Aug. 22, 1944. A. H. GERHARDT 2,356,312

AGITATOR CONSTRUCTION

Filed Oct. 29, 1941 2 Sheets-Sheet 1

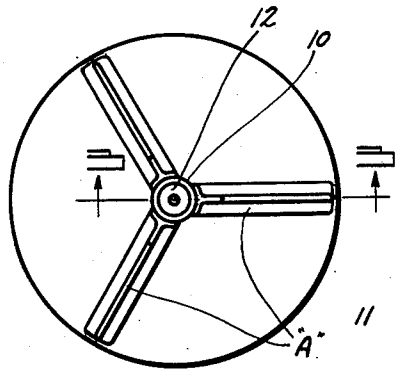


FIG. 2

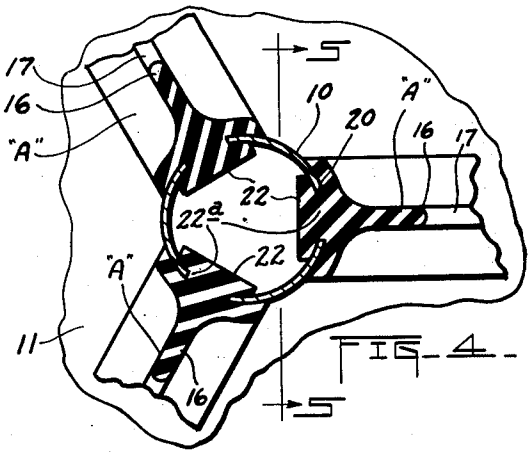


FIG. 4

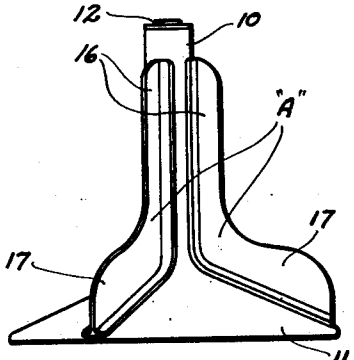


FIG. 1

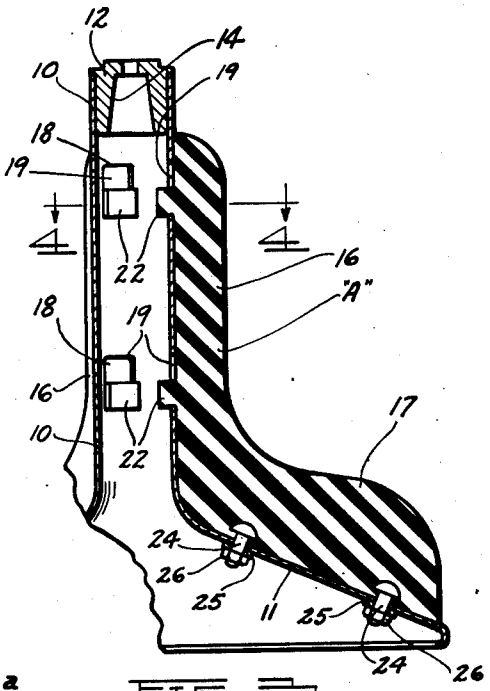


FIG. 3

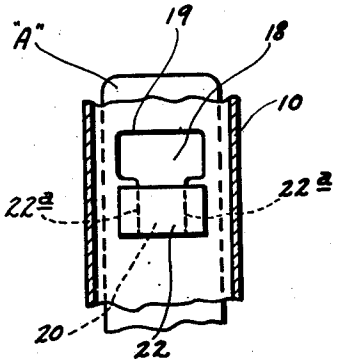


FIG. 5

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AGITATOR CONSTRUCTION

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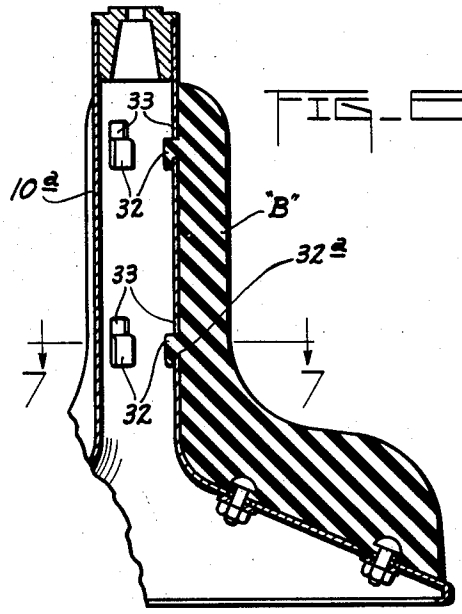


FIG. 6.

