March 3, 1959 C. J. SCHROEDER 2,875,916

RACKS FOR WASHING MACHINE

Filed Sept. 23, 1954 2 Sheets-Sheet 1

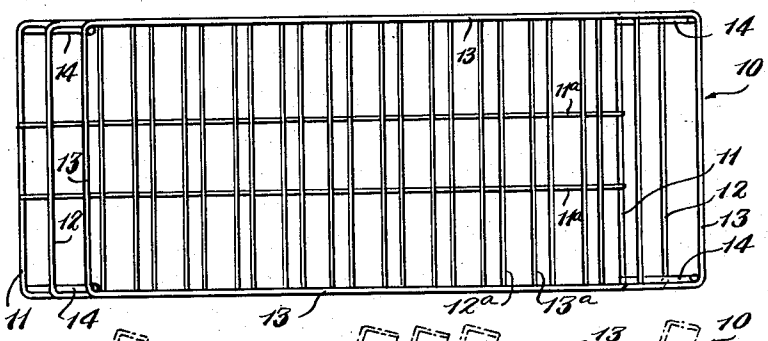


FIG. 3

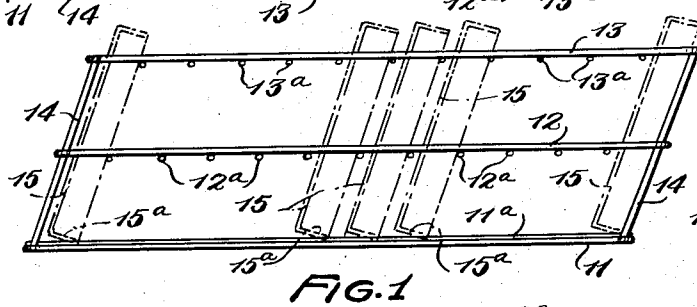


FIG. 1

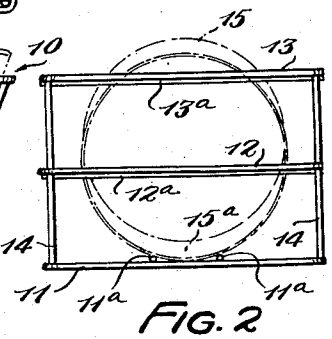


FIG. 2

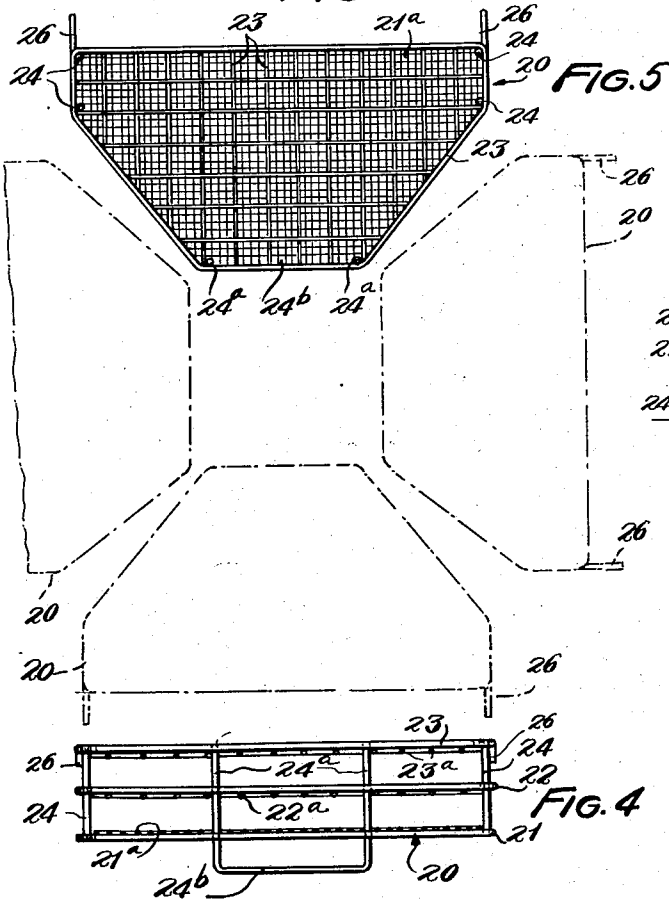


FIG. 5

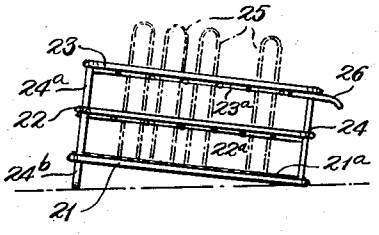


FIG. 6

FIG. 4

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RACKS FOR WASHING MACHINE

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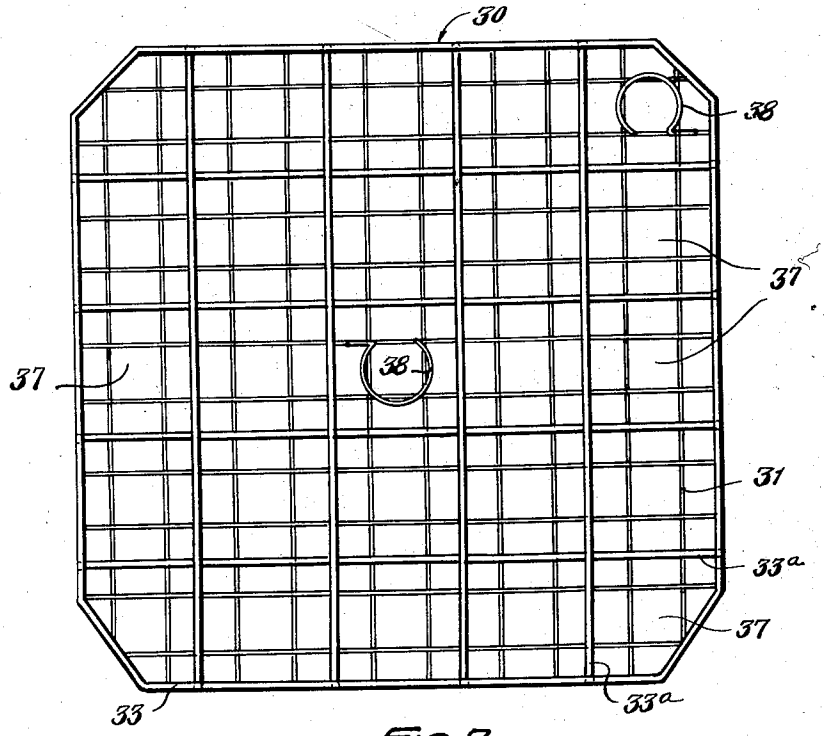


FIG. 7

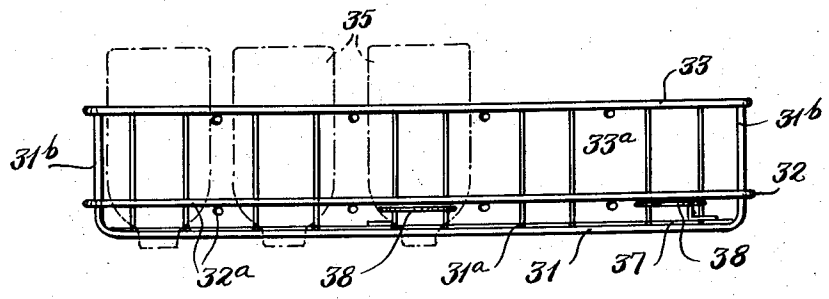


FIG. 8

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RACKS FOR WASHING MACHINE

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Application September 23, 1954, Serial No. 457,939

3 Claims. (Cl. 220—19)

This invention relates to automatic utensil washing apparatus, and more particularly to baskets for supporting laboratory glassware and equipment, of various sizes and shapes, such as test tubes, beakers, bottles, flasks, evaporating dishes and the like in washing machines during washing and drying operations.

The automatic cleaning of laboratory glassware and equipment such as beakers, bottles, flasks, and other articles presents special problems in automatic washing, the shape and configuration of such articles requiring that such glassware be supported in such manner that the maximum volume of cleaning water is directed thereinto.

When it is considered that frequently such laboratory wares contain acids, chemicals and various difficult-to-remove solutions and coatings, it is readily understood that satisfactory washing can best be accomplished by directing the stream of cleaning water from the washing machine into the articles.

I have discovered, that by providing laboratory glassware supporting baskets of certain shapes and constructions various laboratory glassware can be easily mounted thereon and removed therefrom, and that by directing the swirling stream of cleaning water into the open end of such articles, satisfactory cleansing can be accomplished.

Therefore, an object of this invention is to provide baskets for automatic washing machines, which support various types and shapes of laboratory glassware including culture tubes, petri dishes and narrow mouth sample bottles and the like in such position that a maximum volume of swirling cleaning water is directed into such articles and readily drained therefrom.

Other objects are, to provide baskets and supporting means for the above purpose, which can be manufactured at a relatively low cost, are adapted to hold various sizes and shapes of laboratory glassware, permit ready placing and removal of such articles therefrom, are strong and sturdy in operation, may be readily installed in washing machines and are simple and efficient in operation.

