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☒ Patente de Invención.		☐ Patente de Modelo de Utilidad.	
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2 SOLICITANTE (71)	Nombre: WHIRPOOL S.A. Dirección: Avenida das Nações Unidas, 12995—32º, andar, Brooklin Novo, 04578-000-Saõ Paulo, Brasil. Nacionalidad o Domicilio: Brasil. Lugar de Constitución: Brasil. Teléfono: Fax: E-mail:		IDENTIFICACIÓN C.C. ☐ NIT ☐ C.E. ☐ Otro ☐ Cual _____ Número _____
3 REPRESENTANTE O APODERADO	Nombre: JUAN PABLO CADENA SARMIENTO Dirección: Cra. 7 No. 71-21 Torre B – Piso 4, Bogotá, Colombia. Teléfono: 744-2200 Fax: 742-2200 E-mail:		IDENTIFICACIÓN C.C. ☒ NIT ☐ C.E. ☐ Otro ☐ Cual _____ Número 80.410.337 TP 57492
4 INVENTOR (ES) (72)	Nombre: Anderson Luis Camargo MOREIRA, Carlos Eduardo Buratto de TOLEDO, Adriano Salomão IORIATTI. Dirección: Rua Reverendo Alva Hardi, N°586 - Vila, Rocha - Limeira - SP, 13480-644, BR; Rua Terenzio Galesi, N°555 - Bairro, Algodoal - Piracicaba - SP, 13405-440, BR; Rua Sebastião, N°150, Planalto Paraíso - São Carlos - SP, 13562-03, BR (Respectivamente). Nacionalidad o Domicilio: Brasil (Respectivamente).		
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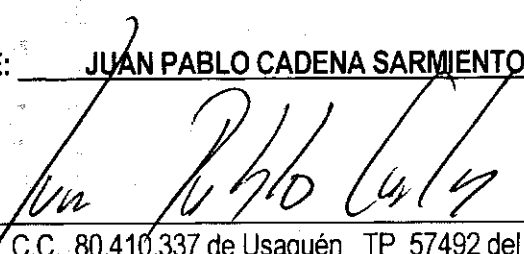
ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud. \$482.000
- ☒ Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso. **Fotocopia autenticada**
- ☐ Documento de cesión del inventor al solicitante o a su causante
- ☐ Declaraciones.
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar efectuado por la IPEA.
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- ☐ De ser el caso, copia del contrato de acceso.
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- ☐ De ser el caso, certificado de depósito del material biológico.
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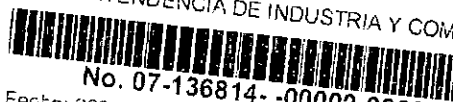
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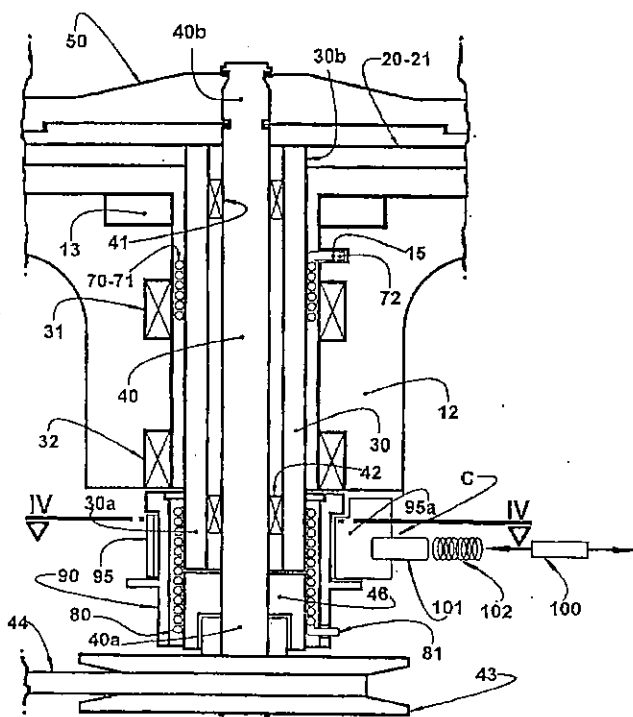
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(54) Title: DRIVING ARRANGEMENT FOR A LAUNDRY MACHINE



(57) Abstract: A driving arrangement for a laundry machine, of the type that comprises a tub (10); a basket (20); a vertical tubular shaft (30) inferiorly and rotatively mounted in a structure (E); a central shaft (40) rotatively mounted inside the tubular shaft (30) and having an upper end (40b) carrying an impeller (50) and a lower end (40a) rotatively coupled to an electric motor (60). The driving arrangement comprises: a helical spring (80) mounted around both the tubular shaft (30) and the central shaft (40), coupling them in a spinning operation of the machine; a cylindrical sleeve (90) rotatively mounted in the structure (E) around the helical spring (80) and being rotatively affixed to a lower end (81) of the latter; a brake band (95) tightly mounted around the cylindrical sleeve (90) and having an inoperative condition, in which it releases the cylindrical sleeve (90) to rotate jointly with the helical spring (80) and with both the tubular and the central shafts (30), (40) in the spinning operation, and an operative condition, in which it has its rotation blocked in said direction, blocking the rotation of both the cylindrical sleeve (90) and the helical spring (80), so as to rotatively disengage the tubular and central shafts (30), (40); and an actuating device (100) selectively driven to alter the operative and inoperative conditions of the brake band (95).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