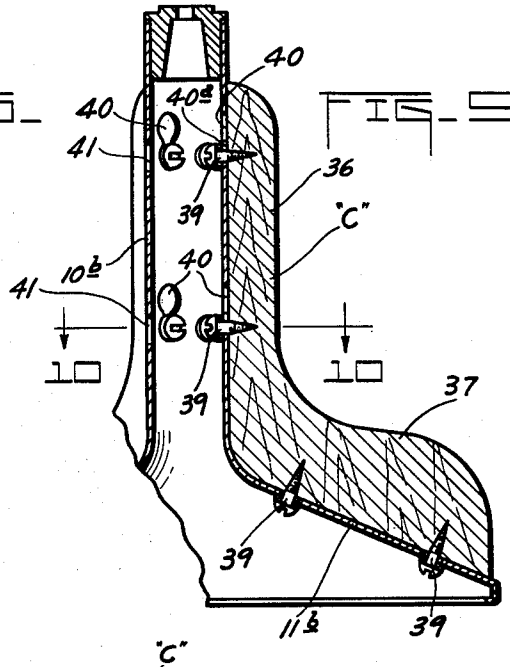


FIG. 9.

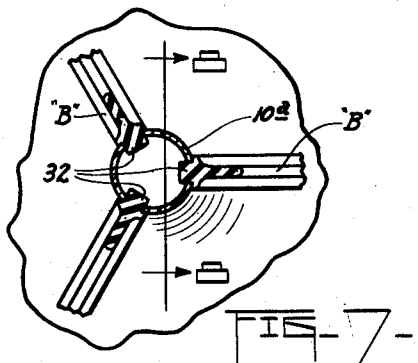


FIG. 7.

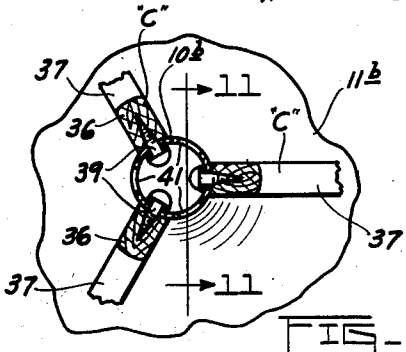


FIG. 10.

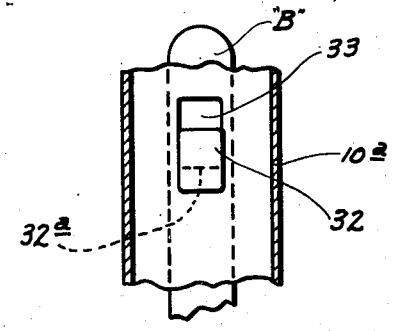


FIG. 8.

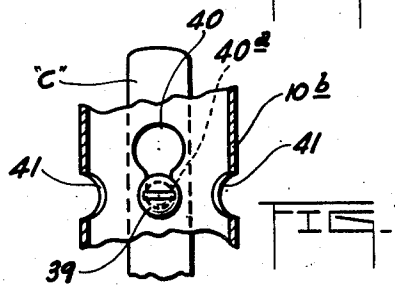


FIG. 11.

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UNITED STATES PATENT OFFICE

2,356,312

AGITATOR CONSTRUCTION

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Application October 29, 1941, Serial No. 416,983

4 Claims. (Cl. 68—134)

The present invention relates to agitating means for use in domestic washing machines, and more particularly to agitating means of the type adapted to be oscillated about a vertical axis and provided with a plurality of circumferentially spaced apart vanes.

In recent years, agitators of this general type have primarily been formed by molding either metal or various types of plastic materials. Agitators thus formed, while possessing certain advantages, also have certain inherent disadvantages. For example, in the use of aluminum agitators for clothes washing machines, the surfaces in contact with the washing fluid often became pitted or developed generally roughened surfaces due to the alkaline action of the washing fluid. Such roughened or pitted surfaces greatly increase the abrasive action upon the clothes and result in unnecessarily reducing the life thereof. It is also known that molded plastic type agitators have a tendency to warp and discolor and are somewhat fragile and may be damaged or broken in the event they are inadvertently dropped after having been removed from the machine during the process of cleansing the machine and/or the agitator.

One of the primary objects of this invention is to provide a novel form of agitating means which eliminates the foregoing disadvantages and which is capable of being economically manufactured.

Another object is to provide a novel agitator construction wherein a plurality of vanes may be quickly and easily detachably connected to a tubular standard, which together constitute the agitating means.

A further object of this invention is to provide a novel form of agitator, comprising a tubular standard, to which may be quickly and easily detachably connected a plurality of circumferentially spaced apart vertically extending vanes.

