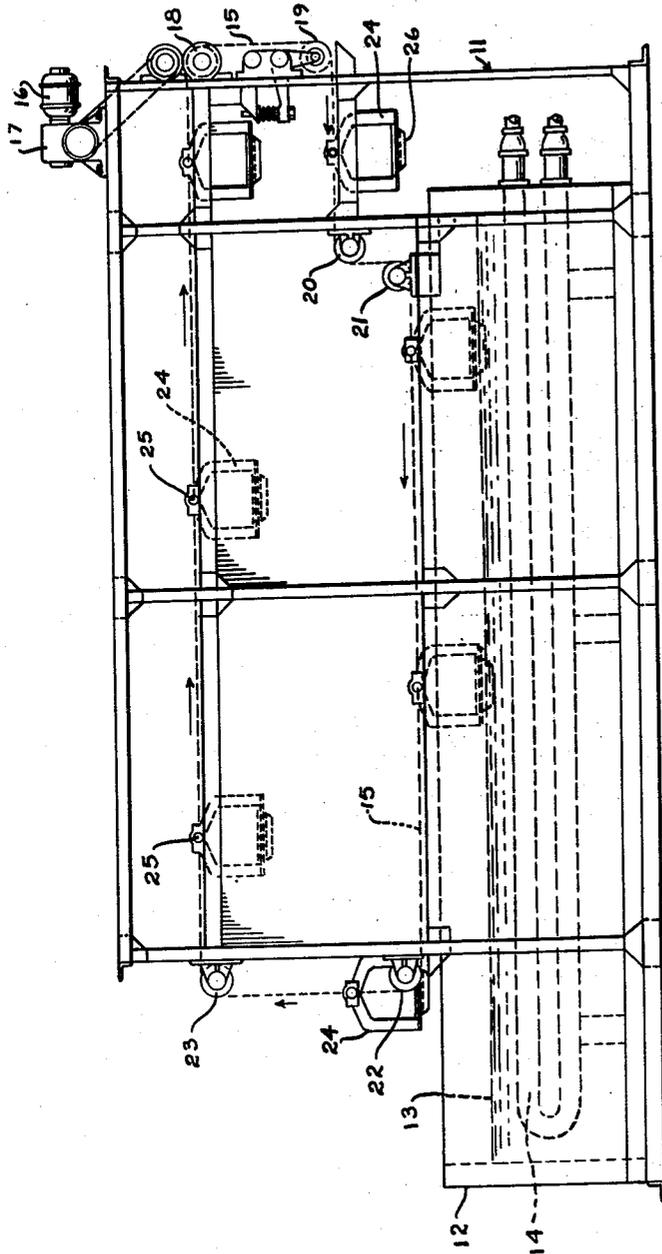


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METHOD OF TESTING GLASSWARE

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METHOD OF TESTING GLASSWARE

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9 Claims. (Cl. 73-51)

The present invention relates to glassware manufactured for uses subjecting it to a wide range of thermal shocks, and to methods of culling from a stock of such ware those pieces which would not be likely to prove satisfactory for such use. Glassware made for top of stove use is one example of such form of ware and to be practicable must withstand both thermal and mechanical shocks. Most of such ware is tempered to give it maximum strength, both thermally and mechanically, and also to impart to it a non-explosive breakage characteristic. The tempering process itself imparts quite a thermal shock to the ware. Nevertheless, since breakage of ware containing hot ingredients is a hazard to the user, a further and more rigorous test of the ability of the ware to withstand its intended use is desirable before offering it for use and sale.

One object of the present invention is a reliable method of ware selection.

Another object is a reliable method of testing glass articles for possible thermal and/or mechanical weaknesses.

A further object is the destruction of any ware considered not safely usable for the purpose intended.

The method embodying the invention comprises the selection of articles of hollow ware, meeting rigid requirements for use, from a supply source by partly filling each article with a liquid and then floating, or in any other suitable fashion subjecting outer surfaces of the articles for a substantial time period to a liquid of a widely different temperature than that introduced into the articles, thereby subjecting the articles to a thermal shock of far greater magnitude than they will encounter in normal use. It has been found that by introducing water of a temperature of 30° into articles of the above character and floating the articles for a period of approximately thirty seconds over a bath of nitrate salts maintained at a temperature of 500°, a thermal shock of sufficient magnitude is given to destroy those articles which are unfit for use for the purpose intended, in that it causes breakage of ware which is thermally and mechanically weak. This weakness may be attributed to variations in wall sections of the ware, stones, seeds or improper tempering.

The accompanying drawing illustrates one form of apparatus by means of which applicants' method may be readily carried out.

