

[54] **LAUNDRY BASKET WITH
REMOVABLE AGITATION MEANS**

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[51] Int. Cl. **D06f 37/14**

[58] Field of Search **68/154, 133, 136, 4, 134**

[56] **References Cited**

UNITED STATES PATENTS

1,745,595	2/1930	Altorfer	68/133
1,795,395	3/1931	Hoke	68/134

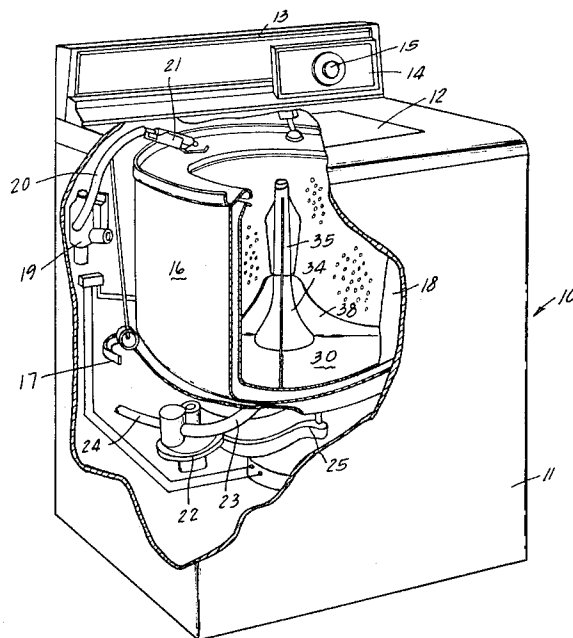
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[57] **ABSTRACT**

An upstanding basket for use in a vertical axis automatic washing apparatus characterized by having an axially disposed hub portion on a bottom wall of the basket with agitator vanes extending outwardly from the hub portion along the bottom wall. The hub portion has an axially extending stub for telescopically receiving an end of an agitator extension which is removably mounted thereon. The agitator configuration of the basket can be changed or varied to be either the configuration of the hub portion alone or a combination of the configuration of the hub portion and the configuration of the agitator extension which extension can be provided in various sizes and with various agitator vane configurations.