"DRIVING ARRANGEMENT FOR A LAUNDRY MACHINE"

Field of the Invention

The present invention refers to a driving arrangement for a laundry machine of the type comprising a structure in which is affixed a vertical cylindrical tub dimensioned to contain a load of washing liquid and in whose interior is mounted a perforated basket, generally cylindrical designed to receive the clothes to be washed, vertically and rotatively mounted in the machine structure by means of a tubular shaft and housing an impeller mounted to the upper end of a vertical central shaft, rotatively mounted in the tubular shaft and which is coupled to a motor unit responsible for the selective rotary drive of both the impeller and the basket in different steps of the machine operation.

Background of the Invention

In the laundry machines of the type mentioned above, the washing operations of the clothes contained in the basket are carried out by rotation of the impeller, generally in two opposite directions by a certain number of turns and at a certain given speed, taking into account the movement to be imparted to both the clothes and the washing liquid, in order to obtain a desired washing efficiency, as well as the wear to be imposed to the clothes due to the movement to which said clothes are submitted.

Such machines further allow a spinning operation to be carried out to extract the water from the clothes, when the basket and the impeller have their shafts coupled and rotated in the same direction, at a rotation that may be equal or superior to that applied to the impeller in the washing operations.

In these known machines, the basket usually requires to be locked, so as not to rotate in relation to both

the tub and the machine structure during the washing operation, in which the impeller is caused to rotate in one or in the opposite direction to move the washing liquid and the clothes immersed therein. For this purpose, there are known electromagnetic locking devices, which are automatically driven to keep the basket locked to the structure during washing and to release it to rotate during spinning. Besides this basket locking device, these machines also require a coupling device, generally also electromagnetic, for connecting the tubular shaft of the basket to the central shaft of the impeller, so that said basket can rotate jointly with the impeller during the spinning operation of the clothes.

The use of two electromagnetic locking devices, one for coupling the basket to the structure and the other for coupling the basket to the impeller, is also a factor that increases the final cost of the machine. Even in the case of using a unidirectional locking device of the wrap spring type between the basket and the structure, it is necessary to lock the basket in the opposite direction through other means, such as for example a unidirectional engaging bearing, which is also a cost-increasing element.

The basket, by not being rotatively locked to the structure in neither rotation direction of the impeller, is caused to rotate jointly with the impeller by action of the drag made by both the washing liquid and the clothes. In this situation, the washing liquid rotates in an increasing speed, creating a vortex and increasing its volume, until possibly flowing over the upper edge of the tub.

To comply with the requirements regarding cost reduction of the machine and the operational conditions, which are necessary to achieve an

efficient washing without causing excessive wear to the clothes, is one of the problems to be solved in the known laundry machines.

Aiming at eliminating the disadvantages and
5 deficiencies of the machines, a solution disclosed in
Brazilian patent application PI0204385-8 has been
proposed by the same applicant, according to which the
central shaft of the impeller is alternatively and
rotatively driven by the motor, in a first rotation
10 direction, during the first rotation time, and in a
second rotation direction during a second rotation
time, which is substantially shorter than the first
rotation time, during a washing operation of the
machine, the tubular shaft of the basket being
15 constantly and rotatively locked in relation to the
structure in said first rotation direction and
maintained rotatively free in the second rotation
direction, said basket having its tubular shaft
rotatively locked to the central shaft of the impeller
20 when the latter is driven by the motor in the second
rotation direction, upon a spinning operation of the
machine.

In said previous solution of the same applicant, the
locking of the tubular shaft to the machine structure
25 is made in a simple way and in a single direction
manner through a locking device of the wrap spring
type, using a first spring which assures the locking
of the basket against rotation in said first direction
in any step of the machine operation, the basket
30 remaining free to rotate in said second direction
during the washing step and jointly with the impeller
in the same second direction upon the spinning step.
The control of the free rotation of the basket in the
second direction in the washing step is made by
35 limitation of time.

On the other hand, in order to couple the tubular shaft of the basket to the central shaft of the impeller during the spinning step, the solution proposed in BR PI0204385-8 uses a coupling device comprising a second helical spring mounted around an axial extension of the tubular shaft and which has a first end attached to the central shaft and a second end attached to a cylindrical sleeve that is rotatively mounted in the structure around the second spring, said cylindrical sleeve rotating jointly with said spring and the central shaft. A brake band is tightly mounted around the cylindrical sleeve and designed to have its rotation selectively blocked during the spinning operation, reducing the rotation of the cylindrical sleeve and thus promoting the tightening of the second spring around the tubular shaft, coupling it rotatively to the central shaft and allowing the basket to rotate jointly with the impeller in the spinning operation.