These and other objects will be apparent in the course of the following specification. In the drawings forming a part of the specification:

Fig. 1 is a side view of a basket adapted to support dish-shaped objects such as petri dishes and the like, showing dishes mounted therein;

Fig. 2 is an end view of the basket shown in Fig. 1;

Fig. 3 is a top view of the basket shown in Fig. 1;

Fig. 4 is a side view of a basket adapted to support culture tubes;

Fig. 5 is a top plan view illustrating four culture tube baskets as assembled in a washing machine, one including full details, the three other baskets being indicated in broken lines;

Fig. 6 is a side view of the basket shown in full lines in Fig. 4, including culture tube baskets mounted therein and illustrating the angular disposition of the basket when disposed in a washing machine;

Fig. 7 is a top plan view of a basket adapted to support bottles in vertical position, while

Fig. 8 is a side view of the foregoing basket illustrating bottles mounted therein.

The invention disclosed herewith is adapted to be used in the utensil washing apparatus of the type disclosed in application of Clark O. Miller, Serial No. 397,094 filed December 9, 1953, disclosing a complete utensil washing machine and various laboratory glassware-supporting racks. However, this invention may be used in various types of washing apparatus.

The invention illustrated in Figs. 1, 2 and 3, comprises a wire frame or dish basket **10** of general rectangular shape, including a bottom frame **11**, an intermediate frame **12** and a top frame **13**, the three frames being supported by four wire end posts **14**. Two longitudinally extending wires **11***a* connecting the ends of the bottom frame **11** of the basket **10** are adapted to support such flat laboratory dishes as petri dishes **15** and the like. If desired for certain purposes, a series of longitudinally and transverse wires connecting the ends of the frame **11** forming a reticulate grille may be used. A series of transversely extending wires **12***a* connect the pair of longitudinally extending wires of intermediate frame **12**, while a set of similar transverse wires **13***a* connect the corresponding wires of top frame **13**.

As shown in Fig. 1, each pair of transverse wires **12***a* and **13***a* is disposed in parallel relationship but is offset vertically, whereby each pair of transverse wires **12***a* and **13***a* provides retaining means to retain a petri dish **15** in tilted position as shown in Fig. 1. Preferably each dish **15** is disposed in the basket **10** with its flange **15***a* tilted downwardly in order that the cleaning water or fluid will drain from the dish **15** after the cleaning operation is completed. The various wires of the basket **10**, as well as other baskets herein disclosed, may be suitably joined together by spot welding, soldering, or any suitable means well known in the art.

The embodiment of the invention illustrated in Figs. 4, 5 and 6, designated as culture tube basket **20**, comprises a series of four similar somewhat segment-shaped baskets **20** as shown in Fig. 5, each including a bottom frame **21**, an intermediate frame **22**, and a top frame **23**. A series of wires **21***a*, suitably mounted on the bottom frame **21** are disposed and arranged in rectangular relationship to each other forming a reticulate shelf for supporting the open ends of such elongated laboratory ware as culture tubes **25**, the wires **21***a* being of relatively narrower gauge than the other wires of the basket **20**, and disposed in such manner that the space between intersecting wires is substantially smaller than the diameter of test tubes to be supported thereon, such construction permitting cleaning fluids to freely pass into the culture tubes **25** and providing support therefor.

The frames **21**, **22** and **23**, are supported by six wire posts **24**, of which the two posts **24***a* at the narrow end of the basket **20** extend below the lower frame **21**, and are joined by a connecting member **24***b* causing the basket **20** to be tilted as shown in Fig. 6. A series of wires **22***a* and **23***a* disposed in rectangular relationship to each other in the frames **22** and **23** respectively serve to retain the tubes **25** in the basket **20**. Preferably the spacings of the wires **22***a* and **23***a* are such that a culture tube of average diameter may be suitably retained therein. Suitable hooks **26** are provided for hooking the four baskets **20** to the washing machine in which it is disposed.

The four test tube baskets **20** of segmental shape may be arranged in a washing machine in the formation shown in Fig. 5 which may have an impeller centrally disposed at the bottom thereof, not shown herein, which circulates cleaning fluid up and around the interior of the machine. The tube baskets **20**, due to the projecting posts **24***a* at the narrow ends thereof, are tilted away from the vertical axis of the washing machine, and thus tubes **25** disposed

in the baskets **20** have their axes similarly tilted, which permits ready access of the cleaning fluid into the test tubes **25** and also permits such fluid to easily drain therefrom.

In Figs. 7 and 8 a rectangular-shaped bottle basket **30** is disclosed comprising a bottom frame **31**, an intermediate frame **32** and a top frame **33**. A series of spaced wires **33***a* horizontally disposed at right angles to each other and connected to the top frame provide means for retaining the upper parts of bottles **35** which may be either Boston-round, French-square type or various types of bottles having broad shoulders and relatively short necks retained in an inverted position.