12 Claims, 4 Drawing Figures



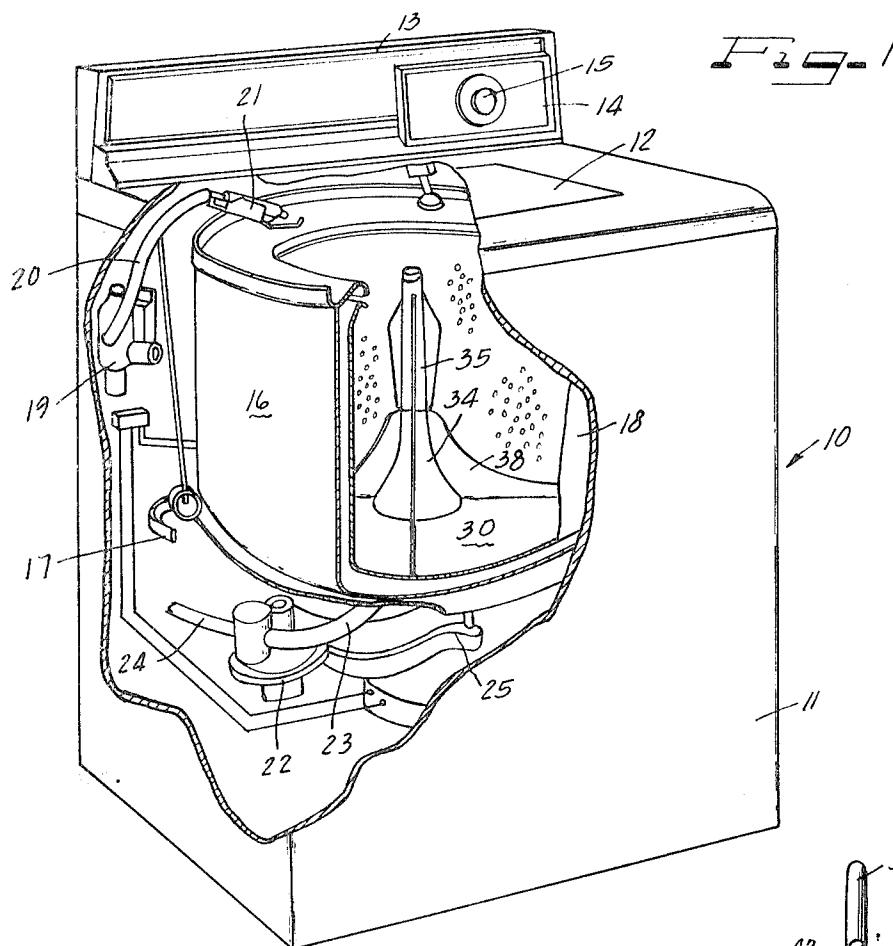


Fig. 4

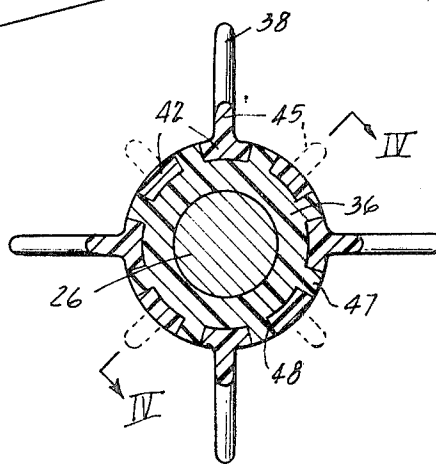
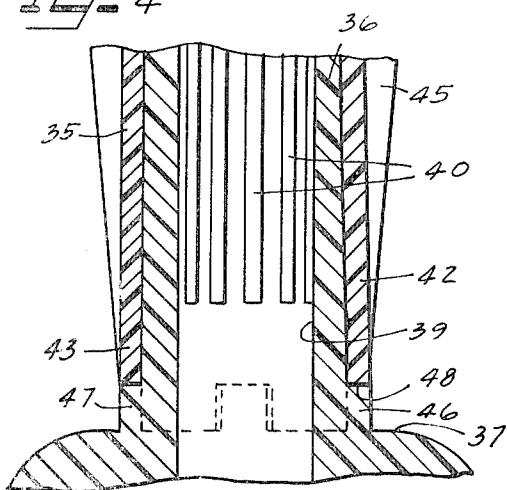


