

Nov. 23, 1943.

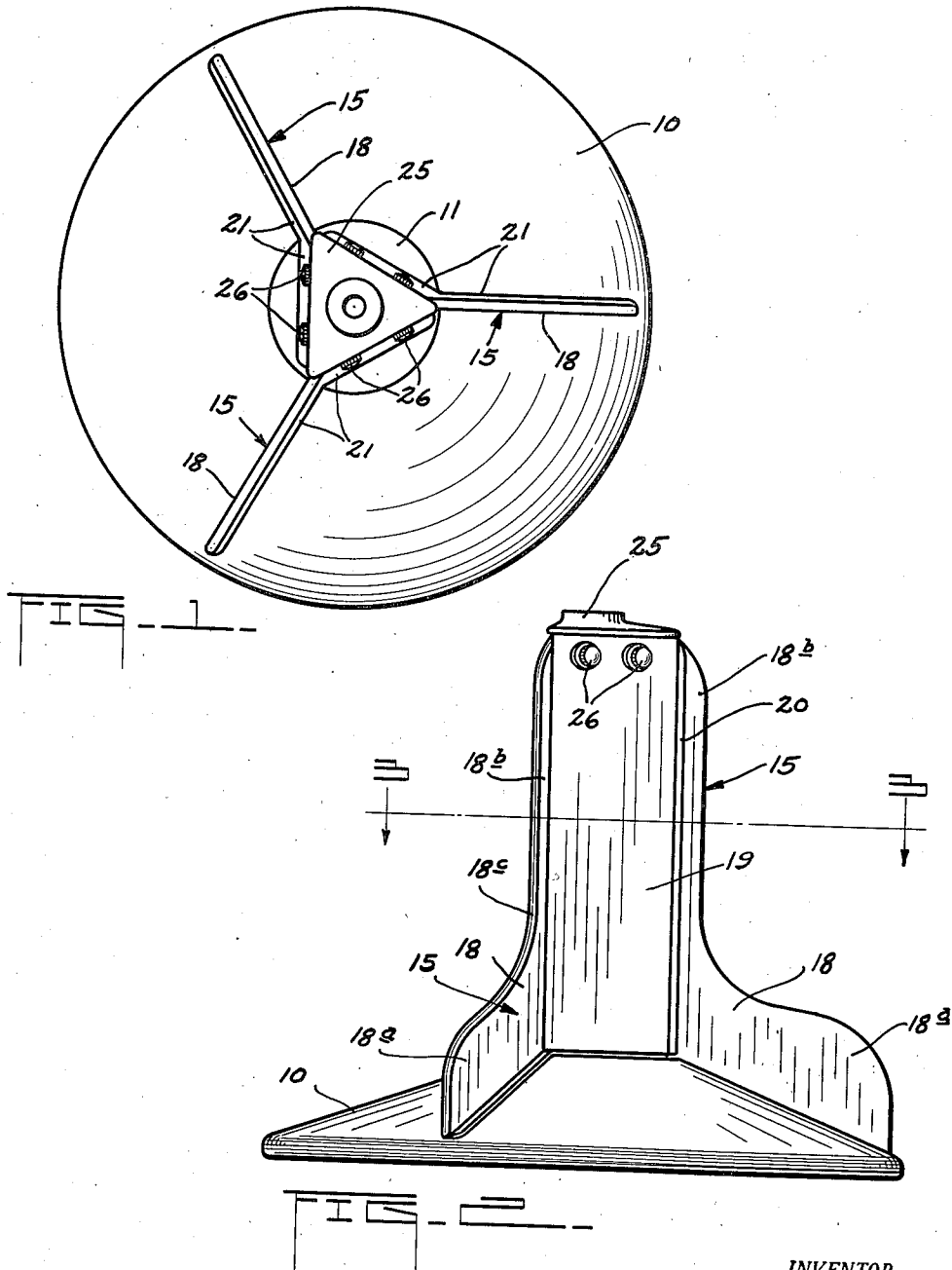
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2,334,859