In this prior construction, an electromagnetic device (solenoid) secured to the structure is energized during the spinning operation, so that its actuating pin blocks the rotation of the brake band jointly with the cylindrical sleeve, so that the latter promotes the tightening of the second spring around the tubular shaft of the basket.

Although assuring a correct and automatic operation of the laundry machine at an acceptable cost, this prior art solution still presents a characteristic that needs to be improved, due to the fact that in the spinning operation the electromagnetic device must remain energized, so as to lock the rotation of the brake band around the cylindrical sleeve, with a force sufficient to assure the frictional tightness of the second spring around the tubular shaft. Moreover,

during the spinning, the brake band remains in a wearing frictional contact with the cylindrical sleeve in a region that is susceptible to the presence of oil, impairing the coupling.

5 Summary of the Invention

Due to the deficiency commented above, it is an object of the present invention to provide a driving arrangement for a laundry machine of the type discussed above, presenting a simple constructive
10 solution with a relatively reduced cost and which may assure an efficient coupling between the central shaft of the impeller and the tubular shaft of the basket in the spinning operation, without being subject to premature wear and to the negative effects of the
15 presence of oil in the coupling region.

The objective mentioned above is attained by a driving arrangement for a laundry machine of the type that comprises a tub attached to a structure; a basket disposed in the interior of the tub; a vertical
20 tubular shaft inferiorly and rotatively mounted in the structure and which has a lower end and an upper end affixed to the basket; a central shaft rotatively mounted in the interior of the tubular shaft and having an upper end inside the basket and carrying an
25 impeller, and a lower end rotatively coupled to a motor unit attached to the structure.

According to the present invention, the driving arrangement comprises a helical spring tightly mounted around the axially adjacent extensions of both the
30 tubular shaft and the central shaft, rotatively coupling them upon rotation of the central shaft, in one direction, in a spinning operation of the machine; a cylindrical sleeve rotatively mounted in the structure around the helical spring and being
35 rotatively affixed to a lower end of the latter; a

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brake band tightly mounted around the cylindrical sleeve and having an inoperative condition, in which it releases the cylindrical sleeve to rotate jointly with the helical spring and with the central and tubular shafts, in said direction, in the spinning operation, and an operative condition, in which its rotation is blocked in said direction, braking and interrupting the rotation of both the tubular sleeve and the helical spring in said rotation direction and radially opening the helical spring, so as to rotatively disengage the tubular and central shafts; and an actuating device mounted to the structure and which is selectively driven from a rest position, in which it conducts the brake band to the operative condition, to a driven position, in which the brake band is conducted to the inoperative condition.

With the construction cited above, the tubular and central shafts remain usually coupled to each other through the helical spring in its rest operational condition, around said shafts and connected to the cylindrical sleeve, which remains free to rotate jointly with the spring and the two shafts in the spinning operation, when the actuating device remains in the driven position, in order to release the rotation of the brake band jointly with the cylindrical sleeve. Thus, in order to couple the shafts, only the tightening force of the helical spring is used. In the washing operation, the actuating device is kept in the rest position, in which it maintains the brake band in the operative condition, with its rotation blocked by the actuating device, making the cylindrical sleeve brake, interrupting its rotation and opening the helical spring in relation to the central shaft and, in a lesser extent, to the tubular shaft, remaining

stationary jointly with the cylindrical sleeve. In this condition, there is no frictional sliding between the brake band and the cylindrical sleeve.

Brief Description of the Drawings

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

Figure 1 is a schematic diametrical vertical sectional view of a laundry machine of the type considered
10 herein;

Figure 2 is a simplified enlarged diametrical sectional view of the region in which the impeller and the basket are rotatively mounted, and in which is mounted a device for automatically locking, in one
15 direction, said basket in relation to the structure of the laundry machine and in which is also mounted a clutch means for promoting a relative rotational coupling between the central shaft of the impeller and the tubular shaft of the basket during the spinning
20 operation;

Figure 3 is a perspective view of a brake band mounted around a cylindrical sleeve, in which interior the helical spring is mounted; and

Figure 4 is an enlarged cross-sectional view of the
25 region in which the central shaft of the impeller and the tubular shaft of the basket are rotatively coupled, taken according to line IV-IV in figure 2 and illustrating the actuating device in the rest, de-energized condition.

30 Description of the Invention

As illustrated in figure 1, the present invention is applied to a laundry machine of the type which comprises a structure E generally defining a prismatic cabinet within which is affixed, by any adequate
35 means, a vertical and generally cylindrical tub 10,

which is inferiorly closed by a bottom wall 11, superiorly opened, and dimensioned to contain a load of washing liquid. It should be understood that the tub 10 may be constructed to define, itself, the upper
5 portion of the structure E.