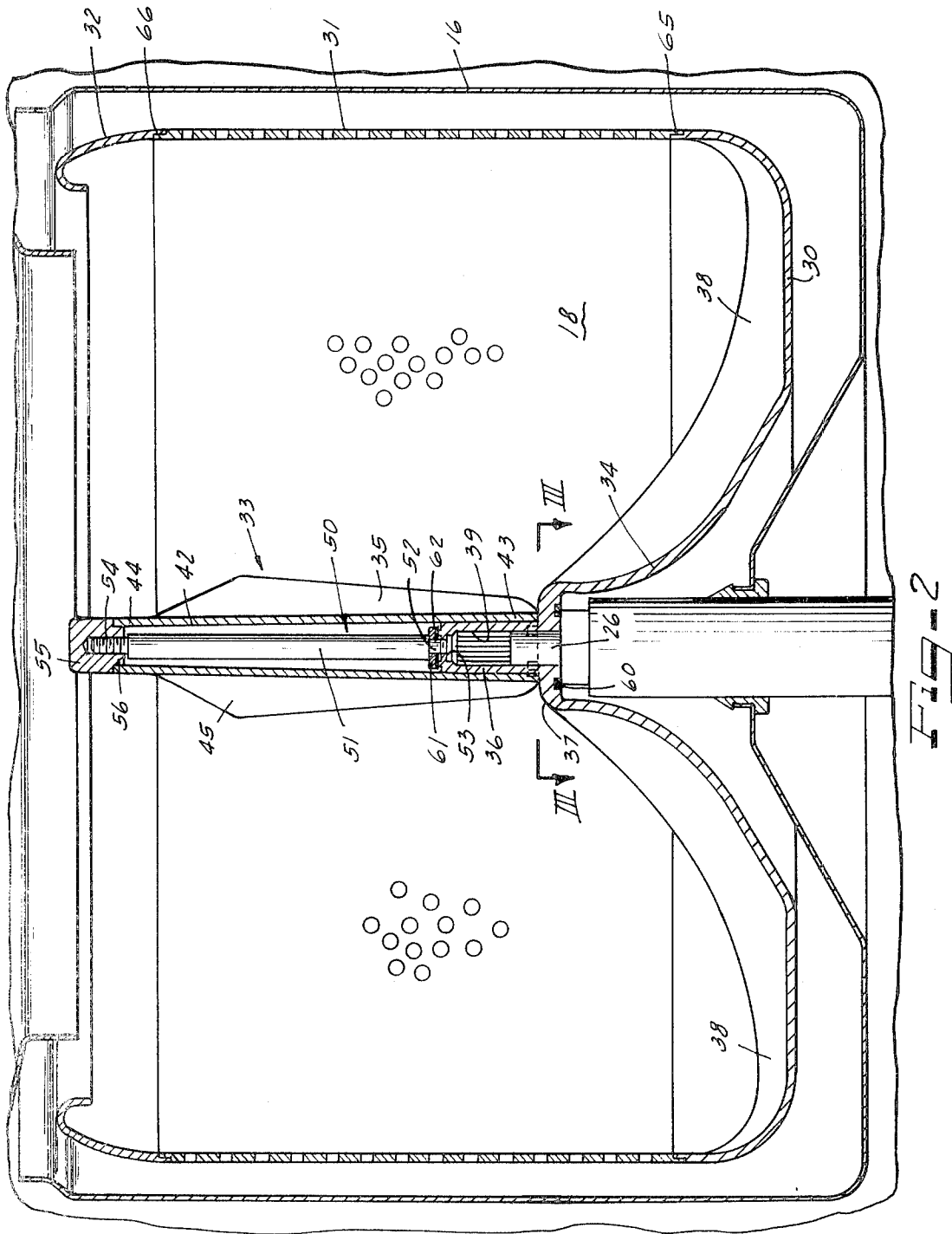
Fig. 3

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LAUNDRY BASKET WITH REMOVABLE AGITATION MEANS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is directed to a basket for an automatic washer and particularly a basket having an agitator which includes a portion integral with the basket and a portion removable therefrom.

2. Prior Art

In washing machines, the use of an agitator, which has vanes and which is disposed in the tub to circulate the washing liquid or fluid along with the clothes, is well known. In order to change the characteristic of an agitator, it has been proposed to provide an agitator having an upstanding post which telescopically receives a sleeve having agitation fins, and an example of such a structure is disclosed in U.S. Pat. No. 1,795,395. It has also been proposed to provide washing devices in which the complete agitator is removable from the tub in order to change the washing device from a clothes washing apparatus to a different type of washing apparatus such as a dishwasher.

In automatic washing machines, the agitator is disposed in the interior of an inner tub or basket which is mounted in an outer tub and has perforations to enable the flow of liquid from the basket to the outer tub. In some automatic washing machines, the agitator is mounted to move relative to both the basket and outer tub with either an oscillatory or vertical movement. In other types of construction such as disclosed in U.S. Pat. No. 2,665,576 issued on Jan. 12, 1954, the agitator is affixed to the basket and is movable relative only to the outer tub. A molded plastic basket with an integral agitator has been proposed for insertion in the inner basket of an automatic washing machine.

SUMMARY OF THE INVENTION

The present invention is directed to an upstanding perforate basket for an automatic washing apparatus which basket has agitating means including a hub portion affixed to the basket which portion includes means for removably mounting an additional agitator portion to enable the changing of the agitator configuration of the basket. In the preferred embodiment, the hub portion is integrally formed with the bottom wall of the basket and has at least one integral vane extending outwardly therefrom and integral with the bottom wall. The hub portion has an axially extending stub portion for telescopically receiving a portion of a hollow sleeve of the additional agitator portion or extension which is secured by fastening means which extend through the stub portion and are engageable with a drive shaft of the drive system for the basket.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view of an automatic washing machine having portions broken away to illustrate the upstanding basket of the present invention;

FIG. 2 is a cross section of the basket of the present invention with portions in elevation for purposes of illustration;

FIG. 3 is a cross section taken on line III—III of FIG. 2; and

FIG. 4 is a cross section taken on line IV—IV of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The principles of the present invention can be employed in many different types of vertical axis washing machines or apparatus and particularly in an automatic vertical axis washing apparatus. It should be understood, therefore, that the particular machine hereinafter described is merely exemplary of a type of machine in which the principles of the present invention find utility.

The particular machine shown in FIG. 1 is a vertical axis automatic washing apparatus generally indicated by the reference numeral 10 having an outer cabinet 11 provided with an outwardly opening access lid 12. A splash shield 13 forms a part of the back assembly of the cabinet and a control

panel 14 including control means such as a normal sequence control knob 15 is mounted on the shield 13.

A stationary impervious outer tub 16 is mounted on an internal support frame 17. A perforated basket or inner tub 18 of the present invention is mounted for both rotational and oscillatory movement in the outer tub 16.

To fill the tub 16, a water inlet means including a solenoid mixing valve 19, which controls both the flow of water from a source and the mixing of the hot and cold water to obtain the desired temperature, has an outlet line 20 extending to a water fixture 21 which discharges into the tub 16. To remove the water from the tub 16, a pump means 22 is connected to the tub 16 by a drain line 23 and discharges into a conduit 24 to an exterior drainage system. If the machine 10 has a suds return feature, the pump means 22 will include means to discharge the washing liquid to storage means and include means for subsequently returning the washing liquid to the tub 16.