AGITATOR CONSTRUCTION

Filed Feb. 27, 1942

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

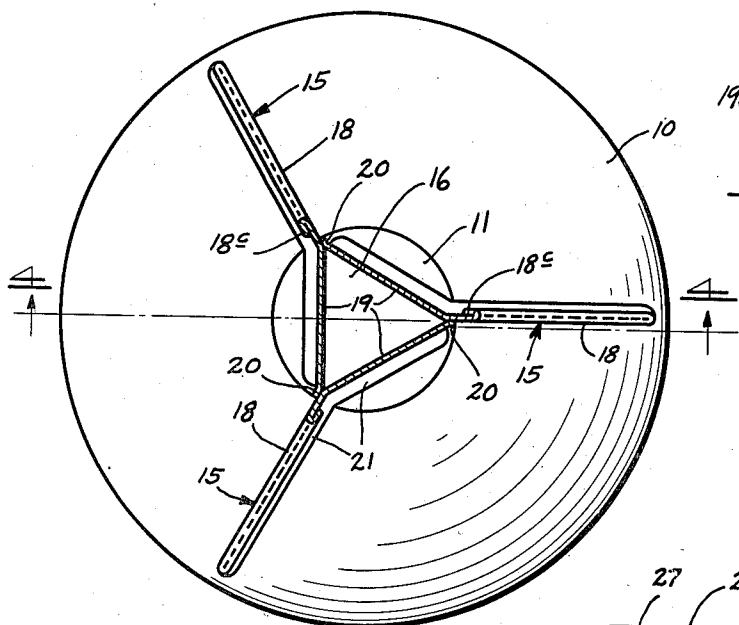
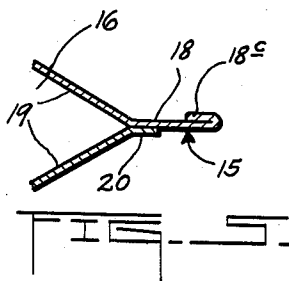
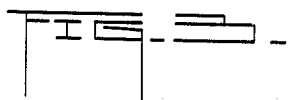
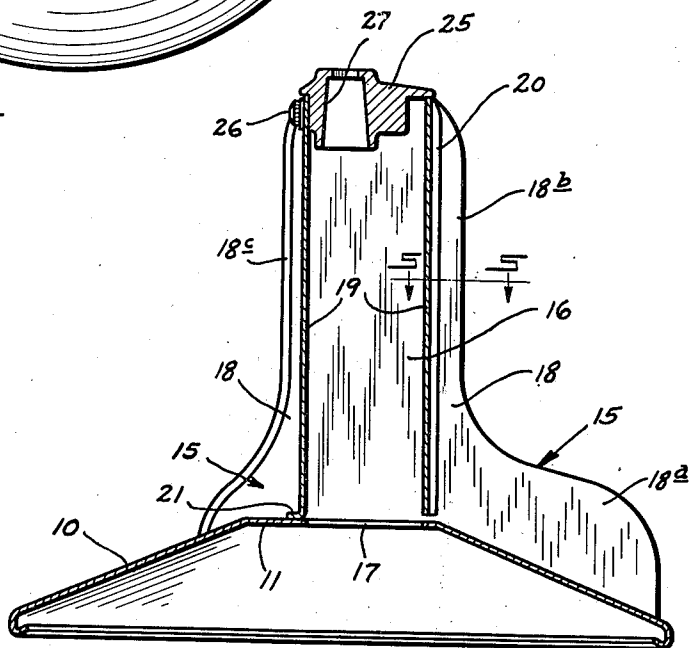


FIG. 4

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UNITED STATES PATENT OFFICE

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AGITATOR CONSTRUCTION

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8 Claims. (Cl. 68—134)

The present invention pertains to agitators for use in domestic clothes washing machines, and more particularly to agitators of the multi-vane type mounted within a tub for oscillation about a vertical axis.

