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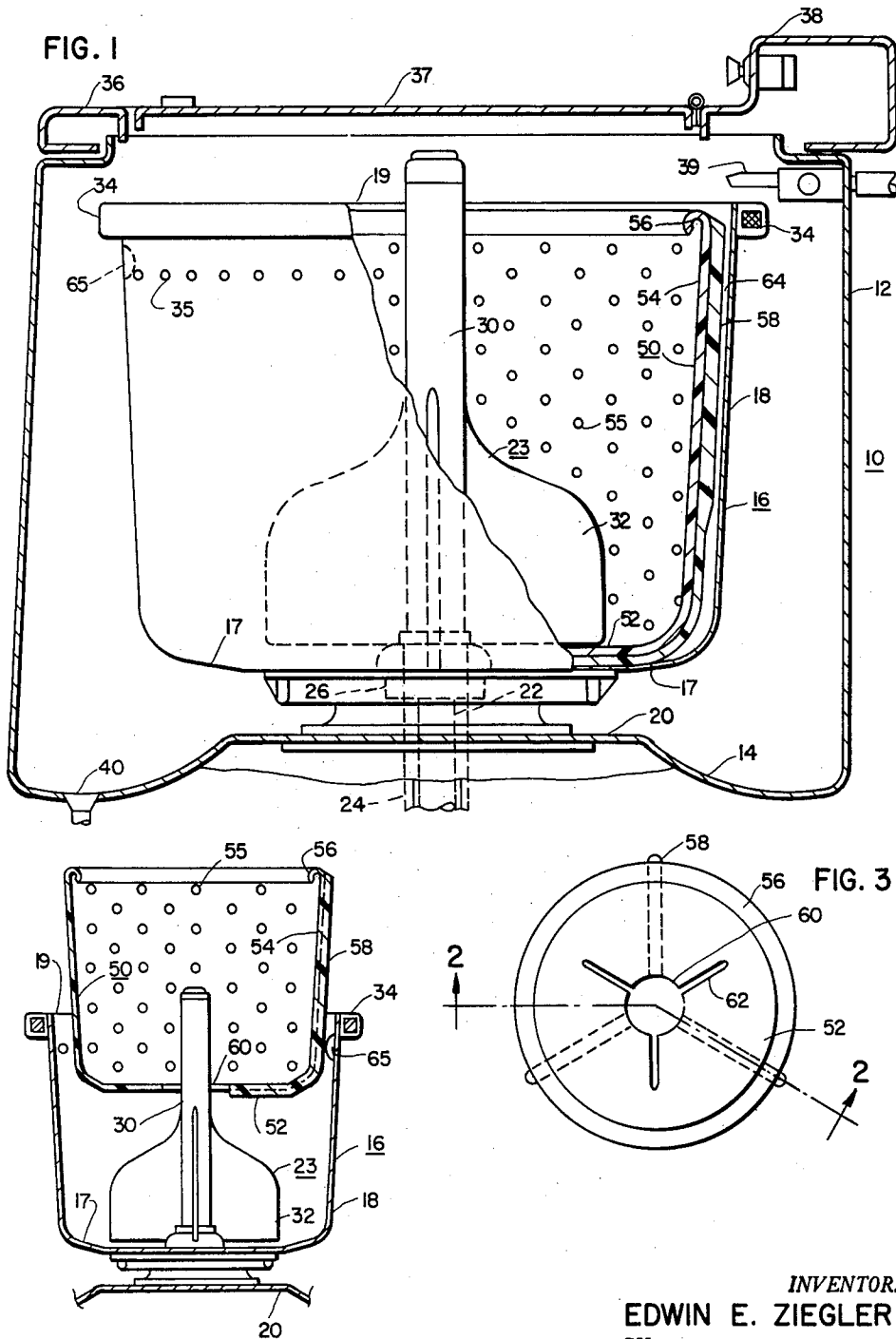
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3,145,551