Inside the tub 10 there is coaxially mounted a perforated and also generally cylindrical basket 20, which is provided with a bottom wall 21, superiorly opened and designed to contain the clothes to be
10 washed, said bottom wall 21 being centrally attached to the upper end 30b of a tubular shaft 30, vertically projecting downwardly and outwardly from the tub 10 to be supported by a pair of bearings 31, 32 mounted to a bearing support 12 which is affixed to the bottom wall
15 11 of the tub 10 or incorporated to said bottom wall 11 in a single piece. This assembly of the basket 20 allows it to rotate freely around its longitudinal axis seated on the tubular shaft 30.

The passage of the tubular shaft 30 through the bottom
20 wall 11 of the tub 10 is made with the aid of a retainer 13 mounted to said bottom wall 11.

Inside the tubular shaft 30, a central shaft 40 is rotatively mounted generally by means of bushings 41, 42, and to the upper end 40b of said central shaft is
25 affixed an impeller 50 in the form of a disk positioned on the bottom wall 21 of the basket 20, maintaining from said bottom wall 21 a small axial spacing.

The lower end 40a of the central shaft 40 projects
30 outwardly from the tubular shaft 30 to receive a driven pulley 43, which is operatively coupled, by means of a belt 44, to a drive pulley 45 affixed to the shaft of an electric motor 60 mounted to the structure E of the machine, usually by being generally
35 directly or indirectly affixed to the bottom wall 11

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of the tub 10. The fixation of the drive pulley 45 to the shaft of the motor 60 can be made by interference, using grooves produced in said shaft, in order to assure the fixation and the transmission of torque therebetween, with no need of using additional fixation elements, such as nuts, for example.

This construction leads to a driving arrangement and transmission that are very simple and present a relatively reduced cost as compared to the driving arrangements with variable speed and the transmissions in which the speed variation is automatically controlled as a function of the required operation.

According to an aspect of the invention, which is illustratively exemplified in figure 2, the laundry machine comprises a locking device 70 for locking the tubular shaft 30 in relation to the structure E, more specifically in relation to the bearing support 12, in a single rotation direction of said tubular shaft 30.

In a preferred constructive form of the invention, the locking device 70 comprises a helical spring 71, which is mounted around the tubular shaft 30, so as to slidably seat around the latter when the locking device 70 is in an inoperative condition, said helical spring 71 having an end 72 projecting radially outwardly, in order to remain constantly fitted and locked in a housing 15 provided in the bearing support 12.

This construction provides an extremely simple and inexpensive locking of the basket in a first rotation direction, but it does not promote any locking in the opposite direction.

Thus, when the machine is working in the washing condition, the impeller 50 is rotated in the first direction for a certain time, tending to make the basket 20 rotate in the same direction. However, the

locking device 70 prevents the basket 20 from rotating in said first direction and consequently avoids the formation of a vortex by the joint displacement of the washing liquid, load of clothes, basket 20 and
5 impeller 50.

Nevertheless, when the impeller 50 has its rotation interrupted and inverted to a second direction opposite to the first one, the basket 20 is forced by the washing liquid to rotate also in the same speed
10 and in said second direction, in which no locking occurs relative the basket 20.

In order to prevent the level of the washing liquid from rising excessively with the rotational acceleration of the basket 20, the invention provides
15 a specific operational procedure which is to produce an asymmetry in the rotation times of the impeller 50 in said two directions.

Since the basket 20 is conducted to rotate freely in said second rotation direction, which tends to
20 increase the level of the washing liquid by formation of a vortex inside the basket 20, the drive of the impeller 50 in this second rotation direction is effected by a second rotation time substantially lower than the first rotation time.

It should be understood that the locking device 70 described and illustrated herein is merely exemplary, since the present driving arrangement can be used jointly with other constructive solutions for locking the tubular shaft of the basket in the washing
30 operation.

In order to allow the basket 20 to rotate with the impeller 50 in the second rotation direction during the spinning operation, the machine is provided with a driving arrangement that comprises a generally
35 electromagnetic clutch means C, which is operatively

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associated with both the tubular shaft 30 and the central shaft 40.

In the exemplary construction illustrated in figure 2, the clutch means C comprises a helical spring 80 which constitutes a second helical spring in the driving means of the machine, said helical spring 80 being tightly mounted around axially adjacent extensions of the tubular shaft 30 and the central shaft 40, the dimensioning of the helical spring 80 being carried out so as to assure, when in a normal rest condition, the safe rotational coupling between the central shaft 40 and the tubular shaft 30 in a rotation direction corresponding to the direction of a spinning operation of the machine.

Thus, whenever the machine performs a spinning operation, the helical spring 80 is maintained tightly seated around both the tubular shaft 30 and the central shaft 40, making said shafts to rotate jointly in said spinning direction, which is opposite to that in which the locking device 70 operates to lock the tubular shaft 30 of the basket 20 to the structure E of the machine, preventing the basket from rotating in the other rotation direction denominated as the first rotation direction in the present disclosure.

