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(12) # EUROPEAN PATENT APPLICATION

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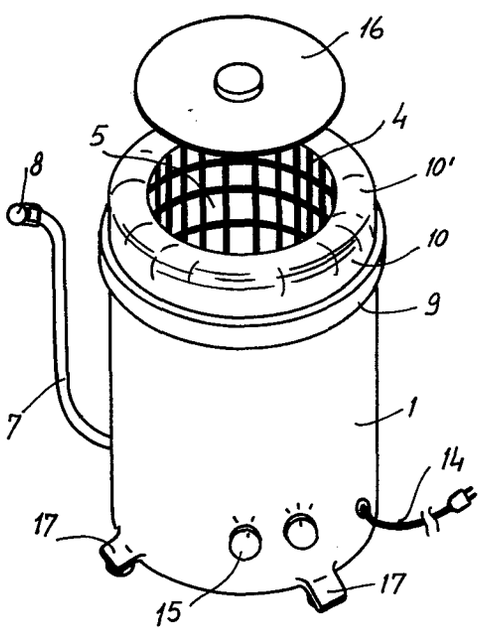
(54) **Washing machine provided with a vertical axis rotating basket and including means for automatically holding the washing water in the inside of the tube.**

(57) There is disclosed a washing machine comprising a vertical axis cylindrical tub, provided with a discharging pipe, in the inside whereof a perforated wall basket is effective to coaxially rotate, said basket being driven by an electric motor, the tub being provided with a top or upper portion, projecting from the basket and inwardly and downwardly curved.



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The present invention relates to a washing machine, provided with a vertical axis rotating basket and including means effective to automatically hold the washing water in the inside of the tub.

As it is known the presently available washing machines are rather complex, and they comprise a high number of component elements and, because of these reasons, are greatly expensive and easily subjected to malfunctions.

In fact, the conventional types of washing machines comprise a basket, effective to rotate about a horizontal axis, and embedded in a tub, also having a horizontal axis and resiliently supported in an outer casing by means of springs and schock absorbers.

That arrangement, in addition to subjecting the basket spindle to great radial thrusts requires the use of pipes for coupling the tub to the outside enviroment, in order to introduce water into the tub itself and for its empting.

The mentioned pipes, on the other hand, are quickly susceptible to wear, as well as the tightness flexible gaskets associated with the washing machine loading port and the washing machine discharging assembly.

Accordingly, the task of the present invention is to overcome the thereinabove mentioned drawbacks by providing such a washing machine which is structurally very simple and strong.

Within that task, it is a main object of the present invention to provide such a washing machine which is practically devoid of any parts subjected to wear such as tightness flexible gaskets, inner pipes and the like.

Another object of the present invention is to provide such a washing machine which comprises a reduced number of component cooperating elements, thereby providing an apparatus greatly reliable in operation.

According to one aspect of the present invention, the above task and objects, as well as yet other objects which will become more apparent thereinafter, are achieved by a washing machine, characterized in that it comprises a vertical axis cylindrical tub, provided with a discharging duct, in the inside whereof a perforated wall basket is able of coaxially rotating, said basket being driven by an electrical motor, said tub being provided with a top portion, projecting from said basked and inwardly and downwardly curved.

Further characteristics and advantages of the washing machine according to the present invention will become more apparent thereinafter from the following detailed secription of a preferred embodiment of the washing machine, being illustrated, by way of a non limitative example, in the Figures of the accompanying drawings, where:

Figure 1 is a perspective view illustrating the washing machine according to the invention;

Figure 2 is a detailed view illustrating the profile of the wall of the washing machine tub and the movement of the washing water therein during the rotation of the basket; and

Figure 3 is a vertical cross-sectional view illustrating one half of the washing machine according to the present invention.

With reference to the Figures of the accompanying drawings, the washing machine according to the invention comprises a cylindrical tubular body 1, open at the top and provided with an intermediate horizontal wall 2.

At the center portion of the mentioned horizontal wall, there is rotatively coupled, by means of suitable supporting members, the vertical spindle 3 of a cylindrical basket 4, the wall whereof is provided with a plurality of quadrangular opening or windows 5.

Said openings or windows, in particolar, are formed on parallel rows, horizontally extending, each row comprising like width openings whereas, starting from the two center rows and proceeding upwardly and downwardly of the basket, the height of said openings is progressively reduced, with a given ratio.

At the bottom of the top or upper box-shaped body 6, defined by the mentioned intermediate wall 2 and tubular body 1, there is provided a coupling with a discharging pipe 7, including, at the free end whereof, a shutting off member 8, of any suitable types.

At the top of said box-shaped body there is tightly affixed, preferably by a collar 9, a shaped annular structure 10, the top portion 10' whereof is shaped as an arc of circle inwardly directed and having its edge downwardly directed.

On the spindle 3 of the basket 4 there is keyed a suitably sized pulley 11 which is driven, through a transmission member 12, by an electric motor 13, supplied through the electric cable 14.