CLOTHES WASHING MACHINE

Filed July 16, 1962

2 Sheets-Sheet 1



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FIG. 4

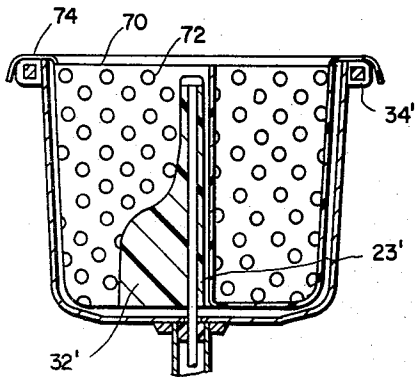


FIG. 5

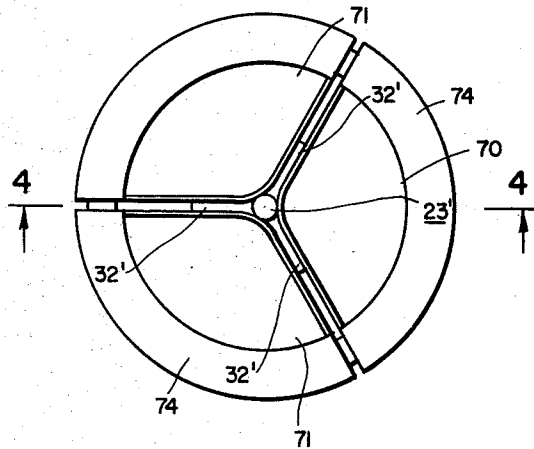


FIG. 6

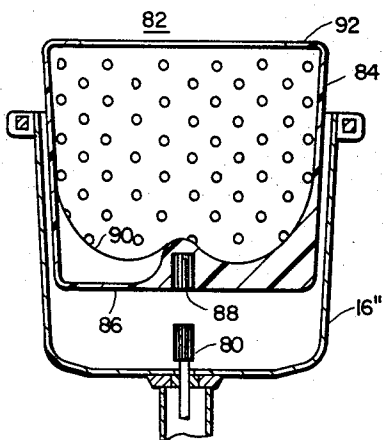
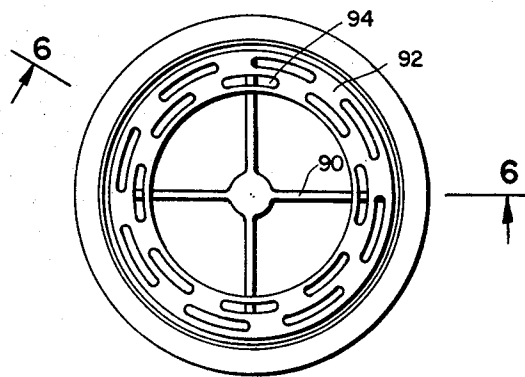


FIG. 7



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## CLOTHES WASHING MACHINE

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Filed July 16, 1962, Ser. No. 209,834  
6 Claims. (Cl. 68—4)

The present invention relates to clothes washing machines of the type in which clothes are agitated and centrifuged in a wash basket.

More specifically the invention refers to a removable basket liner or inner clothes basket which can be used as a hamper within which to accumulate the soiled clothes, and then without removing the clothes the hamper may be placed in the wash basket of the washing machine for the usual washing sequence. At the conclusion of the sequence the clothes and the removable liner may be removed as a unit. The clothes may be carried in the basket liner for placement of the clothes in a dryer or the like. Thus, it is unnecessary for the housewife to handle the clothes piece by piece either when placing them in, or removing them from, the washing machine. In addition, the liner when positioned in the wash basket becomes a functional part of the machine for effecting the wash and centrifuging action.

In one form of the invention, I provide an imperforate wash basket with an oscillating, bladed agitator upstanding centrally in the basket. The inner liner for use with this basket is fabricated by any suitable method of a synthetic resin material such as polyethylene or polypropylene. The basket liner is contoured to fit within the wash basket in spaced relation to the basket interior. The liner walls are generously perforated and the base is slotted to fit over the agitator blades and to rest on the basket bottom during washing. The basket liner becomes in this instance a perforated inner basket containing the clothes to be washed within an imperforate water retaining basket or tub. By this construction, the advantages of perforated basket washing, such as efficient soil removal and isolation of sand and heavy soil from the clothes are achieved in addition to the primary advantage of having a readily removable lightweight clothes basket.

In a further embodiment of the invention there may be provided a wash machine of the type in which the basket is oscillated for washing clothes therein. In such a machine, the basket may include an axial shaft having a splined section extending upwardly into the main basket. The basket liner for use in this machine may have a female spline fitting in its base adapted to mesh with the shaft spline. The basket liner interior may have suitable vanes or ribs spaced about its interior for generating water or wash action during oscillation of the basket liner.