For many years past, agitators of this general type have primarily been formed by moulding either metal or various plastic materials. Agitators thus formed while possessing certain advantages, also have certain inherent disadvantages. For example, in the use of aluminum agitators, the surfaces subjected to the washing fluid become pitted and develop a generally roughened surface 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 well known that moulded plastic type agitators have some tendency to warping and discoloring, and are somewhat fragile, and may be damaged or broken in the event that 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 agitator construction fabricated as an assembly of a plurality of parts stamped from sheet metal.

Another object is to provide an improved agitator construction of the character indicated, consisting of an integral, unitary assembly of a plurality of stamped sheet metal elements, including vanes and a base constructed in such form so that when embodied in a unitary structure as to permit application of a suitable and durable coating, such as vitreous enamel.

A further object is to provide an improved agitator of the character indicated formed as an assembly of a plurality of stamped sheet metal parts, including a multiplicity of vertically disposed vane elements and a base element, and said elements being welded together to form a unitary structure including a centrally disposed upright tubular duct for accommodating a drive shaft therein, and wherein the operating portions of said vanes extend in radial direction.

Still another object is to provide a novel and improved form of agitator which is of simplified construction, durable in operation, and which is capable of economical manufacture.

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 plan view of the novel agitator embodying the present invention.

Fig. 2 is a view in side elevation.

Fig. 3 is a horizontal, transverse, sectional view through the agitator taken substantially as indicated at line 3—3 on Fig. 2.

Fig. 4 is a vertical, section taken substantially as indicated at line 4—4 on Fig. 3.

Fig. 5 is a fragmentary, horizontal, sectional view through the juncture of a pair of adjacent vanes, taken as indicated at line 5—5 on Fig. 4.

The novel agitator, embodying the present invention and as illustrated in the drawings, includes an inverted dished shape base member 10, which, as may be seen in the drawings, is of generally frusto-conical formation, with the lower marginal edge thereof terminating in an in-turned rim, as seen in Fig 4 of the drawings, so as to provide a rounded surface. As seen in Fig. 3 of the drawings, the central upper portion of the base is of flat, circular outline as indicated at 11.

Mounted on the base in central relationship to the axis thereof is a plurality of angularly related, upstanding vane elements 15, herein shown as three in number, which are positioned in such co-relationship to each other that the inner portion of each vane is disposed in abutting relation to a similar portion of the next adjacent vane, so as to define an upstanding tubular duct 16, which is of triangular cross section as seen in Fig. 3 of the drawings. It is to be understood that when the vanes are arranged as shown in the drawings, the tubular duct 16 is disposed in registration with a correspondingly shaped opening 17 formed in the flat central area 11 in the base so as to permit telescoping of the agitator over a drive shaft, as will hereinafter be described.

Each of the vane elements are formed to include a main operating portion 18 and an auxiliary extension portion 19, disposed in an angular relationship with respect to the operating portion 18, as clearly seen in the drawings. Such relationship of the respective portions of each of the vanes is such that when the vanes are assembled together and on the base 10, the operating portions 18 of the vanes are disposed in radial relation to the axis of the base 10 while the auxiliary portions 19 form the tubular duct 16.

The outer terminal edge of the auxiliary portion 19 of each of the vane element terminates in an outwardly extending angular flange 20 so that when the vanes are assembled, as may be

seen in Fig. 3, said flanges 20 seat flat and in parallel relationship to the inner edge of the operating portion 18 of the next adjacent vane, as clearly seen in Fig. 5 of the drawings. The lower edge of the vane elements, including both the operating portion 18 and auxiliary extension 19, are formed with a continuous outwardly extending flange 21 which is bent angularly so as to conform to the contour of the upper surface of the base 10, to seat flat against the tapered conical surface and also upon the flat central area 11. The flanges 20 and 21 of the respective vanes are seam welded respectively to the adjacent vane elements and to the base element so as to form a rigid, unitary structure.

The operating portions 18 of the respective vane elements are of conventional outline as seen in Figs. 2 and 4 of the drawings, including a horizontally extending portion 18^a merging into a vertically disposed portion 18^b. Such design of agitator vanes has been found highly efficient for obtaining a proper washing operation.

