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Patente de Invención.



Patente de Modelo de Utilidad.



Capítulo I.



Capítulo II.

2

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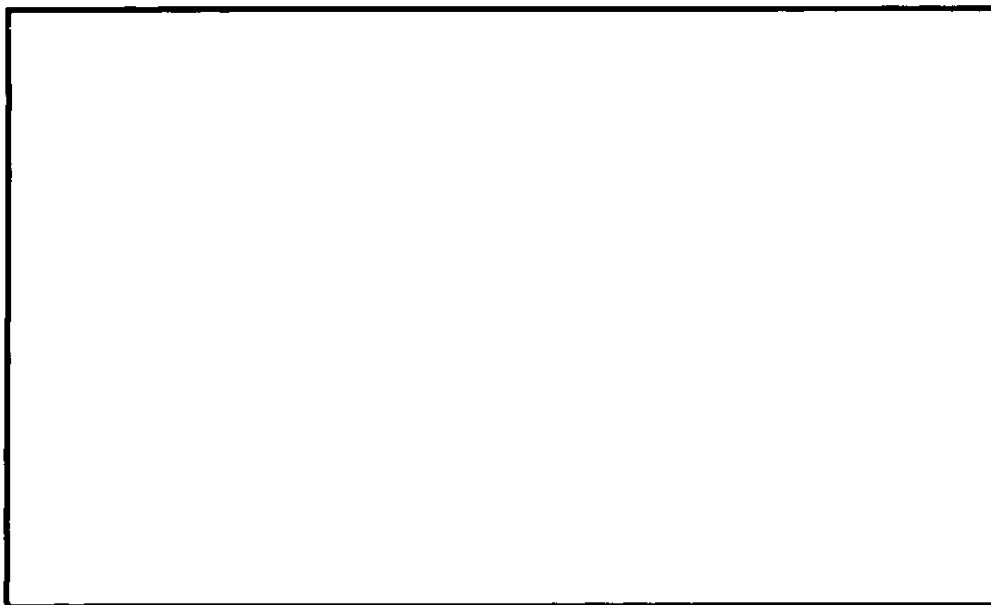
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ANEXOS

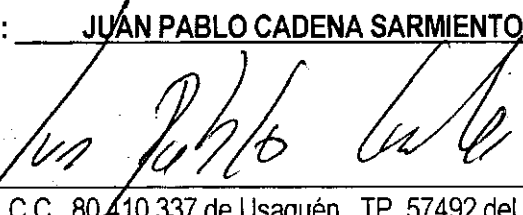
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11 FIGURA CARACTERÍSTICA:



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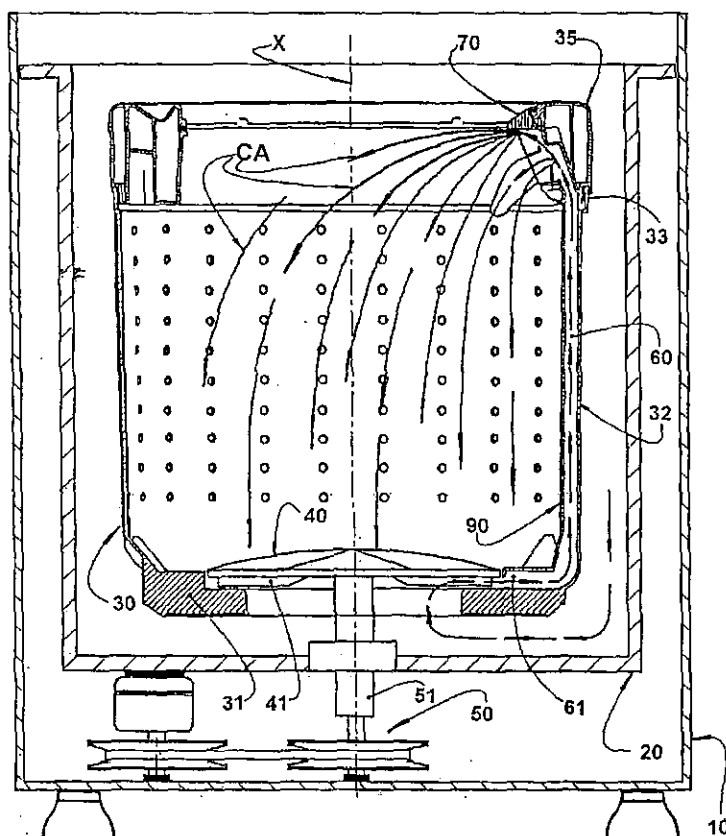
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(54) Title: WATER RECIRCULATION SYSTEM FOR A LAUNDRY MACHINE



(57) Abstract: A water recirculation sys-
tem for a laundry machine that comprises:
a tub (20); a basket (30) rotating around a
vertical axis (X); an agitator (40) rotatively
driven around said vertical axis (X), in or-
der to produce an ascending recirculating
water flow through an axial duct (60) dis-
posed in a vertical wall (32) of the basket
(30). The system comprises: a distributing
nozzle (70) mounted in the upper opening
(62) to receive the recirculating water flow
therefrom, and comprising a first water out-
let (71) and a second water outlet (72), se-
curing a filter (80), said distributing noz-
zle (70) being configured to conduct, to the
first water outlet (71), a substantially con-
stant part of the recirculating water flow re-
ceived from the axial duct (60) and, to the
third water outlet (73), the remaining part
of the recirculating water flow that is not
returning to the basket (30) through the sec-
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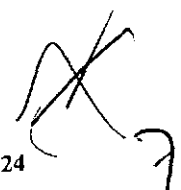


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"WATER RECIRCULATION SYSTEM FOR A LAUNDRY MACHINE"

Field of the Invention

The present invention refers to a water recirculation system used for forming the washing liquid in a laundry machine of the type that comprises a basket to be selectively rotated inside a tub and having an agitator or impeller positioned on its bottom and which is rotatively driven around a vertical axis.

Prior Art

10 It is well known in the prior art the laundry machines provided with a superiorly opened tub, usually cylindrical and in which interior is mounted, with a certain radial gap, a perforated basket rotating around a vertical axis, having a bottom wall and a lateral wall and being dimensioned to contain a certain load of clothes and washing liquid consisting of water, soap and other optional additives. In the interior of the basket, immediately above its bottom wall, there is provided an agitator to be rotatively and selectively driven by a motor unit, in two opposite directions around said vertical axis.

In this type of laundry machine, an internal longitudinal region of the lateral wall of the basket is constructed to define an axial duct having a lower inlet radially positioned next to the agitator and which is designed to receive a water flow impelled by said agitator when the latter is driven in the washing and rinsing operational cycles. The axial duct further presents an upper outlet to discharge the ascending water flow back to the interior of the basket. Generally, the upper outlet of the axial duct is positioned in an edge region of the basket, in which is conventionally fitted a finishing and balancing element in the form of a tubular ring.

35 This known water recirculation system allows, during



the washing and rinsing operational cycles, the rotation of the agitator in two opposite directions to pump water through the ascending axial duct, promoting a water recirculation, in order to allow at least a portion of this water flow to pass through a fluff filter before returning to the basket, as well as to allow at least another portion of the recirculating water flow to be returned to the basket, in the form of a cascade, to increase the washing efficiency of the machine.

Known solutions presenting the basic characteristics mentioned above are described, for example, in patent documents US 5,509,283, US 5,661,989 and US 5,863,423. Although suggesting water recirculation systems that promote the filtration of at least part of the recirculating water flow, as well as the formation of water jets or cascades over the load of clothes contained in the basket, these prior art constructive solutions present some inconveniences.

One problem of the solutions commented above is related to the maintenance of a substantially constant water flow for forming the cascade(s) inside the basket. The higher the incidence of the water cascade falling over the cross section area of the basket, the higher the efficiency of said cascade falling on the load of clothes, with no risk of producing splashes to the outside of the basket and the tub. Since the system is dimensioned to provide a more intense and efficient cascade, with no risks of occurring splashes and with the filter in a clean condition, as the filter is loaded with fluff, the water flow that forms the cascade tends to be altered to a more intense condition, in the cases in which it is parallel to the filtrating flow, or to a less intense condition, in the cases in which it is previously submitted to

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filtration. In both cases, there occurs a loss of the design pattern established for the cascade.

Another deficient aspect of the known solutions results from the construction of the cascade forming means, which tend to be multiplied to maximize the incidence of the water cascade over the load of clothes in the basket. Generally, these solutions need more complex constructions, requiring a relatively large quantity of component parts, making difficult the production, maintenance and cleaning, and increasing the cost of the product. The known solutions do not allow obtaining a single cascade with an optimal degree of incidence over the load of clothes placed inside the basket.

15 Summary of the Invention

On account of the deficiencies of the solutions known so far, it is an object of the present invention to provide a water recirculation system for a laundry machine, which allows filtrating part of the recirculating water flow and forming a respective water cascade over the load of clothes contained in the basket of the machine, from a substantially constant part of said water flow, irrespective of the load loss produced by the operational condition of the filter in the respective part of the recirculating water flow.

It is a further object of the present invention to provide a water recirculation system as mentioned above, which produces a substantially constant water cascade configured to maximize its area of incidence over the load of clothes contained in the basket and to minimize the risks of occurring splashes to the outside of both the basket and the tub.

It is an additional object of the invention to provide a water recirculation system as mentioned above,

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presenting a simple construction, with reduced number of low cost components, which the user can easily remove and clean.

In order to comply with the objectives mentioned above, the present invention provides a water recirculation system for a laundry machine of the type that comprises: a tub; a basket having a bottom wall and a lateral wall and which is mounted inside the tub, so that it can be rotated around a vertical axis; an agitator disposed in the interior of the basket to be rotatively driven around said vertical axis; at least one axial duct disposed in the vertical wall of the basket and having a lower opening turned to the agitator and an upper opening; and a driving assembly to rotate the agitator, in such a way as to produce an ascending recirculating water flow through the axial duct.

According to the invention, the present system comprises: a distributing nozzle removably mounted in the upper opening of a respective axial duct, in order to receive the recirculating water flow therefrom, and comprising a first water outlet; a second water outlet disposed under the first one and to which is affixed a filter, said first and second water outlets being radially turned to the interior of the basket; and a third water outlet disposed under the second water outlet according to a descending direction, turned to the interior of the basket, said distributing nozzle being configured to conduct, to the first water outlet, a substantially constant part of the recirculating water flow received from the axial duct and, to the third outlet water, the remaining part of the recirculating water flow that is not returning to the basket through the second water outlet.

The basic construction defined above allows the

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distributing nozzle, which can be easily mounted to the upper region of the machine basket, next to the upper opening of the axial duct, to define a first water outlet configured to provide a cascade that is maintained substantially constant in the washing and rinsing cycles of the machine, irrespective of the load loss produced by the operational condition of the fluff filter which is mounted in a second water outlet disposed under the first. The provision of the third water outlet, which operates as a relief outlet, allows the water flow, which is progressively reduced through the second outlet opening due to the accumulation of fluff in the filter, to be discharged from the distributing nozzle through the third water outlet, minimizing alterations in the formation of the cascade from the first water outlet.

Brief Description of the Drawings

The invention will be described below, with reference to the attached drawings, given by way of example of an embodiment of the invention and in which:

Figure 1 is a simplified vertical sectional view of a laundry machine provided with the water recirculation system object of the present invention;

Figure 2 is an enlarged detail of part of the assembly illustrated in figure 1, to better visualize the positioning of the distributing nozzle in relation to the axial duct that conducts the recirculating water flow;

Figure 3 is a simplified upper view of the assembly illustrated in figure 1, showing the substantially trapezoidal contour of the water cascade;

Figure 4 is an exploded perspective view of the central region of the machine, illustrating the upper region of the basket in which the distributing nozzle is mounted;

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Figure 5 is a perspective view of the assembly of components of figure 4, already in the mounted condition;

Figure 6 is a perspective view of the assembly of figure 5, when observed from the seating side in the upper region of the basket;

Figure 7 is an exploded radial sectional view of the upper region of the basket and distributing nozzle; and

Figure 8 is a radial sectional view of the assembly of figure 7, with the distributing nozzle in the mounted condition.

Detailed Description of the Invention

As illustrated in the attached drawings and already mentioned above, the present invention relates to the laundry machines of the type provided with a body 10 that usually defines a casing to be seated directly onto a supporting surface and which supports and lodges therewithin, a tub 20 to contain a load of water or washing liquid, comprising water and other optional additives, said tub 20 being generally suspended by elastic means (not illustrated) in the body 10 of the machine. In the interior of the tub 20 is positioned a usually cylindrical and perforated basket (30) presenting a bottom wall 31, which is circular and centrally opened, and a preferably cylindrical lateral wall 32 which terminates in an upper free edge 33. The basket 30 is mounted inside the usually cylindrical tub 20, in order to be rotated around a vertical axis X during determined operational steps of the machine, generally defined by cycles such as spinning or simply expelling the liquid from the clothes.

The basket 30 generally carries, mounted onto its upper edge 33, a balancing tubular ring 35 to avoid

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vibration of the basket 30 during the washing, rinsing and spinning operations carried out by the laundry machine.

In the interior of the basket 30, more specifically on its bottom wall 31, there is provided an agitator 40 in the form of a rotary impeller, with a generally circular contour and being inferiorly provided with a plurality of radial fins 41 which, upon rotation of the agitator 40 in one or in the other direction around said vertical axis X, produce a water flow that is axially upwardly pushed from the bottom of the tub 20 and radially impelled to the outside of the agitator 40 between the latter and the bottom wall 31 of the basket 30, said agitator working as a centrifugal water pump.

The present water recirculation system further comprises, conventionally, at least one axial duct 60 disposed in the vertical lateral wall 32 of the basket 30 and having a lower opening 61 turned to the agitator 40 and an upper opening 62 disposed next to the upper edge 33 of the basket 30. In the illustrated construction, the axial duct 60 is defined between the bottom wall 31 and lateral wall 32 of the basket 30 and an elongated chute 90, with an L-shaped lateral profile and U-shaped cross section, with the free edges of its lateral legs being seated and affixed against the bottom and lateral walls 31, 32 of the basket 30. The L-shaped lateral profile of the elongated chute 90 allows a lower extension of the axial duct 60 to be disposed in a horizontal and radial way, positioning the lower opening 61 of the axial duct 60 next to the agitator 40, so that the radial water flow impelled by the latter can be admitted in the interior of the axial duct 60 through by its lower opening 61. The remaining extension of

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the axial duct 60 is defined close to respective longitudinal extension of the lateral wall 32 of the basket 30, as illustrated in the figures of the attached drawings. It should be understood herein that

5 the fixation of the elongated chute 90 to the basket 30 can be carried out by any adequate manner well known in the art, this aspect not being considered as a differentiating characteristic of the invention. With the construction defined herein for the axial

10 duct 60, when the machine is working in the washing and rinsing cycles, in which the agitator 40 is rotatively driven in two opposite directions around the vertical axis X, an ascending recirculating water flow is formed through the axial duct 60, from its

15 lower opening 61 to its upper opening 62, as indicated by the arrows illustrated in figures 1 and 2. The activation of the agitator 40 is performed by a driving assembly 50, schematically illustrated in the

--- attached drawings by the graphic representation of the

20 vertical shaft 51, to whose upper end is mounted the agitator 40. As already mentioned, the driving assembly 50 allows the agitator 40 to be selectively driven in the different operational cycles of the machine.

25 According to the present invention, the water recirculation system comprises a distributing nozzle 70, generally constructed in a single piece injected in plastic material, to be removably mounted to the upper opening 62 of a respective axial duct 60, in

30 order to receive the recirculating water flow therefrom. The distributing nozzle 70 comprises a first water outlet 71, a second water outlet 72 disposed under the first and to which is affixed a filter 80, generally a filter defined by a mesh net

35 pocket with the free edge hermetically affixed to said

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second water outlet, in such a way as to project to the interior of the basket 30, said first and second water outlets 71, 72 being radially turned to the interior of the basket 30, as better shown in figures 1 and 2.

The distributing nozzle 70 further presents a third water outlet 73 disposed under the second water outlet 72 and according to a descending direction, substantially orthogonal to the direction of the second water outlet 72 and turned to the interior of the basket 30. The distributing nozzle 70 is configured to conduct, to the first water outlet 71, a substantially constant part of the recirculating water flow received from the axial duct 60 and also to conduct, to the third water outlet 73, which takes the form of a relief outlet, the remaining part of the recirculating water flow that is not returning to the basket 30 through the second water outlet 72.

In the illustrated construction, the distributing nozzle 70 comprises a generally rectangular frame, preferably in a single piece injected in plastic material and defined by lower and upper opposite lateral wall portions 70a, 70b, a lower wall 70c, an upper wall 70d and an intermediate wall 70e. The intermediate wall 70e defines, with the lower wall 70c and with respective lower lateral wall portions 70a, the second water outlet 72, to which is affixed the filter 80 projecting outwardly toward the interior of the basket 30, said intermediate wall 70e defining, with the upper wall 70d and with respective upper lateral wall portions 70b, the first water outlet 71.

The construction of the distributing nozzle 70 is made so that the first water outlet 71 presents a certain axial expansion, with a rectangular cross section having the larger dimension lying horizontally and

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increasing toward the basket 30 and having the upper larger side defined by the upper wall 70d of the frame of the distributing nozzle 70, curved outwardly and diverging in relation to the lower larger side that is defined by said intermediate wall 70e of the frame of the distributing nozzle 70, said cross section being substantially rectangular, increasing in the radial direction of the water flow, and dimensioned to produce a water cascade with maximized area of incidence over a load of clothes contained in the basket 30.

With this construction, the width of the lower and upper lateral wall portions 70a, 70b and upper and lower walls 70d, 70c defines the axial extension of the first and second water outlets 71, 72.

The third water outlet 73 is preferably defined by an opening 73a provided in the lower wall 70c of the distributing nozzle 70, which opening 73a can be defined by a simple cutout produced in the rear edge of said lower wall 70c. In the illustrated construction, there is provided a deflecting wall portion 65, radially projecting inwardly, from the upper region of the basket 30, said deflecting wall 65 being positioned under the third water outlet 73, so as to receive the water flow passing through the latter, directing said water flow to the interior of the basket 30.

With the construction proposed herein, the recirculating water flow, which is upwardly discharged through the upper opening 62 of the axial duct 60, is supplied to the distributing nozzle 70, so that part of this recirculating water flow is directed to the first water outlet 71, while the remaining part of this flow is directed to the second water outlet 72 of the distributing nozzle 70, to pass through the filter

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80 before returning to the interior of the basket 30. However, that part of the recirculating water flow reaching the distributing nozzle 70 and which is not discharged by both the first water outlet 71 and the
5 second water outlet 72, is relieved through the third water outlet 73 and returned to the interior of the basket 30.

As a function of the construction imparted to the distributing nozzle 70, and particularly to the first
10 water outlet 71, the water cascade discharged through the latter presents, when viewed from above, a substantially trapezoidal contour, with the smaller base coinciding with the first water outlet 71, with the sides coinciding with projections of the smaller
15 sides of the cross section of the first water outlet 71 and defined by the upper lateral wall portions 70e of the frame of the distributing nozzle 70 and having the larger base in the form of an arc of a circle
-- accompanying -- the -- curvature -- of -- the -- region -- of -- the --
20 cylindrical lateral wall of the basket 30 opposite to that on which the axial duct 60 is positioned.

In this arrangement, the water cascade falls over the cross section region of the basket 30 delimited by said substantially trapezoidal contour of the water
25 cascade when viewed from above.

Besides assuring a specific shape for the water cascade, which maximizes its incidence over the load of clothes contained in the basket 30, the distributing nozzle presents an intermediate wall 70e
30 that is rearly cut to define therein a water flow passage restricted to the first water outlet 71, restricting the water flow directed to the first water outlet 71, so as to produce a water cascade CA (see figures 1 and 3) that maximizes its incidence over the
35 load of clothes contained in the basket 30, with no

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risk of occurring undesirable splashes of water to the outside of both the basket 30 and the tub 20. Preferably, the distributing nozzle 70 is designed so that the first water outlet 71 receives from about 15% to 30% of the recirculating water flow passing through the axial duct 60.

The provision of the third water outlet 73 in the distributing nozzle 70, downwardly directed, from the lower wall 70c of the frame of the distributing nozzle 70, allows maintaining the water flow directed to the first water outlet 71 substantially constant, even with the variation of the water flow that passes through the filter 80. As the filter 80 is loaded with fluff received from the clothes, the water flow through the second water outlet 72 is progressively reduced, whereby, in the absence of the third water outlet 73, it is possible to occur an undesirable increase of the water flow passing through the first water outlet 71, increasing the intensity of the water cascade CA and making the latter exceed the incidence limitations designed to maximize its action over the load of clothes with no risk of occurring splashes to the outside of the basket 30 and the tub 20. With the progressive clogging of the filter, the third water outlet 73 allows the recirculating water flow portion passing therethrough, towards the interior of the basket 30, to be progressively increased, absorbing the amount of water that would be otherwise directed to the first water outlet 71, undesirably increasing the intensity of the water cascade CA.

In the illustrated construction, the distributing nozzle 70 has its lower wall 70c disposed next to the upper opening 62 of the axial duct 60, and the balancing tubular ring 35 of the basket 30 defines an

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upper extension 64 of the axial duct 60, against which the distributing nozzle 70 is seated. The upper wall 70d of the distributing nozzle 70 presents a radially external edge which is seated, in an
5 overlapping relationship onto an upper peripheral step 35a of the tubular ring 35, defining a tight connection to prevent the ascending recirculating water flow from flowing over the tubular ring 35, splashing to the outside of the basket 30 and the tub
10 20.

As illustrated in figures 4-8, the axial duct 60 can be defined jointly with an axial recess 68 provided in the lateral wall 32 of the basket 30, said axial recess 68 being covered by the chute 90 schematically
15 illustrated in figure 1 and also by a cover 101 inferiorly incorporated to a nozzle support 100 which is affixed and retained in a respective cutout 36 provided in the tubular ring 35 and having a rear wall 36a inclined ~~radially outwardly and to the~~
20 inside of the basket 30, defining the upper extension 64 of the axial duct 60.

The nozzle support 100 incorporates the deflecting wall 65 and defines an opened median housing 102 with lateral walls 103 configured to allow the relatively
25 tight fitting of the lower lateral wall portions 70a of the distributing nozzle 70, which are provided by a locking means 77, generally in the form of a small rib, to be fitted into a respective groove 104 provided in each lateral wall 103 of the nozzle
30 support 100 in order to maintain the distributing nozzle 70 retained in its operational position.

While only one embodiment for the present system has been illustrated herein, it should be understood that alterations can be made in the form and physical
35 arrangement of the constitutive elements of the

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system, without departing from the constructive concept defined in the claims that accompany the present specification.

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CLAIMS

1. A water recirculation system for a laundry machine of the type comprising: a tub (20); a basket (30) having a bottom wall (31) and a lateral wall (32) and
5 mounted inside the tub (20), so that it can be rotated around a vertical axis (X); an agitator (40) provided inside the basket (30), in order to be rotatively driven around said vertical axis (X); at least one axial duct (60) disposed in the vertical wall (32) of
10 the basket (30) and having a lower opening (61) turned to the agitator (40) and an upper opening (62) and a driving assembly (50) to rotate the agitator (40), in order to produce an ascending recirculating water flow through the axial duct (60), characterized in that it
15 comprises: a distributing nozzle (70) removably mounted to the upper opening (62) of a respective axial duct (60), to receive the recirculating water flow therefrom, and comprising a first water outlet
20 (71); a second water outlet (72) provided under the first and to which is affixed a filter (80), said first and second water outlets (71,72) being radially turned to the interior of the basket (30); and a third water outlet (73) provided under the second water
25 outlet (72), according to a descending direction substantially orthogonal to the direction of the second water outlet (72) and turned to the interior of the basket (30), said distributing nozzle (70) being configured to conduct, to the first water outlet (71), a substantially constant portion of the recirculating
30 water flow received from the axial duct (60) and, to the third water outlet (73), the remaining part of the recirculating water flow that is not returning to the basket (30) through the second water outlet (72).
2. The system, as set forth in claim 1, characterized
35 in that the first water outlet (71) has a certain

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axial extension presenting a rectangular cross section with the larger dimension disposed horizontally and increasing towards the basket (30) and having the upper larger side outwardly arched and diverging in relation to the lower larger side, said cross section, increasing in the radial direction of the water flow, being dimensioned to produce a water cascade with maximized area of incidence over a load of clothes contained in the basket (30).

3. The system, as set forth in claim 2, characterized in that the water cascade discharged through the first water outlet (71) presents, when viewed from above, a substantially trapezoidal contour with the smaller base coinciding with the first water outlet (71), with the sides coinciding with projections of the smaller sides of the cross section of the first water outlet (71) and with the larger base, in the form of an arc of a circle accompanying the curvature of the region

~~of the cylindrical lateral wall of the basket (30)~~ opposite to that on which the axial duct (60) is positioned.

4. The system, as set forth in claim 3, characterized in that the water cascade falls over the cross section region of the basket (30) delimited by said substantially trapezoidal contour of the water cascade when viewed from above.

5. The system, as set forth in claim 2, characterized in that the first water outlet (71) receives from about 15% to 30% of the recirculating water flow passing through the axial duct (60).

6. The system, as set forth in claim 2, characterized in that the distributing nozzle (70) comprises a generally rectangular frame defined by lower and upper opposite lateral wall portions (70a, 70b), a lower wall (70c), an upper wall (70d) and an intermediate wall

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(70e), said intermediate wall (70e) defining, with the lower wall (70c) and with respective lower lateral wall portions (70a), the second water outlet (72), to which is affixed the filter (80) and, with the upper wall (70d) and with respective upper lateral wall portions (70b), the first water outlet (71).

7. The system, as set forth in claim 6, characterized in that the width of the lower and upper lateral wall portions (70a,70b) and upper and lower walls (70c,70d) defines the axial extension of the first and second water outlets (71,72).

8. The system, as set forth in claim 6, characterized in that the third water outlet (73) is defined by an opening (73a) provided in the lower wall (70c) of the distributing nozzle (70).

9. The system, as set forth in claim 8, characterized in that it comprises a deflecting wall portion (65) radially projecting from the axial duct (60) and positioned under the third water outlet (73), to receive the water flow passing there through.

10. The system, as set forth in claim 6, characterized in that the intermediate wall (70e) is rearly cut to define therein a water flow passage restricted to the first water outlet (71).

11. The system, as set forth in claim 6, characterized in that the axial duct (60) is defined between the bottom and lateral walls (31,32) of the basket (30) and an elongated chute (90), with an L-shaped lateral profile and U-shaped cross section, with the free edges of its lateral legs seating against the bottom and lateral walls (31,32) of the basket (30), said distributing nozzle (70) having its lower wall (70c) seated against the elongated chute (90), next to the upper opening (62) of the axial duct (60).

12. The system, as set forth in claim 11,

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characterized in that the basket (30) has an upper edge (33) carrying a balancing tubular ring (35), which defines an upper extension (64) of the axial duct (60) against which the distributing nozzle it
5 seated and retained.

13. The system, as set forth in claim 12, characterized in that the upper wall (70d) of the distributing nozzle (70) presents a radially external edge seated in an overlapping relationship onto an
10 upper peripheral step (35a) of the tubular ring (35).

14. The system, as set forth in claim 12, characterized in that the axial duct (60) is defined jointly with an axial recess (68) provided in the lateral wall (32) of the basket (30), said axial
15 recess (68) being covered by the chute (90).

15. The system, as set forth in claim 14, characterized in that it comprises a nozzle support (100) to be affixed in a cutout (36) provided in the
tubular ring (35) and having a rear wall (36a)
20 radially inclined outwardly and to the inside of the basket (30) and which defines the upper extension (64) of the axial duct (60).

16. The system, as set forth in claim 15, characterized in that the nozzle support (100)
25 inferiorly incorporates a cover (101) that covers an upper extension of the axial recess (68).