A series of similarly spaced wires **32***a* serve to retain bottles **35** shown in broken lines in Fig. 8. A series of spaced horizontally disposed wires **31***a*, forming the bottom wall of the basket **30**, are disposed at right angles to each other providing a series of rectangular shape openings **37**, of smaller size than the cooperating series of rectangular openings in the wires **32***a* and **33***a*, which serve to support the shoulders of bottles **35** with the bottle necks projecting through the bottom of the frame **31** as shown in Fig. 8. In this form of the invention the ends of the bottom frame wires **31***a* extend upwardly on all four sides of the bottle basket **30** forming upwardly extending frame members **31***b* illustrated in Fig. 8. If desired soap containers may be carried in brackets **38**.

The wires of the baskets **10**, **20** and **30** may be secured together in any suitable manner such as by spot welding or brazing, the diameter of the rack wires being determined by the specific loads to be carried by each basket. I have found that steel wires having a diameter of approximately ⅛" are suitable for most laboratory uses. The baskets disclosed herein are adapted to be installed and used in various types of washing devices. In general, such baskets are disposed above an impeller and may be mounted on other baskets and secured to the interior of the machine or in any suitable manner, as by hooking them to the interior of the machine.

Ordinarily bottle basket **30** is used independently of culture tube basket **20** or petri dish basket **10** and may be suitably disposed in the washing machine. Petri dish baskets **10** and culture tube baskets **20** may be used singly or simultaneously as their sizes and shapes permit them to be fitted in a washing machine in various manners and combinations.

It will be apparent to those skilled in the art that the embodiment of my invention may be variously changed, used or modified, without departing from the spirit of the invention or sacrificing the advantages thereof, and that the present embodiment of the invention is illustrative only, and my invention is not limited thereto.

What I claim is:

1. A set of wire baskets adapted to support elongated open-end vessels comprising a series of like wire baskets arranged about a common point and radially outwardly therefrom in horizontally disposed relationship with their innermost disposed side walls positioned around and spaced from said common point, said baskets including spaced side walls and a bottom wall formed of a series of intersecting wires forming a reticulate bottom wall adapted to support the lower ends of open-end vessels, said baskets including a top frame member connecting said side walls and provided with intersecting wires forming vessel-receiving openings between adjacent wires, and a similar intermediate frame member disposed midway between the bottom wall and said top frame member having corresponding intersecting wires forming openings vertically aligned with the openings in said top frame member, the said innermost side walls of said baskets having a downwardly extending support member projecting below the lower margin of the said walls causing each of the baskets to be tilted upwardly and outwardly from a vertical line through said common point.

2. A set of wire baskets adapted to support elongated

open-end vessels such as culture tubes and the like in inverted position in a washing machine comprising, a series of like substantially sector-shaped wire baskets, each including a rear side wall and a parallel spaced relatively shorter front side wall, said walls being connected by outwardly sloping side walls, said baskets including a reticulate bottom wall connected to said side walls for supporting the lower ends of said tubes thereon, the side walls of each basket being connected by a top wire frame member having a series of spaced intersecting wires forming a series of tube-receiving openings, and a similar intermediate wire frame member disposed between said top frame member and said bottom wall and having a series of correspondingly spaced wires forming cooperating tube-receiving openings vertically aligned with said top frame member openings, said baskets being arranged about a common point and radially outwardly therefrom in horizontally disposed relationship with their short front walls disposed innermost and their side walls extending substantially radially from said common point, the short walls of said baskets having downwardly extending support members projecting below the lower margin of said walls, causing each basket to be tilted upwardly and outwardly from a vertical line through said common point, thereby retaining said tubes in tilted positions for permitting ready access of upwardly directed cleaning fluid into said tubes.

3. A set of wire baskets for supporting tubes and the like in inverted position in a washing machine comprising, a series of like substantially sector-shaped wire baskets, each including a rear side wall and a parallel spaced relatively shorter front side wall forming the apex of said sector-shaped baskets, said walls being connected by outwardly sloping side walls of equal length, the height of said walls being at least equal to a substantial portion of the length of said tubes, said baskets including a reticulate bottom wall connected to said side walls for supporting said tubes thereon, the side walls of each basket being connected by a top wire frame member having a series of spaced intersecting wires forming a series of tube-receiving openings, and a similar intermediate frame member disposed between said top frame member and said bottom wall, said intermediate member having corresponding intersecting wires forming tube-receiving openings vertically aligned with said top frame member openings, said baskets being arranged about a common point and radially outwardly therefrom in horizontally disposed relationship with their short apex front walls disposed innermost and their side walls extending substantially radially from said common point, downwardly extending support members projecting below the lower margin of said short walls, whereby each basket is tilted upwardly and outwardly from a vertical line through said common point, thereby retaining said tubes in a tilted position, for the purposes described.

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