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[31] **15965A/68**

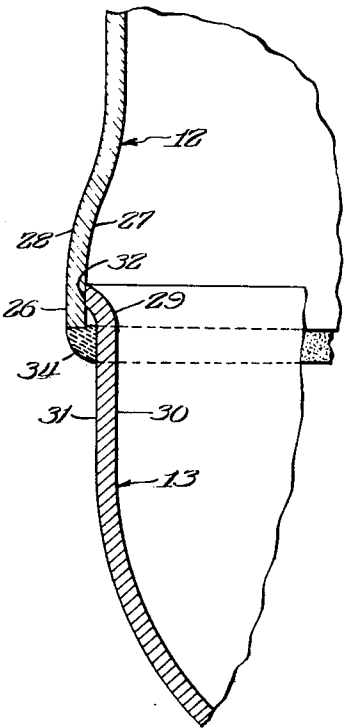
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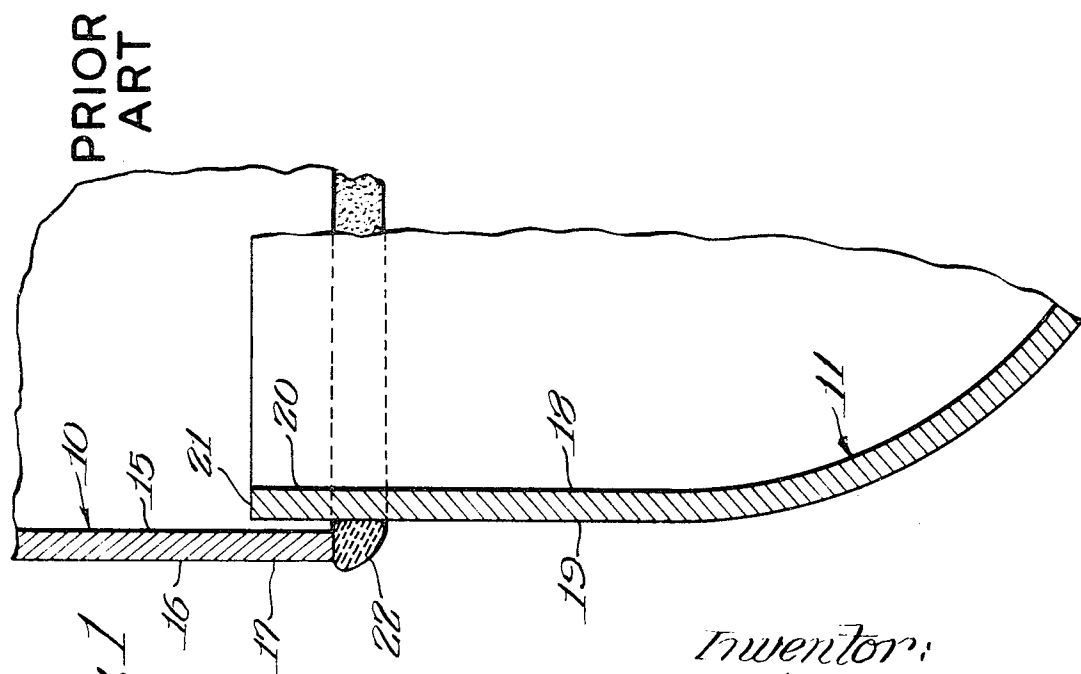
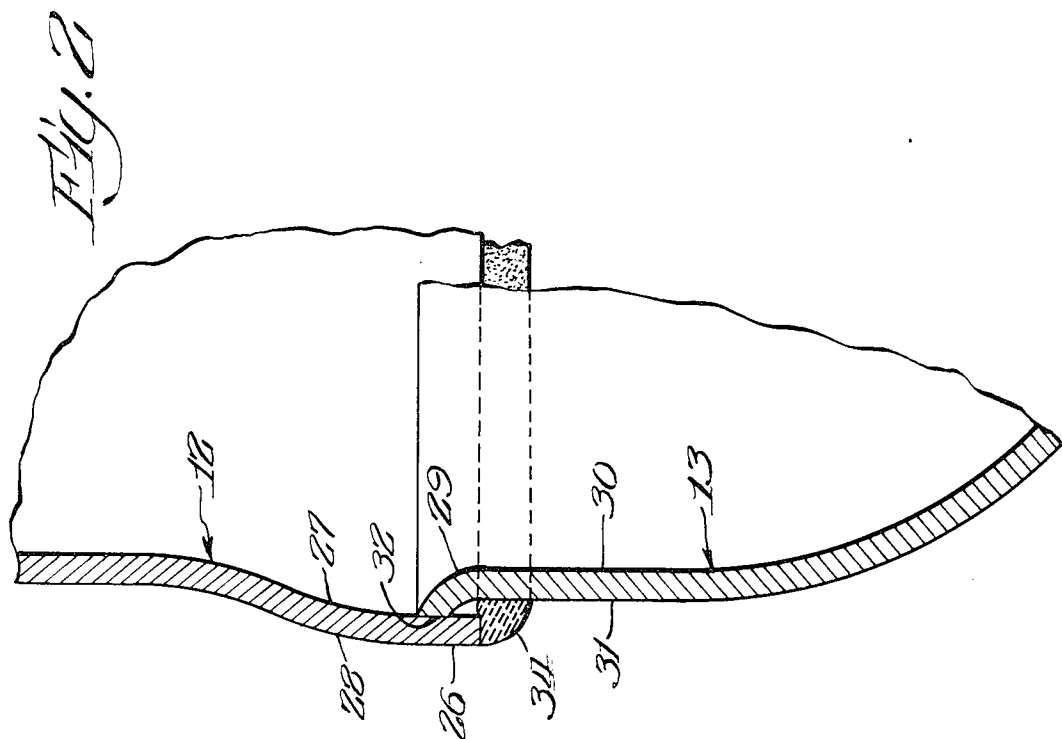
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[54] **SEAL FOR JOINING HOLLOW CYLINDRICAL BODIES TO DISHED CAPS AND METHOD OF PROVIDING SAME**
1 Claim, 2 Drawing Figs.

