

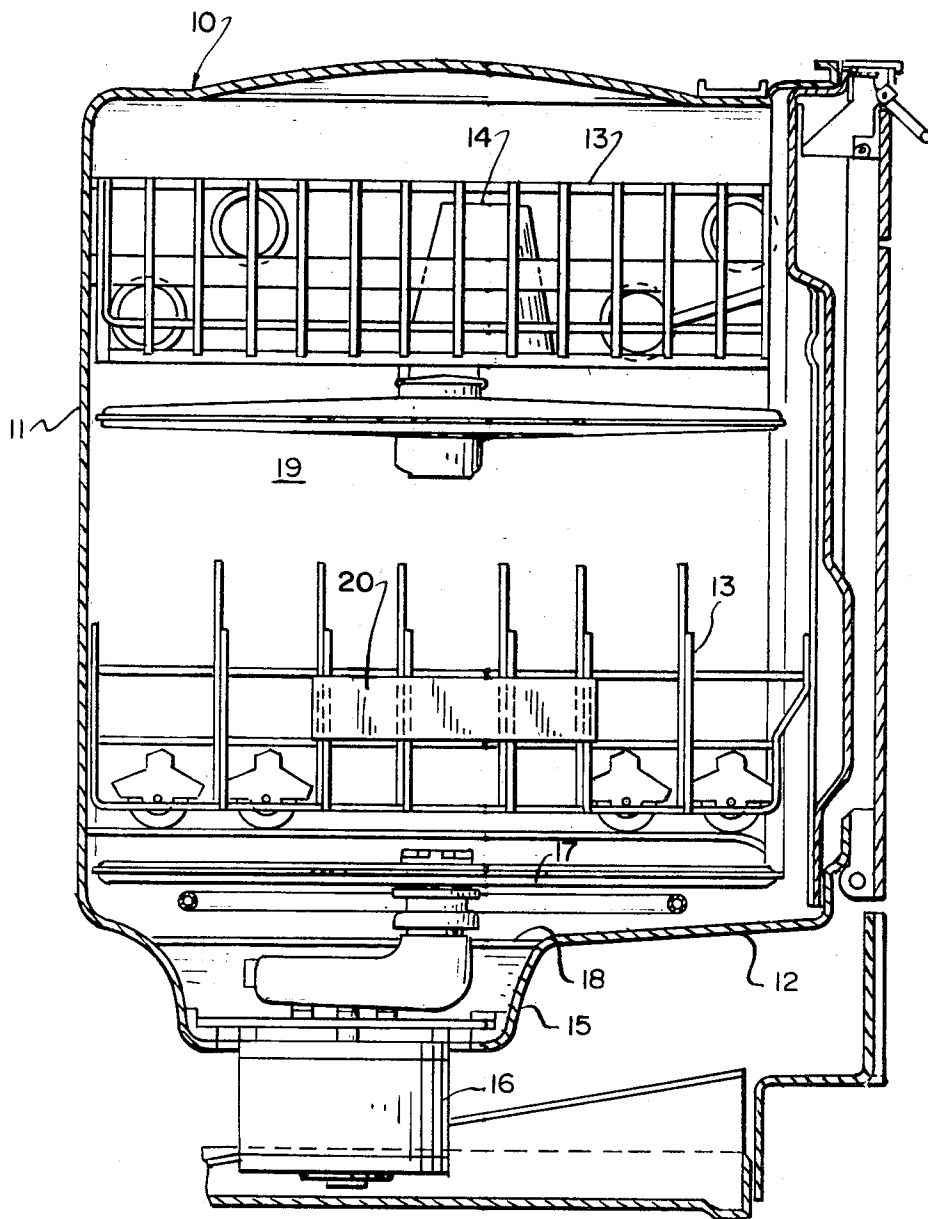
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METHOD TO PREVENT GLASSWARE ETCHING IN A DISHWASHER

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METHOD TO PREVENT GLASSWARE ETCHING IN A DISHWASHER

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8 Claims

ABSTRACT OF THE DISCLOSURE

A method of and apparatus for substantially preventing corrosion of glassware during washing thereof with a corrosion producing detergent solution in a mechanical dishwasher of the household type in which an alkaline detergent solution contacts the glassware for cleaning thereof while simultaneously contacting a piece of metal comprising either zinc or magnesium or a mixture thereof.

BACKGROUND OF THE INVENTION

In washing glassware particularly in mechanical dishwashers of the household type the detergent used to produce the washing solution is quite alkaline with the result that over a period of time the surfaces of the glassware are attacked by the washing solution to produce a permanent cloudy effect due to the corrosion or etching of the glassware surface by the alkaline solution. This glassware etching or corrosion problem is particularly common in soft water areas, but the problem is not limited to such areas. There have been methods and apparatus proposed in the past for preventing such glassware etching or corrosion but these previously proposed methods and apparatus have depended on a galvanic action involving a sacrificial electrode or adding a corrosion inhibiting salt or oxide to the detergent solution.

