A relativley smooth seating surface for a gasket for a dishwasher tub formed by an expanding process is made by displacing the material forming the seating surface sufficiently from its original position established by the expanding step that the wrinkles and irregularities formed during the expanding process are merged into the smooth surface.
DISHWASHER TUB GASKET SURFACE


BACKGROUND OF THE INVENTION

1. Field of the Invention:
The invention pertains to the art of dishwasher tubs and the method of making them, and is specifically concerned with forming a smooth gasket seating surface on the tub.

2. Description of the Prior Art:
Applicant is unaware of prior art dishwasher patents considered pertinent to this invention.

One known way of forming the generally right parallelepiped shape of a dishwasher tub is to use the known expanding process in which segmented dies disposed inside the tub form are moved outwardly to form the contours in the tub walls. This process also accommodates forming a gasket seating surface flange intended to be flat. However, it has been my experience that in using the expanding process to form dishwasher tubs, irregularities and wrinkling of the material forming the gasket seating surface frequently occurs. In the past, efforts have been made to flatten the surface fully by squeezing the wrinkles and irregularities out into the flat; however, even with this step it has been my experience that the irregularities and wrinkles are not adequately removed to provide satisfactory seating in all cases.

This problem of irregularities in the material occasioned by use of the expanding process is known generally in the metal working art, as evidenced, for example, in "Metals Handbook" 8th Edition, Volume 4, of the American Society for Metals, wherein it is stated on page 86 that "The presence of gaps between the forming segments is one of the drawbacks of this method and is the reason that an alternative method, such as rubber pad forming, is sometimes selected."

SUMMARY OF THE INVENTION

In accordance with my invention, a relatively smooth seating surface for a gasket on a dishwasher tub is provided by displacing the material forming that surface sufficiently from its original position established by the expanding step that the wrinkles and irregularities, to the extent they exist, are merged into the smooth surface in its displaced position. This is in contrast to the noted restricting step in the prior art in which the surface is retracted in an effort to flatten the surface to squeeze out any irregularities therein. The displacement contemplated in accordance with the invention results in a stretching of the material wherein the final contour of the seating surface is concave.

DRAWING DESCRIPTION

FIG. 1 is a partly broken, schematic, side view of an expanding process arrangement by which the dishwasher tub is initially formed to its general shape;

FIG. 2 is a perspective view of the dishwasher tub as finally formed;

FIG. 3 is a perspective view of the dishwasher tub for the purpose of illustrating in somewhat exaggerated form a character of wrinkles and irregularities which may be formed in the seating surface during the expanding process, and

FIG. 4 is a horizontal section corresponding to the line IV—IV of FIG. 2 and illustrating in somewhat exaggerated form the displaced position of the seating surface.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The dishwasher tub has a generally right parallelepiped shape as formed and shown in FIG. 2 and includes a top wall 10, bottom wall 12, opposite side walls 14 and 16, and rear wall 18, the center portion 20 of which is absent during the expanding process and is subsequently welded to the remainder of the rear wall. The tub also includes an open front space 22 defined by the perimetric border portion generally designated 24. During the expanding process the various embossments, ribs, and the perimetric border portion are also formed, with the exception that the rearwardly directed stub flange 26 along the outer edge of the perimetric border portion occupies the same plane as the front flange 28.

While expanding processes are well known, a schematic illustration of the arrangement for forming a dishwasher tub is shown in FIG. 1 in which the female die or backup is indicated by the numeral 30, the segmented male dies by the numeral 32, and the ram or punch press by the numeral 34. It will be appreciated that FIG. 1 is a simplified schematic and does not show the intricate configurations in the dies to accomplish forming the embossments and the perimetric border portion 24.

During the expanding process illustrated in FIG. 1 the segmented die arrangement occasions the creation of wrinkles and irregularities of a relatively minor nature in different parts of the tub. In most areas the wrinkles and irregularities, because of their minor nature, are insufficient to create any problem and in fact are generally so imperceptible that the tub must be examined relatively closely to detect these irregularities. However, it has been found that as to the seating surface to which a gasket is either attached, or against which it seats for sealing purposes, minor irregularities and wrinkles can and frequently do permit leakage of water at such locations. In FIG. 3, a fragment of the perimetric border 24 is illustrated in which wrinkles 36 and irregularities 38 are shown in exaggerated size on the gasket seating surface 40 of the perimetric border portion. It is here noted that while in the illustrated embodiment the gasket is carried by the door (not shown) of the dishwasher, the problem of irregularities permitting leakage has been found to exist irrespective of whether the surface with the irregularities is that to which the gasket is attached, or is that to which the gasket moves against and seats to effect a seal.

In accordance with the invention, the material forming the seating surface 40 is retracted in a press forming operation to displace substantially all of the material forming the seating surface sufficiently from its original position, as established by the expanding step, that the wrinkles and irregularities are merged into a smooth contoured surface. As seen in FIG. 4, the dash line 42 indicates the original flat plane which the forward surface of the seating surface 40 occupied after the expanding step, with the restricting operation contouring the surface into the concave shape, as viewed from the front of the tub, this concave shape being shown in slightly exaggerated form in FIG. 4. In practice, as
found with the segmented dies used and in which the width of the seating surface 40 is about 0.56 a contoured depth of 0.020 inches plus or minus 0.010 is sufficient to merge the wrinkles and irregularities into a smooth seating surface. It will be appreciated that a material displacing step need not result in a concave form if the original contour is convex instead of flat and the restriking changes the contour from greater convexity to less convexity. However, the concave final contour is the currently preferred arrangement.

The restriking of the seating surface 40 to provide the contour may be accomplished in connection with the press forming step during which the flange 28 is provided at the edge of the front flange 26.

I claim as my invention:

1. A metal dishwasher tub formed to include a plurality of walls and a forwardly open face defined by perimeter border portions including a seating surface for a gasket, said seating surface extending along at least some of the sides of said open face, said seating surface having a concave shape in transverse section, said concave shape being formed by restriking said seating surface to effect sufficient displacement of the material forming said seating surface to eliminate irregularities created in said seating surface during a tub-forming expanding process.

2. A dishwasher tub according to claim 1 wherein said concave shape is presented as viewed from forwardly of said tub.

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