17. The system, as set forth in claim 16, characterized in that the nozzle support (100) incorporates a deflecting wall (65) radially
30 projecting from the axial duct (60) and which is positioned under the third water outlet (73), to receive the water flow passing there through, said nozzle support (100) defining an opened median housing (102) with lateral walls (103) configured to allow the
35 relatively tight fitting of the lower lateral wall

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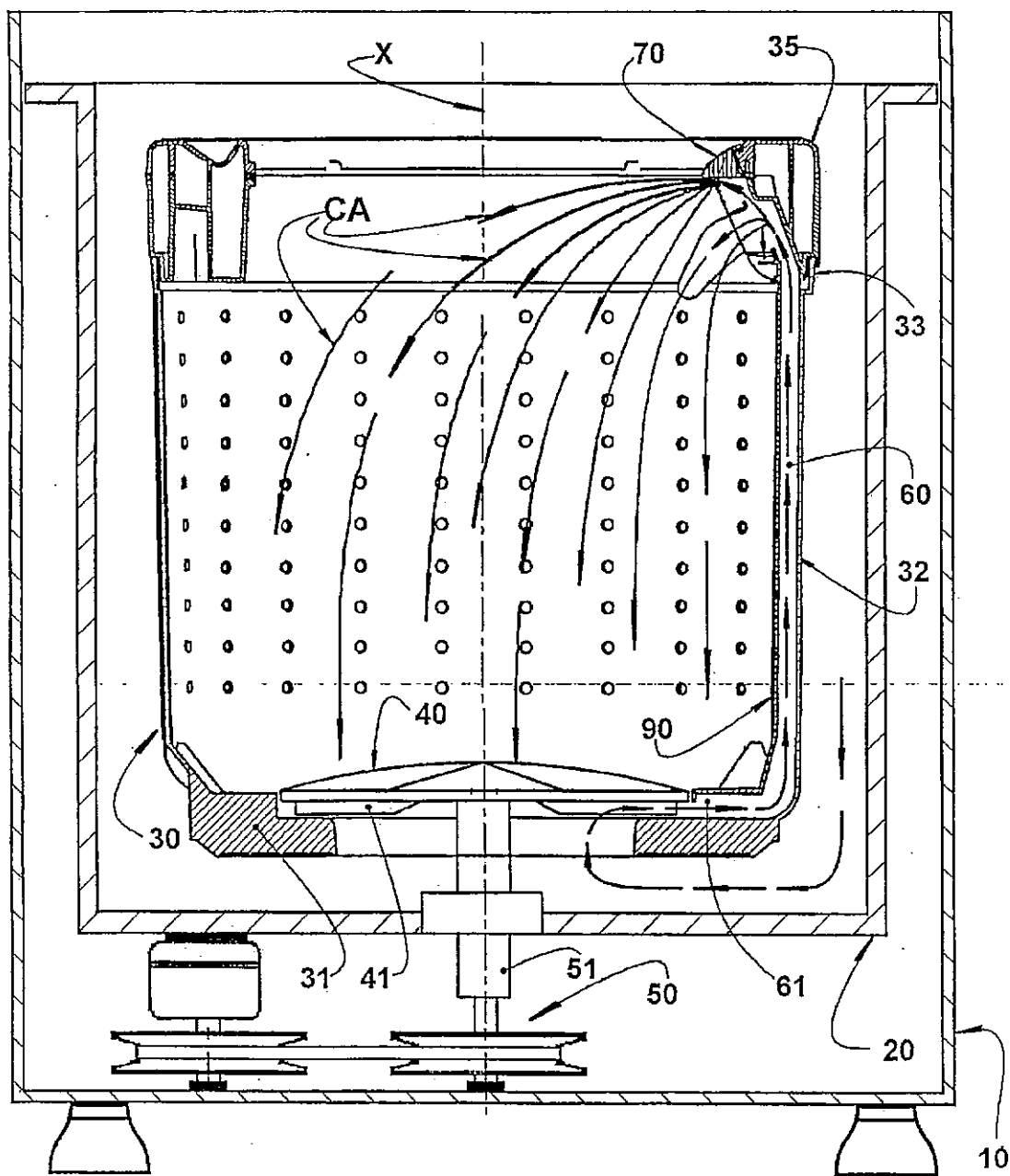


FIG. 1

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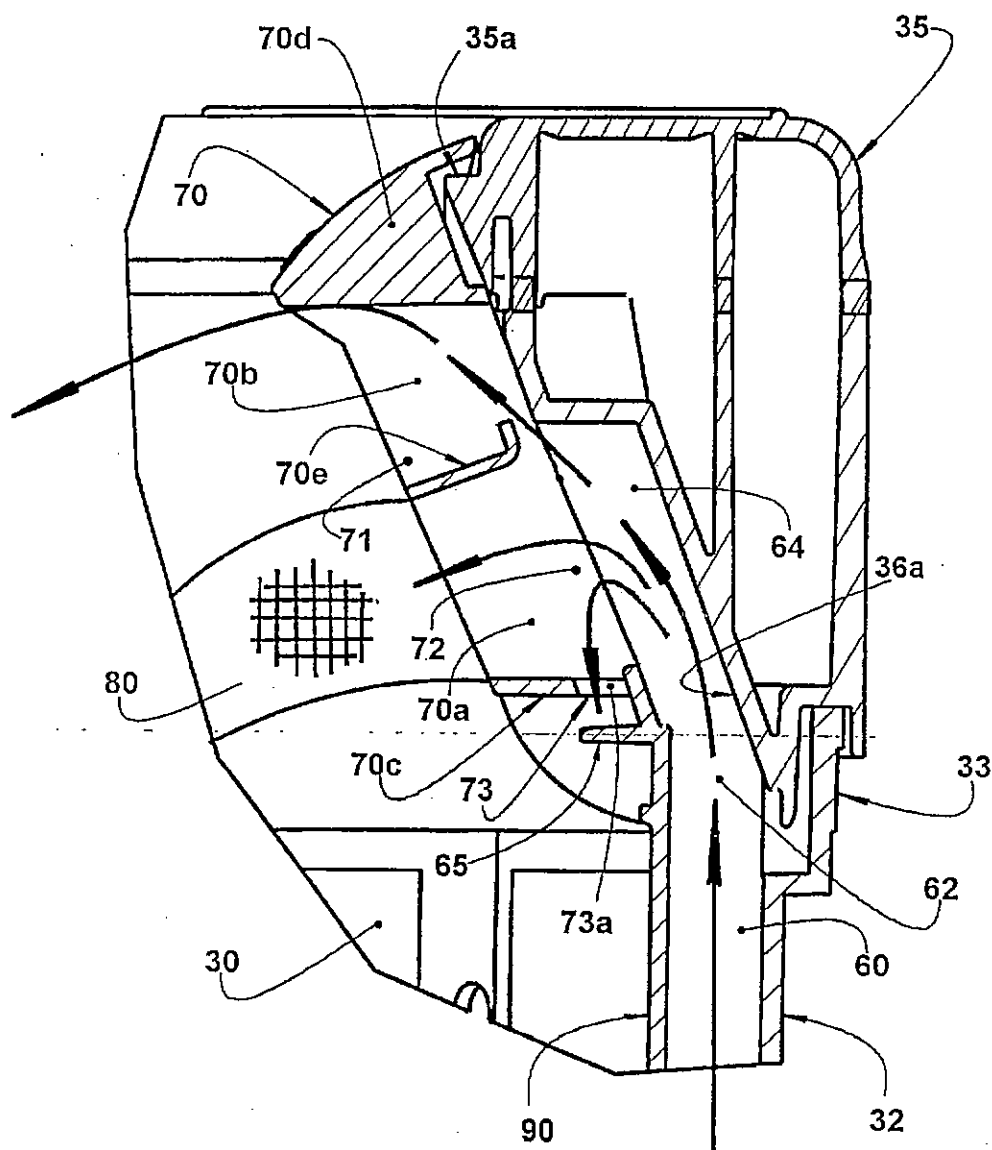


FIG. 2

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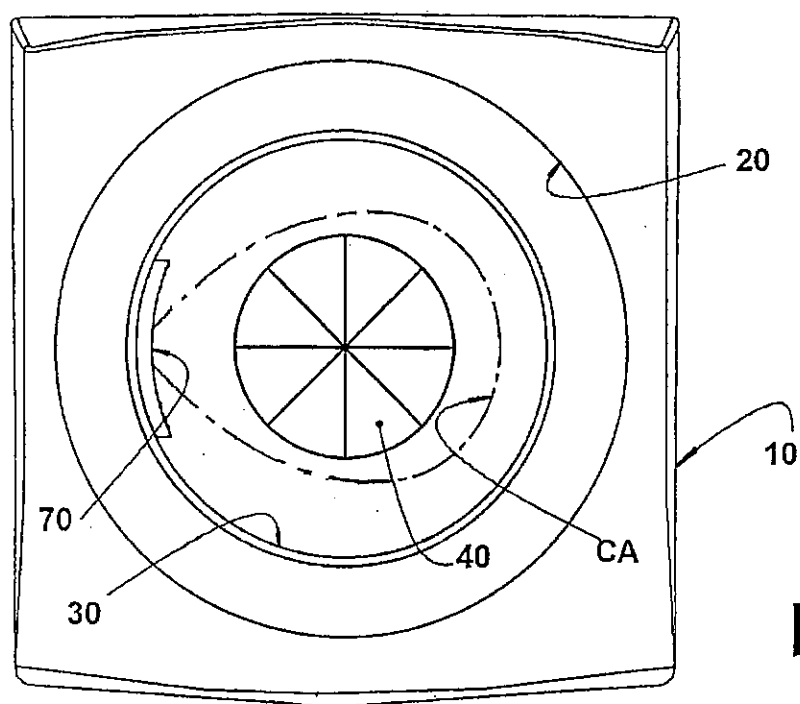


FIG. 3

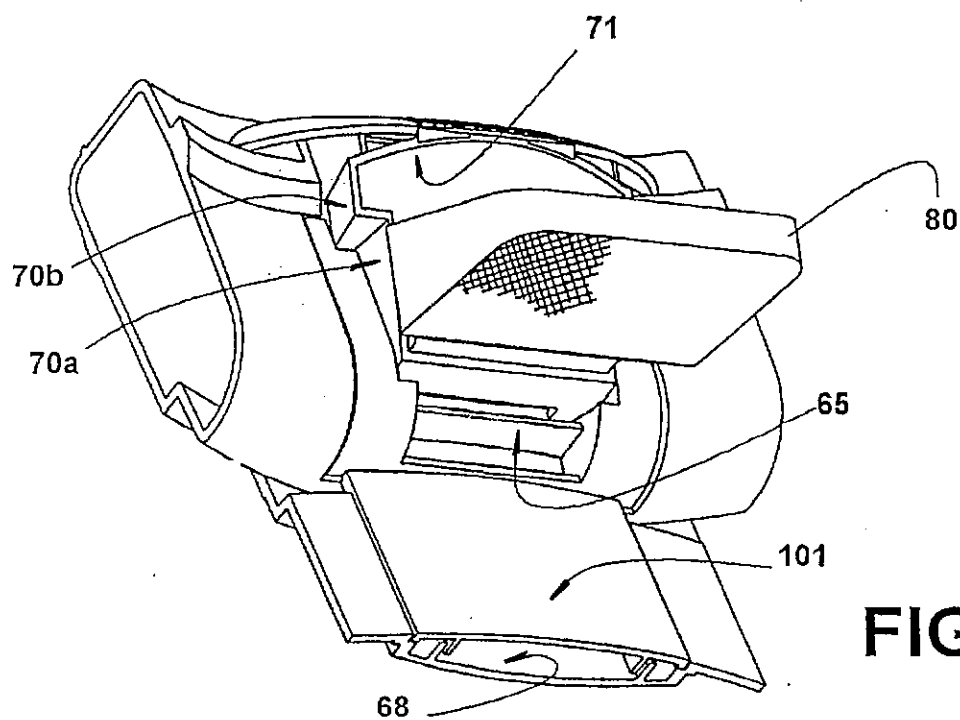
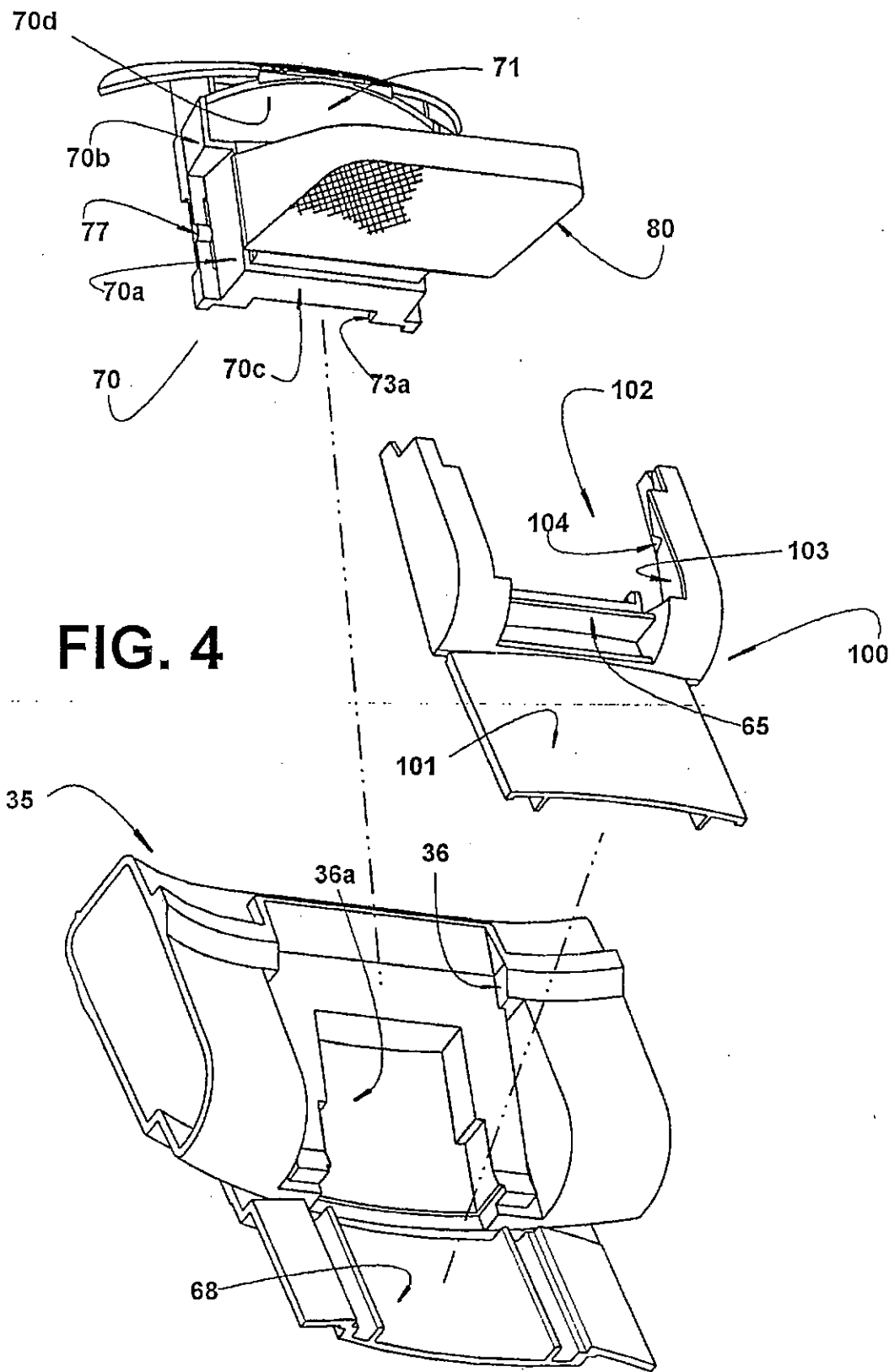
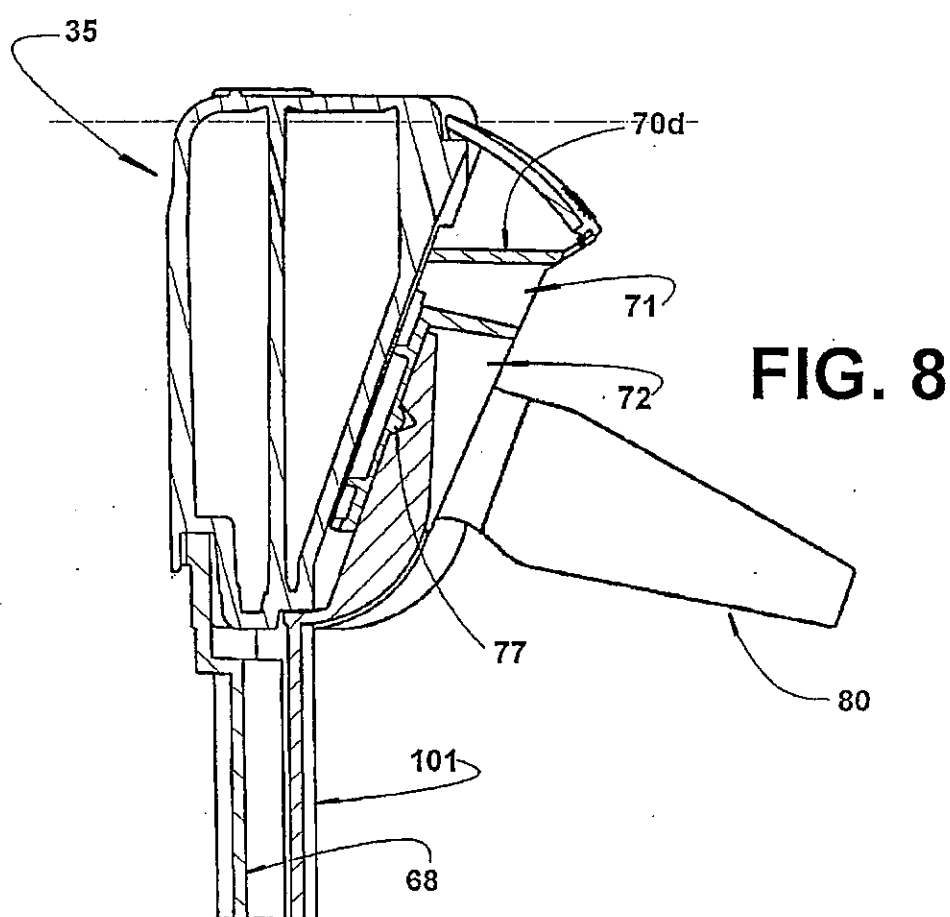
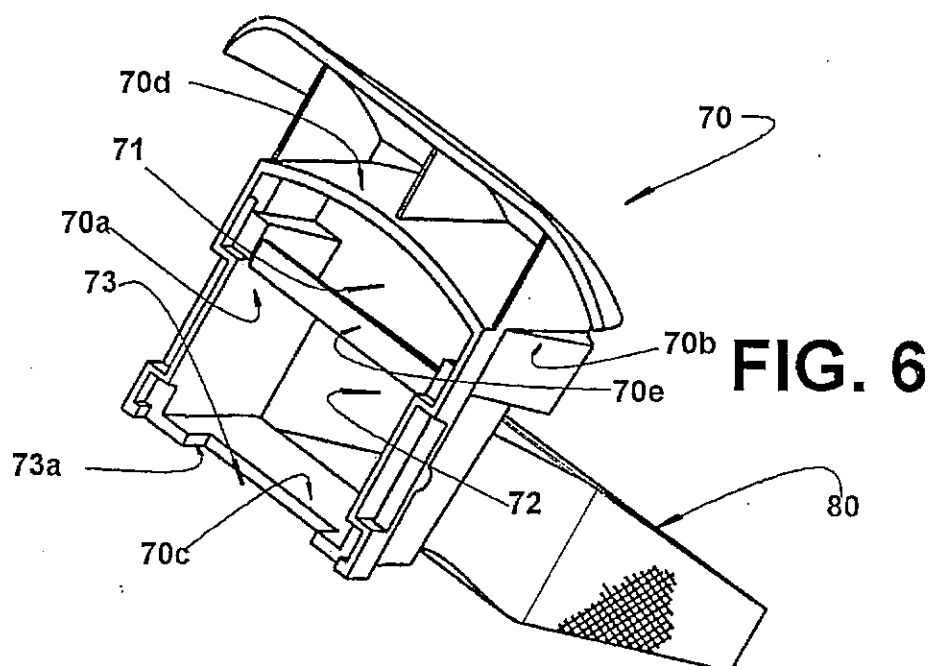


FIG. 5

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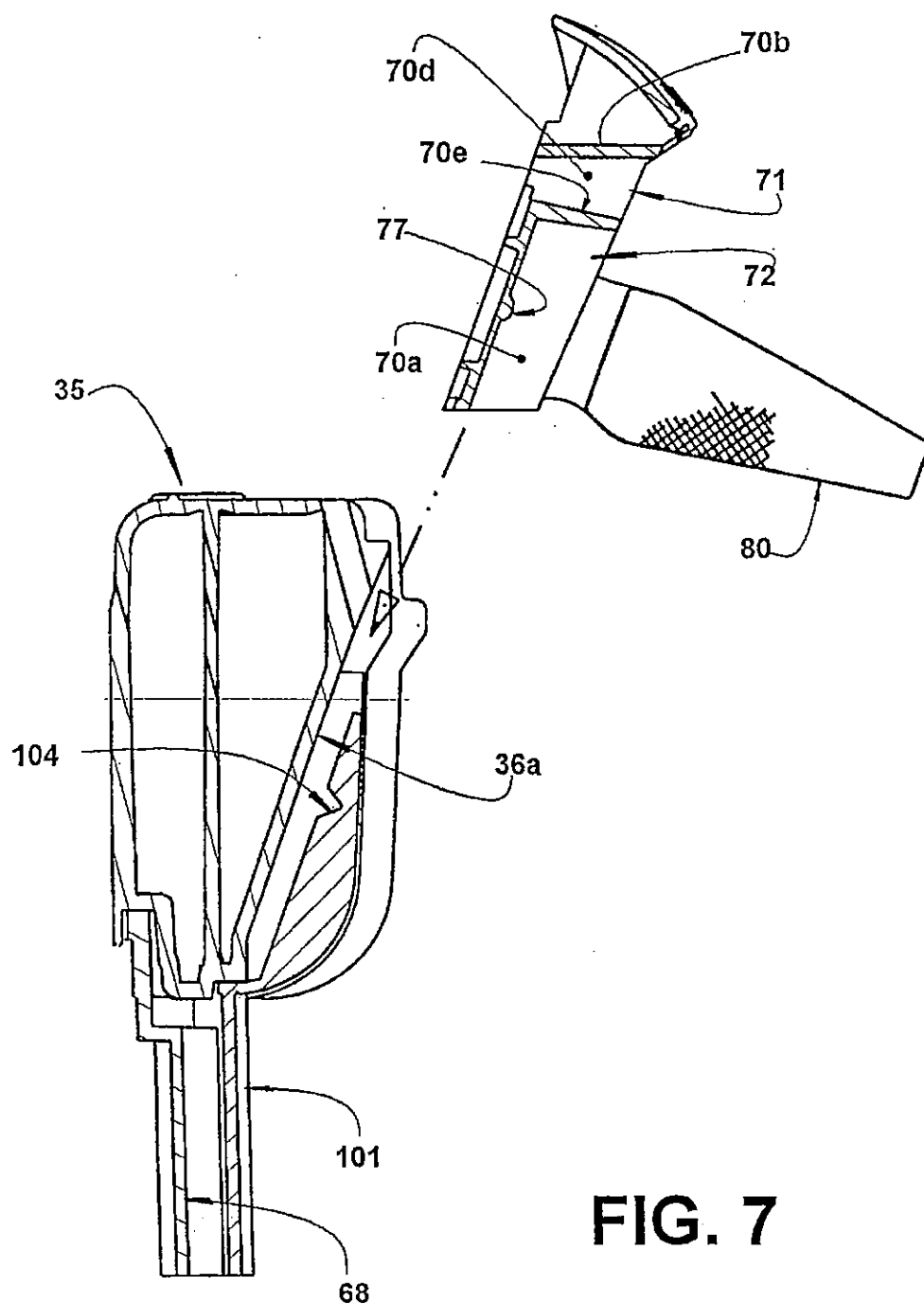


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No

PCT/BR2006/000124

A. CLASSIFICATION OF SUBJECT MATTER
INV. D06F39/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 509 283 A (LEE ET AL) 23 April 1996 (1996-04-23) cited in the application columnn 2, line 63 - column 3, line 49; figures 2-5; abstract	1-17
A	US 5 661 989 A (JEON ET AL) 2 September 1997 (1997-09-02) cited in the application abstract; figures	1-7
A	US 5 863 423 A (SHIN ET AL) 26 January 1999 (1999-01-26) cited in the application abstract; figures	1-17
A	JP 60 142897 A (SANYO DENKI KK; SANYO ELECTRIC CO) 29 July 1985 (1985-07-29) the whole document	1-17

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

26 September 2006

Date of mailing of the International search report

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Clivio, Eugenio

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/BR2006/000124

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5509283	A	23-04-1996	NONE	
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(12) SOLICITUD INTERNACIONAL PUBLICADA BAJO EL TRATADO DE COOPERACIÓN DE PATENTES (PCT)

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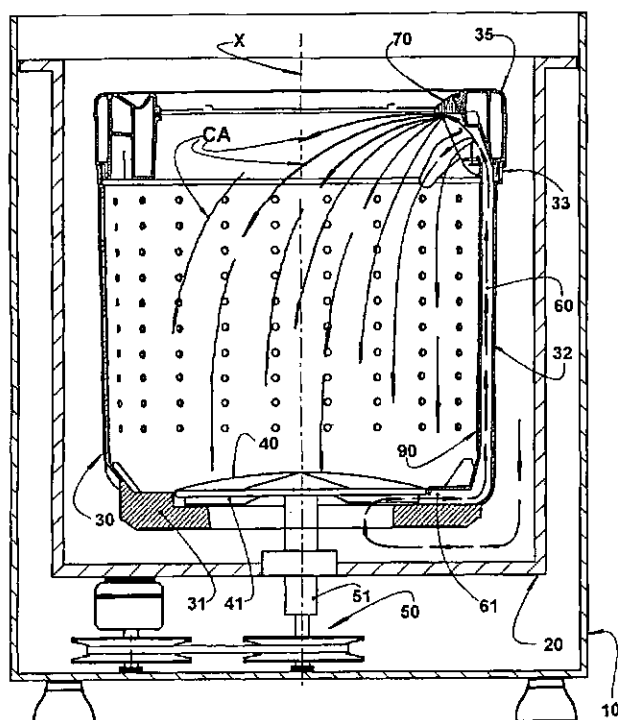
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(81) Estados Designados (a menos que se indique lo contrario, para todo tipo de protección nacional disponible): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HY, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MAMD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UAM UG, UZ, VN, YU, ZA, ZM, ZW.

(84) Estados Designados (a menos que se indique lo contrario, para todo tipo de protección regional disponible): ARIPO (GH, GM, KE, LS, MW, AM, SD, SL, SZ, TZ, UG, ZM, ZW), Euroasiática (AZ, BY, KG, KZ, MD, RU, TJ, TM), Europea (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR,

[Continúa en la siguiente página]

(54) Título: SISTEMA DE RECIRCULACION DE AGUA EN LAVARROPAS



(57) Resumen: Un sistema de recirculación de agua para una máquina lavarropas que comprende: un tanque (20); un cesto (30) girable alrededor de un eje geométrico vertical (X); un agitador (40) accionado rotatoriamente alrededor de dicho eje geométrico vertical (X), para producir un flujo de agua de recirculación ascendente, a través del conducto axial (60) dispuesto en una pared vertical (32) del cesto (30). El sistema comprende: una boca distribuidora (70) montada en la abertura superior (62) para recibir de ella el flujo de agua de recirculación, y que comprende una primera salida de agua (71) y una segunda salida de agua (72) en la cual está fijado un filtro (80), estando dicha boca distribuidora (70) configurada para conducir, a la primera salida de agua (71), una parte sustancialmente constante de flujo de agua de recirculación recibido del conducto axial (60) y, a la tercera salida de agua (73), la parte restante del flujo de agua de recirculación que no está retornando al cesto (30) por la segunda salida de agua (72).

WO 2007/000035 A1



IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Publicado:

— con el informe de búsqueda internacional

Para códigos de dos letras y otras abreviaciones, referirse a las "Notas de guía sobre Códigos y Abreviaturas" que aparecen al comienzo de cada edición de la Gaceta del PCT

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SISTEMA DE RECIRCULACIÓN DE AGUA EN LAVARROPAS

Campo de la Invención

La presente invención se relaciona con un sistema de recirculación de agua utilizado para la formación del líquido de lavado en lavarropas del tipo que comprende un cesto selectivamente rotatorio en el interior de un tanque y sobre cuyo fondo hay colocado un agitador o impulsor que es accionado rotatoriamente alrededor de un eje geométrico vertical.

Técnica previa

Son bien conocidos en la técnica previa las máquinas lavarropas provistas de un tanque abierto superiormente, normalmente cilíndrico y en cuyo interior hay montado, con cierta holgura radial, un cesto perforado, giratorio en torno a un eje geométrico vertical, que tiene una pared de fondo y una pared lateral y estando dimensionado para contener una cierta carga e ropa y de líquido de lavado constituido por agua, jabón y otros aditivos optativos. En el interior del cesto, inmediatamente arriba de su pared de fondo, se provee un agitador que es accionado rotatoria y selectivamente, en uno y otro sentido, a partir de una unidad motora y en torno a dicho eje geométrico vertical.

En este tipo de lavarropas, una región longitudinal interna de la pared lateral del cesto está construida para definir un conducto axial que tiene una entrada inferior

posicionada radialmente y junto al agitador y proyectada, de modo de recibir un flujo de agua impulsada durante este último durante su accionamiento en ciclos operativos de lavado y enjuague. El conducto axial presenta también una salida superior para descargar el flujo de agua ascendente nuevamente al interior del cesto. Generalmente, la salida superior del conducto axial está ubicada en una región de borde del cesto, en la cual hay adaptado convencionalmente un elemento de terminación y balanceado en forma de anillo tubular.

Este conocido sistema de recirculación de agua permite que, durante los ciclos operativos de lavado y enjuague, el giro del agitador, en uno y otro sentido, bombee agua a través del conducto axial ascendente, promoviendo una recirculación de agua, de modo de permitir que al menos una porción de este flujo de agua sea pasada por un filtro de hilachas antes de volver al cesto y también que al menos otra porción del flujo de agua en recirculación sea devuelta al cesto, en forma de cascada, para aumentar la eficiencia de lavado de la máquina.

Soluciones conocidas y que tienen las características básicas mencionadas más arriba se describen, por ejemplo en las patentes US 5.509.283, US 5.661.989 y US 5.863.423. A pesar de sugerir sistemas de recirculación de agua que promueven la filtración de al menos parte del flujo de agua de recirculación y también la formación de chorros o cascadas de agua contra la

carga de ropa contenida en el cesto, estas soluciones constructivas de la técnica previa presentan algunos inconvenientes.

Un problema de las soluciones comentadas más arriba está relacionado con el mantenimiento de un flujo de agua sustancialmente constante en la formación de la cascada o las cascadas a ser formadas en el interior del cesto. La eficiencia de la cascada de agua sobre la carga de ropa en el interior del cesto será tanto mayor cuanto mayor sea su incidencia sobre el área de sección transversal del cesto, sin riesgo de producción de salpicaduras hacia fuera del cesto y del tanque. Al estar el sistema dimensionado para proveer la cascada más intensa y eficiente, sin riesgos de salpicaduras y con el filtro en una condición limpia, a medida que el filtro va siendo cargado con hilachas, el flujo de agua de formación de la cascada tiende a ser alterado para una condición más intensa, en los casos en que es paralelo al flujo de filtrado, o hacia una condición menos intensa, en los casos en que es previamente sometido a filtrado. En ambos casos tiene lugar la pérdida del patrón de diseño establecido para la cascada.

Otro aspecto deficiente de las soluciones conocidas, resulta de la construcción de los medios de formación de la cascada, los cuales tienden a ser multiplicados para que se consiga maximizar la incidencia de la cascada de agua sobre la

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carga de ropa en el cesto. Generalmente, estas soluciones exigen construcciones más complejas, exigiendo una cantidad relativamente grande de las partes componentes, dificultando la producción y el mantenimiento y la limpieza y encareciendo el producto. Las soluciones conocidas no permiten la obtención de una cascada única y con un grado óptimo de incidencia sobre la carga de ropa alojada en el interior del cesto.

Descripción resumida de la invención

Debido a las deficiencias de las soluciones conocidas hasta ahora, la presente invención tiene como finalidad proveer un sistema de recirculación de agua en lavarropas que permite el filtrado de una parte del flujo de agua en recirculación y la formación de una respectiva cascada de agua sobre la carga de ropa contenida en el cesto del lavarropas, a partir de una parte sustancialmente constante de dicho flujo de agua, independientemente de la pérdida de carga producida por la condición operativa del filtro en la respectiva parte del flujo de agua en recirculación.

Es una finalidad adicional de la presente invención proveer un sistema de recirculación de agua según lo mencionado más arriba y que produzca una cascada de agua sustancialmente constante y configurada para maximizar su área de incidencia sobre la carga de ropa contenida en el cesto y minimizar los riesgos de salpicaduras hacia fuera del cesto y del tanque,.

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Es también otra finalidad de la invención proveer un sistema de recirculación de agua según lo mencionado más arriba y que presente una construcción simple, con un número reducido de componentes, de fácil remoción y limpieza por parte del usuario y de costo reducido.

Para lograr los objetivos mencionados más arriba, la presente invención provee un sistema de recirculación de agua en lavarropas del tipo que comprende: un tanque; un cesto que tiene una pared de fondo y una pared lateral y que está montado en el interior del tanque, de modo de poder girar alrededor de un eje geométrico vertical; un agitador dispuesto en el interior del cesto, que es accionado rotatoriamente alrededor de dicho eje geométrico vertical; por lo menos un conducto axial dispuesto en la pared vertical del cesto y que tiene una abertura inferior vuelta hacia el agitador y una abertura superior; y un conjunto accionador para hacer girar el agitador, para producir un flujo de agua de recirculación ascendente, a través del conducto axial.

De acuerdo con la invención, el sistema en cuestión comprende: una boca distribuidora montada removiblemente en la abertura superior de un respectivo conducto axial, para recibir de él el flujo de agua de recirculación, y que comprende una primera salida de agua; una segunda salida de agua dispuesta debajo de la primera y en la cual está fijado un filtro,

estando dichas salidas de agua primera y segunda vueltas radialmente hacia el interior del cesto; y una tercera salida de agua dispuesta debajo de la segunda salida de agua, según una dirección descendente, vuelta hacia el interior del cesto, estando dicha boca distribuidora configurada para conducir, a la primera salida de agua, una parte sustancialmente constante de flujo de agua de recirculación recibido del conducto axial y, a la tercera salida de agua, la parte restante del flujo de agua de recirculación que no está retornando al cesto por la segunda salida de agua.