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ABSTRACT: A cylindrical water tank body is joined with a dished cap which forms the water tank bottom by flaring both the edge of the body and the edge of the cap outwardly so that the lower edge surface of the cap fits against the inner flared surface of the body to hold the cap in a fixed position. The cap is then welded to the body.





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SEAL FOR JOINING HOLLOW CYLINDRICAL BODIES TO DISHED CAPS AND METHOD OF PROVIDING SAME

BACKGROUND OF THE INVENTION

This invention relates to a construction for a seam between a dished cap and a hollow cylindrical body and a method of forming such a seam.

Boilers for water heaters normally consist of a hollow cylindrical body or barrel which is closed off at its bottom end by a dished cap with the concave surface of the cap facing the interior of the hollow cylindrical body. The connection or seam between the cap and the body is normally provided by welding the flat parallel side surface of the cap to a side surface of the cylindrical body. When such a seam is made, a cross section of the water tank reveals that certain of the surfaces on the interior of the water tank are perpendicular; namely, the lower edge surface of the dished cap and the inner wall surface of the cylindrical body are perpendicular to each other. Perpendicular surfaces on the interior of the water tank are undesirable because they adversely affect the uniformity of the glazed lining material on the interior of the tank. For example, glazed enamel may be deposited on the inside of the water heater tank to extend tank life. The glaze does not deposit properly where perpendicular surfaces intersect in the water tank. The sharp edge tends to prevent adherence of the glaze on the edge. This results in accelerated corrosion of the water tank and in addition provides a source for nucleation or formation of air bubbles which impair the proper functioning of the water heater.

It is thus the purpose of the present invention to eliminate these disadvantages by providing a seam or joint between a dished cap and a cylindrical body which does not have sharp corners, but rather is a gradual seam between parts.

SUMMARY OF THE INVENTION

In a principal aspect the present invention comprises an improved construction of a seam or joint between the cylindrical body and the dished cap of a tank. The seam is formed by providing the cylindrical body or the dished cap with an outwardly flaring edge portion. When the edges of the body and cap are joined, the flared edge parts mate and may be welded to provide intersecting interior surfaces which intersect at an angle greater than 90°.