The outer marginal edge of the operating portion of the vanes is folded upon itself as indicated at 18^c so as to provide a reinforcement for the outer marginal edge thereof and at the same time provide a rounded surface so as to insure minimum abrasive action upon encounter with the clothes in actual operation.

Mounted in the upper end of the tubular duct 16 is a triangular shaped driving block 25, which snugly engages the walls of the upper ends of the auxiliary portions 19 of the vane elements, and said block is firmly secured to said auxiliary extension portions by means of screws 26. The driving block is formed interiorly with a tapered socket 27 for a snug, telescopic fit upon a co-operatively tapered driving head carried upon the upper end of an agitator drive shaft (not shown) by virtue of which the drive shaft is caused to impart oscillatory movement to the agitator in a conventional manner.

Because the vane elements and the base element are formed of sheet metal stampings, it is desirable that the elements be first welded together as above mentioned so as to form a rigid, unitary structure, after which the exposed or outer operating surfaces thereof may be coated with any suitable and durable material such as vitreous enamel. It is well known that such a coating of material will not be subject to the alkaline action of the washing fluid and at all times will be capable of quick and easy cleansing so as to conveniently restore the agitator to its original appearance. Such coating further does not result in pitting or roughening of the surface thereof due to alkaline action and accordingly reduces the abrasive action upon the clothes to a minimum.

While I have herein shown and described a preferred embodiment of my invention, manifestly it is capable of 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 form herein disclosed, except as I may be so limited by the appended claims.

I claim:

1. An agitator for use in a washing machine, comprising a stamped sheet metal base member, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending to the full height of the operating portion of the vane, said operating portion and auxiliary portion of each vane

being disposed in angular relation to each other, and said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement and with the outer marginal portion of said auxiliary portion of each vane terminating in an outwardly extending flange abutting against the next adjacent vane, whereby said auxiliary portions form a tubular duct, registering with an aperture in the base for accommodating a vertical drive shaft therein.

2. An agitator for use in a washing machine, comprising a stamped sheet metal base member, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending to the full height of the operating portion of the vane, said operating portion and auxiliary portion of each vane being disposed in angular relation to each other, and said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement and with the outer marginal vertical edge of the auxiliary portion of each vane being disposed in abutting relation to the next adjacent vane, and the outer exposed marginal edge of the operating portion of each vane being bent upon itself to provide a rounded reinforcing edge, whereby said auxiliary portions form a tubular duct, registering with an aperture in the base for accommodating a vertical drive shaft therein.

3. An agitator for use in a washing machine, comprising a stamped sheet metal base member, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending to the full height of the operating portion of the vane, said operating portion and auxiliary portion of each vane being disposed in angular relation to each other, and said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement and with the outer marginal vertical edge of the auxiliary portion of each vane being disposed in abutting relation to the next adjacent vane, and the lower edge of said vanes terminating in an outwardly extending flange seated upon and connected to said base, whereby said auxiliary portions form a tubular duct, registering with an aperture in the base for accommodating a vertical drive shaft therein.

4. An agitator for use in a washing machine, comprising a stamped sheet metal base member, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending to the full height of the operating portion of the vane, said operating portion and auxiliary portion of each vane being disposed in angular relation to each other, and said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement and with the outer marginal vertical edge of the auxiliary portion of each vane being disposed in abutting relation to the next adjacent vane, and the outer exposed marginal edge of the operating portion of each vane being bent upon itself to provide a rounded reinforcing edge, the lower edge of said vanes terminating in an outwardly extending flange seated upon and connected to said base, whereby said auxiliary portions form a tubular duct, registering with an aperture in the base for accommodating a vertical drive shaft therein.