La construcción básica definida más arriba permite que la boca distribuidora, fácilmente adaptable a la región superior del cesto del lavarropas, junto a la abertura superior del conducto axial, defina una primera salida de agua configurada para proveer una cascada que se mantiene sustancialmente constante en los ciclos de agitación y enjuague del lavarropas e independientemente de la pérdida de carga producida por la condición operativa del filtro de hilachas que está adaptado en una segunda salida de agua, dispuesta debajo de la primera. La provisión de la tercera salida de agua, que opera como salida de alivio, permite que el flujo de agua disminuido progresivamente a través de la segunda abertura de salida, en función de la acumulación de hilachas en el filtro, sea liberado de la boca distribuidora por la tercera salida de

agua, minimizando alteraciones en la formación de la cascada a partir de la primera salida de agua.

Breve descripción de los dibujos

La invención será descrita a continuación con referencia a los dibujos anexos, aportados a título de ejemplo de una realización de la invención, y en los cuales:

La figura 1 es una vista en corte vertical simplificado de un lavarropas provisto del sistema de recirculación de agua objeto de la presente invención.

La figura 2 es un detalle ampliado de parte del conjunto ilustrado en la figura 1, para una mejor visualización de la ubicación de la boca distribuidora con relación al conducto axial de conducción del flujo de agua de recirculación;

La figura 3 es una vista superior simplificada del conjunto ilustrado en la figura 1, que ilustra el contorno sustancialmente trapezoidal de la cascada de agua.

La figura 4 es una vista en perspectiva en despiece, tomada a partir de la región central de la máquina, que ilustra la región superior del cesto en la cual está adaptada la boca distribuidora;

La figura 5 es una vista en perspectiva del conjunto de componentes de la figura 4, ya en condición montada;

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La figura 6 es una vista en perspectiva del conjunto de la figura 5, observado por el lado de asentamiento en la región superior del cesto;

La figura 7 es una vista en corte radial en despiece de la región superior del cesto y de la boca distribuidora; y

La figura 8 es una vista en corte radial del conjunto de la figura 7, en la condición montada de la boca distribuidora.

Descripción detallada de la invención

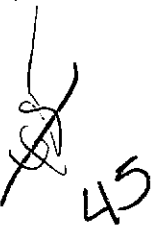
Según lo ilustrado en los dibujos anexos y como se mencionó anteriormente, la presente invención se relaciona con máquinas lavarropas del tipo provisto de un cuerpo 10 que generalmente define una carcasa a ser apoyada directamente sobre una superficie de apoyo y que sustenta y aloja, en su interior, un tanque 20 que contiene una carga de agua o de un líquido de lavado que comprende agua y otros aditivos optativos, estando dicho tanque 20 generalmente suspendido, por medios elásticos (no ilustrados) en el cuerpo 10 de la máquina. En el interior del tanque 20 se ubica un cesto 30, usualmente cilíndrico y perforado, que tiene una pared de fondo 31 circular y perforada y una pared lateral 32 preferiblemente cilíndrica y que termina en un borde superior libre 33. El cesto 30 está montado en el interior del tanque 20, también generalmente cilíndrico, de modo de poder ser girado alrededor de un eje geométrico vertical X durante determinadas fases

operativas de la máquina, definidas generalmente por ciclos de centrifugado o simplemente de expulsión del líquido de la ropa.

El cesto 30 lleva generalmente, montado sobre su borde superior 33, un anillo tubular 35 de balanceo, para evitar la vibración del cesto 30 durante las operaciones de lavado, enjuague y centrifugado, realizadas por la máquina de lavar.

En el interior del cesto 30, más específicamente sobre su pared de fondo 31, se dispone un agitador 40 en la forma de un impulsor rotatorio, de contorno generalmente circular y provisto en su parte inferior de una pluralidad de aletas radiales 41 que, cuando el agitador 40 gira en uno u otro sentido, alrededor de dicho eje geométrico vertical X, producen un flujo de agua que es empujado axial y ascendentemente del fondo del tanque 20 e impulsado radialmente hacia fuera del agitador 40 entre este y la pared de fondo 31 del cesto 30, funcionando dicho agitador como una especie de bomba de agua centrífuga.

El sistema de recirculación de agua en cuestión también comprende, convencionalmente, al menos un conducto axial 60 dispuesto en la pared lateral vertical 32 del cesto 30 y que tiene una abertura inferior 61 vuelta hacia el agitador 40 y una abertura superior 62 dispuesta junto al borde superior 33 del cesto 30. En la construcción ilustrada, el conducto axial 60 está definido entre las paredes de fondo 31 y lateral 32 del



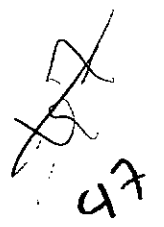
cesto 30 y un canal alargado 90, con perfil lateral en forma de "L" y sección transversal en forma de "U", con los bordes libres de sus patas laterales asentados y fijados contra las paredes de fondo 31 y lateral 32 del cesto 30. El perfil lateral en L del canal alargado 90 permite que un tramo inferior del conducto axial 60 esté dispuesto de modo horizontal y radial, posicionando la abertura inferior 61 del conducto axial 60 junto al agitador 40, de modo que el flujo de agua radial impulsado por este último pueda ser admitido en el interior del conducto axial 60 por su abertura inferior 61. El resto de la extensión del tubo axial 60 es definido junto a una respectiva extensión longitudinal de la pared lateral 32 del cesto 30, según lo ilustrado en los dibujos anexos. Debe entenderse que la fijación del canal alargado 90 al cesto 30 puede efectuarse de cualquier modo apropiado y bien conocido en la técnica, no constituyendo este aspecto una característica distintiva de la invención. Con la construcción aquí definida para el conducto axial 60, cuando la máquina opera en los ciclos de lavado y enjuague, en los cuales el agitador 40 es accionado giratoriamente en uno y otro sentido, alrededor del eje geométrico vertical X, se forma un flujo de agua de recirculación ascendente a través del conducto axial 60, desde su abertura inferior 61 hasta su abertura superior 62 según lo indicado por las flechas ilustradas en las figuras 1 y 2. El

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accionamiento del agitador 40 es efectuado por un conjunto accionador 50, ilustrado esquemáticamente en los dibujos anexos por la representación gráfica del eje vertical 51 en cuyo extremo superior está montado el agitador 40. Según se ha mencionado, el conjunto accionador 50 permite el accionamiento selectivo del agitador 40 en los diferentes ciclos operativos de la máquina.

De acuerdo con la presente invención, el sistema de recirculación de agua comprende una boca distribuidora 70, construida generalmente en una sola pieza, inyectada en material plástico, a ser montado removiblemente en la abertura superior 62 de un respectivo conducto axial 60, para recibir de él el flujo de agua de recirculación. La boca distribuidora 70 comprende una primera salida de agua 71, una segunda salida de agua 72 dispuesta debajo de la primera y en la cual está fijado un filtro 80, generalmente un filtro definido por una bolsa de tela con el borde libre herméticamente fijado en dicha segunda salida de agua, de modo que quedar proyectándose hacia el interior del cesto 30, estando dichas salidas de agua primera y segunda, 71, 72 volcadas radialmente hacia el interior del cesto 30, como puede observarse mejor en las figuras 1 y 2.

La boca distribuidora 70 presenta también una tercera salida de agua 73 dispuesta debajo de la segunda salida de agua 72 y según una dirección descendente, sustancialmente ortogonal



a la dirección de la segunda salida de agua 72 y volcada hacia el interior del cesto 30. La boca distribuidora 70 está configurada para conducir, a la primera salida de agua 71, una parte sustancialmente constante del flujo de agua de recirculación recibido del conducto axial 60 y también conducir, a la tercera salida de agua 73, que toma la forma de una salida de alivio, la parte restante del flujo de agua de recirculación que no está retornando al cesto 30 por la segunda salida de agua 72.

En la construcción ilustrada, la boca distribuidora 70 comprende un armazón generalmente rectangular, preferiblemente de una sola pieza inyectada en material plástico y definida por porciones de pared lateral opuestas inferiores 70a y superiores 70b, una pared inferior 70c, una pared superior 70d y una pared intermedia 70e. la pared intermedia 70e define, con la pared inferior 70c y con respectivas porciones de pared lateral inferiores 70a la segunda salida de agua 72, en la cual está fijado el filtro 80 que se proyecta hacia fuera en dirección al interior del cesto 30, donde dicha pared intermedia 70e define, con la pared superior 70d y con porciones respectivas de pared lateral superiores 70b, una primera salida de agua 71.

La construcción de la boca distribuidora 70 es efectuada de modo que la primera salida de agua 71 presenta una cierta expansión axial con sección transversal rectangular que tiene

la mayor dimensión dispuesta horizontalmente y que es creciente en dirección al cesto 30 y que tiene también el lado mayor superior definido por la pared superior 70d del armazón de la boca distribuidora 70, arqueado hacia fuera y divergente con relación al lado mayor inferior que está definido por la mencionada pared intermedia 70e del armazón de la boca distribuidora 70, siendo dicha sección transversal sustancialmente rectangular, creciente en el sentido radial del flujo de agua, estando dimensionada para producir una cascada de agua con un área de incidencia maximizada sobre una carga de ropa contenida en el cesto 30.

Con esta construcción, el largo de las porciones de pared lateral inferiores 70a y superiores 70b y de las paredes superior 70d e inferior 70c define la extensión axial de la primera y de la segunda salida de agua 71, 72.

La tercera salida de agua 73 está definida preferiblemente por una abertura 73a provista en la pared inferior 70c de la boca distribuidora 70, donde dicha abertura 73a puede estar definida por un simple recorte producido en el borde posterior de dicha pared inferior 70c. En la construcción ilustrada se provee una porción de pared deflector 65, que se proyecta radialmente hacia adentro, a partir de la región superior del cesto 30, estando dicha pared deflectora 65 ubicada sobre la tercera salida de agua 73, de modo de recibir el flujo de agua

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que pasa por esta última, dirigiendo dicho flujo de agua hacia el interior del cesto 30.

Con la construcción ahora propuesta, el flujo de agua de recirculación que es liberado ascendentemente por la abertura superior 62 del conducto axial 60 es provisto a la boca distribuidora 70k para que una parte de ese flujo de recirculación sea dirigida a la primera salida 71, mientras que la parte restante de ese flujo es dirigida a la segunda salida 72 de la boca distribuidora 70 para pasar por el filtro 80 antes de retornar al interior del cesto 30, donde aquella porción de flujo de agua de recirculación que llega a la boca distribuidora 70 y que no es liberada por la primera salida 71 y por la segunda salida 72 es aliviada por la tercera salida 73 y devuelta al interior del cesto 30.

En función de la construcción de la boca distribuidora 70 y, particularmente a la primera salida de agua 71, la cascada de agua liberada a través de esta última presenta, en vista superior, un contorno sustancialmente trapezoidal, con la base menor coincidente con la primera salida de agua 71, con los lados coincidentes con prolongaciones de los lados menores de la sección transversal de la primera salida de agua 71 y definidos por las porciones de pared lateral superiores 70e del armazón de la boca distribuidora 70 y teniendo la base mayor en arcos y círculos que acompañan la curvatura de la región de

pared lateral cilíndrica del cesto 30 opuesta a aquella en que es ubicado el conducto axial 60.

Esta disposición de cascada de agua incide sobre la región de sección transversal del cesto 30 delimitada por dicho contorno sustancialmente trapezoidal de la cascada de agua, en vista superior.

Además de garantizar un formato específico para la cascada de agua, que maximiza su incidencia sobre la carga de ropa contenida en el cesto 30, la boca distribuidora presenta la pared intermedia 70e recortada en la parte posterior para definir allí un pasaje de flujo de agua limitado a la primera salida de agua 71, restringiendo el flujo de agua dirigido a la primera salida de agua 71 de modo de producir una cascada de agua CA (ver figuras 1 y 3) que maximice su incidencia sobre la carga de ropa contenida en el cesto 30 sin el riesgo de que ocurran salpicaduras indeseables de agua hacia fuera del cesto 30 y del tanque 20. Preferiblemente, la boca distribuidora 70 está diseñada para que la primera salida de agua 71 reciba cerca de 15% a 30% del flujo de agua de recirculación que pasa por el conducto axial 60.

La provisión de la tercera salida de agua 73 en la boca distribuidora 70, dirigida hacia abajo, a partir de la pared inferior 70c del armazón de la boca distribuidora 70, permite mantener el flujo de agua dirigido a la primera salida de agua

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71 sustancialmente constante, así como la variación de flujo de agua que pasa por el filtro 80. La medida en que el filtro 80 va siendo cargado con hilachas recibidas de la ropa, el flujo de agua a través de la segunda salida de agua 72 se ve progresivamente reducido, con lo cual, si no existiera la tercera salida de agua 73, puede ocurrir un aumento indeseable de flujo de agua que pasa por la primera salida de agua 71, aumentando la intensidad de la cascada de agua CA y haciendo que esta exceda las limitaciones de incidencia diseñadas para maximizar su acción sobre la carga de ropa sin riesgos de salpicaduras hacia fuera del cesto 30 y del tanque 20. Con la progresiva obturación del filtro, la tercera salida de agua 73 va permitiendo un aumento progresivo de la parte del flujo de agua de recirculación que pasa por ella al interior del cesto, absorbiendo el derrame que de otro modo estaría dirigido a la primera salida de agua 71, aumentando indeseablemente la intensidad de la cascada de agua CA.

En la construcción ilustrada, la boca distribuidora 70 tiene su pared inferior 70c dispuesta junto a la abertura superior 62 del conducto axial 60, donde el anillo tubular 35 balanceador del cesto define una extensión superior 64 de conducto axial 60, contra la cual se asienta la boca distribuidora 70. La pared superior 70d de la boca distribuidora 70 presenta un borde radialmente externo que está

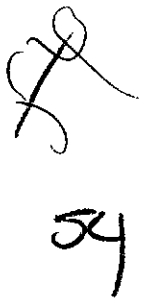
asentado, en superposición, sobre un escalón superior periférico 35a del anillo tubular 35, definiendo una conexión estanca para impedir que el flujo de agua de recirculación ascendente, sobrepase el anillo tubular 35 y salpique hacia fuera del cesto 30 y del tanque 20.

Según lo ilustrado en las figuras 4 a 8, el conducto axial 60 puede estar definido conjuntamente con un rebajo axial 68 provisto en la pared lateral 32 del cesto 30, estando dicho rebajo axial 68 tapado por el canal 90 ilustrado en la figura 1 de modo esquemático y también por una tapa 101 incorporada inferiormente a un soporte de boca 100 que está fijado y retenido en un respectivo recorte 36 practicado en el anillo tubular 35 y que tiene una pared posterior 36a, inclinada radialmente hacia arriba y hacia dentro del cesto 30, que define la extensión superior 64 del conducto axial 60.

El soporte de boca 100 incorpora la pared deflectora 65 y define un alojamiento mediano perforado 102 con paredes laterales 103 configuradas para encajar, de modo relativamente justo, en las porciones de pared lateral inferiores 70a de la boca distribuidora 70, las cuales están provistas con un medio de traba 77, generalmente en forma de pequeño resalto, a ser encajado en una entalladura respectiva 104 provista en cada pared lateral 103 del soporte de boca 100, para mantener la boca distribuidora 70 retenida en su posición operativa.

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A pesar que se ha ilustrado solamente una forma constructiva para el sistema objeto de la invención, debe entenderse que podrán efectuarse alteraciones de forma y de disposición de los elementos constitutivos del sistema, sin alejarse del concepto constructivo definido en las reivindicaciones anexas.



REIVINDICACIONES

1. Sistema de recirculación de agua en lavarropas del tipo que comprende: un tanque (20); un cesto (30) que tiene una pared de fondo (41) y una pared lateral (32) y que está montado en el interior del tanque (20), de modo de poder girar alrededor de un eje geométrico vertical (X); un agitador (40) dispuesto en el interior del cesto (30), que es accionado rotatoriamente alrededor de dicho eje geométrico vertical (X); por lo menos un conducto axial (60) dispuesto en la pared vertical (32) del cesto (30) y que tiene una abertura inferior (61) volcada hacia el agitador y una abertura superior (62) y un conjunto accionador (50) para hacer girar el agitador (40), para producir un flujo de agua de recirculación ascendente, a través del conducto axial (60), donde el sistema está caracterizado por comprender: una boca distribuidora (70) montada removiblemente en la abertura superior (62) de un respectivo conducto axial (60), para recibir de él el flujo de agua de recirculación, y que comprende una primera salida de agua (71); una segunda salida de agua (72) dispuesta debajo de la primera y en la cual está fijado un filtro (80), estando dichas salidas de agua primera y segunda (71, 72) volcadas radialmente hacia el interior del cesto (30); y una tercera salida de agua (73) dispuesta debajo de la segunda salida de agua (72), según una dirección descendente, sustancialmente ortogonal a la dirección



de la segunda salida de agua (72) y vuelta hacia el interior del cesto (30), estando dicha boca distribuidora (70) configurada para conducir, a la primera salida de agua (71), una parte sustancialmente constante de flujo de agua de recirculación recibido del conducto axial (60) y, a la tercera salida de agua (73), la parte restante del flujo de agua de recirculación que no está retornando al cesto (30) por la segunda salida de agua (72).

2. Sistema de acuerdo con la reivindicación 1, caracterizado porque la primera salida de agua (71) tiene una cierta extensión axial con sección transversal rectangular con la mayor dimensión dispuesta horizontalmente y creciente en dirección al cesto (30) y que tiene el lado mayor superior arqueado hacia fuera y divergente con relación al lado mayor inferior, estando dicha sección transversal, creciente en el sentido radial de flujo del agua, dimensionada para producir una cascada de agua con un área de incidencia maximizada sobre una carga de ropa contenida en el cesto (30).

3. Sistema de acuerdo con la reivindicación 2, caracterizado porque la cascada de agua liberada a través de la primera salida de agua (71) presenta, en vista superior, con la base menor coincidente con la primera salida de agua (71), con los lados coincidentes con prolongaciones de los lados menores de sección transversal de la primera salida de agua (71) y con

la base mayor en arco de círculo acompañando la curvatura de la región de pared lateral cilíndrica del cesto (30) opuesta a aquella en la que está ubicado el conducto axial (60).

4. Sistema de acuerdo con la reivindicación 3, caracterizado porque la cascada de agua incide sobre la región de sección transversal del cesto (30) delimita por dicho contorno sustancialmente trapezoidal de la cascada de agua, en vista superior.

5. Sistema de acuerdo con la reivindicación 2, caracterizado porque la primera salida de agua (71) recibe aproximadamente 15% a 30% del flujo de agua de recirculación que pasa por el conducto axial (60).

6. Sistema de acuerdo con la reivindicación 2, caracterizado porque la boca distribuidora (70) comprende un armazón generalmente rectangular definido por porciones de pared lateral opuestas inferiores y superiores (70a, 70b), pared inferior (70c), una pared superior (70d) y una pared intermedia (70e) que define, con la pared inferior (70c) y con respectivas porciones de pared lateral inferiores (70a), una segunda salida de agua (72) en la cual está fijado el filtro (80) y, con la pared superior (70d) y con respectivas porciones de pared lateral superiores (70b), la primera salida de agua (71).

7. Sistema de acuerdo con la reivindicación 6, caracterizado porque el largo de las porciones de pared lateral inferiores (70a) y superiores (70b) y de las paredes superiores (70d) e inferior (70c) definen la extensión axial de la primera y la segunda salida de agua (71, 72).

8. Sistema de acuerdo con la reivindicación 6, caracterizado porque la tercera salida de agua (73) está definida por una abertura (73a) provista en la pared inferior (70c) de la boca distribuidora (70).

9. Sistema de acuerdo con la reivindicación 8, caracterizado por comprender una porción de pared deflectora (65) que se proyecta radialmente del conducto axial (60) y ubicada sobre la tercera salida de agua (73), de modo de recibir el flujo de agua que pasa por ella.

10. Sistema de acuerdo con la reivindicación 6, caracterizado porque la pared intermedia (70e) está recortada en la parte posterior para definir allí un pasaje de flujo de agua limitada a la primera salida de agua (71).

11. Sistema de acuerdo con la reivindicación 6, caracterizado porque el conducto axial (60) está definido entre las paredes de fondo (31) y lateral (32) del cesto (30) y un canal alargado (90), con perfil lateral en forma de "L" y sección transversal en forma de "U" con los bordes libres de sus patas laterales asentados contra las paredes de fondo (31)

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y lateral (32) del cesto (30), teniendo dicha boca distribuidora (70) su pared inferior (70c) asentada contra el canal alargado (90), junto a la abertura superior (62) del conducto axial (60).

12. Sistema de acuerdo con la reivindicación 11, caracterizado porque el cesto (30) tiene un borde superior (33) que lleva un anillo tubular (35) de balanceo, el cual define una extensión superior (64) del conducto axial (60) contra la cual es asentada y retenida la boca distribuidora (70).

13. Sistema de acuerdo con la reivindicación 12, caracterizado porque la pared superior (70d) de la boca distribuidora (70) presenta un borde radialmente externo asentado, en superposición, sobre un escalón superior periférico (35a) del anillo tubular (15).

14. Sistema de acuerdo con la reivindicación 12, caracterizado porque el conducto axial (60) está definido conjuntamente con un rebajo axial (68) provisto en la pared lateral (32) del cesto (30), siendo dicho rebajo axial (68) tapado por el canal (90).

15. Sistema de acuerdo con la reivindicación 14, caracterizado por comprender un soporte de boca (100) que es fijado en un recorte (36) practicado en el anillo tubular (35) y que tiene una pared posterior (36a) inclinada radialmente

RESUMEN

SISTEMA DE RECIRCULACIÓN DE AGUA EN LAVARROPAS, que comprende: un tanque (20); un cesto (30) girable alrededor de un eje geométrico vertical (X); un agitador (40) accionado rotatoriamente alrededor de dicho eje geométrico vertical (X), para producir un flujo de agua de recirculación ascendente, a través del conducto axial (60) dispuesto en una pared vertical (32) del cesto (30). El sistema comprende: una boca distribuidora (70) montada en la abertura superior (62) para recibir de ella el flujo de agua de recirculación, y que comprende una primera salida de agua (71) y una segunda salida de agua (72) en la cual está fijado un filtro (80), estando dicha boca distribuidora (70) configurada para conducir, a la primera salida de agua (71), una parte sustancialmente constante de flujo de agua de recirculación recibido del conducto axial (60) y, a la tercera salida de agua (73), la parte restante del flujo de agua de recirculación que no está retornando al cesto (30) por la segunda salida de agua (72).

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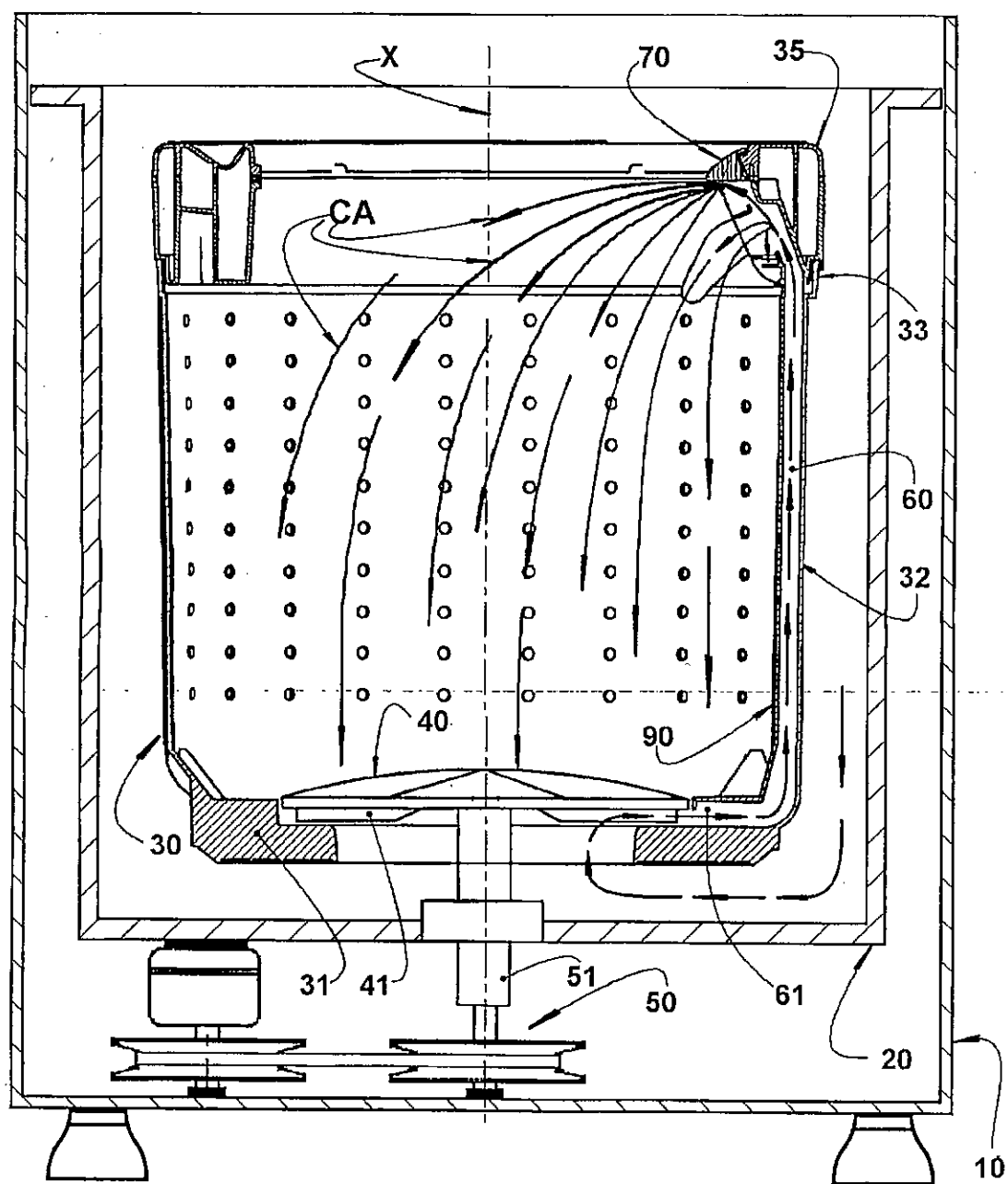


FIG. 1

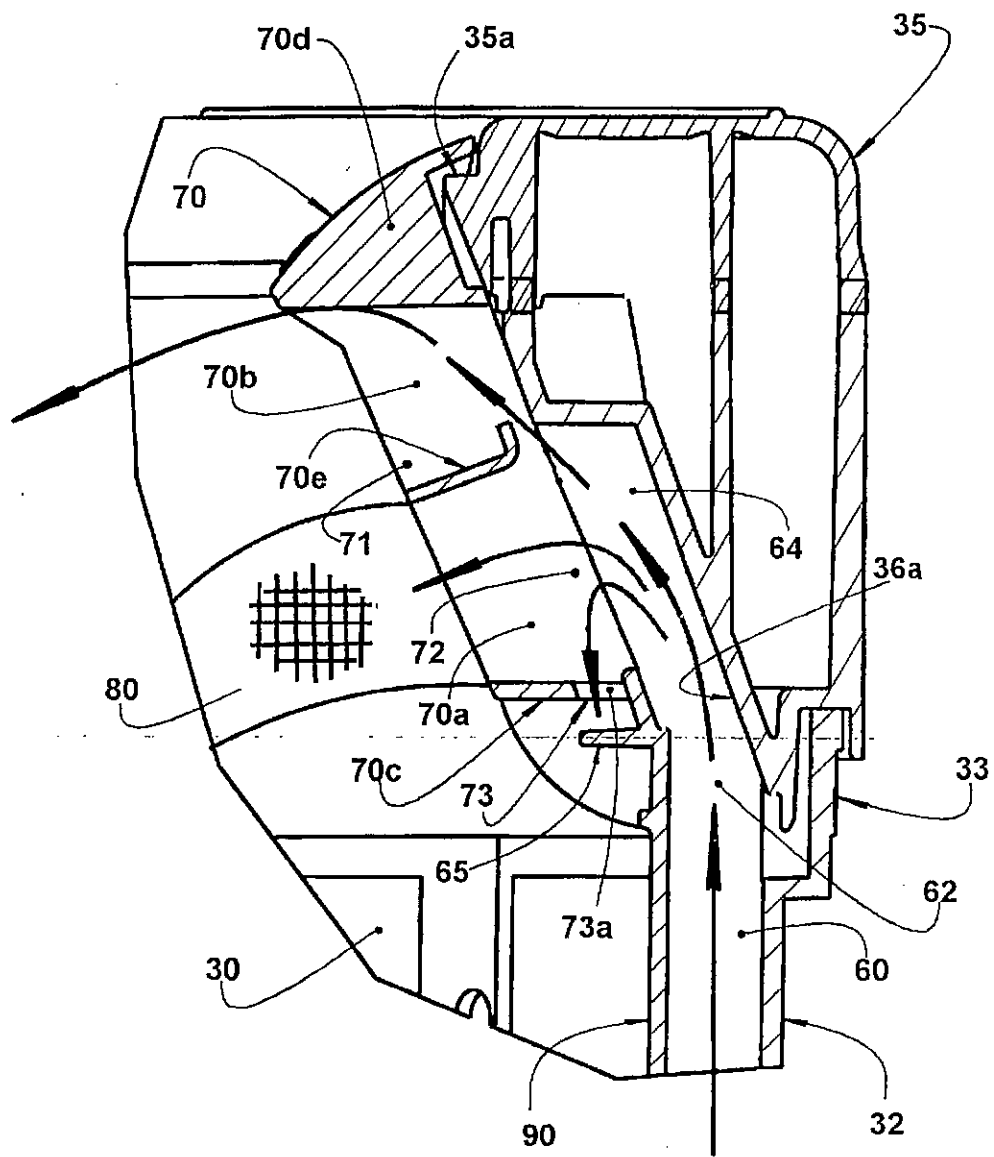


FIG. 2

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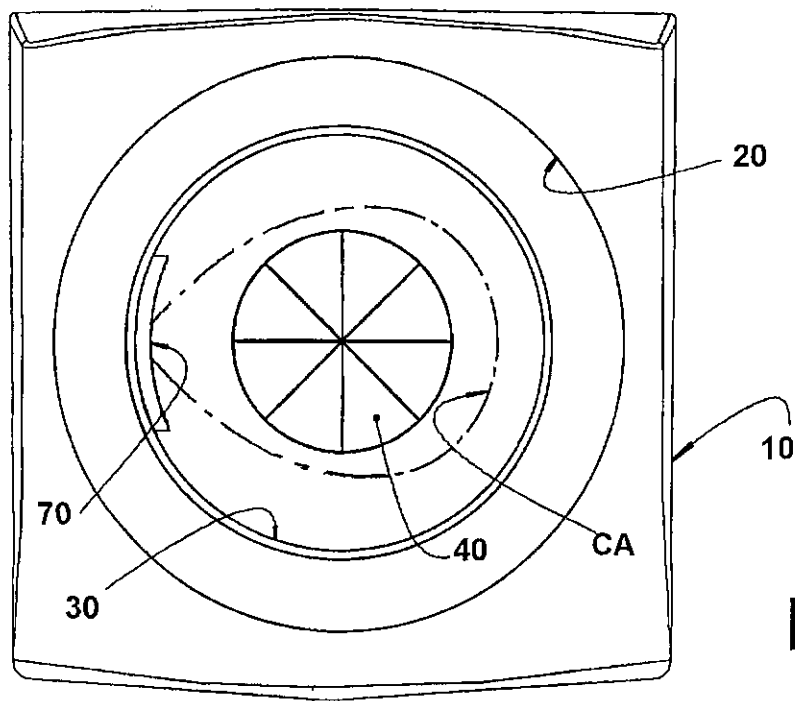