In the drawing numeral 11 designates a framework within which is enclosed a tank 12 containing a fluid bath 13 heated to a desired tempera-

ture by a radiant tube 14. Apparatus for conveying ware through the bath comprises an endless chain 15 arranged to travel in a path lengthwise of the tank 12 over one wall thereof and a similarly mounted chain (not shown) having a like path of movement over the opposite wall of the tank. The chains are continuously driven by a motor 16 through suitable speed reducing apparatus 17 and other conventional power transmitting equipment and are carried by sprocket wheels such as 18-23 all mounted on stub shafts so as to provide an unobstructed path for ware carrying frames 24 which are suspended from rods 25 bridging the conveyor chains and moving therewith.

With the bath 13 heated to the appropriate temperature, an attendant at the right hand end of the apparatus removes a previously deposited article 25 from a frame 24 as such frame comes within his convenient reach and replaces the article with a fresh one containing water. The chains first advance an article over the right hand end of the tank 12 and then lower the article into the bath for a slight distance required to subject its lower outer surfaces to the high temperature fluid and then slowly advances the article toward the other end of the tank, after which the path of travel of the chain is such that it raises the article from the bath and advances it to the right hand end of the apparatus where the article is replaced with a fresh one. Those pieces of ware which are incapable of withstanding the thermal shock imparted to them in the course of their travel break, and any parts remaining in a frame upon its arrival at the right hand end of the apparatus are removed by the attendant.

Articles of ware which are light enough in weight to float when containing the water can be given a similar thermal shock by simply allowing them to float in the fluid bath. However, an arrangement similar to that shown is preferable as it protects an attendant from molten salt which may be spattered when breakage occurs. Obviously, the temperature of fluids and the time period the articles are subjected to them depend on the character of glass of which they are composed, their shape, thickness and the use for which they are intended.

What is claimed is:

1. The method of selecting satisfactory ware from a group of containers fabricated from glass, which includes simultaneously subjecting opposite surfaces of a wall of each container exclusively to fluids of widely differing temperatures for a

predetermined time period and segregating the articles which remain intact from those which are impaired by such treatment.

2. The method of satisfactorily selecting ware from a group of vessels fabricated from glass, consisting of introducing a liquid into each vessel and floating it on a bath of liquid of a temperature widely differing from that of the liquid in the vessel for a predetermined time period, and segregating the articles which remain intact from those which are impaired by such treatment.

3. The method of satisfactorily selecting ware from a group of vessels fabricated from glass, consisting of introducing a quantity of liquid in each vessel and subjecting its surfaces opposite those covered with such liquid to a second liquid of a temperature substantially different from that of the first liquid for a predetermined time period, and segregating the articles which remain intact from those which are impaired by such treatment.

4. The method of satisfactorily selecting ware from a group of vessels fabricated from glass, consisting of introducing a quantity of liquid in each vessel, lowering the vessel into a liquid of a temperature substantially different from that of the first liquid to a depth approximately that of the liquid within the vessel and maintaining the vessel in the latter liquid for a predetermined time period, and segregating the articles which remain intact from those which are impaired by such treatment.

5. The method of satisfactorily selecting ware from a group of vessels fabricated from glass, consisting of partly filling each vessel with a liquid, supporting the vessel at its periphery and while so supported conveying it partly submerged from one part to another of a liquid bath of a temperature differing substantially from that of the liquid within the vessel and for a predetermined time period, and segregating the articles which remain intact from those which are impaired by such treatment.

6. A process of glass container selection which includes introducing a fluid of one temperature into each of a group of containers in succession; placing the containers, in the order in which fluid is introduced therein, on supports moving over a closed path; subjecting only the exterior surfaces of the containers, during their travel about a portion of such path for a predetermined time period, to a fluid differing widely in temperature from that introduced therein; and segregating the articles which are still intact from those which have been impaired during their travel over such path.

7. The method of selecting glass containers which includes simultaneously subjecting the inner surfaces of the containers to a fluid of one temperature and exterior surfaces thereof to a fluid of a different temperature while preventing intermingling of the two fluids by those articles of ware which remain intact, and segregating the latter articles from those which have permitted intermingling of the fluids applied to their opposite surfaces.

8. The method of selecting satisfactory ware from a group of containers fabricated from glass, which includes subjecting one surface of a wall of each container to a fluid of one temperature and subjecting the opposite surface of the same wall to a fluid of a widely differing temperature before the temperature of such opposite surface has been appreciably affected by the action of the first fluid.

9. The method of selecting from a group of glass containers those which should give satisfactory service under normal conditions of use from those that would be likely to fail, which consists of subjecting one wall surface thereof to a first fluid of one temperature and subjecting the opposite surface of the same wall only to a fluid of a widely differing temperature for a predetermined time period.

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