In a still further embodiment which is primarily usable with the first type of machine construction, the liner is comprised of three or more cylindrical sectors each of which may carry clothes of a separate type. These sectors may be fitted between adjacent agitator blades for agitative movement with the blades.

It is therefore an object of the invention to provide a perforated basket liner for use in a conventional vertical axis washing machine, in which the liner retains the clothes during a sequence including wash and centrifuging cycles. The liner is readily removable for carrying the wet clothes and may be used as a hamper for storing clothes prior to washing.

It is a further object of the invention to utilize a lightweight perforated basket in combination with the wash basket of an imperforate basket washer, wherein the first-named basket serves as an inner perforated tub of double-tub washing machine.

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Other objects, features and advantages of the invention will become apparent from the following description read in connection with the accompanying drawings in which:

FIG. 1 is a fragmentary sectional elevation of the upper half of a clothes washing machine using one embodiment of my invention;

FIG. 2 is a side sectional elevation showing the basket liner of FIG. 1 partially removed from the washing machine basket;

FIG. 3 is a top plan view of a basket liner as used in FIG. 1;

FIG. 4 is a side sectional elevation taken on lines 4—4 of FIG. 5, showing the segmented basket liner;

FIG. 5 is a top plan view of the washing machine basket with the segmented liner of FIG. 4 in washing position;

FIG. 6 is a side sectional elevational of a third embodiment of the invention viewed along line 6—6 of FIG. 7; and

FIG. 7 is a top plan view of the basket and liner of FIG. 6.

Now referring to FIG. 1 of the drawings, there is shown the upper portion of a clothes washing machine 10 which includes a box-like outer appearance cabinet 12 within which the machine components are housed. The machine includes an imperforate stationary tub 14 within which there is located an imperforate conventionally shaped wash basket 16. The wash basket includes a circular base 17, an upwardly and outwardly extending imperforate sidewall 18 terminating at a top loading opening 19. The basket is journaled for rotation about a vertical drive shaft. The drive shaft depends through the bottom wall 20 of stationary tub 14 for connection to conventional transmission and drive mechanisms (not shown). This drive shaft includes an inner shaft 22 which extends into the basket for connection to an agitator structure 23 in any known manner to induce oscillation of the agitator mechanism on oscillation of shaft 22. Outwardly of shaft 22, a second coaxial drive shaft 24 in the form of a tube, is connected to the base of basket 16 at hub 26 for rotation of the basket on rotation of shaft 24. Such shaft arrangements, construction and securement are well-known in the art.

The agitator structure 23 includes an upstanding central column 30 from which may extend three or more equally spaced radial blades or vanes 32. These vanes extend from the central agitator column; the base of each vane terminates a short distance above the base 17 of the basket. About the upper periphery of its sidewall, the basket has affixed thereto a heavy inertial ring 34 of high density material. Below the ring the basket sidewall may be apertured to provide a horizontal line of extraction holes 35. These holes may be circular or slotted so that high speed spin of the basket centrifugally ejects wash liquid from the basket into the tub 14. This construction makes the machine useful as a conventional solid-wall basket type, if for some reason it is not expedient to use the basket liners presently described.

Above the basket access opening, the machine top surface 36 is apertured with a large loading opening covered normally by a hinged lid 37. At the machine rear, the top surface 36 is directed upwardly to provide a control console area 38 within which suitable conventional timer and control mechanisms may be installed using control knobs, buttons and the like for manual control of these mechanisms. One of the items controlled by the control mechanism is the water inlet system as indicated by inlet conduit 39 poised above the top basket opening. The inlet conduit may feed hot, warm or cold water from the domestic water supply to the basket as directed by suitable electrically controlled,

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solenoid operated, valves. To remove vitiated water from tube 14, a suitable drain opening 40 is provided which functions to exhaust liquid to the domestic sewage system in any known manner.