FIG. 3

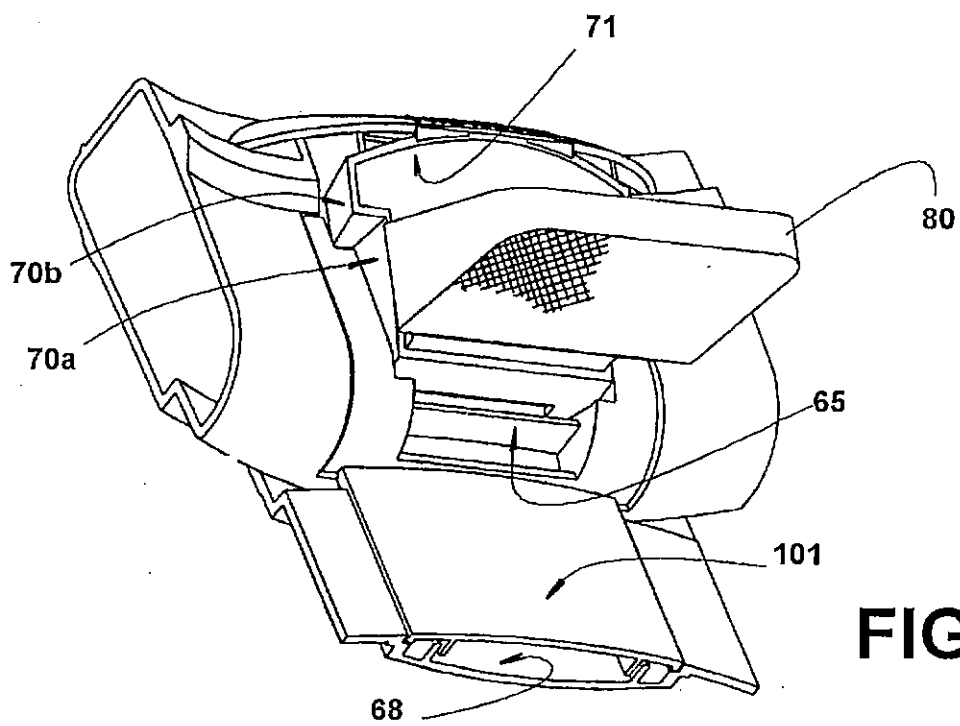
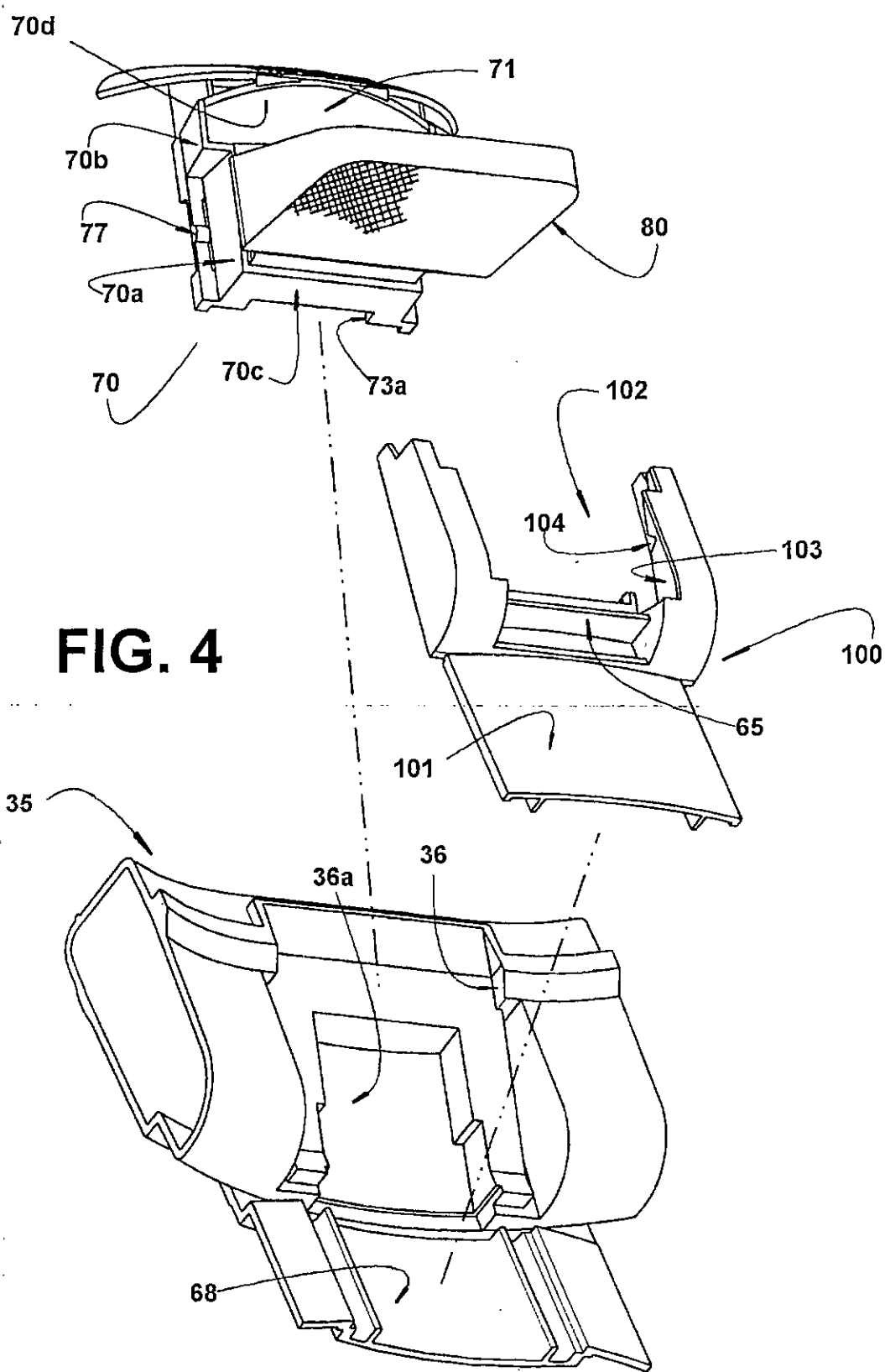
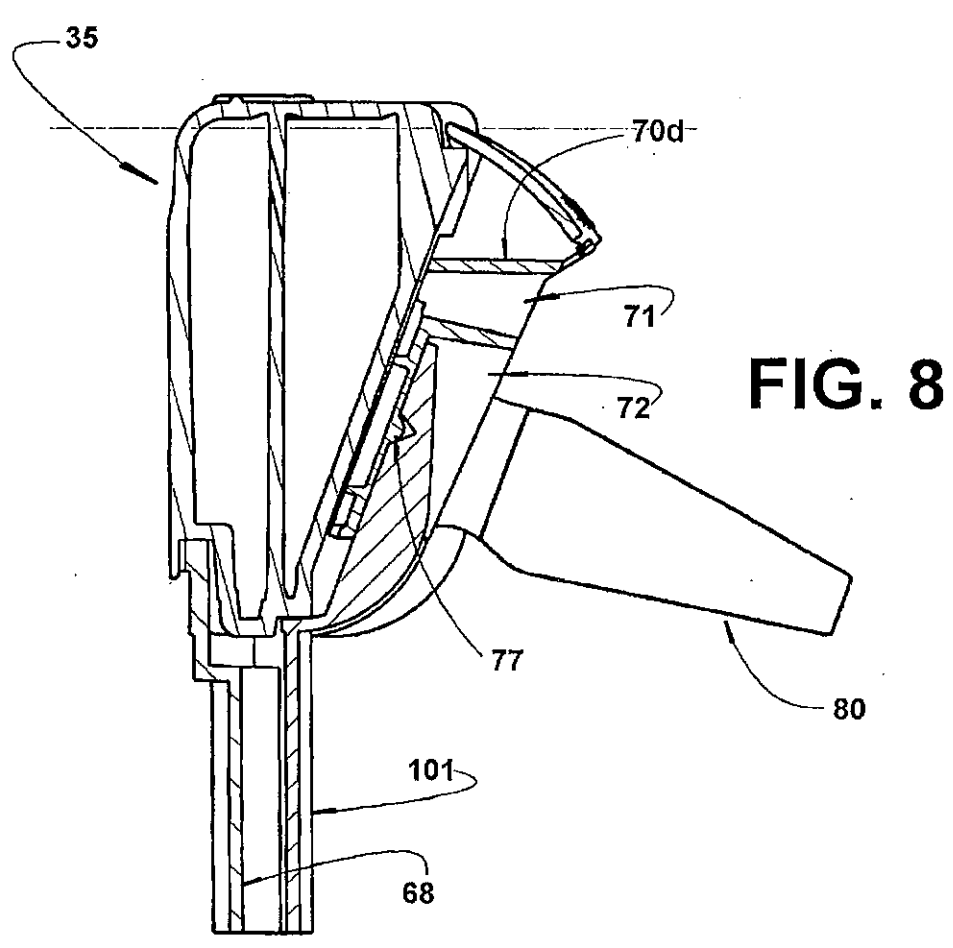
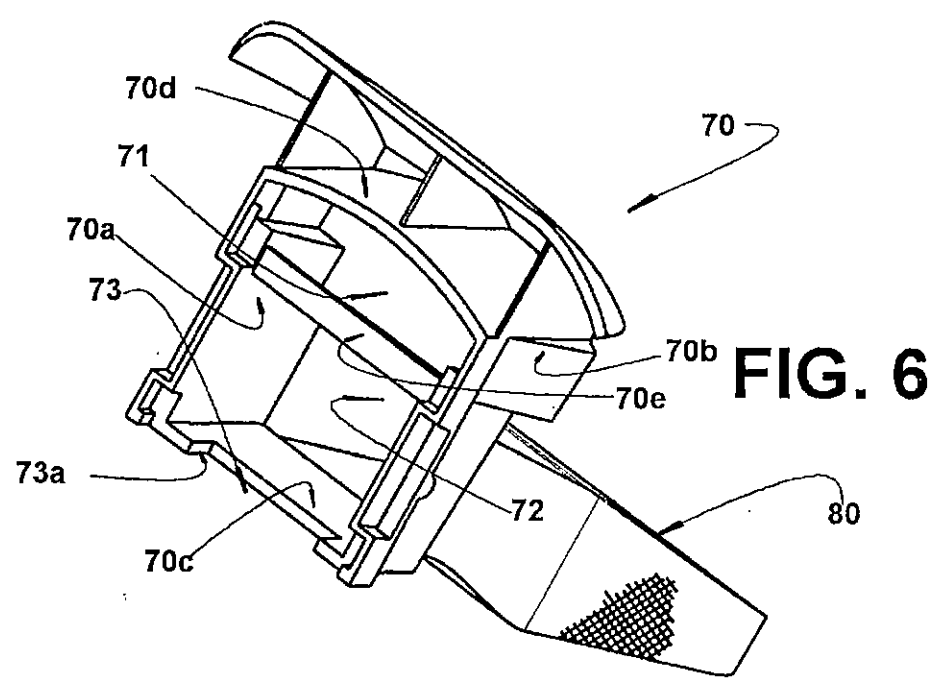


FIG. 5

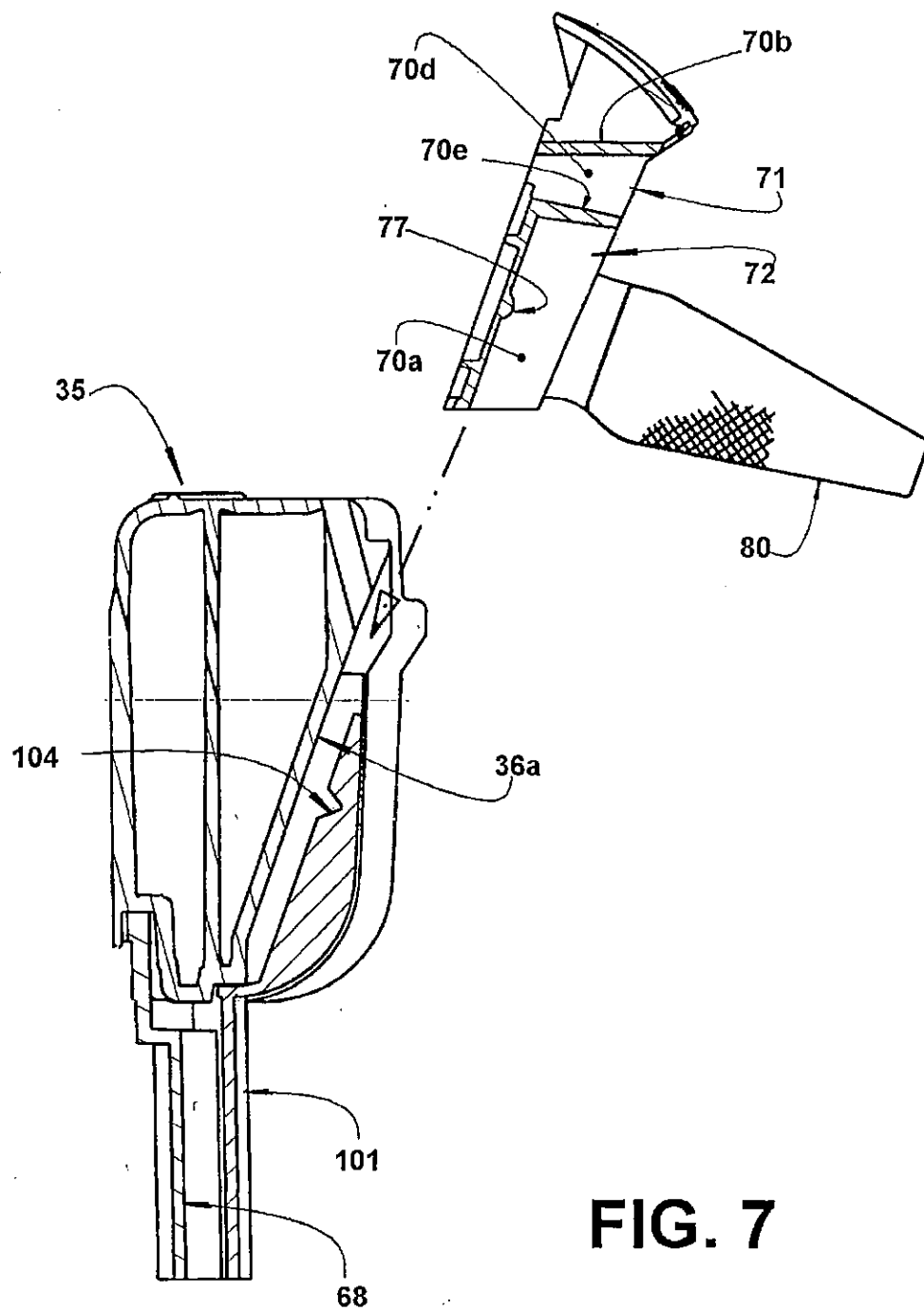
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PATENT COOPERATION TREATY

67
OUT 2006

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

PINHEIRO, NUNES, ARNAUD
& SCATAMBURLO
Attn. Arnaud, Antonio M.P.
Rua José Bonifácio, 93 - 9th floor
01003-901 São Paulo - SP
BRESIL

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year) 09/10/2006	
Applicant's or agent's file reference WHIM-439	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/BR2006/000124	International filing date (day/month/year) 27/06/2006
Applicant WHIRLPOOL S.A.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Malene Strarup
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NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic Instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the International preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference WHIM-439	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/BR2006/000124	International filing date (day/month/year) 27/06/2006	(Earliest) Priority Date (day/month/year) 29/06/2005
Applicant WHIRLPOOL S.A.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (see Box No. III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1
☐ as suggested by the applicant
☐ as selected by this Authority, because the applicant failed to suggest a figure
☒ as selected by this Authority, because this figure better characterizes the invention
b. ☐ none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No
PCT/BR2006/000124A. CLASSIFICATION OF SUBJECT MATTER
INV. D06F39/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 509 283 A (LEE ET AL) 23 April 1996 (1996-04-23) cited in the application columnn 2, line 63 - column 3, line 49; figures 2-5; abstract	1-17
A	US 5 661 989 A (JEON ET AL) 2 September 1997 (1997-09-02) cited in the application abstract; figures	1-7
A	US 5 863 423 A (SHIN ET AL) 26 January 1999 (1999-01-26) cited in the application abstract; figures	1-17
A	JP 60 142897 A (SANYO DENKI KK; SANYO ELECTRIC CO) 29 July 1985 (1985-07-29) the whole document	1-17

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

26 September 2006

Date of mailing of the international search report

09/10/2006

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Clivio, Eugenio

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/BR2006/000124

97

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5509283	A	23-04-1996	NONE	
US 5661989	A	02-09-1997	CN JP JP	1143696 A 2693144 B2 8266786 A
				26-02-1997 24-12-1997 15-10-1996
US 5863423	A	26-01-1999	CN ID JP JP	1208786 A 20694 A 2954139 B2 11057284 A
				24-02-1999 18-02-1999 27-09-1999 02-03-1999
JP 60142897	A	29-07-1985	JP JP	1399064 C 62004159 B
				07-09-1987 28-01-1987

PATENT COOPERATION TREATY

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From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/BR2006/000124

International filing date (day/month/year)
27.06.2006

Priority date (day/month/year)
29.06.2005

International Patent Classification (IPC) or both national classification and IPC
INV. D06F39/08

Applicant
WHIRLPOOL S.A.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Clivio, Eugenio

Telephone No. +49 89 2399-7251



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/BR2006/000124

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No. **74**
PCT/BR2006/000124

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-17
	No: Claims	
Inventive step (IS)	Yes: Claims	1-17
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	

2. Citations and explanations

see separate sheet

45 75

Re Item V.

1. Reference is made to the following documents:

D1 = US-A-5509283.

2. Prior art

Document D1, which is considered to represent the most relevant state of the art, discloses (the references in parentheses applying to this document):

A water recirculation system for a laundry machine (clothes washer having water recirculation system) of the type comprising a tub (water container (20)); a basket (basket (30)) having a bottom wall and a lateral wall and mounted inside the tub, so that it can be rotated around a vertical axis; an agitator (pulsator (40)) provided inside the basket, in order to be rotatively driven around said vertical axis; at least one axial duct (passage (76)) disposed in the vertical wall of the basket and having a lower opening (inlet (72)) turned to the agitator and an upper opening (first outlet (81)); a driving assembly (power transmitting means (60)) to rotate the agitator, in order to produce an ascending recirculating water flow through the axial duct.

Said system further comprises:

A second water outlet (second outlet (82)) provided under said first outlet and to which is affixed a filter (filter net (83)), said first and second water outlets being radially turned to the interior of the basket; a third water outlet (third outlet (73)) provided under said second water outlet.

The subject-matter of claim 1 is therefore novel (Article 33(2) PCT)

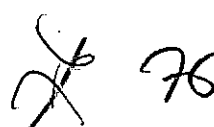
3. Problem

The problem to be solved by the present invention may be regarded as, how to provide a water recirculation system for a laundry machine, which allows to produce a constant water cascade configured to maximize its area of incidence over the load of clothes in the basket.

4. Solution

The water recirculating system comprises a distributing nozzle removably mounted to the upper opening of said axial duct, to receive the recirculating water flow therefrom,

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**


International application No.

PCT/BR2006/000124

and comprising a third descending water outlet provided under said second water outlet; said third outlet is substantially orthogonal to the direction of said second water outlet and turned to the interior of said basket.

These features are not known nor suggested by the available prior art.

5. Claims 2-17 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.



US005863423A

United States Patent [19]

Shin et al.

[11] Patent Number: 5,863,423

[45] Date of Patent: Jan. 26, 1999

[54] FILTER FOR A WASHING MACHINE

[75] Inventors: Jung-soo Shin; Ki-pyo Ahn, both of Suwon, Rep. of Korea

[73] Assignee: Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

[21] Appl. No.: 28,523

[22] Filed: Feb. 24, 1998

[30] Foreign Application Priority Data

Aug. 16, 1997 [KR] Rep. of Korea 97-39038
Aug. 16, 1997 [KR] Rep. of Korea 97-39044

[51] Int. Cl.⁶ D06F 39/10; B01D 29/35; B01D 35/153; B01D 35/22

[52] U.S. Cl. 210/167; 210/196; 210/238; 210/136; 210/346; 68/18 F

[58] Field of Search 210/136, 238, 210/346, 167, 196; 68/18 F

[56] References Cited

U.S. PATENT DOCUMENTS

2,939,305 6/1960 Snyder .
3,626,728 12/1971 Traube .
5,509,283 4/1996 Lee .
5,661,989 9/1997 Jean .

FOREIGN PATENT DOCUMENTS

62-14896 1/1987 Japan .
1-230394 9/1989 Japan .
3-103296 4/1991 Japan .
4-285595 10/1992 Japan .

Primary Examiner—Thomas M. Lithgow
Attorney, Agent, or Firm—Burns, Doane, Swecker Mathis, L.L.P.

[57] ABSTRACT

A filter for a washing machine is disclosed. The filter includes a waterfall discharging portion. The waterfall discharging portion has a penetrating hole formed at upper portion of a front panel of a pocket type filter and discharges the washing water introduced via a guide passage into the interior of a dehydrating tub. The waterfall discharging portion includes a first protrusion protruded from lower portion of the penetrating hole having a semi-spherical shape and a second protrusion extended from rear upper portion of the penetrating hole. Accordingly, a part of the washing water discharged from the pocket type filter is guided upwardly by the guide passage and discharged into the interior of the dehydrating tub to strike the laundry in the dehydrating tub after the flow speed of the washing water is increased by the first and second protrusions. The washing efficiency against the laundry is enhanced.

3 Claims, 7 Drawing Sheets

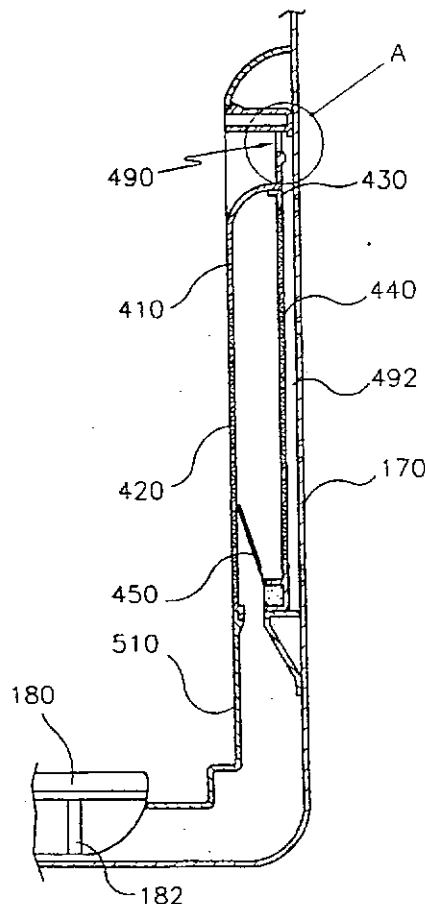
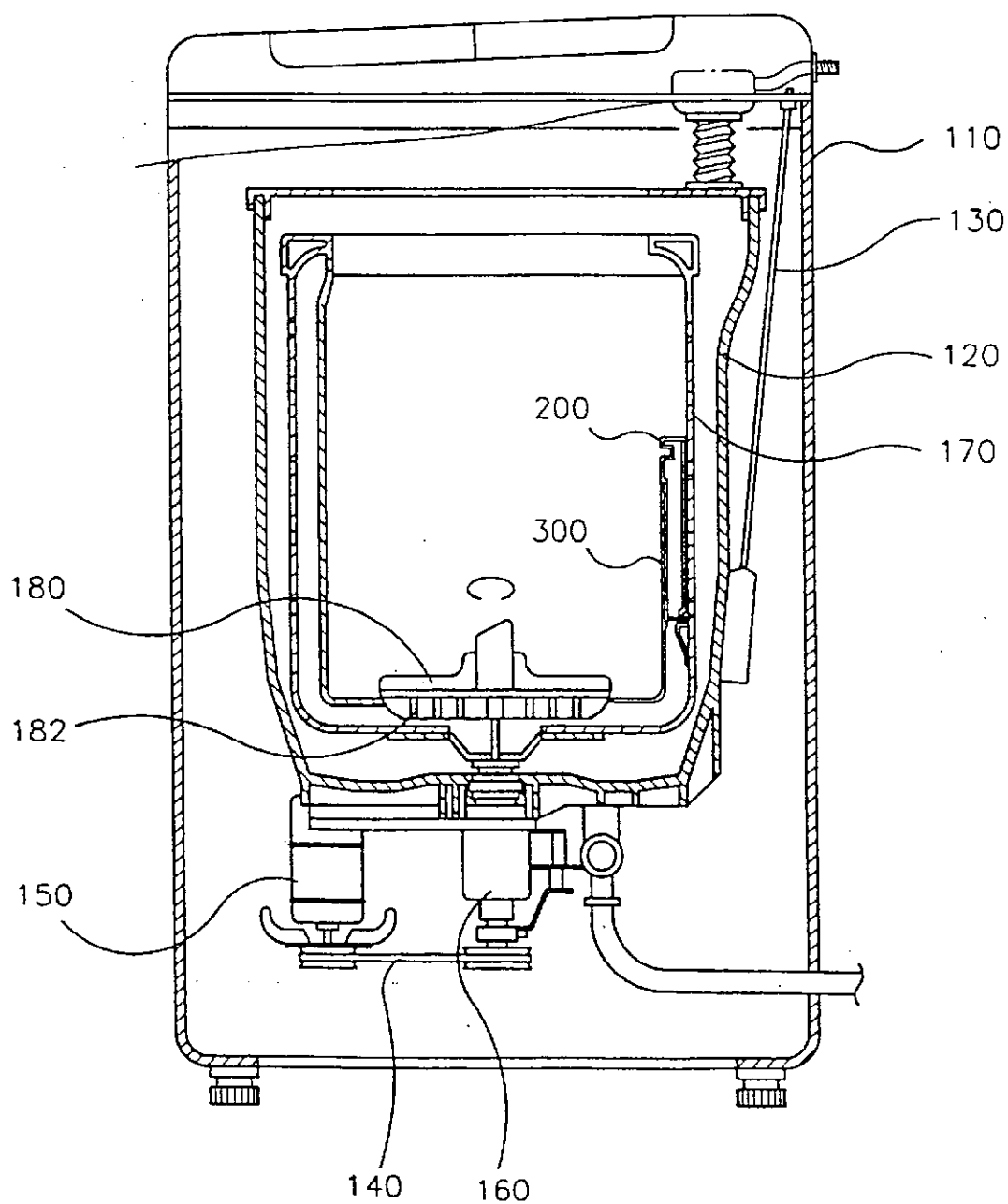
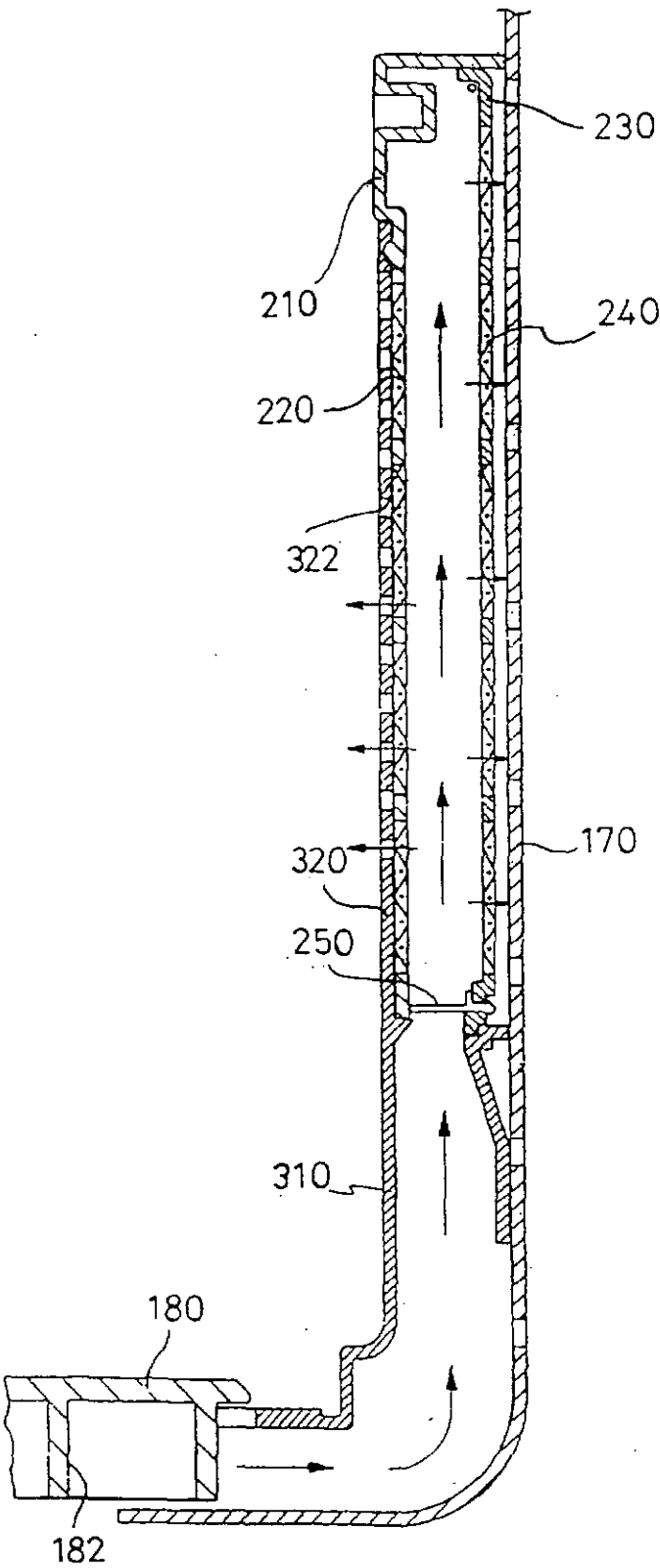


FIG. 2
PRIOR ART



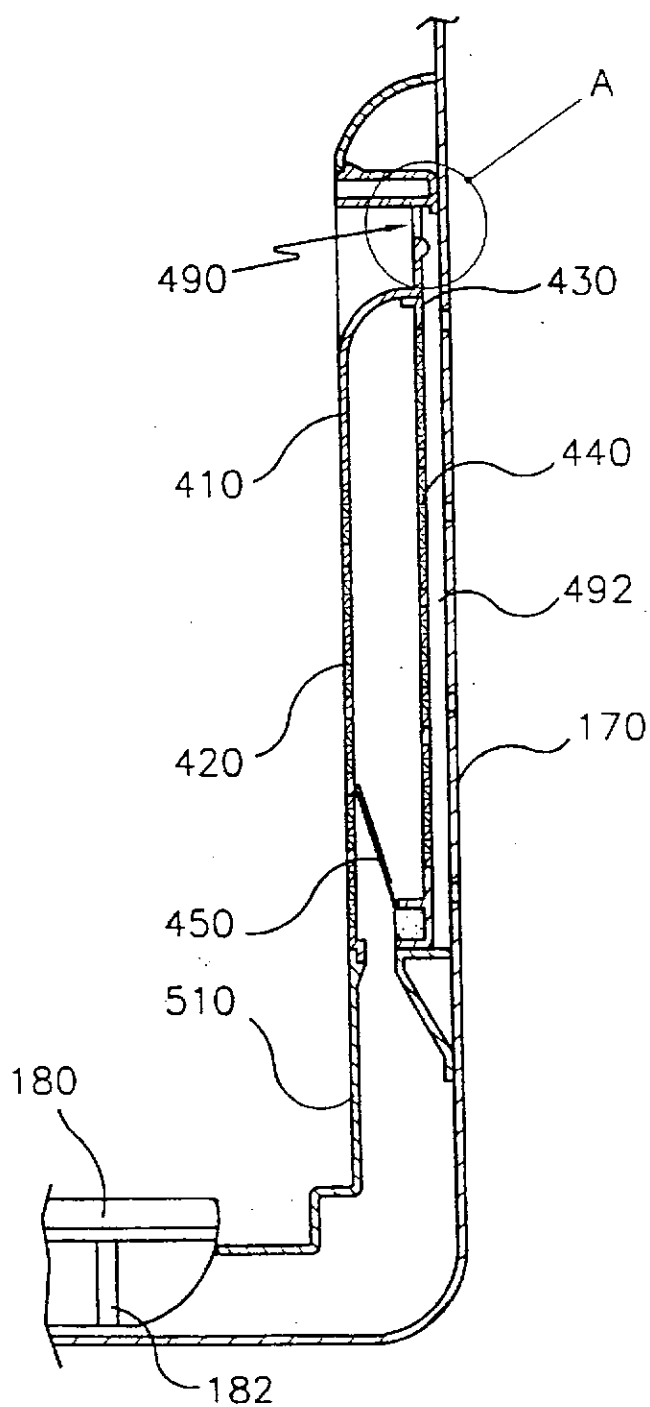
79

FIG. 4
PRIOR ART



80

FIG. 6A



FILTER FOR A WASHING MACHINE

RELATED INVENTION

This invention is related to inventions disclosed in commonly filed U.S. Ser. Nos. 09/028,522, 09/028,354, 09/028,526, 09/028,668, and 09/028,670, the disclosures of which are incorporated by reference herein.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a washing machine, and more particularly to a filter for a washing machine for filtering foreign matters such as fluff from washing water.