The supplying to the mentioned motor, which may advantageously be of the two speed types, is controlled by a switch, preferably of the knob type, 15, and it may be possibly driven by a timer.

A device may be moreover provided for controlling the washing and rinsing water level, and a solenoid valve may be provided, controlled by the mentioned timer, and inserted in the coupling of the discharging pipe 7.

The inlet port of the top or upper box-shaped body, moreover, is provided with a round cross-section cover, indicated at 16, and provided with a suitable handle, whereas at the bottom of said tubular body 11 radially extending lugs may be provided, outwardly directed, and indicated at 16, effective to act as supporting feet.

In operation, after having loaded the linen to be washed and the required water amount, as well as the cleansing agent, into the basket, the latter is caused to rotate.

The washing water, because of the cen-

trifugal force, developped in the inside of the basket, is pushed against the wall of the box-shaped body 6, moves therealong and is sent, by the curved top portion 10', acting as a baffle, downwardly to the inside of the basket itself.

The latter, as it shoudl be apparent, after the washing and rinsing step and after the discharging of water, provides, by its rotation, a centrifuge operation thereby removing water from the washed linen.

From the above disclosure and observation of the Figures of the accompanying drawings, will be self evident the great functionality and use facility characterizing the washing machine according to the present invention.

While the washing machine according to the invention has been thereinabove disclosed with reference to a preferred embodiment thereof, it should be apparent that it is susceptible to all modifications and variations falling within the scope of the invention, as defined in the accompanying Claims.

CLAIMS

1. A washing machine, characterized in that it comprises a vertical axis cylindrical tub (1, 6), provided with a discharging pipe (7), in the inside whereof a perforated wall (5) basket (4) is effective to coaxially rotate, said basket being driven by an electric motor, the tub being provided with a top or upper portion, projecting from the basket and inwardly and downwardly curved.

2. A washing machine, according to the preceding Claims, characterized in that said tub (1) is formed by the top portion of a cylindrical tubular body (1), provided with an intermediate horizontal wall (2), and to the top whereof is tightly affixed, preferably by means of a collar (9) a shaped annular structure (10) the top portion (10') whereof is profiled as a circle arc, inwardly directed and having its edge downwardly directed.

3. A washing machine, according to the preceding Claims, characterized in that at the central portion of said horizontal wall (2) there is rotatively coupled, by means of supporting members, the vertical spindle (3) of said basket (4), the wall of said basket being provided with a plurality of quadrangular openings or windows (5), said openings being formed in parallel horizontally extending rows, each row comprising openings of like width, whereas, starting from the two center rows and proceeding upwardly and downwardly of said basket (4), the height of said openings is progressively reduced with a given

ratio.

4. A washing machine, according to one or more of the preceding Claims, characterized in that at the bottom of said upper or top box-shaped body (6) there is provided a coupling with said discharging duct (7) which is provided, at the free end whereof, with a shut off member (8).

5. A washing machine, according to one or more of the preceding Claims, characterized in that on the spindle (3) of said basket (4) there is keyed a suitably sized pulley (11) driven, through a transmission member (12) by an electric motor (13) which may be of the two speed type, the supplying to said motor being controlled by a timer.

6. A washing machine, according to one or more of the preceding Claims, characterized in that the inlet port of said tub (1, 6) is provided with a round cross-section cover (16) having a handle, whereas at the bottom of said tubular body there are provided radially extending lug (17) outwardly directed.

7. A washing machine, according to the preceding Claims, characterized in that it comprises a device effective to control the washing and rinsing water level, as well as a solenoid valve, controlled by said timer and inserted in the coupling of said discharging pipe (7).

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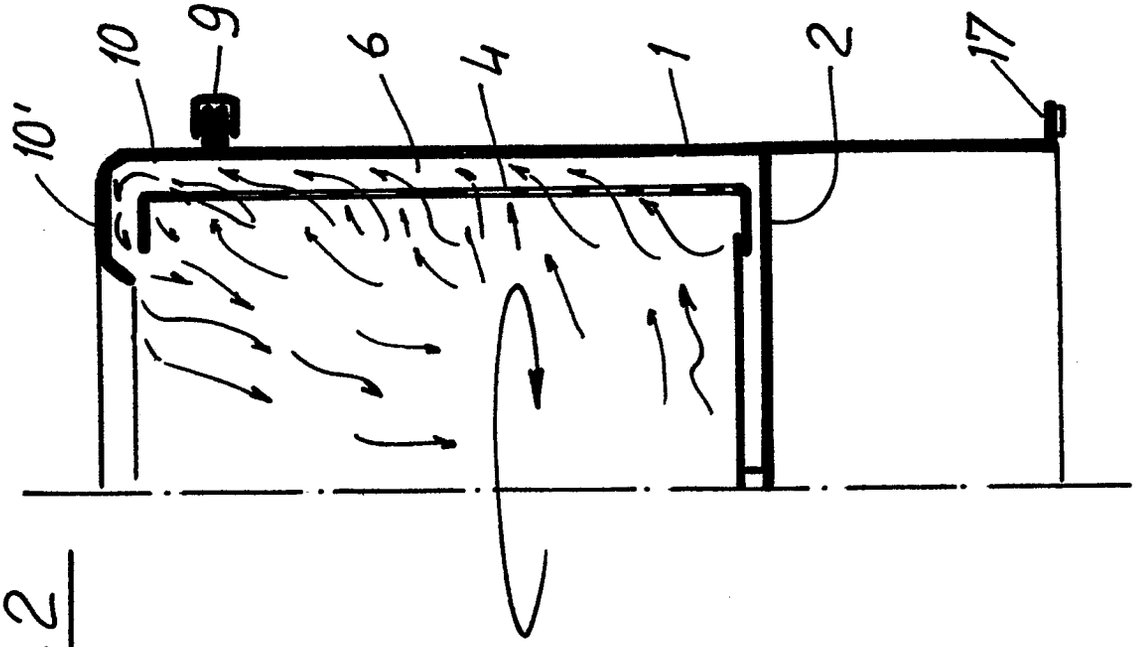