Still another object is to provide an improved agitator construction, comprising a tubular metallic upright standard, connected at its lower end to a cone-shaped disc, together with a plurality of vertically disposed circumferentially spaced apart vanes, shaped to provide vertically disposed vane portions and laterally disposed vane portions, with said vane portions being formed for detachable connection respectively to the tubular standard and the cone-shaped disc.

Other objects and advantages of this invention will be apparent from the following description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a view in side elevation of an agitator embodying the present invention.

Fig. 2 is a top plan view thereof.

Fig. 3 is an enlarged vertical sectional view, taken substantially as indicated at line 3—3 on Fig. 2.

Fig. 4 is an enlarged transverse sectional view, taken as indicated at line 4—4 on Fig. 3.

Fig. 5 is a fragmentary vertical sectional view, taken substantially as indicated at line 5—5 on Fig. 4.

Fig. 6 is an enlarged vertical sectional view through an agitator, embodying a modified form of the present invention.

Fig. 7 is a transverse sectional view of the modified form of agitator, taken at line 7—7 on Fig. 6.

Fig. 8 is a fragmentary vertical section, taken at line 8—8 on Fig. 7.

Fig. 9 is an enlarged vertical sectional view through an agitator embodying a further modification of the invention.

Fig. 10 is a transverse sectional view, taken substantially as indicated at line 10—10 on Fig. 9.

Fig. 11 is a fragmentary vertical sectional view, taken at line 11—11 on Fig. 10.

It is to be understood that the agitator embodying the present invention is adapted for use in connection with the conventional type of clothes washing machine, wherein the agitator is supported at its upper end on a vertically disposed oscillatable shaft projecting upwardly from the bottom of the tub.

Referring now in detail to the drawings, the agitator embodying the present invention includes a body member including a tubular metallic standard 10, the lower end of which, as shown in Fig. 3 of the drawings, merges into an enlarged cone-shaped disc 11. It is to be understood that the standard 10 and disc 11 are formed of metal and preferably are made as separate elements and securely connected together in any suitable manner such as by welding, brazing, etc., depending upon the nature of the material employed.

Press fitted into the upper end of the tubular standard 10, is a driving block 12 formed with an internal socket 14 for a tapered, snug fit upon the upper end of the drive shaft (not shown) or driving member mounted upon the upper end of said shaft, by virtue of which oscillation is imparted from the shaft to the agitator.

In the construction illustrated, the agitator is provided with three equidistant, circumferentially spaced apart vanes indicated generally at A.

These vanes, as will presently be described, are adapted to be detachably connected, preferably to both the tubular standard 10 and the disc 11, as seen in Fig. 3 of the drawings. Said vanes each include a vertically extending portion 16, and a laterally extending portion 17, the former being adapted to be seated against the exterior of the tubular standard 10, and the latter upon the exterior of the disc 11. The upright standard 10 is provided with three sets of openings indicated at 18, each set comprising a pair of vertically aligned openings. Each of said openings includes a generally rectangular-shaped portion 19 which merges at its lower end into a reduced portion or slot 20 of less width than the width of the opening portion 19. The vertical portion 16 of each vane is formed with a pair of vertically spaced apart projections 22, which are of a size to snugly fit through the opening portion 19. Said projections are undercut at the two lateral sides thereof, as clearly seen in Fig. 4, so as to provide a reduced neck portion 22a of reduced cross-section, adapted to be projected downwardly into the reduced portion 20 of the opening and thereby lock the vane portion 16 in position, as seen in Figs. 3 to 5.

Embedded into the underside of the lower edge of each laterally extending vane portion 17 are a pair of spaced apart bolts 24 adapted, when the vertically disposed vane portion 16 is locked in the openings in the standard, to be aligned with and projected through apertures formed in the disc 11. The lower ends of the bolts beneath the disc 11 are provided with lock washers 25 and nuts 26 to firmly secure the lateral vane portions 17 to said disc.

It will now be apparent that, if necessary, the vanes A may be quickly and easily removed from the body member of the agitator for repair or replacement should conditions necessitate. This may be accomplished by merely removing the nuts 26 and lock washers 25 so as to permit withdrawal of the bolts 24 from the disc, upon exertion of an upward force on the vane so as to dislodge the projections 22 from the slots or opening portions 20 and thus permit withdrawal of said projections 22 through the openings 19.

As shown in the drawings, the vanes are made of rubber. It has been found that the property of rubber eliminates many of the disadvantages characteristic of certain materials heretofore employed. It is to be understood, however, that any other suitable material may be utilized and still have the advantage of a relatively simple and economical agitator construction, as for example, the vanes may be made of ferrous metal provided with a vitreous enamel coating.