Pursuant to the present invention, a perforated basket liner or inner basket 50 is arranged to fit within the wash basket 16. This basket liner preferably is fabricated of some lightweight material which may be a molded synthetic resin such as polyethylene or polypropylene. This liner is shaped to generally conform to the shape of the main basket 16, that is to say, it has a circular base 52 flaring into the upwardly and outwardly directed sidewall 54. Sidewall 54 is perforated regularly with circular openings 55 evenly spaced about the entire sidewall. At its upper edge, the sidewall periphery is rolled inwardly to form a flange 56 which serves as a handle for grasping the basket liner.

Suitable strengthening ribs 58 extend from the outer surface of the liner. Three ribs are shown in the embodiment of FIGS. 1-3. From a circular centrally positioned opening 60 in base 52, these ribs extend radially outwardly along the underside of the base and then extend vertically along the sidewall 54 to terminate adjacent the upper sidewall edge. Further, as can be seen in FIG. 3, the base has three equiangularly disposed slots 62, each of which is approximately midway between adjacent ribs. Each slot is sufficient in length to extend beyond the agitator vanes 32. When the vanes and slots are positioned in alignment, the basket liner may be inserted into the basket, or removed therefrom, as shown in FIG. 2.

With the embodiment shown in FIGS. 1-3, clothes may be washed in the imperforate basket 16 in a generally known conventional manner by omitting the basket liner 50 entirely from the machine.

Alternatively, the basket liner 50 may be used as a clothes hamper in which clothes are stored prior to washing. When a full load has been accumulated in the liner, the liner may be inserted into basket 16. The liner would be slid down over the agitator and the agitator vanes 32 would be fitted through slots 62. The ribs 58 of the basket liner 50 would then come to rest on the basket base 17 with the liner sidewall 54 inwardly of the basket sidewall 18.

During a washing operation, the agitator structure 23 is oscillated by shaft 22. The basket and liner remain substantially stationary. The spacing between the liner and the basket allows heavy dirt, sediment, and the like to pass through the perforate liner during agitation. Such sediment will accumulate in the interspace 64 between the liner sidewall 54 and the basket sidewall 18, and will thus be isolated from contact with the articles of clothing in the liner.

During spin following agitation, the basket is rotated rapidly. Although the liner will rotate sympathetically because the outwardly directed centrifugal forces will expand the basket so that its ribs 58 will press firmly against the basket wall in frictional engagement therewith, the rotation may be made positive by means such as the embosses 65 extending inwardly from the basket walls near the top thereof. These embosses, equal in number to, and spaced similarly to, the ribs 58, will engage with the latter ribs to effect a positive driving relationship.

During high speed spin the wash water passes through the liner perforations 55, and flows upwardly along the basket, to pass through the apertures 35, as well as flowing over the top of the basket. Any heavy dirt and sediment which may have accumulated in the interspace 64 will be discharged into the tub with the main flow. From the tub, this vitiated water is expelled to the building sewage system by way of the tub drain opening 40.

At the conclusion of the entire wash sequence, if the

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basket liner containing clothes is to be removed, the liner may be rotated manually until the slots are aligned with the agitator vanes. With the inner flange 56 being used as a lifting handle the basket liner can be raised vertically out of the washing machine. The basket liner containing the clothes may then be taken to the dryer, or clothesline.

A second embodiment of the invention is shown in FIGS. 4 and 5 as applied to a washing machine similar to that one previously described. The basket liner 70 differs in that it is divided into three separate pie-shaped cylindrical sectors 71. Each sector individually fits between adjacent blades 32' of agitator structure 23', and each is removable separately. The sides of the sectors are perforated profusely with openings 72 of generally larger diameter holes than used in the prior embodiment. These openings 72 comprise a greater percentage of the sidewall area than the solid area. This open wall construction is provided to insure effective water circulation between the sectors. With this embodiment, small amounts of clothes may be placed in each sector and the sectors inserted into the basket. The clothes in each sector are physically segregated from direct contact with the clothes in the other basket liner sectors. During agitation, the water action generated by the movement of the agitator blades will tend to be considerably muted by the combined imposition of the sector walls. Thus, this embodiment will produce a wash action which is ideal for use with delicate garments such as women's underthings.

For handling the sector liners of this second embodiment suitable outwardly directed flanges 74 may be affixed to the outer edge of each basket upper sector. During the wash action, the liner sectors will themselves oscillate due to the driving force imparted by the agitator vanes. These sectors will ride on the flange portion and will cause the entire basket to oscillate gently during the agitate wash period. For spin, the entire basket is rotated at high speed rotating the basket liner sectors along with the basket. Again in this embodiment, a double-walled basket is effected by using the revised multiple sector liner 70.