5. An agitator for use in a washing machine, comprising a stamped sheet metal base of frusto-conical contour, including a continuous tapered wall merging into a flat central portion, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending the full height of the operating portion of the vane, said operating and auxiliary portions of each vane being disposed in angular relation to each other, said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement, and with the outer marginal vertical edge of the auxiliary portion of each vane disposed in abutting relation to the next adjacent vane, the lower edge of said vanes being shaped to the contour of said base with the operating portions seated on the tapered surface and the auxiliary portions seated on flat central portion, whereby the auxiliary portions of said vanes form a tubular duct, registering with an aperture in said flat central portion of the base, for accommodating a vertical drive shaft therein.

6. An agitator for use in a washing machine, comprising a stamped sheet metal base of frusto-conical contour, including a continuous tapered wall merging into a flat central portion, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending the full height of the operating portion of the vane, said operating and auxiliary portions of each vane being disposed in angular relation to each other, said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement, and with the outer marginal vertical edge of the auxiliary portion of each vane terminating in an outwardly extending flange, disposed in abutting relation to the next adjacent vane, the lower edge of said vanes being shaped to the contour of said base with the operating portions seated on the tapered surface and the auxiliary portions seated on flat central portion, whereby the auxiliary portions of said vanes form a tubular duct, registering with an aperture in said flat central portion of the base, for accommodating a vertical drive shaft therein.

7. An agitator for use in a washing machine, comprising a stamped sheet metal base of frusto-conical contour, including a continuous tapered wall merging into a flat central portion, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending the full height of the operating portion of the vane, said operating and auxiliary portions of each vane being disposed in angular relation to each other, said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement, and with the outer marginal vertical edge of the auxiliary portion of each vane terminating in an outwardly extending flange, disposed in abutting relation to the next adjacent vane, the lower edge of said vanes being shaped to the contour of said base with the operating portions seated on the tapered surface and the auxiliary portions seated on flat central portion, and the lower edge of the respective portions of each vane terminating in an outwardly extending flange seated upon and connected to the respective tapered and flat surfaces of said base, said vertical flanges being welded to said adjacent vanes and said lower edge flanges being welded to said base, to form a unitary structure, whereby the auxiliary portions of said vanes form a tubular duct, registering with an aperture in said flat central portion of the base, for accommodating a vertical drive shaft therein.

8. An agitator for use in a washing machine, comprising a stamped sheet metal base of frusto-conical contour, including a continuous tapered wall merging into a flat central portion, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending the full height of the operating portion of the vane, said operating and auxiliary portions of each vane being disposed in angular relation to each other, said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement, and with the outer marginal vertical edge of the auxiliary portion of each vane disposed in abutting relation to the next adjacent vane, the lower edge of said vanes being shaped to the contour of said base with the operating portions seated on the tapered surface and the auxiliary portions seated on flat central portion, and the lower edge of the respective portions of each vane terminating in an outwardly extending flange seated upon and connected to the respective tapered and flat surfaces of said base, whereby the auxiliary portions of said vanes form a tubular duct, registering with an aperture in said flat central portion of the base, for accommodating a vertical drive shaft therein.

8. An agitator for use in a washing machine, comprising a stamped sheet metal base of frusto-conical contour, including a continuous tapered wall merging into a flat central portion, and a plurality of stamped sheet metal vanes each including a flat operating portion and a flat auxiliary portion extending the full height of the operating portion of the vane, said operating and auxiliary portions of each vane being disposed in angular relation to each other, said vanes being mounted in upright position on said base in angular relation to each other to dispose the operating portions of said vanes in radial arrangement, and with the outer marginal vertical edge of the auxiliary portion of each vane terminating in an outwardly extending flange, disposed in abutting relation to the next adjacent vane, the lower edge of said vanes being shaped to the contour of said base with the operating portions seated on the tapered surface and the auxiliary portions seated on flat central portion, and the lower edge of the respective portions of each vane terminating in an outwardly extending flange seated upon and connected to the respective tapered and flat surfaces of said base, said vertical flanges being welded to said adjacent vanes and said lower edge flanges being welded to said base, to form a unitary structure, whereby the auxiliary portions of said vanes form a tubular duct, registering with an aperture in said flat central portion of the base, for accommodating a vertical drive shaft therein.

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