse in response to somewhat greater shocks.

If a filled tank were standing vertically and were supported on the surface **27**, and were then knocked over, the radially projecting outer surface portion **26** of the upper skirt **13** would engage the flat supporting surface, and a shock would be transmitted radially inwardly through the flange **24**. However, as there is no portion of the tank immediately in back of the portion **26** of the flange **24**, the flange **24** would merely yield radially inwardly at the enlarged radius **26**, thereby absorbing the shock without transmitting a denting force to the enclosed upper end **22** of tank **11**. A similar result would take place if a blow were applied against the radially outwardly projecting surface portion **25** of the skirt **12**. The portions **25, 26** thus also absorb horizontal blows which can be transmitted from tank-to-tank when and if they are slammed against each other laterally. If the tank assembly **10** were being carried by a handle portion **36** defined by the hand hole **20**, and were then set down rather sharply, there would be a tendency to transmit a force from the lower surface **27** through the bracing means **29** against the undersurface of the lower end **21** of the tank **11**. However, as the frusto-conical bracing means **29** is of somewhat thinner cross-sectional configuration, it buckles relatively easily in absorbing such shock, allowing the flange portion **23** to bend in the nature of a cantilever, without

transmitting a tank-denting force to the enclosed lower end **21** of the tank. Owing to the resiliency of the elastomeric material, the shapes of the skirts **12, 13** are immediately self-restoring. Preferably, the material of the skirts **12, 13** has a hardness of durometer 95.

Thus by the present invention, the tank assembly **10** is so constructed as to be resistant to dents or indentations, particularly of the type that would be concealed by the skirts **12, 13**, whereby the good washability of the interior of the tank **11** has not been adversely affected, and whereby the internal volume of the tank has not been unknowingly changed. Further, also, the rough handling forces or shocks are thus absorbed and transmitted in such a manner that the skirts **12, 13** do not tend to separate from the tank **11**, and the configuration enables the use of a relatively large bonding area, whereby an overall high quality product is provided. Even though two closely adjacent vertical tanks may support a third tank which straddles such two tanks, the four points of support both given and received resist sagging so that the stacked tanks will not tip of their own properties.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A tank assembly comprising in combination:

(a) a cylindrical tank having a pair of external axially-directed annular shoulders respectively disposed near the outer ends thereof; and

(b) a pair of annular support skirts of resilient material, said skirts respectively having annular flanges secured to and seated against said shoulders, said skirts each having an outer wall diameter intermediate its ends and lying axially beyond the end of the tank, such outer wall diameter being greater than any outside diameter on said tank, said greater outside skirt diameter tapering smoothly to a smaller diameter at said flanges such that said resilient flanges are substantially flush with the outside diameter of said tank at said shoulders, and bracing means comprising a frusto-conical web integral at its larger diameter with the axially outer end of said annular flange and secured at its smaller end to said one end of said tank, and being less resistant to collapse than said tank is to indentation.

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