In the embodiment shown in FIGS. 6 and 7, the agitator structure as such has been removed from a conventional wash basket of the type previously shown. The agitator shaft upper end leads to a male spline member 80 upstanding in the basket 16" a short distance above the basket base. Within the basket is fitted a single cylindrical basket liner 82 whose circumferential perforate sidewall surface 84 is closely akin to that of the adjacent basket wall. The base 86 of the basket liner is formed or otherwise constructed with a downwardly open female spline member 88 at the base center. This female spline mates with the agitator shaft spline 80 to render the basket liner responsive to oscillations of the agitator shaft. Internally in the basket liner, suitable vanes 90 or fins are formed to generate water action internally in the basket liner. Ribs (not shown) similar to those employed in the first embodiment may be used to strengthen the basket, if deemed necessary. The liner is perforated regularly along its sidewall 84 to approximate a double-wall construction as in the prior embodiments.

With this embodiment, the liner top may be formed inwardly at a flange 92 which serves as a clothes guard 94 and gripping medium for liner withdrawal. The liner is an integral and necessary part of the wash action since the liner is agitated to perform the wash action. A splined agitator (not shown) may also be provided to allow the user the choice of conventional agitation wash in an imperforate basket, or oscillatory basket, double-wall arrangement above noted.

While there have been described what are at present thought to be the preferred embodiments of the invention, it will be understood that various modifications may be made therein, and it is intended in the following claims

to cover all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. In a clothes washing machine having an upstanding, open-topped, substantially imperforate, basket within which clothes may be washed and rinsed,

means for admitting water thereinto to provide a washing and rinsing medium, and

an agitator within said basket arranged to be operated to create pulsations in said water, said basket being arranged to be rotated at relatively high speed for removing said water therefrom,

the improvement comprising:

a combination basket liner and clothes hamper for optional use within said basket, said liner having approximately the axial and radial dimensions of the basket and conforming substantially to the shape thereof,

means in the bottom wall of said liner accommodating the passage of the agitator therethrough whereby said liner may be inserted wholly into said basket for subsequent operation of the agitator therein, and means including rib members projecting from exterior wall surfaces of said liner to establish relatively narrow water flow passages between said basket and said liner.

2. Apparatus according to claim 1, further characterized by embossed members extending inwardly from said basket for engagement with said liner rib members.

3. Apparatus for washing articles of clothing and centrifugally extracting wash liquid therefrom, comprising, in combination,

an imperforate frusto-conical basket,

means for introducing wash liquid thereinto,

a combination basket liner and hamper conforming generally to the shape and size of said basket and being removably disposed within said basket to receive the articles to be washed,

said liner being of lightweight rigid material, and having a multiplicity of openings through its side walls,

means on the exterior of said liner engaging with the side and bottom of said basket to maintain the walls of said liner in spaced relation to the adjacent walls of said basket while supporting said liner for rotation with said basket,

means for agitating the wash liquid within said liner to effect a washing of the clothes therein, and

means for rotating said basket and liner to effect centrifugal discharge of liquid therefrom,

whereby subsequent to said liquid discharge said liner and contents may be removed as a unit from said basket in preparation for further treatment of said contents.

4. In a clothes washing machine of the type including a substantially imperforate wash basket rotatable about a vertical axis,

liquid agitation means extending upwardly in said basket at the axis of rotation thereof, said agitation means including a plurality of radially extending blade members,

a combination basket liner and clothes hamper to receive articles to be washed, said liner being of lightweight, rigid material having perforate sidewalls, means for supporting said liner on said basket for free removal therefrom, said supporting means maintaining said liner in relatively close spaced relation to the base and sidewalls of said basket, said liner having structure accommodating the passage therethrough of said agitator blades, and

means for mounting said basket and the therein positioned liner for rotation to effect centrifugal extraction of liquid therefrom.

5. A clothes washing machine according to claim 4, in which the base of said liner occupies a space between the bottom of said agitator blade members and the bottom of said basket.

6. A clothes washing machine according to claim 4, in which the base of said liner has a central aperture and slots extending therefrom to accommodate passage of said agitator blades.

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