In the modified construction disclosed in Figs. 6 to 8, inclusive, which correspond generally to Figs. 3 to 5, inclusive, of the preferred embodiment above described, it will be noted that the essential difference in the construction consists primarily in that the vanes designated at B are each formed on the inner edge of the vertical portion with a pair of vertically spaced apart hook-shaped members 32 which are undercut at the underside thereof and are adapted to be projected through a pair of aligned apertures 33 formed in the upright tubular standard 10a. It will be noted that the apertures 33 are of such size as to permit convenient insertion of the hook projections 32 therethrough, after which the vane B is moved downwardly so that the depending hook portion 32a extends downwardly below the lower edge of the opening 33, as clearly seen in Fig. 8 of the drawings. Other than the above distinction, the construction represented in Figs. 6 to 8 is similar to the construction disclosed in Figs. 1 to 5 above described.

In the modified construction disclosed in Figs. 9 to 11, the tubular standard 10b and the disc portion 11b have secured thereto vanes C, which are shown as formed of wood. It will be manifest, however, that other materials may be utilized advantageously by mounting on the body member of the agitator in a similar manner. Said vanes each include a vertically extending portion 36 adapted to be disposed adjacent the exterior of the tubular standard 10b, and integral laterally extending vane portions 37 adapted to be seated upon the external surface of the disc 11b.

The vanes "C" are firmly secured in position by four screws 39, two connecting the vertical standard to the vertical vane portion 36, and two connecting the disc 11b to the laterally extending vane portion 37. For purposes of convenience in assembly, the tubular standard is provided with openings 40 of a size to permit entrance therethrough of the head of the screws 39. Said openings terminate at their lower ends into slot portions 40a of a size to accommodate the shank portion of the screws. When the vanes are to be assembled to the standard 10b and disc 11b, the screws are first secured in place on the inner vertical edges of the vane portion 36 and the heads of the screws are then first projected through the openings 40 and upon downward movement of the vane, the shank portion of the screw becomes seated in the slot portion 40a of the openings 40. In order to tighten the screws and firmly secure the vanes in position to the standard, said standard is formed with aligned diametrically opposite openings 41, as seen in Figs. 10 and 11, so as to permit entrance of a screw driver therethrough for engaging the head of the screw carried on the vertical portion 36 of the vane, located at the opposite side of the standard. The screws 39 for securing the laterally extending vane portions 37 to the disc 11b may be conveniently inserted in place from the underside of said disc 11b.

While I have herein shown and described certain embodiments of my invention, manifestly it is capable of further modification and rearrangement of parts without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting this invention to the precise forms herein shown and described, except as it may be so limited by the appended claims.

I claim:

1. An agitator for use in a washing machine, comprising a body member including an upright tubular standard and a disc member connected to the lower end of the standard, and a plurality of circumferentially spaced apart upright vanes seated upon said body member, each of said vanes including an upright portion adapted to be seated against the exterior of the standard, and a laterally extending portion adapted to be seated upon the upper surface of said disc, each upright vane portion being provided with one or more undercut projections for interlocking engagement in slots formed in said standard.

2. An agitator for use in a washing machine, comprising a body member including an upright tubular standard and a disc member connected to the lower end of the standard, a plurality of circumferentially spaced apart upright vanes seated upon said body member, each of said vanes including an upright portion adapted to be seated

against the exterior of the standard, and a laterally extending portion adapted to be seated upon the upper surface of said disc, each upright vane portion being provided with one or more undercut projections for interlocking engagement in slots formed in said standard, and threaded fastening members for securing the laterally extending vane portions to said disc from the underside thereof.

3. An agitator for use in a washing machine, comprising a body member including an upright tubular standard and a disc member connected to the lower end of the standard, a plurality of circumferentially spaced apart upright vanes detachably connected to said body member, each of said vanes including an upright portion adapted to be seated against the exterior of the standard, and a laterally extending portion adapted to be seated upon the upper surface of said disc, and threaded fastening members for connecting the upright vane portions to the standard from the interior of said standard, said standard being formed with suitable openings to permit access of a tool for manipulating said fastening members.

4. An agitator for use in a washing machine, comprising a body member including an upright tubular standard and a disc member connected to the lower end of the standard, a plurality of circumferentially spaced apart upright vanes detachably connected to said body member, each of said vanes including an upright portion adapted to be seated against the exterior of the standard, and a laterally extending portion adapted to be seated upon the upper surface of said disc, threaded fastening members for connecting the upright vane portions to the standard from the interior of said standard, said standard being formed with suitable openings to permit access of a tool for manipulating said fastening members, and threaded fastening members for securing the laterally extending vane portions to said disc from the underside thereof.

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