2. Description of the Prior Art

FIG. 1 illustrates a conventional washing machine. Referring to FIG. 1, in the conventional washing machine, a washing tub 120 is suspended by a suspension 130 into inside of a case 110.

A dehydrating tub 170 and a pulsator (or an agitator; hereinafter refer to "a pulsator") 180 selectively driven by a clutch assembly 160 which is connected to a motor 150 by means of a belt 140, are disposed in the inner side of washing tub 120.

An impeller 182 as a pump is integrally formed to the lower side of pulsator 180, and a filter 190 is provided around the upper end of dehydrating tub 170. A guide portion 172 for guiding the washing water pumped by impeller 182 toward filter 190 is formed between impeller 182 and filter 190.

In the washing machine constructed as above, once pulsator 180 is rotated by motor 150 and clutch assembly 160 during a washing or rinsing cycle, the washing water pumped by impeller 182 at the lower portion of pulsator 180 is guided to filter 190 along guide portion 172 to be dropped into the interior of dehydrating tub 170 via filter 190. During this process, foreign matters intermingled in the washing water are filtered by filter 190.

However, according to the conventional washing machine constructed as above, filter 190 is arranged around the upper end of dehydrating tub 170. For this reason, when a small amount of articles is washed in a small quantity of cleaning water, the washing water cannot reach filter 190. That is, the foreign matters intermingled in the washing water cannot be sufficiently filtered by filter 190 to lower washing efficiency.

FIGS. 2 to 4 show other example of a filter for a washing machine proposed to overcome the above described problems as a example.

As illustrated, the filter for a washing machine is attached to the inner lower portion of dehydrating tub 170, which includes a filter case 300 and a pocket type filter 200 for filtering fluff by being inserted into filter case 300.

Filter case 300 is attached to the inner lower portion of dehydrating tub 170 to form a predetermined space with dehydrating tub 170, which includes an attachment portion 310 for attaching itself onto dehydrating tub 170, a front plane portion 320 formed with a plurality of discharging holes 322 and inserting guide portions 330 formed to both rear sides of front plane portion 320 while having the upper portion opened.

Pocket type filter 200 includes a front panel 210, a rear panel 230 and a check valve 250. Front panel 210 and rear panel 230 are coupled to be opened/closed by a hinge shaft 232 formed to rear panel 230, and attached with mesh nets 220 and 240 for filtering the fluff. Check valve 250 for

opening/closing the space between front panel 210 and rear panel 230, is fixed to the lower side of rear panel 230 and made of a material such as a rubber.

Pocket type filter 200 as described above is inserted into the interior of the space between filter case 300 and dehydrating tub 170 by being slidably moved along inserting guide portions 330 from the upper portion of inserting guide portions 330 of filter case 300.

According to the filter as described above, the washing water pumped by impeller 182 flows into pocket type filter 200 via the space between dehydrating tub 170 and filter case 300 during the washing or rinsing cycle. Check valve 250 is upwardly pushed away by means of the washing water thereby the washing water is introduced into the interior of pocket type filter 200.

The washing water introduced into inside of pocket type filter 200 is discharged into dehydrating tub 170 via mesh nets 220 and 240 of front panel 210 and rear panel 230. At this time, the fluff within the washing water is filtered by mesh nets 220 and 240 attached to the front panel 210 and rear panel 230. Also, the washing water exhausted out of pocket type filter 200 is discharged into the interior of dehydrating tub 170 via discharging holes 322 formed in front plane portion 320 of filter case 300.

Under the state that the rotation of a pulsator is stopped after completing the washing or rinsing cycle, check valve 250 returns to its original position by means of gravity. Consequently, the filtered fluff is accumulated into the interior of pocket type filter 200 without getting away from pocket type filter 200.

The fluff accumulated on the interior of pocket type filter 200 is closely attached toward rear panel 230 due to a centrifugal force exerting upon the fluff by dehydrating tub 170 which is rotated at high speed during a dehydrating cycle. By doing so, the washing water pumped by impeller 182 can be easily introduced into pocket type filter 200 during the initial period of the next washing or rinsing cycle.

Meanwhile, as the amount of the fluff accumulated within pocket type filter 200 is increased, user grasps the upper portion of the pocket type filter and moved pocket type filter 200 in upper direction along inserting guide 230 of the filter case so as to separating pocket type filter 200 from the space between filter case 300 and dehydrating tub 170, then opens pocket type filter 200 and removes the fluff.

However, according to the filter of the prior art, there are drawbacks as followed.

As shown in FIG. 1, the washing water is fallen down toward pulsator 180 in dehydrating tub 170 from nearby the upper end of dehydrating tub 170 and the potential energy is high. Thus, the washing water is discharged into dehydrating tub 170 through filter 190, fallen down toward the laundry within dehydrating tub 170, and strikes the laundry so that may enhance the washing effect of a washing machine. Hereinafter, the washing water to be fallen down toward the laundry is referred to "a waterfall".

However, according to the filter of the other example of the prior art as shown in FIGS. 2 to 4, the kinetic energy of the washing water which is discharged into dehydrating tub 170 via pocket type filter 200, is reduced during passing through mesh nets 220 and 240 of front panel 210 and rear panel 230. Since the discharging position of the washing water into dehydrating tub 170 is low, the potential energy of the washing water is low. Thus, there are disadvantages that the washing water discharged through pocket type filter 200 does not form the waterfall and the washing water is not hoped for enhancing washing effect of the laundry within dehydrating tub 170.

According to the present invention as described in detail, a part of the washing water discharged from the pocket type filter is guided upwardly by the guide passage and discharged into the interior of the dehydrating tub to strike the laundry in the dehydrating tub after the flow speed of the washing water is increased. The washing efficiency against the laundry is enhanced.

While the present invention has been particularly shown and described with reference to particular embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be effected therein without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A filter apparatus for a washing machine comprising:
 - a filter case attached to an inner lower portion of a dehydrating tub of the washing machine for forming a predetermined space with the dehydrating tub, including an attachment portion for being attached to the dehydrating tub and a filter receiving portion formed with an opening portion; and
 - a pocket filter including a front panel attached with a mesh net to one side thereof for filtering fluff intermingled in washing water, a rear panel for forming a predetermined space with the front panel by being coupled to the front panel by hinge shafts for opening and/or

closing said pocket filter, said rear panel further including a mesh net for filtering the fluff intermingled in the washing water, a check valve fixed to the lower side of the rear panel for confining the flow of the washing water introduced into the space between the front panel and the rear panel, said pocket filter further formed with a penetrating hole at an upper portion thereof and a waterfall discharging portion for changing a portion of the washing water introduced into between the front panel and the rear panel into waterfall and discharging the waterfall from the penetrating hole into the interior of the dehydrating tub, the pocket filter being inserted into the filter receiving portion.

2. The filter apparatus for a washing machine as claimed in claim 1, wherein the waterfall discharging portion discharges the washing water which is introduced along a guide passage into the interior of the dehydrating tub, the guide passage is formed between the rear panel and the dehydrating tub.

3. The filter apparatus for a washing machine as claimed in claim 2, wherein the waterfall discharging portion includes a first protrusion being protruded from lower portion of the penetrating hole and having a semi-spherical shape and a second protrusion being extended downwardly from upper portion of the penetrating hole.

* * * * *



US005661989A

United States Patent [19]
Jeon et al.

[11] Patent Number: 5,661,989
[45] Date of Patent: Sep. 2, 1997

[54] WASHING MACHINE HAVING VERTICAL
WATER GUIDING CHANNELS ON INNER
SURFACE OF WASHING BASKET

[75] Inventors: Yong Byeong Jeon; Hyeong Reol Lee,
both of Suwon, Rep. of Korea

[73] Assignee: Samsung Electronics Co., Ltd.,
Suwon, Rep. of Korea

[21] Appl. No.: 620,349

[22] Filed: Mar. 22, 1996

[30] Foreign Application Priority Data

Mar. 23, 1995 [KR] Rep. of Korea 95-5212

[51] Int. Cl.⁶ D06F 39/10

[52] U.S. Cl. 68/18 F; 68/23.5; 68/23.7;
68/207

[58] Field of Search 68/23.3, 23.1,
68/23.5, 23.7, 207, 18 F

[56] References Cited

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2,270,750 1/1942 Bariffi 68/18 F
2,278,911 4/1942 Breckenridge 68/12.24
3,195,327 7/1965 Cobb 68/12.24

5,509,283 4/1996 Lee et al. .

FOREIGN PATENT DOCUMENTS

54-19563 2/1979 Japan 68/23.3
60-53186 3/1985 Japan 68/23.2
60-142897 7/1985 Japan 68/23.2
64-27591 1/1989 Japan 68/12.06
3-133497 6/1991 Japan 68/23.1
3-168196 7/1991 Japan 68/23.1

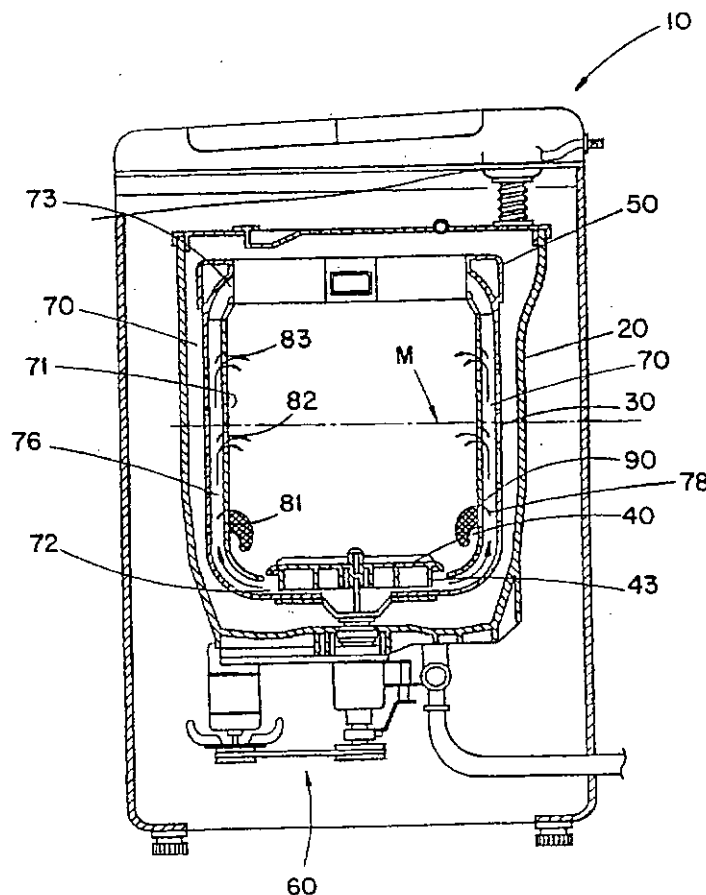
Primary Examiner—Frankie L. Stinson

Attorney, Agent, or Firm—Burns, Doane, Swecker &
Mathis, L.L.P.

[57] ABSTRACT

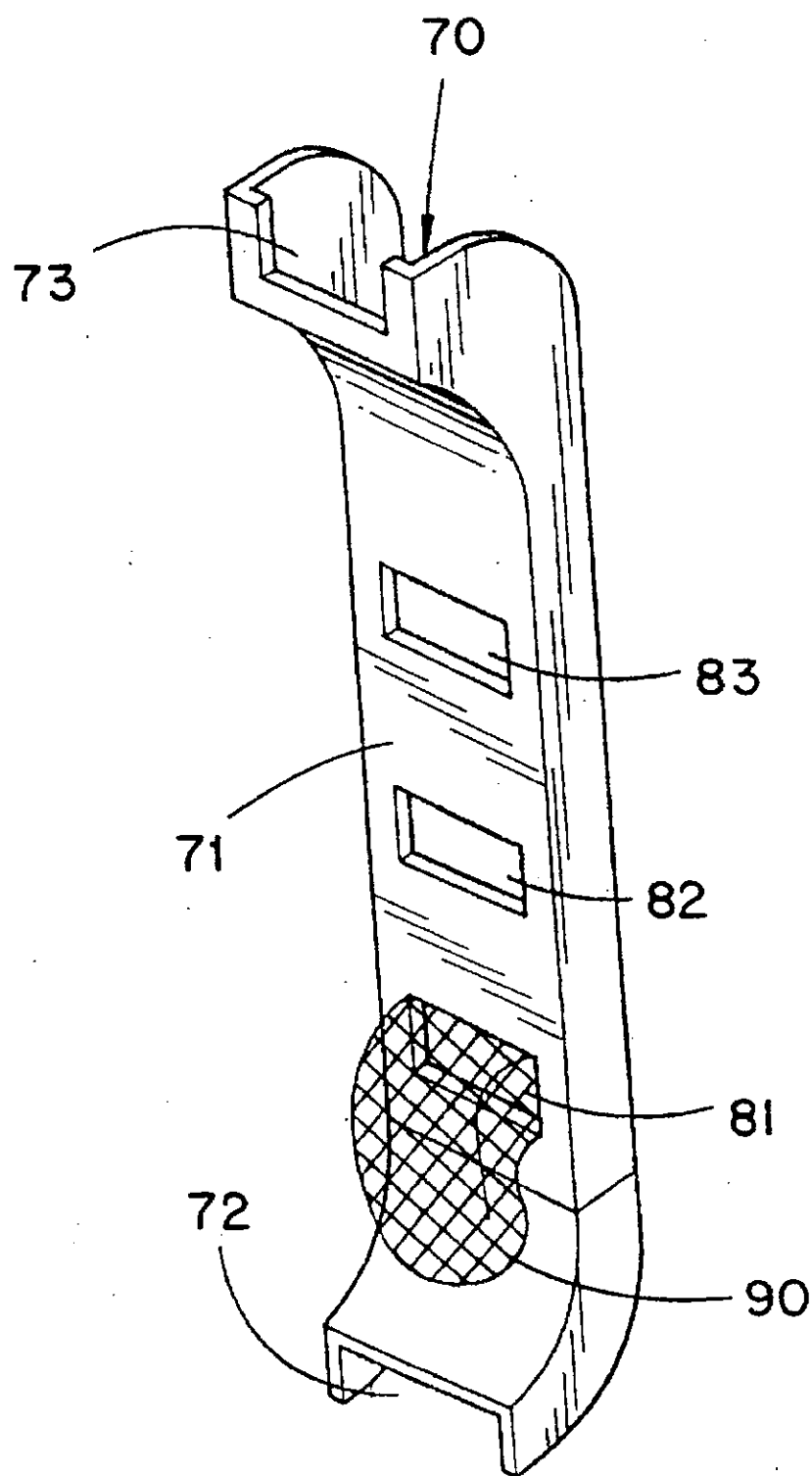
An automatic clothes washing machine comprises a water container, a washing basket mounted inside the water container to rotate about a vertical axis, and an agitator having a plurality of radial vanes for rotating about the vertical axis to radially propel the water into vertical channels arranged on the inside of the side wall of the washing basket. The channels discharge the propelled water vertically along the side wall. Each vertical channel has a water inlet at the lower end, for receiving radially propelled water, and a plurality of vertically spaced water outlets for discharging the water back into the washing basket. At least one of the water outlets is disposed below a vertical center of its respective channel, and a filter is mounted at the lowest water outlet.

6 Claims, 3 Drawing Sheets



Handwritten signature and initials.

FIG. 2



1

WASHING MACHINE HAVING VERTICAL WATER GUIDING CHANNELS ON INNER SURFACE OF WASHING BASKET

RELATED INVENTION

This invention is related to that disclosed in U.S. Pat. No. 5,509,283, issued Apr. 23, 1996.

BACKGROUND OF THE INVENTION

The present invention concerns a washing machine, which comprises a water container enclosed in a housing for containing water, a washing basket mounted inside the water container to rotate about a vertical axis, an agitator for rotating about the vertical axis to radially expel the water, a guide channel arranged on the inside of the side wall of the washing basket for upwardly conducting the radially propelled water and discharging the water back in to the washing basket.

Referring to FIG. 3 for illustrating a conventional automatic washing machine, a water container 2 is mounted in a housing 1. A washing basket 3 is mounted inside the water container 2, and has an agitator 4. Mounted on the bottom of the water container 2 is a drive mechanism 5, which includes a drive motor 5a, and a power transfer part 5b for transferring the power of the drive motor 5a to rotate the washing basket 3 and the agitator 4.

The washing basket 3 has a water guide channel 3a provided in a part of the side wall. The water guide channel 3a has a water inlet 3b formed at the lower end to take in the water in the washing basket and a water outlet 3c formed at the upper end to discharge the water back to the inside of the washing basket, so that the water is circulated through the water guide channel 3a. A filter 3d is attached to the water outlet 3c to filter the water guided through the water guide channel.

When washing clothes, the drive motor 5a oscillates the agitator 4. Then, the water in the washing basket is radially expelled to partly flow into the water inlet 3b of the water guide channel 3a. As a result, a part of the water is circulated from the inside of the washing basket through the water guide channel 3a, and back to the inside of the washing basket. This operation is repeated for a programmed time. The foreign matters such as hairy materials and scraps contained in the water discharged through the water outlet 3c are removed by the filter 3d.

Although such conventional washing machine is considerably effective in a washing operation, it suffers a drawback in that the water flowing into the water guide channel cannot be discharged through the water outlet during either a low or medium water level washing mode, thereby preventing the benefits of the water guide channel from being realized.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a washing machine with means for discharging the water in the guide channel into the washing basket even in the lower or medium water level mode.

According to an embodiment of the present invention, an automatic clothes washing machine comprises:

- a water container enclosed in a housing for containing water;
- a washing basket mounted inside the water container to rotate about a vertical axis, the washing basket having a bottom and a side wall;

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an agitator having a plurality of radial vanes for rotating about the vertical axis to radially expel the water, the agitator being arranged over the bottom;

at least a vertical channel means arranged on the inside of the side wall of the washing basket for guiding and discharging the water along the vertical length of the side wall into the washing basket; and

a drive means for rotating said washing basket and the agitator, wherein the vertical channel means has a water inlet at the lower end, an uppermost water outlet at the upper end, and a plurality of intermediate water outlets between the lower and upper ends, so that the water radially expelled may come into the water inlet to be discharged through the uppermost or intermediate water outlets into the washing basket, and a filter attached to at least one of the water outlets for filtering the discharged water to remove hairy materials, scraps, etc.

The present invention will now be described with reference to the drawings attached only by way of example.

BRIEF DESCRIPTION OF THE ATTACHED DRAWINGS

FIG. 1 is a cross sectional view for illustrating the structure of a washing machine according to the present invention;

FIG. 2 is a perspective view of the essential part of the inventive washing machine; and

FIG. 3 is a cross sectional view for illustrating a conventional automatic washing machine.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to FIG. 1, mounted in a housing 10 is a water container 20 for containing water, and a washing basket 30 with an agitator 40 disposed inside the water container. The washing basket 30 has a bottom and a side wall. Along the upper end of the washing basket 30 there is provided a liquid balance device 50 to prevent the washing basket from vibrating in operation. A power transfer mechanism 60 is mounted on the bottom of the water container 20.

At least one vertical channel 70 is arranged on the inside of the side wall of the washing basket 30 for guiding and discharging the water expelled radially outward by the agitator 40 at different levels along the vertical length of the side wall into the washing basket.

Referring to FIG. 2, the vertical channel 70 extends upwardly from the periphery of the agitator 40 to a position beneath the liquid balance device 50 so as to form a hollow space 76 by means of a guide member 71. The vertical channel 70 includes a water inlet 72 at the lower end and an uppermost water outlet 73 at the upper end. It is preferable to arrange a plurality of the guide members 71 along the inside of the washing basket 30. The water inlet 72 and the water outlet 73 are preferably curved toward the central axis of the washing basket. Two of the water outlets 81 and 82 are disposed below a plane M defining a vertical midpoint of each channel.

The guide channel 70 has an ejecting structure which causes the water flowing into the water inlet 72 by the rotation of the agitator 40 alternately in the opposite directions to be discharged back into the washing basket at different levels. The ejecting structure comprises a plurality of intermediate water outlets 81, 82, 83 formed at different levels between the lower and upper ends of the guide



US005509283A

United States Patent [19]

Lee et al.

[11] Patent Number: 5,509,283

[45] Date of Patent: Apr. 23, 1996

[54] CLOTHES WASHER HAVING WATER RECIRCULATION SYSTEM

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both of Rep. of Korea

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[21] Appl. No.: 355,197

[22] Filed: Dec. 8, 1994

[30] Foreign Application Priority Data

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Mar. 26, 1994 [KR] Rep. of Korea 94-6153 U

[51] Int. Cl.⁶ D06F 17/06; D06F 39/10

[52] U.S. Cl. 68/18 F; 68/23.7; 68/53

[58] Field of Search 68/18 F, 23.7,
68/53

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14896	1/1987	Japan	68/18 F
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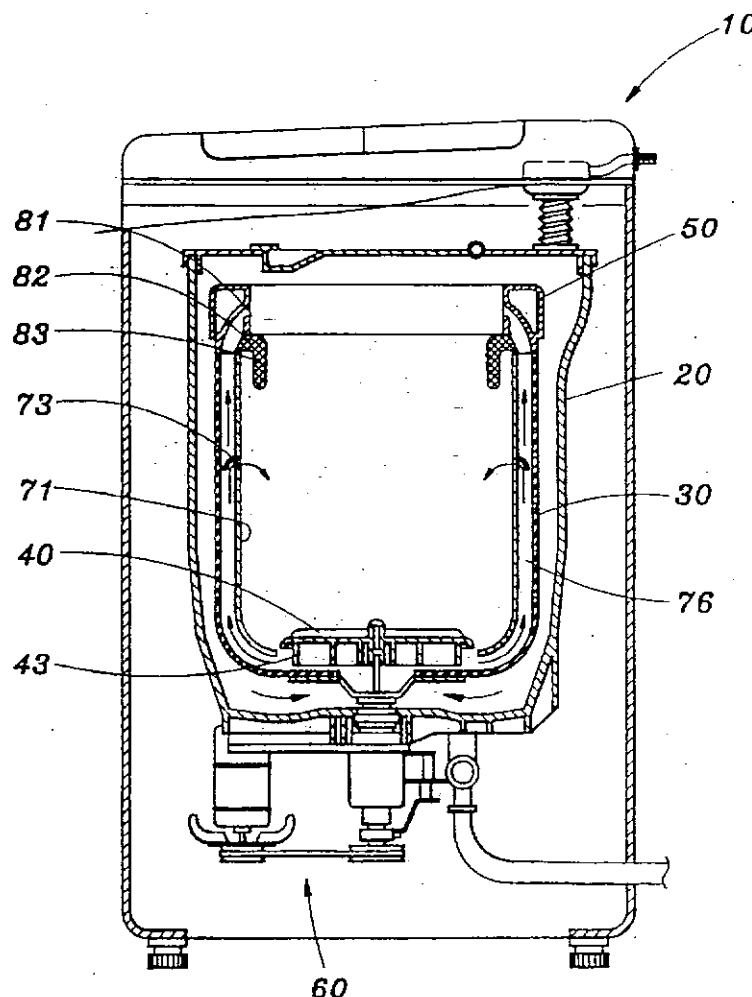
Primary Examiner—Philip R. Coe

Attorney, Agent, or Firm—Burns, Doane, Swecker & Mathis

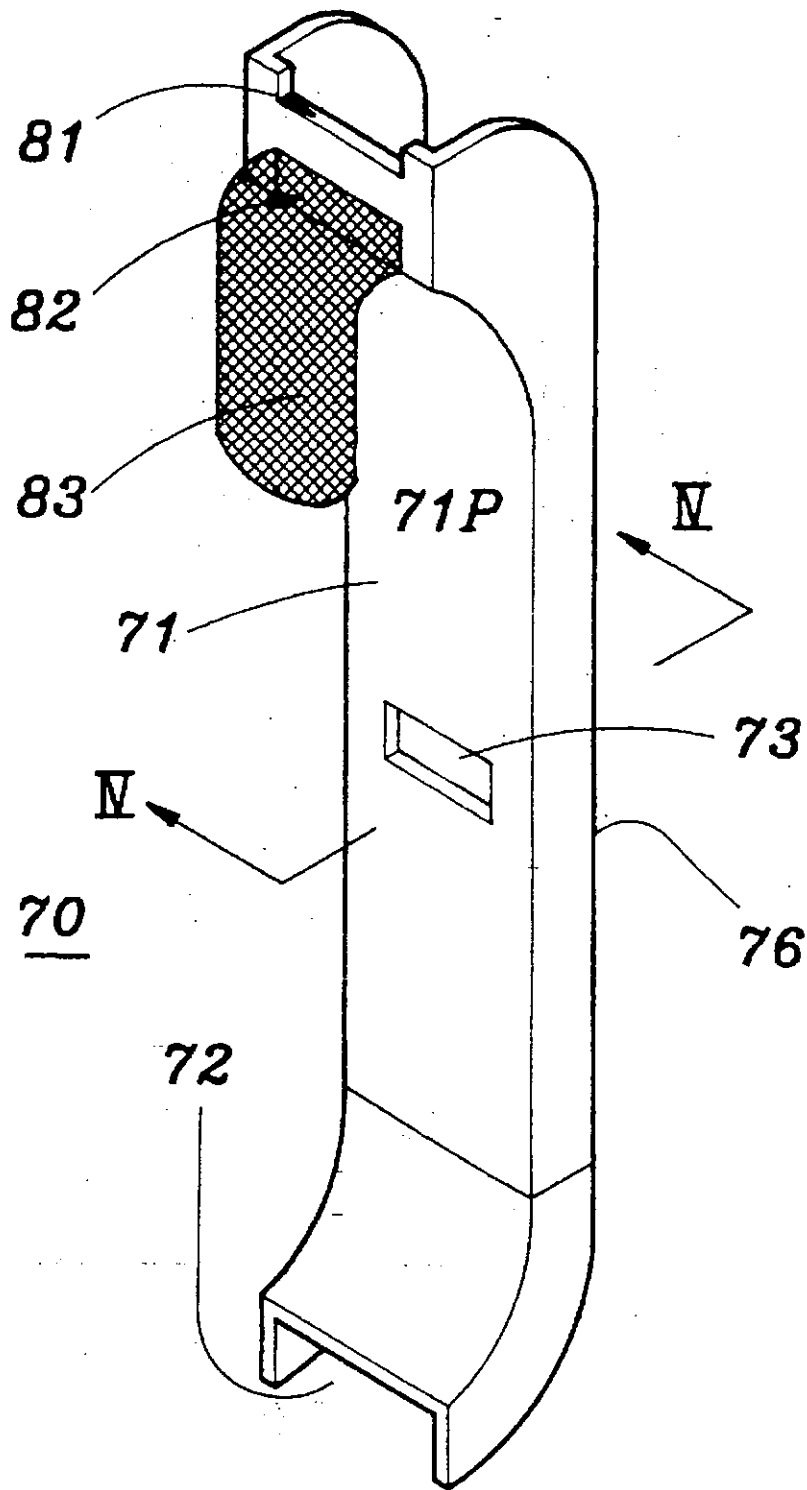
[57] ABSTRACT

A clothes washing machine includes a water container, a spin-drying basket disposed in the container, and an oscillatory agitator disposed at the bottom of the basket. A plurality of upright water passages are formed in a vertical wall of the basket for conducting an upward flow of water generated by the agitator. Each passage includes vertically spaced first and second water outlets disposed above a water level in the basket. The second outlet is disposed below the upper outlet and has a lint filter. A third water outlet is formed in each passage and is disposed below the water level.

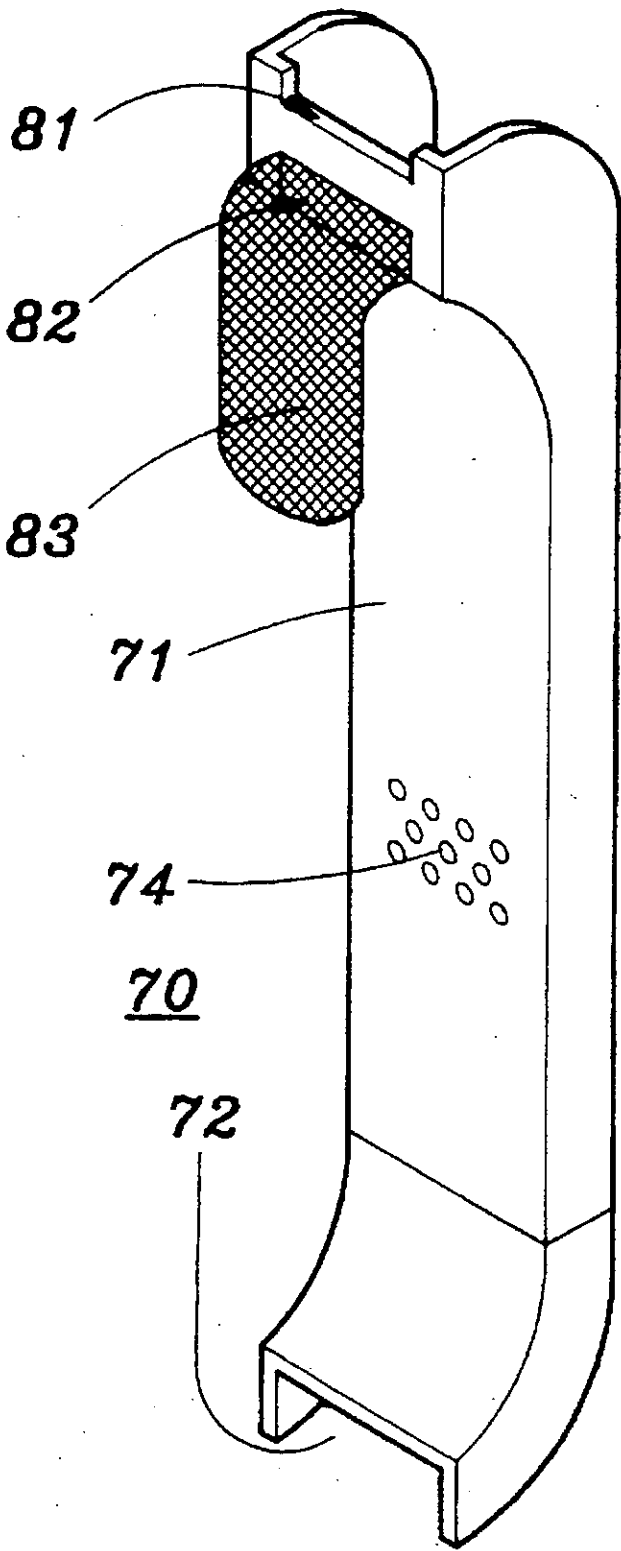
10 Claims, 5 Drawing Sheets



F i g. 2



F i g. 5



CLOTHES WASHER HAVING WATER RECIRCULATION SYSTEM

BACKGROUND OF THE INVENTION

The present invention is related to providing a clothes washing machine having means for circulating water from the bottom of a basket to the top thereof under the action of an oscillating agitator.