Fig. 2

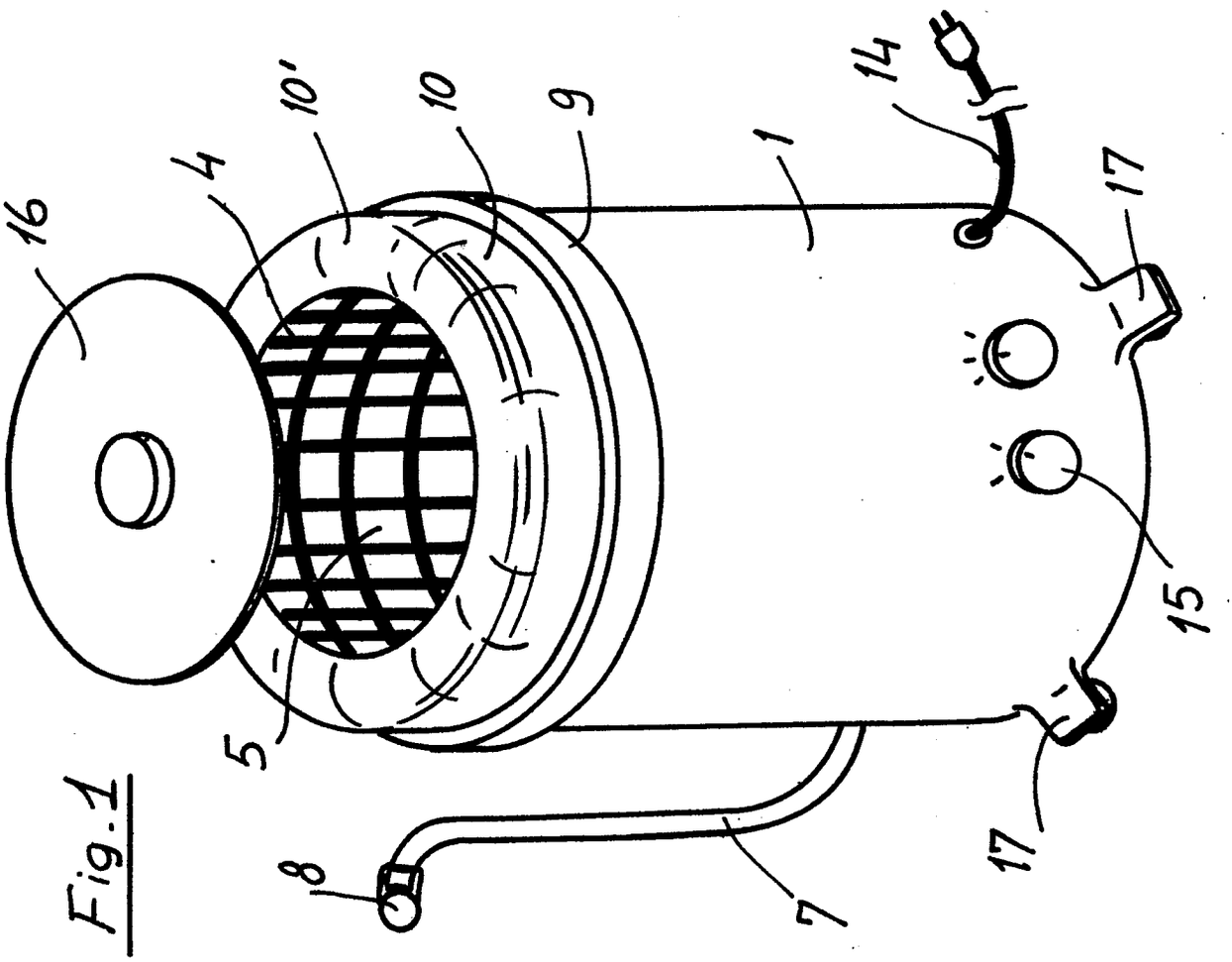

Fig. 1

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Fig. 3