The driving arrangement further comprises a cylindrical sleeve 90, constructed in any adequate material, such as for example synthetic material, which is rotatively affixed in the structure E around the helical spring 80, maintaining a certain radial gap in relation to the latter and being rotatively affixed to a lower end 81 of the helical spring 80. In the illustrated construction, the helical end 81 of the helical spring 80 is radially bent outwardly and inserted in a corresponding radial bore made in the cylindrical sleeve 90, assuring the rotational locking

between the helical spring 80 and the cylindrical sleeve 90, but allowing a certain radial displacement of the lower end 81 of the helical spring 80 inside the radial bore of the cylindrical sleeve 90. With
5 this arrangement, the helical spring 80 can be radially moved, maintaining its lower end 81 coupled to the cylindrical sleeve 90.

Around the cylindrical sleeve 90 is mounted a brake band 95 constructed in any adequate material and
10 generally having an end 95a radially projecting away from the cylindrical sleeve 90, so as to selectively cooperate with an actuating device 100, to be described ahead, in order to assume an inoperative condition, in which the cylindrical sleeve 90 is
15 released to rotate jointly with the helical spring 80 and with both the tubular and central shafts 30,40 in said rotation direction during the spinning operation, and an operative condition, in which its rotation is blocked in said direction, braking and interrupting
20 the rotation of the cylindrical sleeve 90 and of the helical spring 80 in said rotation direction. When the cylindrical sleeve 90 is locked by the brake band 95, the helical spring 80 is also rotatively locked, whereby, when the central shaft 40 starts its rotation
25 in the spinning direction, said helical spring 80 is opened in the radial direction, loosening its frictional contact not only with the central shaft 40 but also, generally in a lesser extent, in relation to the lower end 30a of the tubular shaft 30, allowing
30 the central shaft 40 to rotate freely inside the tubular shaft 30, carrying only the impeller 50, while the helical spring 80 and the cylindrical sleeve 90 remain stationary as a function of the actuation of the brake band 95.

35 The brake band 95 has its end 95a selectively blocked



by an actuating device 100 mounted in the structure E and which is driven from a rest position, in which it conducts the brake band 95 to the operative condition, towards a driven position, in which the brake band 95 is conducted to the inoperative condition.

In the preferred illustrated construction, the actuating device 100 comprises an electromagnetic actuator (solenoid) provided with an actuating pin 101, which is constantly forced by a return spring 102, to the rest condition of the actuating device 100, in which the actuating pin 101 blocks the rotation of the brake band 95, more specifically by blocking the rotation of said end 95a thereof, braking and interrupting the rotation of the cylindrical sleeve 90 and, consequently, of the helical spring 80, producing the radial opening of the latter and disengaging the central shaft 40 of the impeller 50 from the tubular shaft 30 of the basket 20.

The construction described above allows, in the rest condition of the actuating device 100, its return spring 102 to maintain the actuating pin 101 in a position in which it interferes with the rotation of the end 95a of the brake band 90, disengaging the central shaft 40 and the tubular shaft 30, which disengagement is necessary for carrying out the washing operation of the machine.

During the spinning operation, the actuating device 100 is automatically energized to retain its actuating pin 101 displaced from the rest position, in which it interferes with the rotation of the brake band 95, to the operative position, that is to say, to a driven and retracted position, in which said actuating pin stops actuating onto the brake band 95, which assumes the inoperative condition, in which it rotates jointly with the cylindrical sleeve 90, and allowing the

helical spring 80 to remain in its rest condition, in which it is kept tightly mounted around the tubular shaft 30 and the central shaft 40, maintaining them mutually coupled for performing the spinning operation
5 of the machine.

As it can be noted, upon energization of the electromagnetic actuating device 100, the electromagnetic force is sufficient to retract the actuating pin 101 against the constant action of the
10 return spring 102, which is dimensioned to produce the displacement of the actuating pin 101 to the rest position, when the electromagnetic actuating device 100 is deenergized.

The electromagnetic actuating device 100 is usually
15 automatically deenergized when the laundry machine begins to perform the washing operations, in which the central shaft 40 and the impeller 50 are driven by the motor 60 in a condition in which the tubular shaft 30 is disengaged from the basket 20.

As already mentioned above, the deenergization of the electromagnetic actuating device 100 makes the return spring 102 impel the actuating pin 101 to the rest position, in which said actuating pin interferes with the brake band 95, so as to block the rotation of the
20 latter and also of the helical spring 80 coupled thereto, opening the helical spring 80 and disengaging the tubular and central shafts 30,40 during the washing operation.