SUMMARY OF THE INVENTION

In the present invention the corroding or etching of the glassware in a mechanical dishwasher is substantially prevented by contacting the washing solution with a metal comprising either metallic zinc, metallic magnesium or a mixture thereof simultaneously with the applying of a detergent solution to the glassware in the washing portion of the cycle. Although this invention is not limited to any theory of operation it appears that the inhibiting effect of the metal is not the result of a galvanic action and the metallic zinc or magnesium or mixtures thereof does not function as a sacrificial electrode. What appears to be the case is that the washing solution slowly dissolves the metal and deposits it as a protective barrier layer on the glass surface. Because the metal is slowly dissolved it is of course necessary after a period of time to replace the used metal with a fresh metal structure.

One of the features of this invention therefore is to provide an improved method of substantially preventing corrosion of glassware during washing thereof by contacting the washing solution with metallic zinc, metallic magnesium or mixtures thereof.

Another feature of the invention is to provide a mechanical dishwasher for washing glassware which would ordinarily be subjected to corrosive conditions therein by including in the tub in which the glassware is retained during washing a supply of metallic zinc, metallic magnesium or a mixture of them in position to be contacted by the washing liquid.

BRIEF DESCRIPTION OF THE DRAWINGS

In the single figure of the drawing there is illustrated a mechanical dishwasher of the household type embodying

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the apparatus of this invention with which the method of the invention is practiced.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the illustrated embodiment of the drawing the dishwasher disclosed is of the type described and claimed in the prior patent to J. B. Lyman No. 3,444,870 assigned to the same assignee as the present application. Thus, the dishwasher 10 is of the household type that comprises a cabinet 11 enclosing a tub 12 that contains a rack 13 for retaining glassware 14 as illustrated by the single glass held by the rack 13.

In order to circulate washing solution over the rack 13 and dishes including glassware 14 retained therein the bottom of the tub 12 is recessed to form a sump 15 in which is located a motor pump unit 16 that not only draws liquid from the sump 15 for circulation over the rack 13 but which also rotates the customary spray arm 17 through which the washing liquid is forced in sprays to contact articles held in the racks 13. As can be seen the arm 17 is positioned above the top 18 of the sump 15.

In order to prevent substantial corrosion of the glassware 14 by the washing liquid there is mounted on the side of the basket or rack 13 an elongated strip 20 comprising the metal of this invention. This metal may be either zinc, magnesium or a mixture of these and when mounted in this position is contacted by the circulating washing liquid substantially simultaneously with its contacting with the glassware 14. Preferably this mass or strip of metal has an exposed surface area of about sixty square inches with a thickness of at least $\frac{1}{16}$ inch.

In practicing the method of this invention it was noted that with the use of ordinary dishwasher detergent and particularly those containing sequestering materials such as polyphosphates the corroding of the glassware began almost immediately and after relatively few washings the cloudy effect produced on the glassware became quite noticeable. Because this is the result of etching the surface of the glassware and not due to a foreign deposit it was of course impossible as a practical matter to remove it.

In contrast, when metallic zinc or magnesium was present such as by mounting the strip 20 in the tub 12 of the dishwasher and using the same detergent having a high polyphosphate content etching or corroding of the glassware could not be detected even after repeated washings of the glassware. Furthermore, the dissolution of the zinc or magnesium was so slow that it did not have to be replaced until after greatly extended periods of time.

The block of metal used in this invention may of course be any shape desired and is not limited to the illustrated elongated strip. Similarly, it may be mounted at any desired area in the liquid circuit where there is space available and where it will not materially interfere with the liquid flow.

Having described my invention as related to the embodiment shown in the accompanying drawing, it is my intention that the invention be not limited by any of the details of description, unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the appended claims.

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. The method of substantially preventing corrosion of glassware during washing thereof with an alkaline detergent in a mechanical dishwasher comprising contacting an alkaline detergent solution with a solid piece of metal of the class consisting of zinc and magnesium and with said glassware for cleaning of said glassware.

2. The method of claim 1 wherein said metal comprises zinc.

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3. The method of claim 1 wherein said metal comprises magnesium.

4. The method of claim 1 wherein said contacting is accomplished by circulating said solution over both said glassware and said metal.

5. A mechanical dishwasher for washing glassware while substantially preventing corrosion thereof by a washing liquid, comprising: a tub in which said glassware is retained during said washing thereof; a solid piece of zinc in said tub, said metal having an exposed surface area of about sixty square inches with a thickness of at least $\frac{1}{16}$ inch; and means for circulating said washing liquid in contact with said metal and with the glassware to prevent substantial corrosion of said glassware by said washing liquid.

6. The dishwasher of claim 5 wherein said metal comprises zinc.

7. The dishwasher of claim 5 wherein said means for contacting said liquid with said metal comprises means for mounting said metal in said tub and means for simultaneously circulating said liquid over said glassware and said metal in said tub.

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8. A mechanical dishwasher for washing glassware while substantially preventing corrosion thereof by a washing liquid, comprising: a tub in which said glassware is retained during said washing thereof; a solid piece of zinc in said tub; and means for circulating said washing liquid in contact with said zinc and with the glassware to prevent substantial corrosion of said glassware by said washing liquid.

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