A conventional clothes washing machine is configured, as shown in FIG. 6, to provide a water tank 2 which is provided in the inside of a body 1 and containing a predetermined volume of water needed for a washing cycle. A hydrating spinning basket 3 is housed in the tank 2 and has a pulsator 4. A power generating member 5 is provided beneath the tank 2 for transmitting the power to the dehydrating basket 3 or the pulsator 4.

The power generating member 5 comprises a motor 5a provided beneath the water tank 2, and a power transmitting element 5b for operating the basket 3 and the pulsator 4 by the power of the motor 5a.

Further, at a predetermined area of the inner wall of the basket 3 there is formed a water guide duct 3a for guiding the water upwardly from the pulsator 4. The water guide duct 3a comprises an inlet 3b provided at the lower end and receiving the water from the pulsator during the washing and the rinsing cycle, an outlet 3c provided at upper end for discharging water, and a filter 3d detachably provided at the front of the outlet 3c for collecting lint contained in the discharged water through outlet 3c.

The typical conventional art is described in Japanese Patent Laid Open Publication No. 80-24066 (1980.2.20).

In the washing machine having the above structure, the pulsator 4 is oscillated by the power transmitted from the motor 5a, and thus the washing and the rinsing cycle are achieved.

As the rotating pulsator 4 acts as an impeller, part of the washing water is forcefully induced to the inlet 3b of the water guide duct 3a, and the water through the inlet 3b is discharged from the outlet 3c of the water guide duct 3a, which is circulated during the washing cycle.

While the process can be repeated during the predetermined programmed period, the washing step and the rinsing step are accomplished. The lint accompanying the water is discharged through the outlet 3c, and is collected by the filter 3d. While the washing machine has a fairly effective washing cycle, it has the following problems.

In both the washing and rinsing cycles, the oscillating pulsator 4 causes the water to turn into a stream. Since the water tends to be directed to the inlet 3b of the water guide duct 3a which is formed as a single opening in the inner wall of the basket 3, a swirling effect of the water occurs particularly adjacent to the inlet 3b. The swirling of the water causes the clothes to become extremely twisted. Additionally, since the stream of water is concentrated adjacent to the single inlet, no effective circulation of the water can be achieved and not enough detergent can be dissolved which decreases the cleaning efficiency of the washer. Further, the undissolved detergent is drained with the drain water which results in a waste of detergent and water pollution.

Furthermore, above-described swirling generated by the rotation of the pulsator raises the clothes toward the upper central surface of the water, so the clothes are exposed above the water surface. When this occurs, the washing efficiency decreases.

In order to resolve these problems, one of the main objectives of the present invention is to provide a clothes washing machine having a plurality of passages from which most of the water pours down to the central portion of the dehydrating basket, forming a waterfall, so the clothes which rise above the water surface by the rotation of the pulsator are forced downward until fully immersed, thereby increasing the washing efficiency.

Another objective of the present invention is to provide each passage with a vortex chamber, in which the lint contained in the water is easily separated.

Still another objective of the present invention is to provide each passage with vertically spaced water outlets generating different water heads, in which the clothes in the lower water head as well as the higher water head can be immersed, and the turbulence of the water can easily be developed.

SUMMARY OF THE INVENTION

In order to accomplish these objects, the present invention relates to a clothes washing machine which comprises an upwardly open water container having water therein; a dehydrating basket disposed in the water container; a power transmitting means for transmitting the power of a motor to the dehydrating basket; an oscillatory pulsator disposed in the bottom of the dehydrating basket for being operated by the turning direction of the power transmitting means; an impeller having a plurality of vanes extending radially on the bottom surface of the pulsator; channels attached to the inner wall of the dehydrating basket for guiding the water discharged from the impeller to be run upwardly. Further, the channel has a water inlet at the lower end, a first water outlet at the upper end, and a second water outlet below the first water outlet, the second water outlet having a lint filter.

Furthermore, at the upper end of the channel there is provided a vortex chamber which curves toward the first water outlet.

Furthermore, a third water outlet is provided below the second water outlet.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be explained in detail with reference to the attached drawings, in which:

FIG. 1 is a vertical cross-sectional view showing a clothes washing machine provided with a plurality of channels according to the present invention;

FIG. 2 is a perspective view of a channel of FIG. 1;

FIG. 3 is a vertical cross-sectional view of an upper end of the channel of FIG. 2;

FIG. 4 is a vertical cross-sectional view taken along line IV-IV of FIG. 2;

FIG. 5 is a view similar to FIG. 2 of another embodiment of a channel; and

FIG. 6 is a vertical cross-sectional view showing a prior art clothes washing machine provided with a channel.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 represents a clothes washing machine according to the present invention, which includes a body 10. The body 10 is provided with a water container 20 which retains washing-water therein and a washing tank or dehydrating basket 30 which receives clothing. The dehydrating basket

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- outlet disposed adjacent an upper end thereof, and a second water outlet disposed below said first water outlet;
- a filter mounted at said second outlet for filtering-out lint from water discharged through said second water outlet; and
- a drive mechanism for rotating said basket and rotatably oscillating said agitator for displacing water upwardly through said passage and out of said first and second water outlets;
- wherein said passage includes an enlargement adjacent said first and second water outlets for defining a vortex chamber with which said first and second outlets communicate.
2. The clothes washing machine according to claim 1, wherein there is a plurality of said passages spaced apart circumferentially.
3. The clothes washing machine according to claim 1, wherein an overhead wall of said vortex chamber includes a generally vertical rear end and a generally horizontal front end and is smoothly curved from said rear end to said front end.
4. The clothes washing machine according to claim 1, wherein said passage includes a third water outlet disposed below said second water outlet and below a water level in said basket.
5. The clothes washing machine according to claim 4, further including a vane disposed in a path of water running upwardly through said passage for diverting a portion of that water to said third water outlet.
6. The clothes washing machine according to claim 1, wherein said agitator vanes are disposed on a bottom surface of said agitator and lie at the same level as said water inlet.
7. The clothes washing machine according to claim 1, wherein said passage includes radially spaced inner and outer vertical walls and side walls extending between said inner and outer walls.

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8. A clothes washing machine, comprising:
- a water container including means for filling said water container with wash water to a predetermined level;
- a dehydrating basket disposed in said water container and mounted for rotation about a vertical axis, said basket including a bottom wall and a vertical wall;
- an agitator situated above said bottom wall and mounted for oscillation about said axis, said agitator including a plurality of generally radially extending vanes for displacing water in a generally radially outward direction in response to oscillation of said agitator;
- at least one upright passage disposed in said vertical wall of said basket, said passage including a water inlet disposed adjacent a lower end thereof, a water outlet situated above said predetermined level and a water outlet situated below said level;
- a drive mechanism for rotating said basket and oscillating said agitator for displacing water upwardly through said passage and out of said water outlets; and
- a vane disposed in the path of water running upwardly through said passage for diverting a portion of that water through said water outlet disposed below said predetermined level.
9. The clothes washing machine according to claim 8, wherein there is a plurality of said passages spaced circumferentially apart.
10. The clothes washing machine according to claim 8, wherein said passage includes radially spaced inner and outer vertical walls, and side walls extending between said inner and outer walls.

* * * * *

OK
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⑩ 日本国特許庁(JP) ⑪ 特許出願公開
⑫ 公開特許公報(A) 昭60-142897

⑬ Int.Cl.⁴ 識別記号 庁内整理番号 ⑭ 公開 昭和60年(1985)7月29日
D 06 F 39/08 Q-8119-4L

審査請求 有 発明の数 1 (全5頁)

⑮ 発明の名称 脱水洗濯機

⑯ 特 願 昭59-228319
⑰ 出 願 昭53(1978)8月10日
⑱ 特 願 昭53-98372の分割

⑲ 発 明 者 林 源 太 郎 守口市京阪本通2丁目18番地 三洋電機株式会社内
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明 細 書

1. 発明の名称 脱水洗濯機
2. 特許請求の範囲

(1) 回転翼の裏羽根によるポンプ作用によって、外槽と洗濯兼脱水槽間の水を吐出管を介して脱水槽の上部に送出し且つ槽内に吐出させる脱水洗濯機に於いて、上記脱水槽の上部に取付けられたバランスリングに、上記吐出管の上端を止める保持環と、吐出管上端と水出口の間を連通する通路を設け、この通路を構成し且つ保持環を覆うカバーを上記バランスリングに上方から着脱可能に止着し、上記カバーを、上記外槽の上部に設けられた環状の外槽カバーの開口内に臨ませたことを特徴とする脱水洗濯機。

3. 発明の詳細な説明

(イ) 産業上の利用分野

本発明は、回転翼の裏羽根によるポンプ作用によって、外槽と洗濯兼脱水槽間の水を吐出管を介して脱水槽の上部に送出し且つ槽内に吐出させる脱水洗濯機に関する。

(ロ) 従来の技術

この種の脱水洗濯機は例えば実開昭53-159173号公報で提案されているが、吐出管は脱水槽の外面に形成され、その上端をバランスリング内のリントフィルターに臨ませている。また、外槽カバーは吐出管の上端からバランスリングのほとんどを覆うようになっている。従って、吐出管の目詰り等を解消すべく清掃作業を行なうには、外槽カバーを外す必要がある。一般に外槽カバー上には操作箱が配設されており、外槽カバーを外すにはそれらの操作、制御系統も分解することになり、極めて煩雑となる。

(ハ) 発明が解決しようとする問題点

本発明は、吐出水路系の清掃作業を簡単に実行できるようにするものである。

(ニ) 問題点を解決するための手段

本発明は、脱水槽上部のバランスリングに、吐出管の上端を止める保持環と、吐出管上端と水出口の間を連通する通路を設け、この通路を構成し且つ保持環を覆うカバーを上記バランスリングに

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(38)(40)をその開口縁を滑着することにより形成されている。バランスリング(34)の内側壁には下側が完全に開放し、上側も基本的には開放した凹所(41)が形成されている。この凹所(41)の奥側の上部、つまり上側凹溝体(39)には、凹所(41)の相対する側壁間を橋絡する如き連絡部(42)が設けられ、この連絡部(42)により上記保持環(35)が形成されている。

そして、バランスリング(34)の上面にネジ(43)により取付けられたカバー(44)の垂下片(45)にて吐出管(33)の上端を押え付け、吐出管(33)の下端が吐出水路(28)より外れないようにしている。

上記上側凹溝体(39)には、吐出管(33)の上端より上方へ向けて吐出される水を、上記カバー(44)及び連絡部(42)と共同して下方へその向きを変更するガイド(46)が、丁度連絡部(42)と同様に凹所(41)の手前側上端の相対する側壁間を橋絡する如く設けられている。

ポンプ室(21)の吐出用の水路は、上記した如き、脱水槽外底面に形成された吐出水路(28)、吐

出管(33)、それにカバー(44)や連絡部(42)やガイド(46)により構成される通路(47)により形成され、下向きの水出口(48)が最終的な吐出口となる。

(49)はバランスリング(34)に着脱自在に取付けられたリントフィルターで、円錐状のネット(50)と合成樹脂製の取付枠(51)から成り、上記下向き水出口(48)からの吐出水を下方から受け、水中のリント等を採取し、槽内に水を戻す。

(52)は回転翼(7)の外周に(A)寸法だけ垂下するように形成されたリブで、ポンプ室(21)内の回転時に於ける圧力を高め、開口(6)の隙間から槽内に出る水量を減少させる。

(53)は上記外槽(1)の上部に被せられた環状の外槽カバーで、その開口の内周縁が上記ネジ(43)の止着部分より外方に位置し、上記カバー(44)のほとんどの部分を開口に露ませている。

動作を説明すると、まず洗濯やすすぎ時に回転翼(7)が回転すると、底羽根(9)のポンプ作用により、外槽(1)と脱水槽(2)間の水は第1図

矢印の如く透孔(22)からポンプ室(21)に吸込まれる。吸込まれた水の大部分は、回転翼(7)がどちらに回転しても、直線部(24)(24)に沿って速やかに開放部(23)へ送出され、そこから前記吐出水路(28)へ送りこまれ、吐出管(33)及び通路(47)を運って下向き水出口(48)からリントフィルター(49)を介して脱水槽(2)内へ吐出される。

この結果、洗濯水は回転翼(7)による水流に水出口(48)からの水が混ざって複雑なものとなり、洗濯物の上下の入れ替えを促進して洗浄率やすすぎ効果を向上させることができる。また、洗濯水中に含まれている糸屑等をリントフィルター(49)にて確実に除去することができる。この際、図の如くネット(50)の先端が洗濯水面(L)(高水位での)より(B)寸法だけ沈むようにすれば、洗濯物がネット(50)に当たり、この時の振動で、ネット(50)にかかった糸屑をその先端へ押しやり、フィルター(49)の清掃をする際ネット(50)から糸屑を簡単に除去することができる。

さらに、吐出管(33)等の吐出用の水路系が糸屑

等で詰まって、水出口(48)からの水量が減少してきた場合、吐出水路系を清掃する必要がある。この場合は、外槽カバー(53)の開口からドライバーでネジ(43)を外し、バランスリング(34)上面のカバー(44)を外せば、吐出管(33)を持ち上げて下端を吐出水路(28)から外し、そしてその上端を保持環(35)から外して簡単に吐出管(33)を外すことができ、吐出管(33)や通路(47)の清掃を容易に行なうことができる。このようにカバー(44)は上方から簡単に脱着でき、サービス性が向上している。

尚、本実施例ではカバー(44)をネジ(43)によって止めているが、バランスリング(34)に対して弾性係合機構によって取付けるようにすれば、着脱がより簡単となり、サービス性を一層向上することができる。

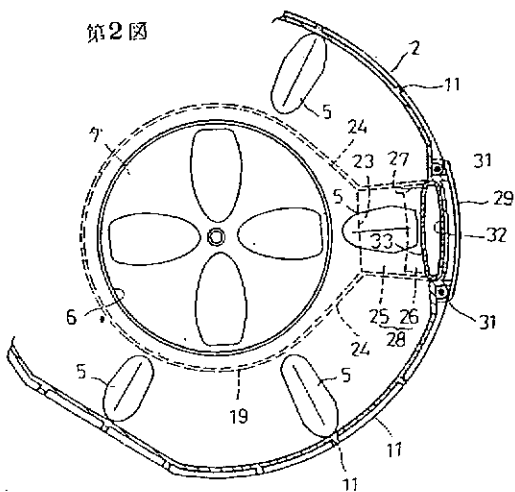
(ト) 発明の効果

本発明による脱水洗濯機は、吐出用の通路の構成体であるカバーを外槽カバーの開口を介して上方から脱着でき、清掃作業時に於けるサービス性を向上できるものである。

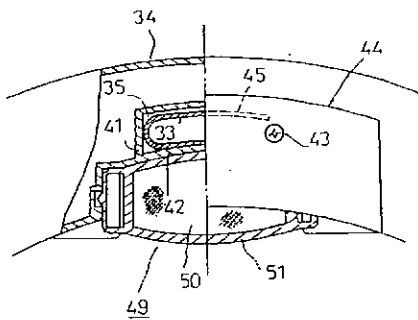
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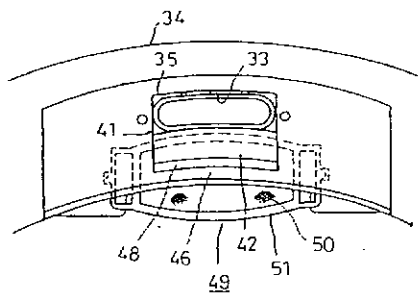
第2図



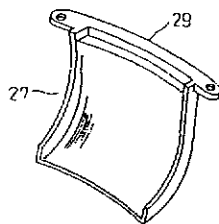
第4図



第5図



第3図



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From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

ARNAUD, Antonio M.P.
Rua José Bonifácio, 93 - 9th Floor
01003-901 São Paulo - SP
BRÉSIL

Date of mailing (day/month/year) 18 September 2006 (18.09.2006)	
Applicant's or agent's file reference WHIM-439	IMPORTANT NOTIFICATION
International application No. PCT/BR2006/000124	International filing date (day/month/year) 27 June 2006 (27.06.2006)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 29 June 2005 (29.06.2005)
Applicant WHIRLPOOL S.A. et al	

1. By means of this Form, which replaces any previously issued notification concerning submission or transmittal of priority documents, the applicant is hereby notified of the date of receipt by the International Bureau of the priority document(s) relating to all earlier application(s) whose priority is claimed. Unless otherwise indicated by the letters "NR", in the right-hand column or by an asterisk appearing next to a date of receipt, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. (If applicable) The letters "NR" appearing in the right-hand column denote a priority document which, on the date of mailing of this Form, had not yet been received by the International Bureau under Rule 17.1(a) or (b). Where, under Rule 17.1(a), the priority document must be submitted by the applicant to the receiving Office or the International Bureau, but the applicant fails to submit the priority document within the applicable time limit under that Rule, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
3. (If applicable) An asterisk (*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b) (the priority document was received after the time limit prescribed in Rule 17.1(a) or the request to prepare and transmit the priority document was submitted to the receiving Office after the applicable time limit under Rule 17.1(b)). Even though the priority document was not furnished in compliance with Rule 17.1(a) or (b), the International Bureau will nevertheless transmit a copy of the document to the designated Offices, for their consideration. In case such a copy is not accepted by the designated Office as the priority document, Rule 17.1(c) provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
29 June 2005 (29.06.2005)	PI0502662-8	BR	31 August 2006 (31.08.2006)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Simin Baharlou

Facsimile No. +41 22 338 82 70

Facsimile No. +41 22 338 71 30

Telephone No. +41 22 338 99 32

From the INTERNATIONAL BUREAU

PCT

FIRST NOTICE INFORMING THE APPLICANT OF
THE COMMUNICATION OF THE INTERNATIONAL
APPLICATION (TO DESIGNATED OFFICES WHICH
DO NOT APPLY THE 30 MONTH TIME LIMIT
UNDER ARTICLE 22(1))

(PCT Rule 47.1(c))

To:

ARNAUD, Antonio M.P.
Rua José Bonifácio, 93 - 9th Floor
01003-901 São Paulo - SP
BRÉSIL

05 MAR 2007

Date of mailing (day/month/year)

01 February 2007 (01.02.2007)

Applicant's or agent's file reference

WHIM-439

IMPORTANT NOTICE

International application No.

PCT/BR2006/000124

International filing date (day/month/year)

27 June 2006 (27.06.2006)

Priority date (day/month/year)

29 June 2005 (29.06.2005)

Applicant

WHIRLPOOL S.A. et al

1. **ATTENTION:** For any designated Office(s), for which the time limit under Article 22(1), as in force from 1 April 2002 (30 months from the priority date), **does apply**, please see Form PCT/IB/308(Second and Supplementary Notice) (to be issued promptly after the expiration of 28 months from the priority date).
2. Notice is hereby given that the following designated Office(s), for which the time limit under Article 22(1), as in force from 1 April 2002, **does not apply**, has/have requested that the communication of the international application, as provided for in Article 20, be effected under Rule 93bis.1. The International Bureau has effected that communication on the date indicated below:
04 January 2007 (04.01.2007)

CH

In accordance with Rule 47.1(c-bis)(i), those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

3. The following designated Offices, for which the time limit under Article 22(1), as in force from 1 April 2002, **does not apply**, have not requested; as at the time of mailing of the present notice, that the communication of the international application be effected under Rule 93bis.1:

LU, SE, TZ, UG

In accordance with Rule 47.1(c-bis)(ii), those Offices accept the present notice as conclusive evidence that the Contracting State for which that Office acts as a designated Office does not require the furnishing, under Article 22, by the applicant of a copy of the international application.

4. TIME LIMITS for entry into the national phase

For the designated Office(s) listed above, and unless a demand for international preliminary examination has been filed before the expiration of **19 months** from the priority date (see Article 39(1)), the applicable time limit for entering the national phase will, **subject to what is said in the following paragraph**, be **20 MONTHS** from the priority date.

In practice, time limits other than the 20-month time limit will continue to apply, for various periods of time, in respect of certain of the designated Offices listed above. For **regular updates on the applicable time limits** (20 or 21 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pct/en/index.html>.

It is the applicant's sole responsibility to monitor all these time limits.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Simin Baharlou

Facsimile No. +41 22 338 82 70

e-mail: pt09@wipo.int

WHIM-439

PCT REQUEST



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Original (for SUBMISSION)

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0	For receiving Office use only	
0-1	International Application No.	PCT / BR 2006 / 000124
0-2	International Filing Date	27 JUN 2006 27 06 06
0-3	Name of receiving Office and "PCT International Application"	INPI/BRAZIL-PCT INTERNATIONAL APPLICATION
0-4	Form PCT/RO/101 PCT Request	
0-4-1	Prepared Using	PCT-SAFE [EASY mode] Version 3.51.005.180 MT/FOP 20060401/0.20.4rc.2.7
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	National Institute of Industrial Property (Brazil) (RO/BR)
0-7	Applicant's or agent's file reference	WHIM-439
I	Title of Invention	"WATER RECIRCULATION SYSTEM FOR A LAUNDRY MACHINE"
II	Applicant	
II-1	This person is	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	WHIRLPOOL S.A.
II-5	Address	Avenida das Nações Unidas, 12.995 - 32º andar - Brooklin Novo 04578-000 São Paulo - SP Brazil
II-6	State of nationality	BR
II-7	State of residence	BR
II-8	Telephone No.	(55) (11) 5586-6316
II-9	Facsimile No.	(55) (11) 5586-6043

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PCT REQUEST

Original (for SUBMISSION)

III-1	Applicant and/or inventor	
III-1-1	This person is	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	OLIVEIRA, Denilson Fernandes de
III-1-5	Address	Avenida M 19, No. 206 - Jd. Floridiana - Rio Claro - SP 13505-002 BRAZIL Brazil
III-1-6	State of nationality	BR
III-1-7	State of residence	BR
III-2	Applicant and/or inventor	
III-2-1	This person is	applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	BROCH, Oscar
III-2-5	Address	Rua 13 A, No. 1416 - Vila Nova - Rio Claro - SP 13506-557 BRAZIL Brazil
III-2-6	State of nationality	BR
III-2-7	State of residence	BR
III-3	Applicant and/or inventor	
III-3-1	This person is	applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	BORTOLOTTI, Silvio Antônio
III-3-5	Address	Avenida 60 A, No. 423 - Jd. América - Rio Claro - SP 13506-055 BRAZIL Brazil
III-3-6	State of nationality	BR
III-3-7	State of residence	BR

WHIM-439

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PCT REQUEST

Original (for SUBMISSION)

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IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	ARNAUD, Antonio M.P.
IV-1-2	Address	Rua José Bonifácio, 93 - 9th floor 01003-901 São Paulo - SP Brazil
IV-1-3	Telephone No.	(55) (11) 3106-5522
IV-1-4	Facsimile No.	(55) (11) 3106-1377
IV-1-5	e-mail	aarnaud@pinheironunes.com.br
IV-2	Additional agent(s)	additional agent(s) with same address as first named agent
IV-2-1	Name(s)	NUNES, Luiz Antonio Ricco; SCATAMBURLO, Paulo Sérgio
V	DESIGNATIONS	
V-1	The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.	
VI-1	Priority claim of earlier national application	
VI-1-1	Filing date	29 June 2005 (29.06.2005)
VI-1-2	Number	PI0502662-8
VI-1-3	Country	BR
VI-2	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)

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VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	-	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	-	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	
IX	Check list	number of sheets	electronic file(s) attached
IX-1	Request (including declaration sheets)	5	✓
IX-2	Description	14	-
IX-3	Claims	5	-
IX-4	Abstract	1	✓
IX-5	Drawings	6	-
IX-7	TOTAL	31	
	Accompanying Items	paper document(s) attached	electronic file(s) attached
IX-8	Fee calculation sheet	✓	-
IX-17	PCT-SAFE physical media	-	✓
IX-18	other	Form PCT/IB/372 ("NOTICE OF WITHDRAWAL")	
IX-18	other	Letter to the WIPO requesting the change of Applicant's name	
IX-19	Figure of the drawings which should accompany the abstract	2	
IX-20	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative		
X-1-1	Name (LAST, First)	ARNAUD, Antonio M.P.	
X-1-2	Name of signatory		
X-1-3	Capacity		

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PCT REQUEST

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Original (for SUBMISSION)

PCT / B R 2006 / 0 0 0 1 2 4

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FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	27 JUN 2006 2 7 0 6 0 6
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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PCT (ANNEX - FEE CALCULATION SHEET)

Original (for SUBMISSION)

(This sheet is not part of and does not count as a sheet of the international application)

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0	For receiving Office use only	PCT / B R 2006 / 000124		
0-1	International Application No.			
0-2	Date stamp of the receiving Office			
0-4	Form PCT/RO/101 (Annex) PCT Fee Calculation Sheet Prepared Using	PCT-SAFE [EASY mode] Version 3.51.005.180 MT/FOP 20060401/0.20.4rc.2.7		
0-9	Applicant's or agent's file reference	WHIM-439		
2	Applicant	WHIRLPOOL S.A.		
12	Calculation of prescribed fees	fee amount/multiplier	Total amounts (BRR)	Total amounts (EQF)
12-1	Transmittal fee T	⇒	305	
12-2-1	Search fee S	⇒		4714.86
12-2-2	International search to be carried out by	EP		
12-3	International filing fee (first 30 sheets) i1	2614.18 EQF		
12-4	Remaining sheets	1		
12-5	Additional amount (X)	28.01 EQF		
12-6	Total additional amount i2	28.01 EQF		
12-7	i1 + i2 = i	2642.19 EQF		
12-12	EASY Filing reduction R	EQF-186.73		
12-13	Total International filing fee (i-R) I	⇒		2455.46
12-14	Fee for priority document Number of priority documents requested	1		
12-15	Fee per document (X)	95 BRR		
12-16	Total priority document fee: P	⇒	95	
12-17	TOTAL FEES PAYABLE (T+S+I+P)	⇒	400	7170.32
12-19	Mode of payment	cash		

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Original (for SUBMISSION)

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13-2-7	Validation messages Contents	Yellow! The power of attorney or a copy of the general power of attorney will need to be furnished unless all applicants sign the request form.
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PINHEIRO, NUNES, ARNAUD E SCATAMBURLO ADVOGADOS

MAURÍCIO TIBAU ARNAUD (1918-1986)
EMÍLIO SCATAMBURLO (1943-1992)

RUA JOSÉ BONIFÁCIO, 93 - 7º E 8º ANDARES
01003-901 - SÃO PAULO - SP
BRAZIL

WALDEMAR ALVARO PINHEIRO
LUIZ ANTONIO RICCO NUNES
ANTONIO MAURÍCIO PEDRAS ARNAUD
ROBERTO SANTO SCATAMBURLO
CLÁUDIO CALEFFI
PAULO SÉRGIO SCATAMBURLO
GABRIEL PEDRAS ARNAUD
MARTHA ELIZABETH DUDAS DO NASCIMENTO
APARECIDA SCATAMBURLO
ANTHONY HORTA
LUIZ ANTONIO SCATAMBURLO
JOSÉ MOITA HORTA
VERA LÚCIA REQUIA KUNTZ
MARIA CRISTINA SCATAMBURLO
EDWARD MAX WEIL
CHRISTINA MARIA HORTA
JOSELITO SANTOS SANTIAGO
JOSÉ CARLOS DE LIMA JÚNIOR
SIMONE GUERREIRO SCATAMBURLO
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pinheironunes@pinheironunes.com.br
www.pinheironunes.com.br

Copy

OUR REF.: PT-1909/06

YOUR REF.:

June 26, 2006

Messrs.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20
SWITZERLAND

Re: New International Application

Claiming Priority from Brazilian Patent Application No. PI 0502662-8

Applicant: MULTIBRÁS S.A. ELETRODOMÉSTICOS

Title: "WATER RECIRCULATION SYSTEM FOR A LAUNDRY MACHINE"

PCT easy ref.: WHIM-439

Dear Sir/Madam,

Concerning the above-referenced Patent Application, please be informed that the name of the Applicant (Multibrás) was changed from June 1, 2006 to:

WHIRLPOOL S.A.

Avenida das Nações Unidas, 12995
32º andar - Brooklin Novo
04578-000 - São Paulo - SP
Brazil

Therefore, please send us the PCT/IB/306 form confirming the change of name from "Multibrás S.A. Eletrodomésticos." to "WHIRLPOOL S.A".

Please find attached the documents showing the change above-mentioned:

1) Minutes of the general regular and special meetings held on April 28, 2006 (a copy in Portuguese and its translation into English) showing the change of the name of Multibrás S.A. Eletrodoméstico to WHIRLPOOL S.A. (page 5 upper half);

2) Minutes of the general regular and special meetings held on April 28, 2006 (original in Portuguese and its translation into English) showing the appointment of the Chairman and Vice-Chairman of the Managing Board; and reelection and election of the Board of Director's Members of WHIRLPOOL S.A.; and

PINHEIRO, NUNES, ARNAUD E SCATAMBURLO ADVOGADOS

- 2 -

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3) Publication in "Diário Oficial Empresarial" certifying the recordal, at the Board of Trade of the State of São Paulo, of the "Minutes of the general regular and special meetings held on April 28, 2006", (item 1 above).

The Power of Attorney executed by the new patent owner WHIRLPOOL S.A. shall be sent to the International Bureau as soon as possible.

Sincerely,

Ed. Leonard

Antonio M.P. Arnaud

PATENT COOPERATION TREATY

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PCT

NOTICE OF WITHDRAWAL

(PCT Rules 90bis.1, 90bis.2, 90bis.3 and 90bis.4)

To:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20
Switzerland
Facsimile No: +41 22 740 14 35

Applicant's or agent's file reference

WHIM-439

International application No.

PCT/BR2006/000124

International filing date
(day/month/year)

Applicant

WHIRLPOOL S.A.

Priority date

(day/month/year) June 29, 2005

1. The applicant hereby withdraws:

- ☐ the international application identified above (Rule 90bis.1) (where the international application is withdrawn, the international processing of the international application will be discontinued (Rule 90bis.6(b)):
- ☐ the withdrawal is made conditional on its being received by the International Bureau in time to prevent international publication
- ☒ the designations specified below (Rule 90bis.2) (withdrawal of all designated States will be treated as withdrawal of the international application under Rule 90bis.1. In such a case, the check-box "the international application" should preferably be marked instead):
- ☒ the following designation(s):
BRAZIL
- ☐ all designations except:
- ☐ the priority claim(s) specified below (Rule 90bis.3) (if multiple priorities have been claimed, this notice relates to the following priority claim(s)) (withdrawal of the earliest priority claim will result in the re-calculation of time limits which have not already expired (Rule 90bis.3(d))):
- ☐ the withdrawal is made conditional on its being received by the International Bureau in time to prevent international publication
- ☐ the demand (Rule 90bis.4) (where the demand is withdrawn, the processing of the international application by the International Preliminary Examining Authority will be discontinued (Rule 90bis.6(c)))
- ☐ the election(s) specified below (Rule 90bis.4) (where all elections are withdrawn, the processing of the international application by the International Preliminary Examining Authority will be discontinued (Rule 90bis.6(c)). In such a case, the check-box "the demand" should preferably be marked instead):

2. ATTENTION: Under Rule 90bis.6(a), withdrawal of the international application, of any designation, of any priority claim, of the demand or of any election under Rule 90bis will have no effect in any designated or elected Office where the processing or examination of the international application has already started under Article 23(2) or 40(2).