It is thus an object of the present invention to provide an improved joint or seam for joining a cylindrical body with a dished cap.

It is a further object of the present invention to provide an economical and simple method for joining the body and cap of a water heater tank.

One further object of the present invention is to provide a method for joining a cylindrical body with a dished cap wherein the resulting container does not include any sharp angles or edges formed by or in the surfaces on the interior of the formed container.

These and other objects, advantages and features of the invention will be set forth in greater detail in the description which follows.

BRIEF DESCRIPTION OF THE DRAWING

In the detailed description which follows reference will be made to the drawing comprised of the following figures:

FIG. 1 is a cross-sectional view illustrating the prior art method of joining a cylindrical body to a dished cap, and

FIG. 2 is a cross-sectional view of a cylindrical body and dished cap construction of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, there is shown a typical prior art seam construction for a cylindrical body or barrel 10 of a boiler of a water heating apparatus joined to a dished cap or bottom 11 of a boiler of a water-heating apparatus. The cylin-

drical body 10 includes an inner surface 15, an outer surface 16 and an upper edge portion 17. Similarly, the cap 11, which has its concave surface facing the interior of the body 10, includes an inner surface 18, an outer surface 19, an edge portion 20, and an edge surface 21.

After the edge portion 17 of the body 10 is properly aligned with the edge portion 20 of the cap 11, the body 10 and cap 11 are held together by means of a weld 22. The resulting welded seam provides a sharp angular edge on the interior of the boiler tank where the inner surface 18 and the edge surface 21 of the cap 11 intersect. These surfaces 18 and 21 meet at substantially a right angle, and, as previously mentioned, such a sharp edge has an adverse affect on the tank, especially when coating the inside surfaces of the boiler tank with a glaze material, for example.

FIG. 2 illustrates the method and apparatus of the present invention. In FIG. 2 a barrel or body 12 is connected with a cap or bottom 13 to form the water heater boiler tank. As previously described for FIG. 1, the body 12 includes an edge portion 26, an inner surface 27, and an outer surface 28. The cap 13, likewise, includes an edge portion 29, an inner surface 30, and an outer surface 31. The cap 13 also includes a lower edge surface 32. Both the edge portion 26 and the edge portion 29 are flared outwardly so that the lower edge surface 32 fits against the inner surface 27 of the body 12.

The body 12 and cap 13 are then joined together by a weld 34. The angle formed between the inner surface 27 and inner surface 30, where the surfaces meet, is greater than 90°. Thus, the sharp edges on the interior of the tank have been eliminated by providing an angle between the joined surfaces greater than 90°. It should be noted that this desired result may be obtained by flaring only the edge of the cap 13 or the edge of the body or barrel 12, though flaring or both is preferred.

One advantage of this construction results because the cap 13 will not slide beyond a predetermined limit within the barrel 12. In other words the flared upper edge 26 of the tank 12 provides a surface against which the cap 13 abuts. The cap is thereby precisely positioned and held in relation to the barrel 12 for purposes of welding.

Finally, this construction has been tested and tests have shown that deposition of liquid glazed enamel on the boiler tank interior is greatly enhanced. Thus, when the enamel is fired in an oven or furnace in connection with the glazing of such boilers, a more uniform coating results.

What is claimed is:

1. A seam for a tank, said tank including an open ended, cylindrical body and a dished cap over said open end of said body, said cap including an interior surface, a lower edge surface and an exterior surface, said seam comprising, in combination:

a circumferential edge portion of said body at the open end thereof comprising a wall flared outwardly from the longitudinal axis of said body, said wall terminating at the open end of said body and said wall also including an inside and an outside,

a circumferential edge portion of said cap including the lower edge surface, said circumferential edge portion of said cap flared outwardly from the longitudinal axis of said cap, said lower edge surface of said cap defining the maximum diameter of said cap, said lower edge surface of said cap abutting against the inside of said wall and providing a first section of said inside extending outside said tank, said first section not in contact with said cap and defining a diameter no less than said maximum diameter of said cap, and a second section of said inside within said tank, said interior surface of said cap forming an angle of intersection with said second section greater than 90°, and

only a single weld between said exterior surface of said cap and said body adjacent said first section.

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