To cause movement of the basket 18, a drive means 25, which includes a power source such as an electric motor and is capable of producing both oscillatory and rotating movement, is located in the cabinet 11 and has a drive shaft 26 (FIG. 2) which is connected to the basket 18. Suitable control means are provided for the drive means so that the basket can be oscillated and rapidly rotated during the washing and spinning cycles respectively. The control means also control the filling and emptying of the tub 16 during the washing and rinsing cycles.

As best illustrated in FIG. 2, the basket 18 has a bottom wall 30 and a surrounding upstanding sidewall 31 which extends to a peripheral portion 32 which has an inwardly directed flange which defines a top opening of the basket. To agitate the washing liquids during the washing cycle and during a deep rinse cycle, agitating means, generally indicated at 33, is disposed in the interior of the basket 18 and includes a hub portion 34 and an agitator extension 35 removably mounted on the hub portion.

The hub portion 34 is axially affixed to the bottom wall 30 and has an upwardly axially extending stub portion or extension 36 of a reduced diameter which provides a shoulder 37. Extending outwardly from the hub portion 34 below the shoulder 37 are a plurality of agitator vanes 38 which extend radially along the inner surface of the bottom wall 30 to the upstanding wall 31. The stub 36 has a hollow portion 39 provided with means such as spines 40 (FIG. 4) for receiving an end of the drive shaft 26 and keying the basket thereto.

The agitator extension 35 is substantially a hollow tubular member 42 which, as illustrated, has a slight taper so that one end 43 has a larger inner and outer diameter than the other end 44 to insure proper orientation during mounting on the hub portion. Extending outwardly from the member 42 are a plurality of agitation vanes 45. The tubular member 42 is mounted on the stub portion 36 with the one end 43 telescopically received thereon.

To insure rotation of the agitator extension 35 with the basket 18, the hub portion 34 and the one end 43 of the member 42 are provided with coacting key means 46, as best illustrated in FIGS. 3 and 4. The key means 46 comprise projections 47 extending from the outer surface of the stub portion 36 along the shoulder 37 which projections are received in slots 48 which are provided on the one end 43 of the member 42.

To hold the agitator extension 35 onto the stub portion 36, fastening means, generally indicated at 50, are provided and cooperate with the stub portion to provide mounting means for the agitator extension 35. The fastening means 50 include a shaft 51 having one end 52 which extends through an aperture 53 in the stub portion 36 and is provided with means such as threads to coact with the end of the drive shaft 26 to form a threaded connection. The other end 54 of the shaft 51 has means, such as threads, provided for forming a connection with a cap 55 which has a reduced diameter portion 56 which is telescopically received in the other end 44 of the member 42 of the agitator extension 35. By appropriately tightening

the connections of the shaft 51 to the cap 55 and the shaft to the drive shaft 26, the agitator extension is securely mounted to the hub portion 34 of the basket 18.

To prevent leaking of the washing fluids through the agitator, and to prevent the leaking of any lubricants from the drive means into the washing fluids, sealing means such as a sealing ring 60 is provided between the interior of the hub 34 and the drive means 26 and a sealing means 61 such as a sealing washer is provided to surround the threaded end 52 and is held tightly against the upper surface of the stub portion 36 by a shoulder 62 on the shaft 51.

To remove the agitator extension 35, the cap 55 is unthreaded from the shaft 51 allowing the agitator extension 35 to be removed from its mounting on the stub 36. A different agitator extension similar to 35 having a different vane configuration can then be telescopically inserted over the stub 36, and then is fastened in place by threading the cap 55 on the shaft 51. Due to the taper of the member 42, only the one end 43 of the agitator extension 35 will be assembled with the correct orientation.

If it is determined that the agitator extension 35 should be removed, then after removing the cap 55 and the agitator extension 35, the shaft 51 is removed. A cap similar to cap 55 having sealing means similar to means 61 is threadedly connected to the drive shaft 26 to hold the basket in place.