3. Signature of applicant(s), agent or common representative (in order for the withdrawal to be effective, the notice of withdrawal must be signed by (all) the applicant(s), their appointed agent or appointed common representative. Where one of the applicants is considered to be the common representative under Rule 90.2(b), all applicants must sign (see Rule 90bis.5)).

Antonio M.P. Arnaud - Agent

Date: June 26, 2006

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"WATER RECIRCULATION SYSTEM FOR A LAUNDRY MACHINE"

Field of the Invention

The present invention refers to a water recirculation system used for forming the washing liquid in a laundry machine of the type that comprises a basket to be selectively rotated inside a tub and having an agitator or impeller positioned on its bottom and which is rotatively driven around a vertical axis.

Prior Art

10 It is well known in the prior art the laundry machines provided with a superiorly opened tub, usually cylindrical and in which interior is mounted, with a certain radial gap, a perforated basket rotating around a vertical axis, having a bottom wall and a lateral wall and being dimensioned to contain a certain load of clothes and washing liquid consisting of water, soap and other optional additives. In the interior of the basket, immediately above its bottom wall, there is provided an agitator to be rotatively and selectively driven by a motor unit, in two opposite directions around said vertical axis.

In this type of laundry machine, an internal longitudinal region of the lateral wall of the basket is constructed to define an axial duct having a lower inlet radially positioned next to the agitator and which is designed to receive a water flow impelled by said agitator when the latter is driven in the washing and rinsing operational cycles. The axial duct further presents an upper outlet to discharge the ascending water flow back to the interior of the basket. Generally, the upper outlet of the axial duct is positioned in an edge region of the basket, in which is conventionally fitted a finishing and balancing element in the form of a tubular ring.

35 This known water recirculation system allows, during

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the washing and rinsing operational cycles, the rotation of the agitator in two opposite directions to pump water through the ascending axial duct, promoting a water recirculation, in order to allow at least a portion of this water flow to pass through a fluff filter before returning to the basket, as well as to allow at least another portion of the recirculating water flow to be returned to the basket, in the form of a cascade, to increase the washing efficiency of the machine.

Known solutions presenting the basic characteristics mentioned above are described, for example, in patent documents US 5,509,283, US 5,661,989 and US 5,863,423. Although suggesting water recirculation systems that promote the filtration of at least part of the recirculating water flow, as well as the formation of water jets or cascades over the load of clothes contained in the basket, these prior art constructive solutions present some inconveniences.

One problem of the solutions commented above is related to the maintenance of a substantially constant water flow for forming the cascade(s) inside the basket. The higher the incidence of the water cascade falling over the cross section area of the basket, the higher the efficiency of said cascade falling on the load of clothes, with no risk of producing splashes to the outside of the basket and the tub. Since the system is dimensioned to provide a more intense and efficient cascade, with no risks of occurring splashes and with the filter in a clean condition, as the filter is loaded with fluff, the water flow that forms the cascade tends to be altered to a more intense condition, in the cases in which it is parallel to the filtrating flow, or to a less intense condition, in the cases in which it is previously submitted to

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filtration. In both cases, there occurs a loss of the design pattern established for the cascade.

Another deficient aspect of the known solutions results from the construction of the cascade forming means, which tend to be multiplied to maximize the incidence of the water cascade over the load of clothes in the basket. Generally, these solutions need more complex constructions, requiring a relatively large quantity of component parts, making difficult the production, maintenance and cleaning, and increasing the cost of the product. The known solutions do not allow obtaining a single cascade with an optimal degree of incidence over the load of clothes placed inside the basket.

15 Summary of the Invention

On account of the deficiencies of the solutions known so far, it is an object of the present invention to provide a water recirculation system for a laundry machine, which allows filtrating part of the recirculating water flow and forming a respective water cascade over the load of clothes contained in the basket of the machine, from a substantially constant part of said water flow, irrespective of the load loss produced by the operational condition of the filter in the respective part of the recirculating water flow.

It is a further object of the present invention to provide a water recirculation system as mentioned above, which produces a substantially constant water cascade configured to maximize its area of incidence over the load of clothes contained in the basket and to minimize the risks of occurring splashes to the outside of both the basket and the tub.

It is an additional object of the invention to provide a water recirculation system as mentioned above,

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presenting a simple construction, with reduced number of low cost components, which the user can easily remove and clean.

In order to comply with the objectives mentioned above, the present invention provides a water recirculation system for a laundry machine of the type that comprises: a tub; a basket having a bottom wall and a lateral wall and which is mounted inside the tub, so that it can be rotated around a vertical axis; 10 an agitator disposed in the interior of the basket to be rotatively driven around said vertical axis; at least one axial duct disposed in the vertical wall of the basket and having a lower opening turned to the agitator and an upper opening; and a driving assembly 15 to rotate the agitator, in such a way as to produce an ascending recirculating water flow through the axial duct.

According to the invention, the present system comprises: a distributing nozzle removably mounted in 20 the upper opening of a respective axial duct, in order to receive the recirculating water flow therefrom, and comprising a first water outlet; a second water outlet disposed under the first one and to which is affixed a filter, said first and second water outlets being 25 radially turned to the interior of the basket; and a third water outlet disposed under the second water outlet according to a descending direction, turned to the interior of the basket, said distributing nozzle being configured to conduct, to the first water 30 outlet, a substantially constant part of the recirculating water flow received from the axial duct and, to the third outlet water, the remaining part of the recirculating water flow that is not returning to the basket through the second water outlet.

35 The basic construction defined above allows the

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distributing nozzle, which can be easily mounted to the upper region of the machine basket, next to the upper opening of the axial duct, to define a first water outlet configured to provide a cascade that is maintained substantially constant in the washing and rinsing cycles of the machine, irrespective of the load loss produced by the operational condition of the fluff filter which is mounted in a second water outlet disposed under the first. The provision of the third water outlet, which operates as a relief outlet, allows the water flow, which is progressively reduced through the second outlet opening due to the accumulation of fluff in the filter, to be discharged from the distributing nozzle through the third water outlet, minimizing alterations in the formation of the cascade from the first water outlet.

Brief Description of the Drawings

The invention will be described below, with reference to the attached drawings, given by way of example of an embodiment of the invention and in which:

Figure 1 is a simplified vertical sectional view of a laundry machine provided with the water recirculation system object of the present invention;

Figure 2 is an enlarged detail of part of the assembly illustrated in figure 1, to better visualize the positioning of the distributing nozzle in relation to the axial duct that conducts the recirculating water flow;

Figure 3 is a simplified upper view of the assembly illustrated in figure 1, showing the substantially trapezoidal contour of the water cascade;

Figure 4 is an exploded perspective view of the central region of the machine, illustrating the upper region of the basket in which the distributing nozzle is mounted;



Figure 5 is a perspective view of the assembly of components of figure 4, already in the mounted condition;

Figure 6 is a perspective view of the assembly of figure 5, when observed from the seating side in the upper region of the basket;

Figure 7 is an exploded radial sectional view of the upper region of the basket and distributing nozzle; and

10 Figure 8 is a radial sectional view of the assembly of figure 7, with the distributing nozzle in the mounted condition.

Detailed Description of the Invention

As illustrated in the attached drawings and already mentioned above, the present invention relates to the laundry machines of the type provided with a body 10 that usually defines a casing to be seated directly onto a supporting surface and which supports and lodges therewithin, a tub 20 to contain a load of water or washing liquid, comprising water and other optional additives, said tub 20 being generally suspended by elastic means (not illustrated) in the body 10 of the machine. In the interior of the tub 20 is positioned a usually cylindrical and perforated basket (30) presenting a bottom wall 31, which is circular and centrally opened, and a preferably cylindrical lateral wall 32 which terminates in an upper free edge 33. The basket 30 is mounted inside the usually cylindrical tub 20, in order to be rotated around a vertical axis X during determined operational steps of the machine, generally defined by cycles such as spinning or simply expelling the liquid from the clothes.

The basket 30 generally carries, mounted onto its upper edge 33, a balancing tubular ring 35 to avoid

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vibration of the basket 30 during the washing, rinsing and spinning operations carried out by the laundry machine.

In the interior of the basket 30, more specifically on its bottom wall 31, there is provided an agitator 40 in the form of a rotary impeller, with a generally circular contour and being inferiorly provided with a plurality of radial fins 41 which, upon rotation of the agitator 40 in one or in the other direction around said vertical axis X, produce a water flow that is axially upwardly pushed from the bottom of the tub 20 and radially impelled to the outside of the agitator 40 between the latter and the bottom wall 31 of the basket 30, said agitator working as a centrifugal water pump.

The present water recirculation system further comprises, conventionally, at least one axial duct 60 disposed in the vertical lateral wall 32 of the basket 30 and having a lower opening 61 turned to the agitator 40 and an upper opening 62 disposed next to the upper edge 33 of the basket 30. In the illustrated construction, the axial duct 60 is defined between the bottom wall 31 and lateral wall 32 of the basket 30 and an elongated chute 90, with an L-shaped lateral profile and U-shaped cross section, with the free edges of its lateral legs being seated and affixed against the bottom and lateral walls 31, 32 of the basket 30. The L-shaped lateral profile of the elongated chute 90 allows a lower extension of the axial duct 60 to be disposed in a horizontal and radial way, positioning the lower opening 61 of the axial duct 60 next to the agitator 40, so that the radial water flow impelled by the latter can be admitted in the interior of the axial duct 60 through its lower opening 61. The remaining extension of

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the axial duct 60 is defined close to respective longitudinal extension of the lateral wall 32 of the basket 30, as illustrated in the figures of the attached drawings. It should be understood herein that the fixation of the elongated chute 90 to the basket 30 can be carried out by any adequate manner well known in the art, this aspect not being considered as a differentiating characteristic of the invention. With the construction defined herein for the axial duct 60, when the machine is working in the washing and rinsing cycles, in which the agitator 40 is rotatively driven in two opposite directions around the vertical axis X, an ascending recirculating water flow is formed through the axial duct 60, from its lower opening 61 to its upper opening 62, as indicated by the arrows illustrated in figures 1 and 2. The activation of the agitator 40 is performed by a driving assembly 50, schematically illustrated in the attached drawings by the graphic representation of the vertical shaft 51, to whose upper end is mounted the agitator 40. As already mentioned, the driving assembly 50 allows the agitator 40 to be selectively driven in the different operational cycles of the machine.

According to the present invention, the water recirculation system comprises a distributing nozzle 70, generally constructed in a single piece injected in plastic material, to be removably mounted to the upper opening 62 of a respective axial duct 60, in order to receive the recirculating water flow therefrom. The distributing nozzle 70 comprises a first water outlet 71, a second water outlet 72 disposed under the first and to which is affixed a filter 80, generally a filter defined by a mesh net pocket with the free edge hermetically affixed to said

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second water outlet, in such a way as to project to the interior of the basket 30, said first and second water outlets 71, 72 being radially turned to the interior of the basket 30, as better shown in figures 1 and 2.

The distributing nozzle 70 further presents a third water outlet 73 disposed under the second water outlet 72 and according to a descending direction, substantially orthogonal to the direction of the second water outlet 72 and turned to the interior of the basket 30. The distributing nozzle 70 is configured to conduct, to the first water outlet 71, a substantially constant part of the recirculating water flow received from the axial duct 60 and also to conduct, to the third water outlet 73, which takes the form of a relief outlet, the remaining part of the recirculating water flow that is not returning to the basket 30 through the second water outlet 72.

In the illustrated construction, the distributing nozzle 70 comprises a generally rectangular frame, preferably in a single piece injected in plastic material and defined by lower and upper opposite lateral wall portions 70a, 70b, a lower wall 70c, an upper wall 70d and an intermediate wall 70e. The intermediate wall 70e defines, with the lower wall 70c and with respective lower lateral wall portions 70a, the second water outlet 72, to which is affixed the filter 80 projecting outwardly toward the interior of the basket 30, said intermediate wall 70e defining, with the upper wall 70d and with respective upper lateral wall portions 70b, the first water outlet 71.

The construction of the distributing nozzle 70 is made so that the first water outlet 71 presents a certain axial expansion, with a rectangular cross section having the larger dimension lying horizontally and

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increasing toward the basket 30 and having the upper larger side defined by the upper wall 70d of the frame of the distributing nozzle 70, curved outwardly and diverging in relation to the lower larger side that is defined by said intermediate wall 70e of the frame of the distributing nozzle 70, said cross section being substantially rectangular, increasing in the radial direction of the water flow, and dimensioned to produce a water cascade with maximized area of incidence over a load of clothes contained in the basket 30.

With this construction, the width of the lower and upper lateral wall portions 70a, 70b and upper and lower walls 70d, 70c defines the axial extension of the first and second water outlets 71, 72.

The third water outlet 73 is preferably defined by an opening 73a provided in the lower wall 70c of the distributing nozzle 70, which opening 73a can be defined by a simple cutout produced in the rear edge of said lower wall 70c. In the illustrated construction, there is provided a deflecting wall portion 65, radially projecting inwardly, from the upper region of the basket 30, said deflecting wall 65 being positioned under the third water outlet 73, so as to receive the water flow passing through the latter, directing said water flow to the interior of the basket 30.

With the construction proposed herein, the recirculating water flow, which is upwardly discharged through the upper opening 62 of the axial duct 60, is supplied to the distributing nozzle 70, so that part of this recirculating water flow is directed to the first water outlet 71, while the remaining part of this flow is directed to the second water outlet 72 of the distributing nozzle 70, to pass through the filter

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80 before returning to the interior of the basket 30. However, that part of the recirculating water flow reaching the distributing nozzle 70 and which is not discharged by both the first water outlet 71 and the
5 second water outlet 72, is relieved through the third water outlet 73 and returned to the interior of the basket 30.

As a function of the construction imparted to the distributing nozzle 70, and particularly to the first
10 water outlet 71, the water cascade discharged through the latter presents, when viewed from above, a substantially trapezoidal contour, with the smaller base coinciding with the first water outlet 71, with the sides coinciding with projections of the smaller
15 sides of the cross section of the first water outlet 71 and defined by the upper lateral wall portions 70e of the frame of the distributing nozzle 70 and having the larger base in the form of an arc of a circle accompanying the curvature of the region of the
20 cylindrical lateral wall of the basket 30 opposite to that on which the axial duct 60 is positioned.

In this arrangement, the water cascade falls over the cross section region of the basket 30 delimited by said substantially trapezoidal contour of the water
25 cascade when viewed from above.

Besides assuring a specific shape for the water cascade, which maximizes its incidence over the load of clothes contained in the basket 30, the distributing nozzle presents an intermediate wall 70e
30 that is rearly cut to define therein a water flow passage restricted to the first water outlet 71, restricting the water flow directed to the first water outlet 71, so as to produce a water cascade CA (see figures 1 and 3) that maximizes its incidence over the
35 load of clothes contained in the basket 30, with no

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risk of occurring undesirable splashes of water to the outside of both the basket 30 and the tub 20. Preferably, the distributing nozzle 70 is designed so that the first water outlet 71 receives from about 15% to 30% of the recirculating water flow passing through the axial duct 60.

The provision of the third water outlet 73 in the distributing nozzle 70, downwardly directed, from the lower wall 70c of the frame of the distributing nozzle 70, allows maintaining the water flow directed to the first water outlet 71 substantially constant, even with the variation of the water flow that passes through the filter 80. As the filter 80 is loaded with fluff received from the clothes, the water flow through the second water outlet 72 is progressively reduced, whereby, in the absence of the third water outlet 73, it is possible to occur an undesirable increase of the water flow passing through the first water outlet 71, increasing the intensity of the water cascade CA and making the latter exceed the incidence limitations designed to maximize its action over the load of clothes with no risk of occurring splashes to the outside of the basket 30 and the tub 20. With the progressive clogging of the filter, the third water outlet 73 allows the recirculating water flow portion passing therethrough, towards the interior of the basket 30, to be progressively increased, absorbing the amount of water that would be otherwise directed to the first water outlet 71, undesirably increasing the intensity of the water cascade CA.

In the illustrated construction, the distributing nozzle 70 has its lower wall 70c disposed next to the upper opening 62 of the axial duct 60, and the balancing tubular ring 35 of the basket 30 defines an

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upper extension 64 of the axial duct 60, against which the distributing nozzle 70 is seated. The upper wall 70d of the distributing nozzle 70 presents a radially external edge which is seated, in an overlapping relationship onto an upper peripheral step 35a of the tubular ring 35, defining a tight connection to prevent the ascending recirculating water flow from flowing over the tubular ring 35, splashing to the outside of the basket 30 and the tub

5 20.

As illustrated in figures 4-8, the axial duct 60 can be defined jointly with an axial recess 68 provided in the lateral wall 32 of the basket 30, said axial recess 68 being covered by the chute 90 schematically illustrated in figure 1 and also by a cover 101 inferiorly incorporated to a nozzle support 100 which is affixed and retained in a respective cutout 36 provided in the tubular ring 35 and having a rear wall 36a inclined radially outwardly and to the inside of the basket 30, defining the upper extension 64 of the axial duct 60.

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The nozzle support 100 incorporates the deflecting wall 65 and defines an opened median housing 102 with lateral walls 103 configured to allow the relatively tight fitting of the lower lateral wall portions 70a of the distributing nozzle 70, which are provided by a locking means 77, generally in the form of a small rib, to be fitted into a respective groove 104 provided in each lateral wall 103 of the nozzle support 100 in order to maintain the distributing nozzle 70 retained in its operational position.

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While only one embodiment for the present system has been illustrated herein, it should be understood that alterations can be made in the form and physical arrangement of the constitutive elements of the

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X

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CLAIMS

1. A water recirculation system for a laundry machine of the type comprising: a tub (20); a basket (30) having a bottom wall (31) and a lateral wall (32) and mounted inside the tub (20), so that it can be rotated around a vertical axis (X); an agitator (40) provided inside the basket (30), in order to be rotatively driven around said vertical axis (X); at least one axial duct (60) disposed in the vertical wall (32) of the basket (30) and having a lower opening (61) turned to the agitator (40) and an upper opening (62) and a driving assembly (50) to rotate the agitator (40), in order to produce an ascending recirculating water flow through the axial duct (60), characterized in that it comprises: a distributing nozzle (70) removably mounted to the upper opening (62) of a respective axial duct (60), to receive the recirculating water flow therefrom, and comprising a first water outlet (71); a second water outlet (72) provided under the first and to which is affixed a filter (80), said first and second water outlets (71,72) being radially turned to the interior of the basket (30); and a third water outlet (73) provided under the second water outlet (72), according to a descending direction substantially orthogonal to the direction of the second water outlet (72) and turned to the interior of the basket (30), said distributing nozzle (70) being configured to conduct, to the first water outlet (71), a substantially constant portion of the recirculating water flow received from the axial duct (60) and, to the third water outlet (73), the remaining part of the recirculating water flow that is not returning to the basket (30) through the second water outlet (72).

2. The system, as set forth in claim 1, characterized in that the first water outlet (71) has a certain

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axial extension presenting a rectangular cross section with the larger dimension disposed horizontally and increasing towards the basket (30) and having the upper larger side outwardly arched and diverging in relation to the lower larger side, said cross section, increasing in the radial direction of the water flow, being dimensioned to produce a water cascade with maximized area of incidence over a load of clothes contained in the basket (30).

3. The system, as set forth in claim 2, characterized in that the water cascade discharged through the first water outlet (71) presents, when viewed from above, a substantially trapezoidal contour with the smaller base coinciding with the first water outlet (71), with the sides coinciding with projections of the smaller sides of the cross section of the first water outlet (71) and with the larger base, in the form of an arc of a circle accompanying the curvature of the region of the cylindrical lateral wall of the basket (30) opposite to that on which the axial duct (60) is positioned.

4. The system, as set forth in claim 3, characterized in that the water cascade falls over the cross section region of the basket (30) delimited by said substantially trapezoidal contour of the water cascade when viewed from above.

5. The system, as set forth in claim 2, characterized in that the first water outlet (71) receives from about 15% to 30% of the recirculating water flow passing through the axial duct (60).

6. The system, as set forth in claim 2, characterized in that the distributing nozzle (70) comprises a generally rectangular frame defined by lower and upper opposite lateral wall portions (70a, 70b), a lower wall (70c), an upper wall (70d) and an intermediate wall

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(70e), said intermediate wall (70e) defining, with the lower wall (70c) and with respective lower lateral wall portions (70a), the second water outlet (72), to which is affixed the filter (80) and, with the upper wall (70d) and with respective upper lateral wall portions (70b), the first water outlet (71).

7. The system, as set forth in claim 6, characterized in that the width of the lower and upper lateral wall portions (70a,70b) and upper and lower walls (70c,70d) defines the axial extension of the first and second water outlets (71,72).

8. The system, as set forth in claim 6, characterized in that the third water outlet (73) is defined by an opening (73a) provided in the lower wall (70c) of the distributing nozzle (70).

9. The system, as set forth in claim 8, characterized in that it comprises a deflecting wall portion (65) radially projecting from the axial duct (60) and positioned under the third water outlet (73), to receive the water flow passing there through.

10. The system, as set forth in claim 6, characterized in that the intermediate wall (70e) is rearly cut to define therein a water flow passage restricted to the first water outlet (71).

11. The system, as set forth in claim 6, characterized in that the axial duct (60) is defined between the bottom and lateral walls (31,32) of the basket (30) and an elongated chute (90), with an L-shaped lateral profile and U-shaped cross section, with the free edges of its lateral legs seating against the bottom and lateral walls (31,32) of the basket (30), said distributing nozzle (70) having its lower wall (70c) seated against the elongated chute (90), next to the upper opening (62) of the axial duct (60).

12. The system, as set forth in claim 11,

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characterized in that the basket (30) has an upper edge (33) carrying a balancing tubular ring (35), which defines an upper extension (64) of the axial duct (60) against which the distributing nozzle it
5 seated and retained.

13. The system, as set forth in claim 12, characterized in that the upper wall (70d) of the distributing nozzle (70) presents a radially external edge seated in an overlapping relationship onto an
10 upper peripheral step (35a) of the tubular ring (35).

14. The system, as set forth in claim 12, characterized in that the axial duct (60) is defined jointly with an axial recess (68) provided in the lateral wall (32) of the basket (30), said axial
15 recess (68) being covered by the chute (90).

15. The system, as set forth in claim 14, characterized in that it comprises a nozzle support (100) to be affixed in a cutout (36) provided in the tubular ring (35) and having a rear wall (36a)
20 radially inclined outwardly and to the inside of the basket (30) and which defines the upper extension (64) of the axial duct (60).

16. The system, as set forth in claim 15, characterized in that the nozzle support (100)
25 inferiorly incorporates a cover (101) that covers an upper extension of the axial recess (68).

17. The system, as set forth in claim 16, characterized in that the nozzle support (100) incorporates a deflecting wall (65) radially
30 projecting from the axial duct (60) and which is positioned under the third water outlet (73), to receive the water flow passing there through, said nozzle support (100) defining an opened median housing (102) with lateral walls (103) configured to allow the
35 relatively tight fitting of the lower lateral wall

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portions (70a) of the distributing nozzle (70), which are provided with a locking means (77), generally in the form of a small rib, to be fitted in a respective groove (104) provided in each lateral wall (103) of the nozzle support (100), in order to maintain the distributing nozzle (70) retained in its operational position.

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ABSTRACT

A water recirculation system for a laundry machine that comprises: a tub (20); a basket (30) rotating around a vertical axis (X); an agitator (40) rotatively driven around said vertical axis (X), in order to produce an ascending recirculating water flow through an axial duct (60) disposed in a vertical wall (32) of the basket (30). The system comprises: a distributing nozzle (70) mounted in the upper opening (62) to receive the recirculating water flow therefrom, and comprising a first water outlet (71) and a second water outlet (72), securing a filter (80), said distributing nozzle (70) being configured to conduct, to the first water outlet (71), a substantially constant part of the recirculating water flow received from the axial duct (60) and, to the third water outlet (73), the remaining part of the recirculating water flow that is not returning to the basket (30) through the second water outlet (72).

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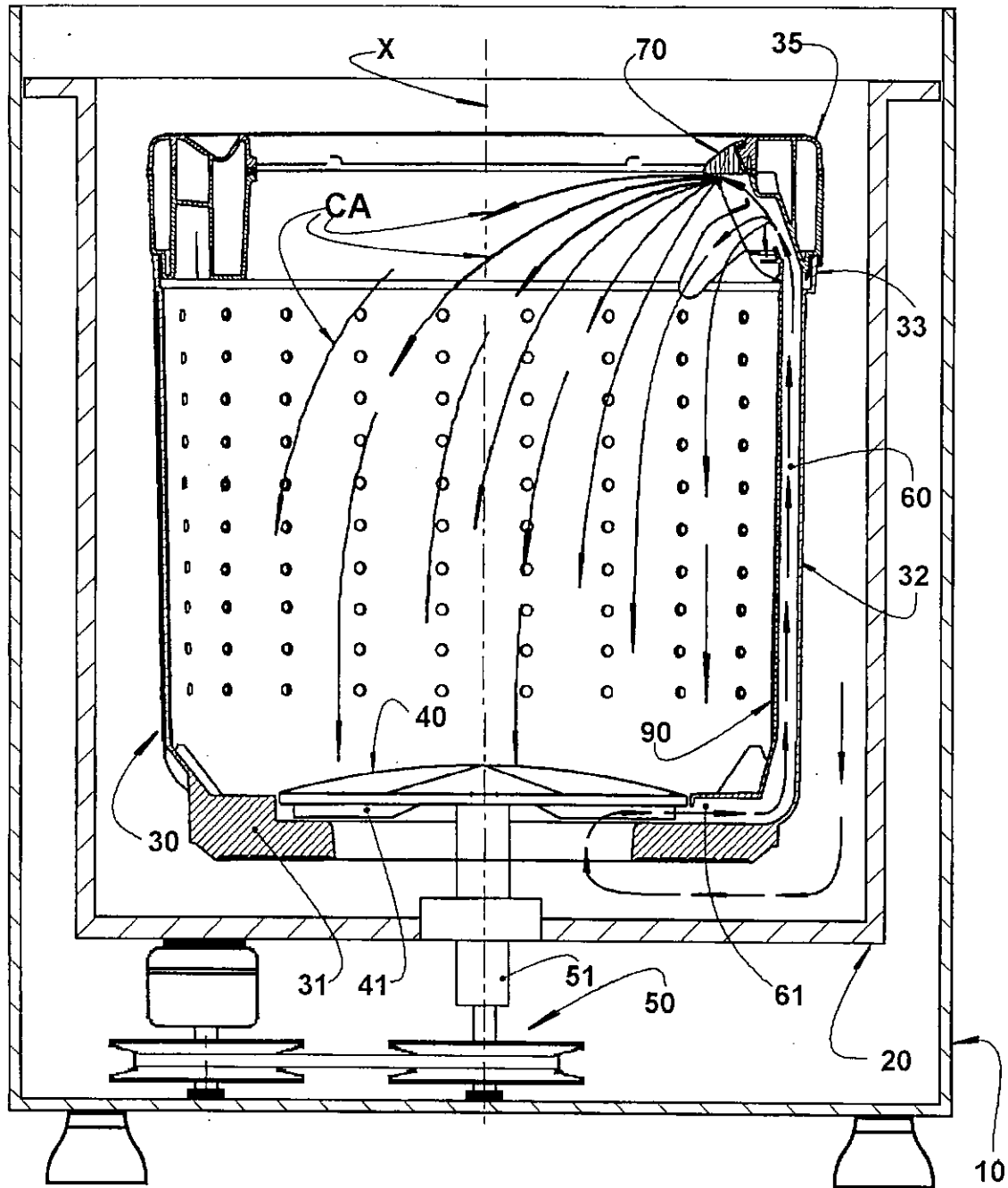


FIG. 1

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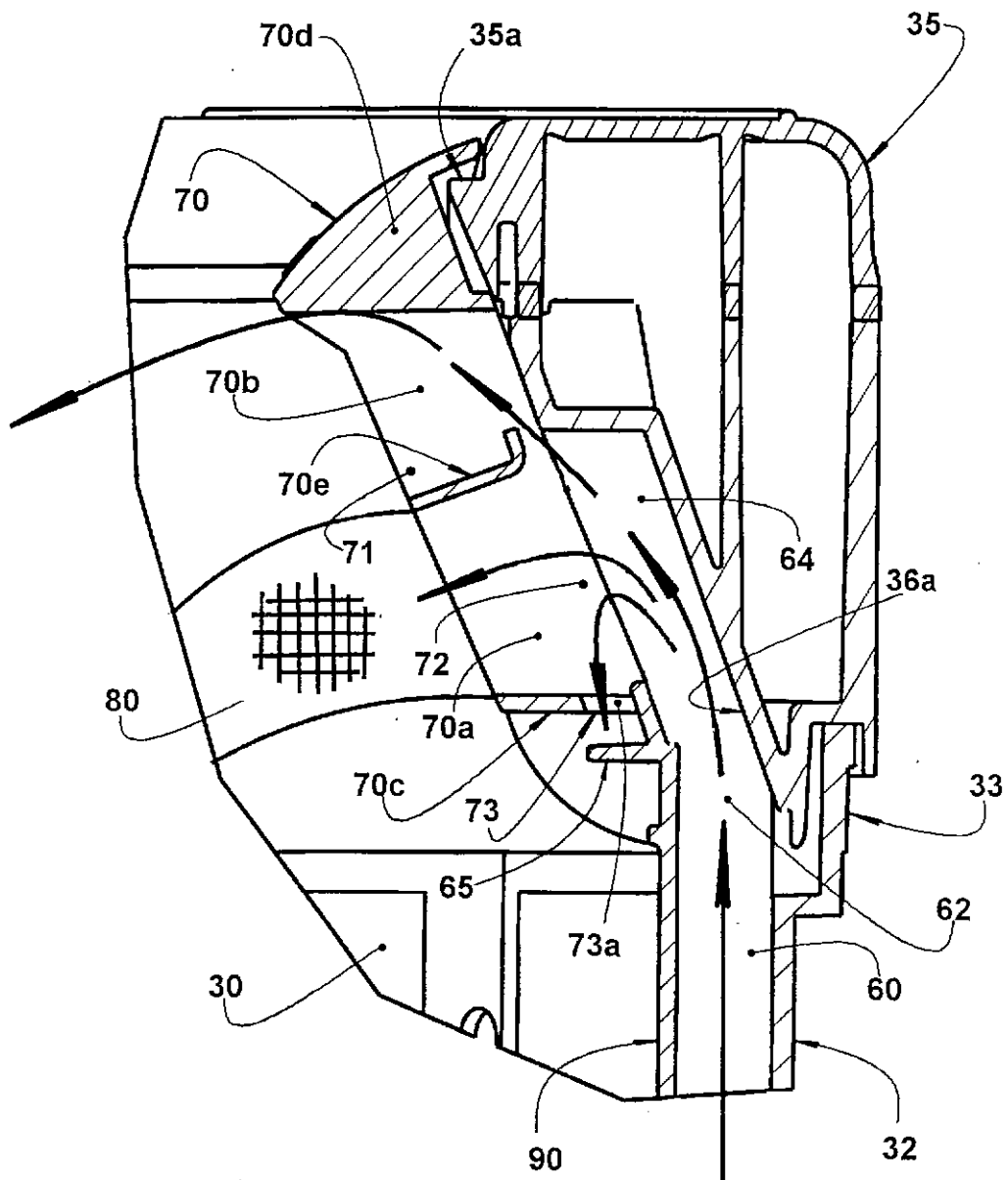