Still in accordance with the illustrated construction,
30 the central shaft 40 incorporates an adjacent cylindrical widening 46 external to the lower end 30a of the tubular shaft 30 and presenting an outer diameter substantially equal to the outer diameter of said lower end 30a of the tubular shaft 30. This
35 construction allows said lower end 30a of the tubular

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shaft 30 and said cylindrical widening 46 of the central shaft 40 to define the axially adjacent extensions of both shafts, around which the helical spring 80 is mounted, which is preferably constructed
5 with substantially a single diameter along its axial extension, so as to simultaneously tighten both shafts upon the spinning operation of the machine.

While only one embodiment of the invention has been illustrated herein, it should be understood that
10 alterations can be made in the form and relative arrangement of the elements, without departing from the constructive concept defined in the appended claims.

CLAIMS

1. A driving arrangement for a laundry machine of the type comprising a tub (10) affixed to a structure (E); a basket (20) disposed inside the tub (10); a vertical
5 tubular shaft (30) inferiorly and rotatively mounted in the structure (E) and having a lower end (30a) and an upper end (30b) affixed to the basket (20); a central shaft (40) rotatively mounted inside the tubular shaft (30) and having an upper end (40b)
10 inside the basket (20) and carrying an impeller (50) and a lower end (40a) rotatively coupled to an electric motor (60) affixed to the structure (E), said driving arrangement characterized in that it comprises a helical spring (80) tightly mounted around the
15 axially adjacent extensions of both the tubular shaft (30) and the central shaft (40), coupling them rotatively upon rotation of the central shaft (40), in one direction, in a spinning operation of the machine; a cylindrical sleeve (90) rotatively mounted in the
20 structure (E) around the helical spring (80) and being rotatively affixed to a lower end (81) of the latter; a brake band (95) tightly mounted around the cylindrical sleeve (90) and having an inoperative condition, in which it releases the cylindrical sleeve
25 (90) to rotate jointly with the helical spring (80) and with the tubular and central shafts (30), (40), in said direction in the spinning operation, and an operative condition, in which said brake band (95) has its rotation blocked in said direction, braking and
30 interrupting the rotation of both the cylindrical sleeve (90) and the helical spring (80) in said rotation direction and radially opening the helical spring (80), in order to rotatively disengage the tubular and central shafts (30), (40); and an actuating
35 device (100) mounted in the structure (E) and

selectively driven from a rest position, in which it conducts the brake band (95) to the operative condition, to a driven position, in which the brake band (95) is conducted to the inoperative condition.

5 2. The driving arrangement, as set forth in claim 1, characterized in that the actuating device (100) comprises an electromagnetic actuator provided by an actuating pin (101) which is constantly forced by a return spring (102) to a rest condition of the
10 actuating device (100), in which the actuating pin (101) blocks the rotation of the brake band (95) carried by the cylindrical sleeve (90), blocking the rotation of the latter.

3. The driving arrangement, as set forth in claim 2,
15 characterized in that the brake band (95) comprises an opposite end (95a) radially projecting away from the cylindrical sleeve (90) to be coupled by the actuating pin (101) when the actuating device (100) is in a rest position.

20 4. The driving arrangement, as set forth in claim 2, characterized in that the electromagnetic actuating device (100) is automatically deenergized when the laundry machine carries out the washing operations, in which the central shaft (40) and the impeller (50) are
25 driven by the motor (60) in a condition in which they are disengaged from the tubular shaft (30).

5. The driving arrangement, as set forth in claim 1, characterized in that the central shaft (40) incorporates an adjacent cylindrical widening (46)
30 external to the lower end (30a) of the tubular shaft (30) and presenting an outer diameter substantially equal to the outer diameter of said lower end (30a) of the tubular shaft (30), said lower end (30a) and said cylindrical widening (46) defining the axially
35 adjacent extensions of the tubular and central shafts