With the provision of means for removably mounting the agitator extension 35 on the hub 34, various agitator configurations and washing actions can be achieved. For example, the agitator extension 35 may be replaced with one having the desired vane configuration which can either be straight vanes as illustrated, curved vanes, or wavy vanes as shown in Design Pat. No. 205,044. It is also possible to use agitator extensions having a shorter axial length by using a fastening means with shorter axial length. Further, the agitator extension 35 may be placed on hub 34 in a manner such that the vanes 45 are not aligned with the vanes 38 as is shown in FIG. 1, but rather, in accordance with the orientations permitted by the key means 46, the vanes 45 may be spaced angularly from the vanes 38 to thereby vary the washing action effected by the basket assembly 18. Such a spaced orientation is illustrated by the dashed lines of FIG. 3. Thus, the removably mounted agitator extension 35 allows a great flexibility in the configuration of the agitator means for the washing basket 18 and the selection of different agitator extensions enables changes in the aesthetic appeal of the basket structure.

The basket 18 is preferably formed of a plastic material in three sections. The upper peripheral portion 32 is formed as one section, the upstanding wall 31 is formed as another section, and the bottom wall 30, the hub 34 and vanes 38 are formed as an integral molded third section. The three sections are assembled together by utilizing peripheral joints such as 65 and 66. As illustrated, the upstanding wall 31 is provided with perforations and the bottom wall and hub portion 34 can also be provided with perforations if desired. Furthermore, the bottom wall 30 can be provided with external pumping vanes and the upstanding wall 31 can be provided with filter means as disclosed and claimed in the patent application filed by John H. Traube and Robert A. Brenner on Aug. 6, 1970, and assigned U.S. Ser. No. 61,677 which application is assigned to the assignee of the present application.

Although various minor modifications might be suggested by those versed in the art, it should be understood that we wish to employ within the scope of the patent warranted hereon, all such embodiments as reasonably and properly come within the scope of our contribution to the art.

What is claimed is:

1. A clothes basket for a vertical axis laundry apparatus, said basket having a bottom wall and a surrounding upstanding side wall defining a basket interior, wherein the improvement comprises: agitation means comprising first agitator vane means affixed to the bottom of said basket within its in-

terior, said agitation means having a hub portion disposed about the rotational axis of said basket; and an agitator extension comprising second agitator vane means, said extension being removably affixed to the hub portion of said agitation means.

2. A clothes basket according to claim 1, including keyed means for removably attaching the agitator extension to the hub portion of the agitation means.

3. A clothes basket according to claim 1, wherein the hub portion has a stub portion extending axially above the agitator vane of the hub portion for telescopically receiving a portion of the agitator extension as it is removably attached thereto.

4. A clothes basket according to claim 3, wherein said stub portion has means for keying the agitator extension thereto and has means enabling the securing of the agitator extension thereto.

5. A clothes basket according to claim 4, wherein said second agitator vane means forms a continuous extension of said first agitator vane means.

6. A clothes receptacle for a vertical axis laundry apparatus comprising: a bottom wall; an upstanding side wall surrounding said bottom wall to define a receptacle interior; agitator means affixed to said receptacle about its interior, said means comprising at least one agitator vane affixed to the bottom of said receptacle; and an agitator extension comprising at least one agitator vane, said extension being removably affixed to said receptacle and disposed about the rotational axis of said receptacle.

7. A receptacle according to claim 6, including keyed hub means for keying the agitator extension to the receptacle, said hub further having means for keying said receptacle to a drive shaft.

8. A receptacle according to claim 7, wherein the agitator extension is a hollow member and is removably secured to the hub by a fastening means extending therealong for engaging the drive shaft.

9. A receptacle according to claim 6, wherein the bottom wall and agitation means are an integral molded plastic unit.

10. In a vertical axis automatic washing apparatus having a drive shaft of a drive means connected to an upstanding basket mounted for movement in an outer imperforate tub, the upstanding basket having a perforated bottom and a surrounding perforated side wall terminating in an upper periphery defining an open top, and agitation means disposed in the basket, the improvement comprising the agitation means having an axially disposed hub portion affixed to the bottom wall and extending into the basket therefrom, at least one agitator vane extending outwardly from said hub portion along said bottom wall toward the side wall, an agitator extension having at least one outwardly extending vane, said hub portion having means for removably mounting said agitator extension axially on said hub portion, said means for removably mounting including means keying said extension to the hub portion so that said agitator extension both rotates and oscillates with said basket, whereby a configuration of the agitator means can be selectively varied by removing said extension and by replacing the agitator extension with one having a different configuration.

11. In a vertical axis automatic washing apparatus according to claim 10, wherein said hub portion includes an axially extending stub for receiving an end of the drive shaft of the apparatus and telescopically receiving one end of the agitator extension.

12. In a vertical axis automatic washing apparatus according to claim 11, wherein said means for removably mounting the agitator extension includes fastening means extending axially through the agitator extension and an end of said stub, said fastening means having means coacting with said means on the end of the drive shaft to hold said agitator extension on said stub.

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