FIG. 2

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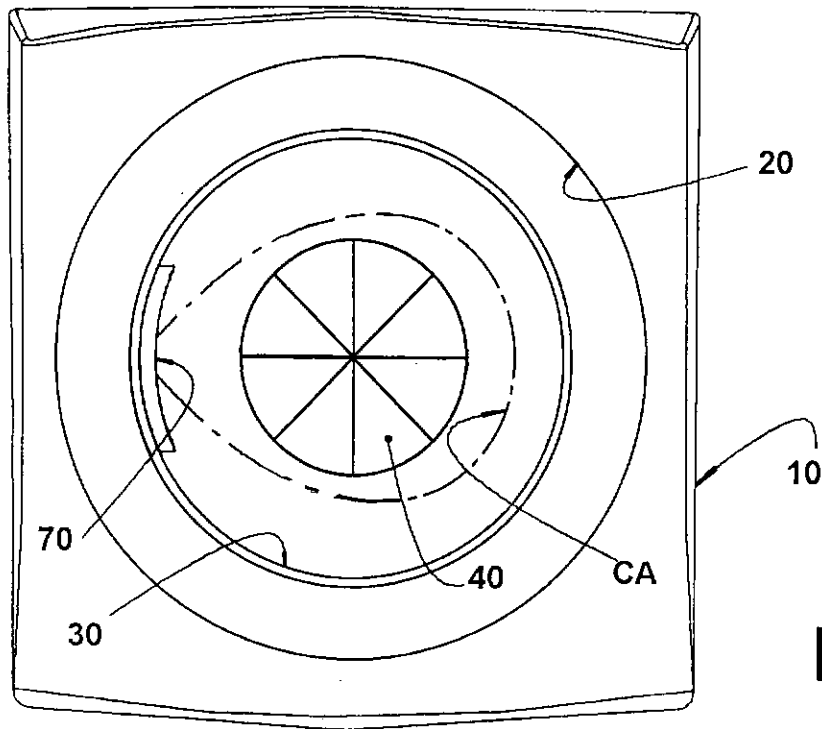


FIG. 3

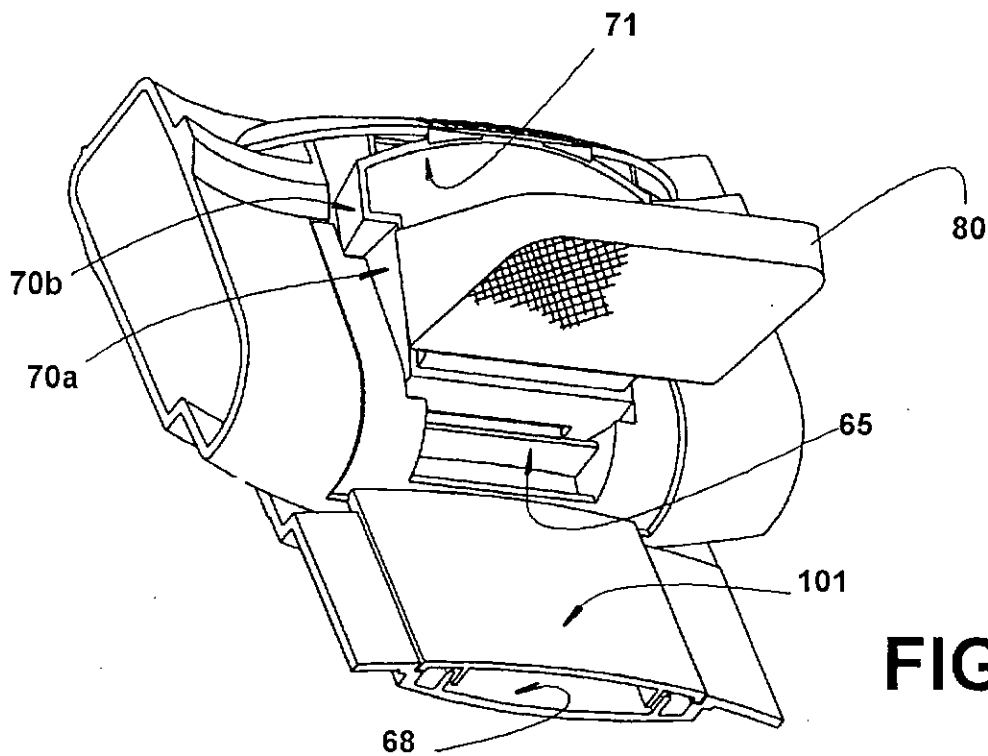
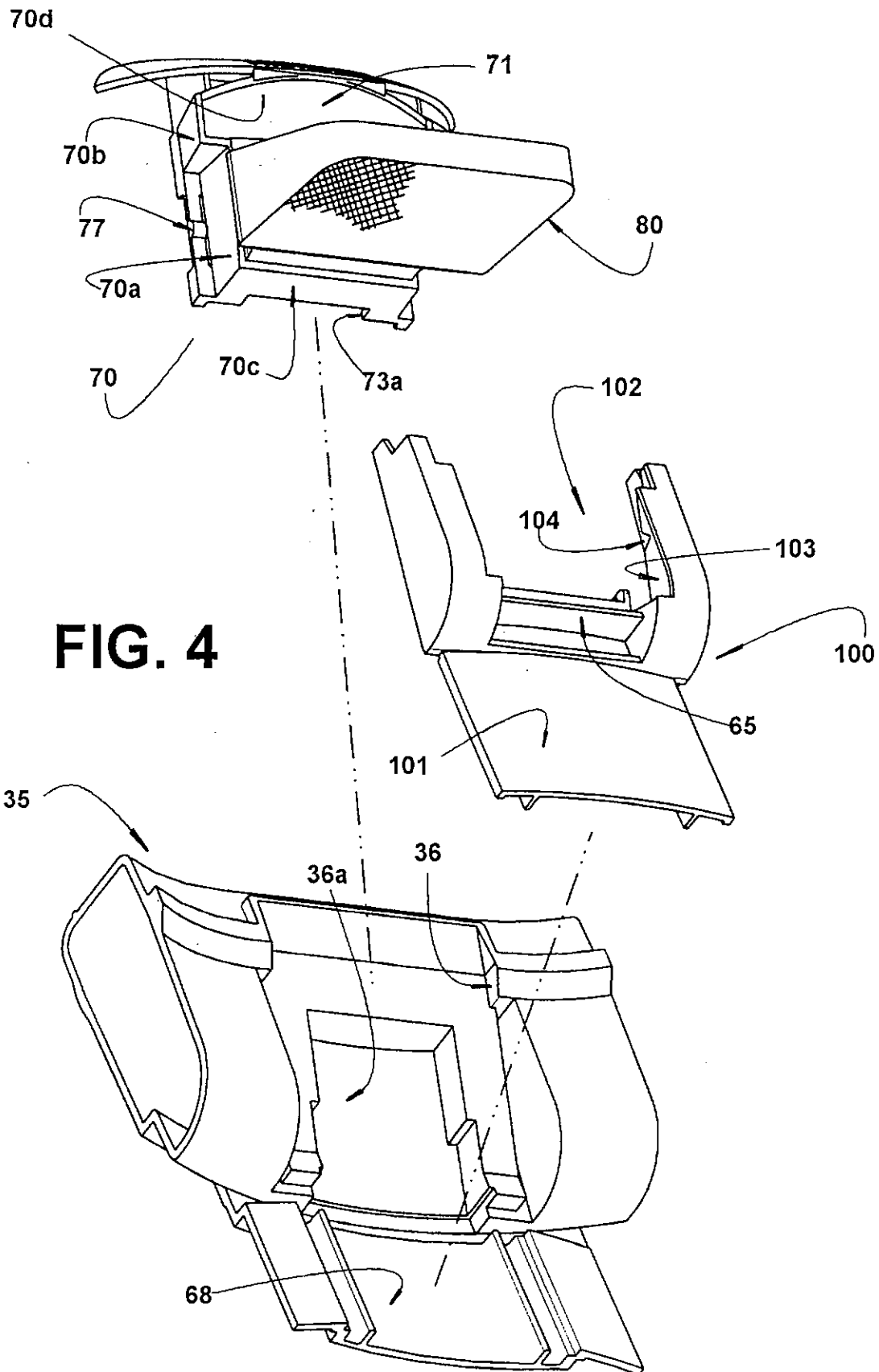
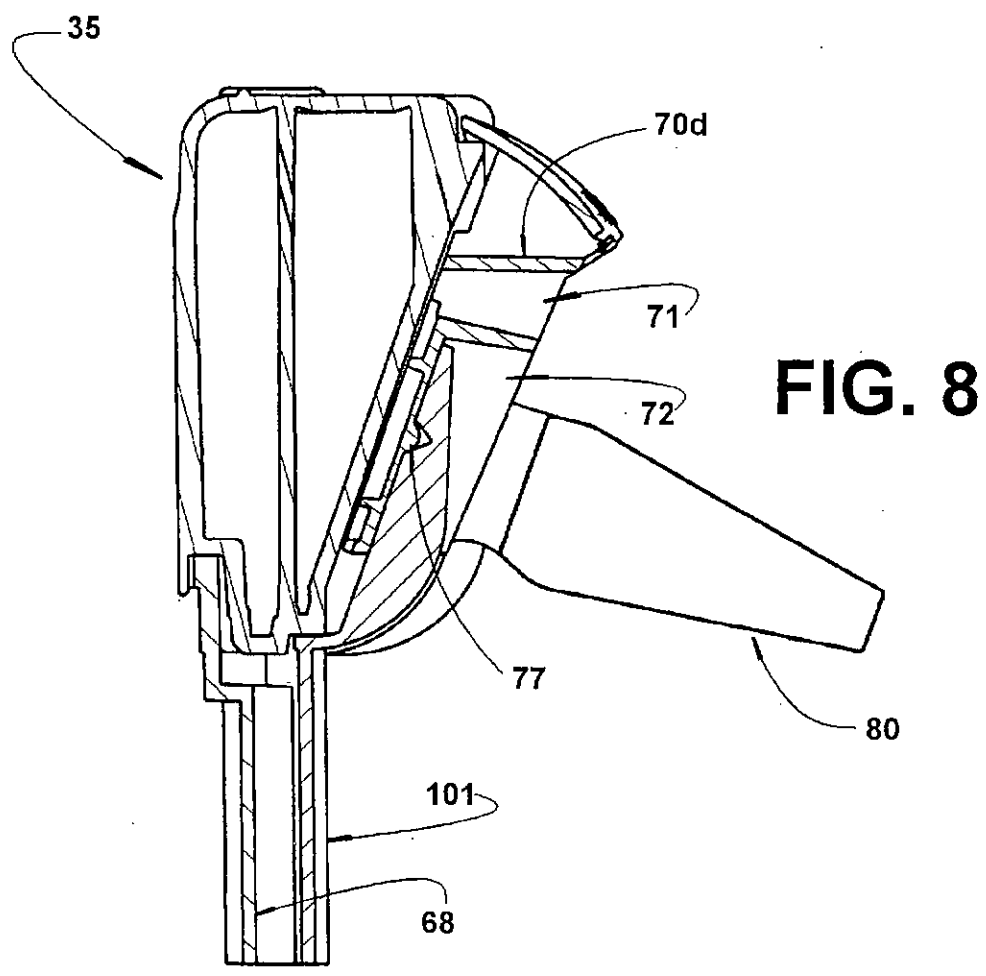
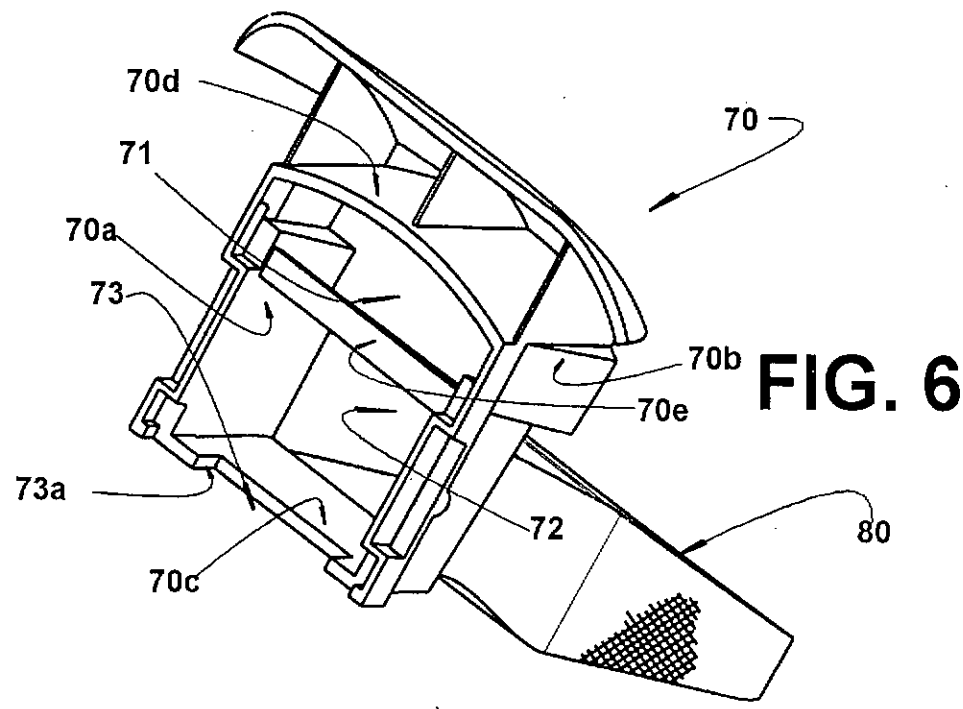


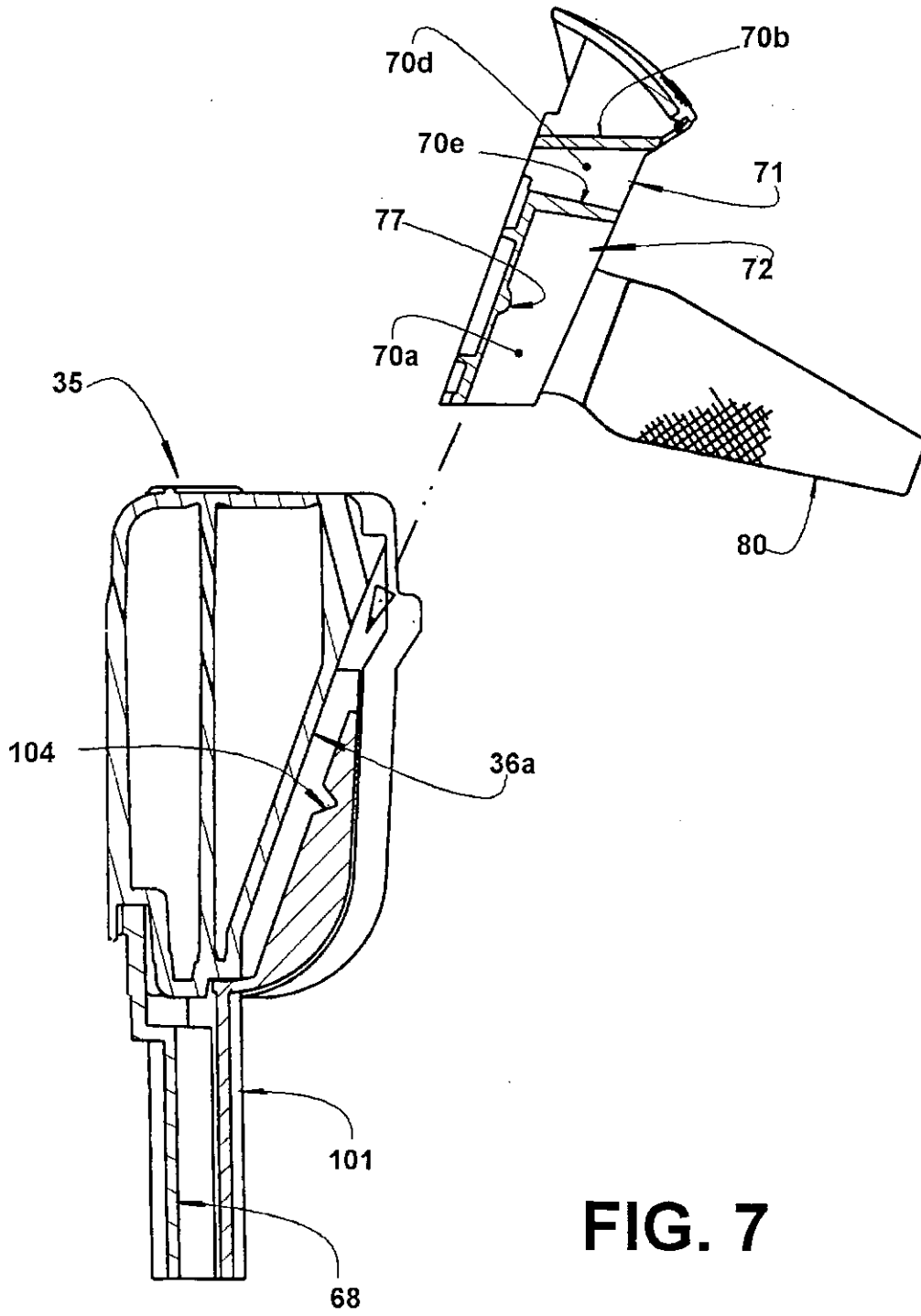
FIG. 5

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Brigard & Castro
BOGOTÁ - COLOMBIA

PODER

POWER OF ATTORNEY

Yo (nosotros) Whirlpool S.A.

domiciliado(s) en Avenida das Nações Unidas, 12995 - 32º andar, Brooklin Novo, São Paulo, Brasil

I (We) Whirlpool S.A.

domiciled in Avenida das Nações Unidas, 12995 - 32º andar, Brooklin Novo, São Paulo, Brasil

Nombro(amos) a: JUAN PABLO CADENA SARMIENTO y/o CARLOS H. PALACIO EASTMAN y/o MARTIN E. TORRES CARDOZO, de Bogotá, Colombia, apoderados verdaderos y legales con poder especial, amplio y suficiente, para recabar de las oficinas y autoridades colombianas administrativas, judiciales y de policía, en cualquier instancia o recurso, la obtención de patentes de invención, registros de marcas, diseños industriales, modelos de utilidad, depósitos de nombres comerciales, lemas comerciales y enseñanzas, registros de derechos de autor y contratos sobre los mismos, obtención de certificados de obtentor de variedades vegetales, así como sus prórrogas, renovaciones, anotaciones de traspaso, cambios de nombre, domicilio y/o dirección; elaborar, tramitar y registrar contratos de licencia y licencias de cualesquiera clases; intervenir como demandante o como demandado en cualquier instancia y recurso ante cualquier juez, corporación, funcionario público o autoridad en acciones judiciales, administrativas y de policía tales como: oposiciones al registro de marcas; acciones de caducidad, cancelación y nulidad; acciones reivindicatorias, acciones derivadas de la obtención o explotación de licencias; acciones de competencia desleal; demandas penales; acciones de indemnización de perjuicios, reclamos y observaciones a solicitudes de patentes, diseños industriales, modelos de utilidad, en el ejercicio de medidas cautelares y en otras acciones o medidas similares.

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Este poder comprende la facultad de ratificar o confirmar en mi (nuestro) nombre lo actuado así como la facultad de desistir, transigir, comprometer, y la de sustituirlo en todo o en parte y revocar sustituciones. Asimismo nombro(amos) a: JUAN PABLO CADENA SARMIENTO y/o CARLOS H. PALACIO EASTMAN y/o MARTIN E. TORRES CARDOZO, domiciliado(s) en la Carrera 7 No. 71-21, Torre B, Piso 4, mis (nuestros) apoderados en Colombia, con facultades para recibir notificaciones y designar apoderados judiciales o extrajudiciales.

Otorgado y firmado en

hoy de 200_

Firma

Nombre
Cargo

Granted and signed in 17 SET. 2007

this day of 200_

Signature

Name

Title

EMERSON M. DO VALLE
Diretor

José Aurelio Drummond
Presidente

13º Tabelião de Notas
da Capital - SP

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27 NOV. 2007
NORBY FERNANDO MORA S.
Bogotá, D.C. Colombia

AS: 105075

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3.º TABELIÃO DE NOTAS DE SÃO PAULO - SP - Bel AVELINO LUIS MARQUES
RUA PRINCESA ISABEL, 333 - BROOKLIN PAULISTA - CEP 04501-001 - TEL/FAX: (11) 5041-7622
RECIBIDO POR EMERSON M. DO VALLE, 17/09/2007, J. AURELIO DRUMMOND, PRESIDENTE
JUAN PABLO CADENA SARMIENTO, CARLOS H. PALACIO EASTMAN, MARTIN E. TORRES CARDOZO
SÃO PAULO, 17 de setembro de 2007
ROBERTO VALENTE, AVELINO LUIS MARQUES
VALIDO SOBRE CERTA OBRIGACIONES DE VALOR R\$ 5.200,00
1098AA15047

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CERTIFICADO NOTARIAL (SOCIEDAD)

NOTARIAL CERTIFICATE (CORPORATION)

Hoy de de
personalmente compareció ante mí

On this day of of
personally appeared before me

a quien conozco, y de quien me consta que firmó el anterior documento, debidamente juramentado declaró y dijo que él (ella) es

to me known, and known to me to be the person who signed the foregoing instrument who being by me duly sworn did depose and say that he (she) is the

de Whirlpool S.A.

of Whirlpool S.A.

Sociedad legalmente constituida para un período de duración que aún no ha terminado; que el declarante está autorizado por dicha compañía para conferir este poder; que el sello estampado por él al pie de tal poder, en nombre y representación de la expresada compañía, es el sello oficial de ella; y que el objeto para el cual se confiere este instrumento está comprendido dentro del objeto social de la sociedad.

Which is legally constituted for a term not yet expired, that deponent is authorized by said Company to confer this Power of Attorney: that the seal affixed hereunto by the deponent in the name and on behalf of said Corporation is the corporate seal thereof; and that the purpose for which this instrument is granted is included within the corporate purpose of company.

El suscrito Notario hace constar que tuvo a la vista las pruebas de la existencia de la sociedad.

The undersigned Notary Public attests that he has seen the documents that prove the existence of the company.

Estado de
con fecha

State of
under date of

y que quien confiere el presente poder es su representante.

and that he (she) who grants the present power of attorney is its Representative.

Notario Público (sello)

Public Notary (Seal)

**CERTIFICADO NOTARIAL
PERSONA NATURAL**

**NOTARIAL CERTIFICATE
NATURAL PERSON**

Hoy de de , compareció(eron) ante mí

On this day of of
personally appeared before me

a quien (es) conozco y me consta que es(son) la(s) persona(s) firmante(s) del documento que precede y quien(es) declara(n) que otorgan el mismo para los fines y propósitos que en él se expresan.

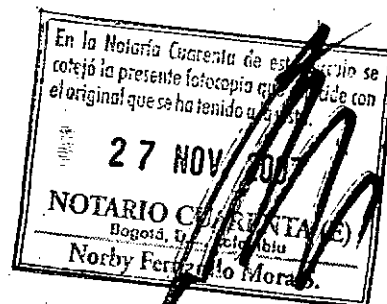
who is(are) known to me and who I attest executed the foregoing document and he (they) declared he (they) grant(s) the document for the uses and purposes therein expressed.

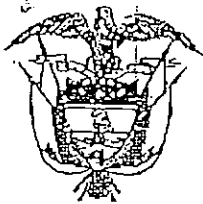
Notario Público (sello)

Notary Public (Seal)

LEGALIZACION ANTE CONSUL COLOMBIANO ES REQUERIDA.

LEGALIZATION BEFORE THE COLOMBIAN CONSUL IS REQUIRED.





CONSULADO GENERAL DE COLOMBIA

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CONSULADO GENERAL DE COLOMBIA EN SÃO PAULO

N.º 468

EL SUSCRITO CONSUL GENERAL DE COLOMBIA, vistos los documentos presentados por los interesados, CERTIFICA: Que al señor JOSENILDA DA SILVA BARBOSA quien como ESCRIBIENTE AUTORIZADO autenticó la firma del signatario del poder precodante, ejerce en la fecha las funciones indicadas y su firma corresponde a la registrada en este Consulado; Que la compañía W.H.I.RI POOL S/A.

es una Sociedad constituida de acuerdo con las leyes de BRASIL y cumple su objeto conforme a las mismas; Que señor(es) EMERSON MARIA DO VALLE, JOSE AURELIO DRUMMOND JR.

quien(es) en su carácter de REPRESENTANTES LEGALES

de la citada compañía confiere(n) el poder precodante y cuya(s) firma(s) fue(ron) autenticada(s) ante

NOT. 13 São Paulo - SP

representante(s) legal(es) en este país.

El Consúl no asume responsabilidad por el contenido del documento

São Paulo, 03 10. 2007

DERECHOS US\$ 29.00 (VEINTINUEVE DOLARES)

PAGADO IMPUESTO DE TIMBRE

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CARLOS MAURICIO ACERO MONTEJO
CONSUL GENERAL

SECRETARÍA DE ESTADO
RELACIONES EXTERIORES
BOGOTÁ D.C.

1007 OCT 28 11:28

673430

Carlos Acero

En la Notaría Coarctada de este Consulado se
cotejó la presente fotocopia que concuerda con
el original que se ha tenido a la vista

27 NOV. 2007

NOTARIO CUARTELA (C)
Bogotá, D.C., Colombia

Norby Fernando Mora C.

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TRADUCCIÓN OFICIAL NO. 5158 DE UN DOCUMENTO CON SELLOS EN PORTUGUÉS, REALIZADA EL 19 DE OCTUBRE, 2007 POR LETICIA SALAMANCA ALVES, C.C. 41.322.380 DE BOGOTÁ, TRADUCTORA E INTÉRPRETE JURAMENTADA SEGÚN RESOLUCIÓN NO. 235 DEL MINISTERIO DE JUSTICIA, BOGOTÁ, COLOMBIA. -----

PODER DE WHIRPOOL S.A.

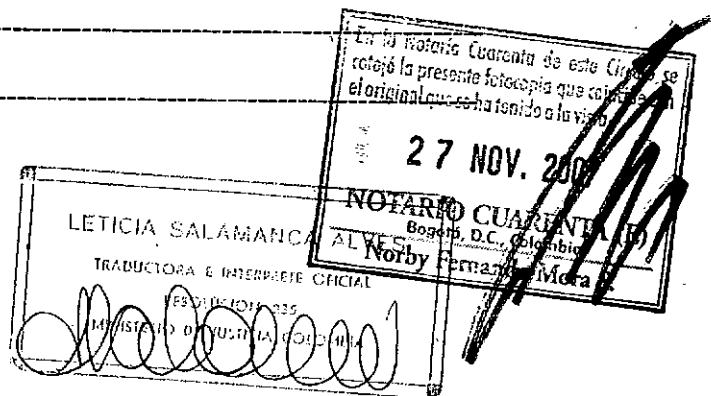
Firmado por Emerson M. Do Vale, Director y José Aurelio Drummond Jr. Presidente, el 17 de Septiembre, 2007

Aparece un sello de la Notaría 13ª. De Notas en São Paulo, reconociendo las firmas de este documento. Dado en São Paulo el 17 de Septiembre, 2007 con la firma del Escribiente Autorizado y una estampilla de Autenticación.

Otro sello de la misma Notaría que dice que este documento para que tenga efectos legales en Brasil, debe ir traducido al portugués y su traducción registrada en la Notaría de Registro de Título y Documentos.

En hoja aparte aparece un sello del consulado General de Colombia en São Paulo No. 468 certificando la firma anterior. Dado en SPaulo el 03.10.2007 con la firma de Carlos Mauricio Acero Montejo, Cónsul General.

Un sello del Ministerio de Relaciones Exteriores No. 673430 legalizando la firma del Cónsul en São Paulo. Dado en Bogotá, D.C. el 18 de Octubre, 2007 con la firma del Jefe de Legalizaciones. -----



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TRADUCCIÓN FIEL Y COMPLETA DE SU ORIGINAL, COPIA DE LA CUAL
QUEDA EN EL ARCHIVO DE LETICIA SALAMANCA ALVES PARA SU
CONFRONTACIÓN.

LETICIA SALAMANCA ALVES
TRADUCTORA E INTERPRETE OFICIAL
E.F.O. 0010101 235
INSTITUTO DE DEFENSA JURIDICA

MINISTERIO DE
RELACIONES EXTERIORES
DEPARTAMENTO DE
RELACIONES EXTERIORES

674311
Leticia Salamanca
COMISIONADO DE DEFENSA JURIDICA
INSTITUTO DE DEFENSA JURIDICA

MINISTERIO DE
RELACIONES EXTERIORES

1971 OCT 19 A 10:40
Jefe de la Oficina de
Bogotá D.C.

En la Notaría Cuarenta de este año se
cotejó la presente fotocopia que se tiene con
el original que se ha tenido en custodia
27 NOV 1971
NOTARIO (C) (E)
Bogotá, D.C.
Norby Fernando Mora S.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 07-136817- -00000-0000

Fecha: 2007-12-27 17:43:48
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Act. 411 PRESENTACION

Dep. 2020 NUECREACIONI
Eve: 378 FASENACIONALI
Folios: 136



Industria y Comercio
SUPERINTENDENCIA

REQUISITOS MINIMOS PARA ADMISION A TRAMITE
PCT

PATENTE DE INVENCION

[4]

MODELO DE UTILIDAD []

- ◆ Indicación de que se solicita la concesión de una patente. [X]
- ◆ Datos de identificación del solicitante o de la persona que presenta la solicitud. [X]
- ◆ Descripción de la invención. [X]
- ◆ Dibujos de ser estos pertinentes. [X]
- ◆ Comprobante de pago de las tasas establecidas. [X]

COMPLETA []

INCOMPLETA []

DISEÑO INDUSTRIAL []

- ◆ Indicación de que se solicita el registro de Diseño Industrial. []
- ◆ Datos de identificación del solicitante o de la persona que presenta la solicitud. []
- ◆ Representación gráfica y fotográfica del Diseño Industrial o muestra del material que incorpora el diseño. []
- ◆ Comprobante de pago de las tasas establecidas. []

COMPLETA []

INCOMPLETA []

ESQUEMA DE TRAZADO []

- ◆ Indicación de que se solicita el registro de un Esquema de Trazado. []
- ◆ Datos de identificación del solicitante o de la persona que presenta la solicitud. []
- ◆ Representación gráfica del esquema trazado. []
- ◆ Comprobante de pago de las tasas establecidas. []

COMPLETA []

INCOMPLETA []

Firma Responsable

12 7 DIC. 2007

Fecha

Carrera 13 No. 27-00 Piso 5, 7 y 10

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www.slc.gov.co

Bogotá, D.C., Colombia

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REPUBLICA DE COLOMBIA
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Bogotá,
2020

Doctor(a)
CADENA SARMIENTO JUAN PABLO
Apoderado(a) y/o Representante de
WHIRPOOL S.A. BRASIL

REFERENCIA	Radicación No.	7 136817
	Solicitud internacional	PCT/BR2006/000124
	Fecha inicio fase nacional	29/01/2008
	Trámite	11
	Evento	378
	Actuación	430
	Oficio No.	2317

Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

1. La solicitud no contiene la copia del documento en que consta la cesión del derecho a la patente del inventor al solicitante o a su causante. (Art. 26-k) Decisión 486.

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Unica No.10 de 2001.

ALIX CARMENZA CESPEDES DE VERGEL
Jefe de la división de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista de
fecha 15 FEB 2008
jfernand