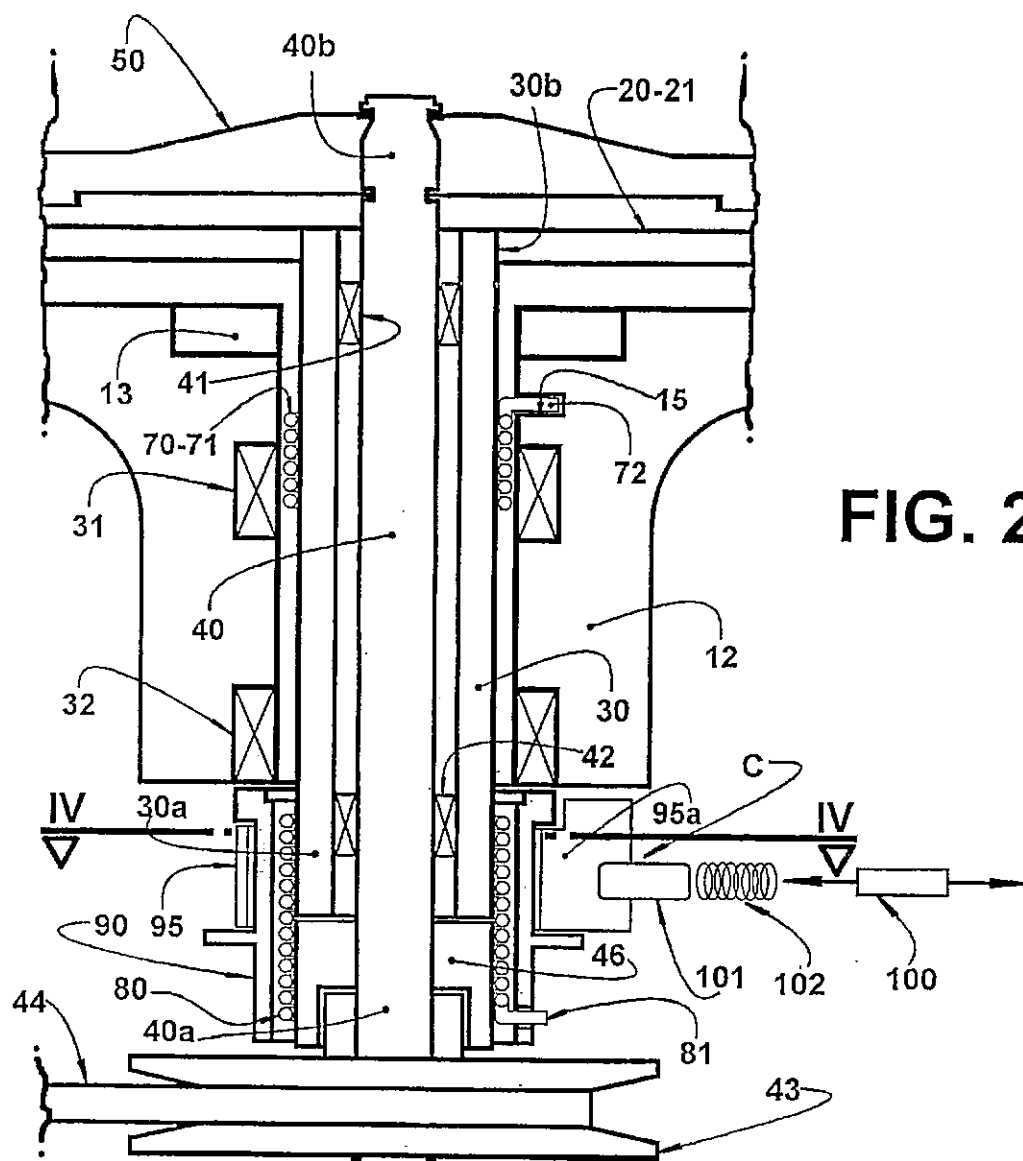


FIG. 2

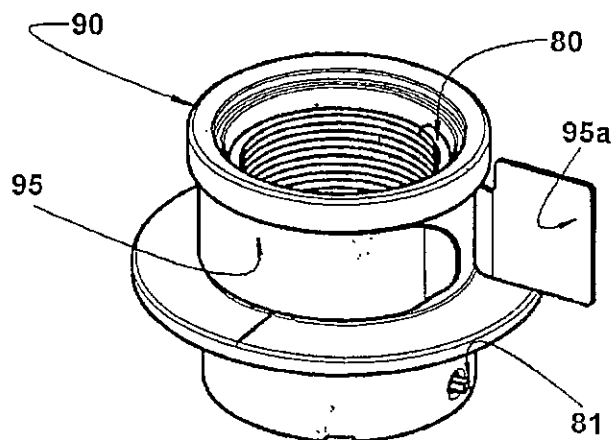


FIG. 3

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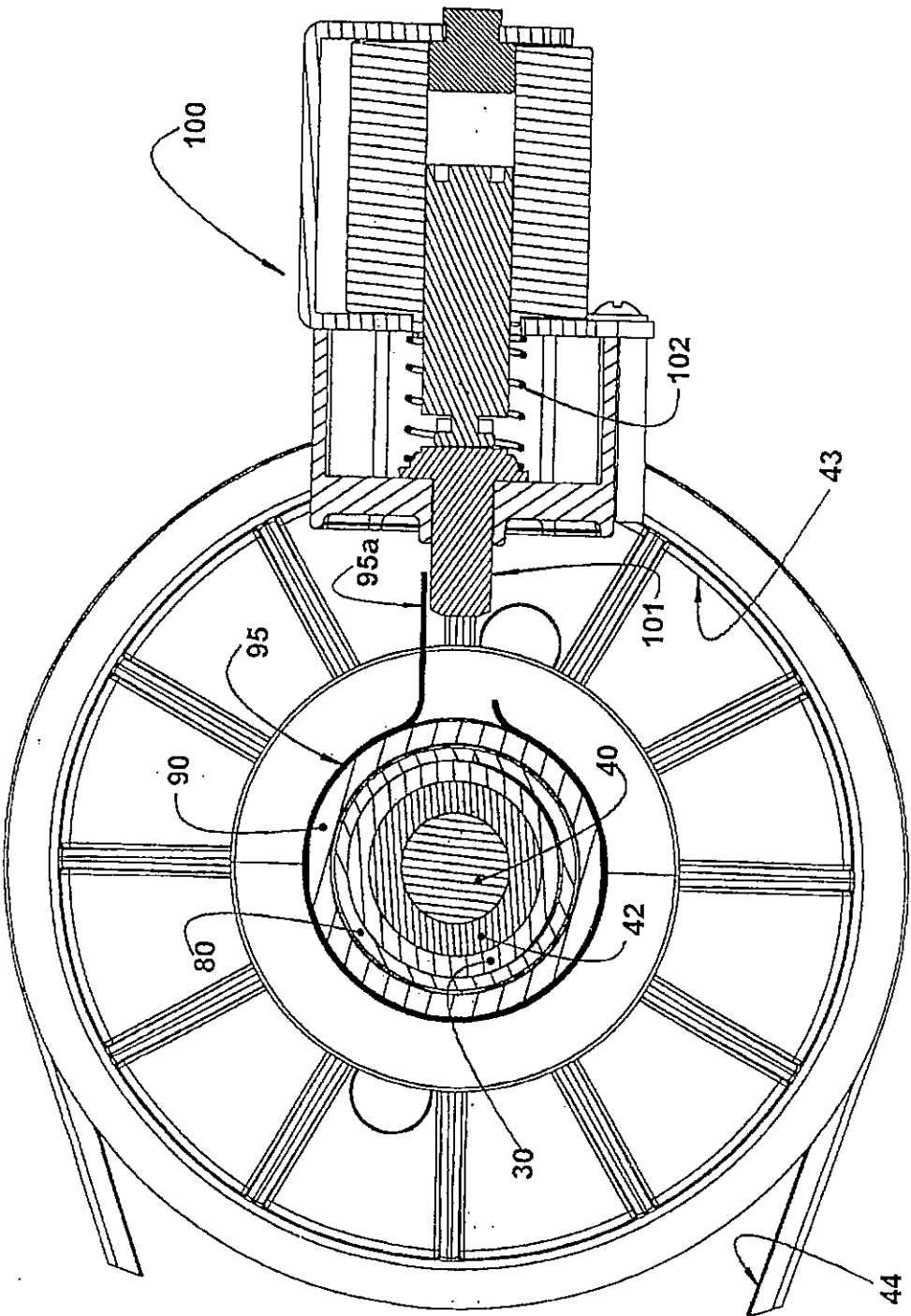


FIG.4

INTERNATIONAL SEARCH REPORT

International application No
PCT/BR2006/000123

A. CLASSIFICATION OF SUBJECT MATTER

INV. D06F37/40

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/081573 A1 (HAN JIN C) 21 April 2005 (2005-04-21)	1,5
A	page 2, paragraphs 25-28; page 3, paragraphs 32, 39, 41, 42; abstract; figures	2-4
X	US 2003/034054 A1 (LEE JOON-YEOP ET AL) 20 February 2003 (2003-02-20)	1,5
A	page 1, paragraphs 6-9, 14,15; page 2, paragraph 49 - page 3, paragraph 62; figures 2,4	2-4
A	US 2003/051516 A1 (LEE TAE HEE ET AL) 20 March 2003 (2003-03-20)	1-5
	page 1, paragraphs 2-8; page 2, paragraphs 16-19; abstract; figures	
	-/-	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the International search

21 September 2006

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INTERNATIONAL SEARCH REPORT

International application No
PCT/BR2006/000123

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 969 341 A (BURK ET AL) 13 November 1990 (1990-11-13) the whole document	1-5

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/BR2006/000123

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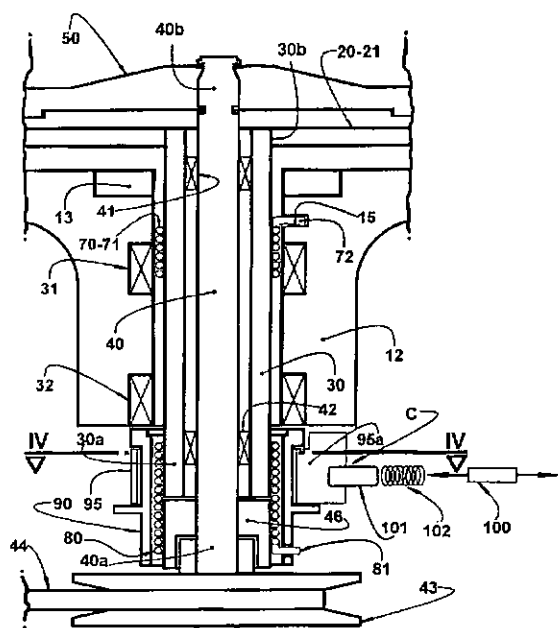
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- (74) Agente: ARNAUD, Antonio M.P. y colaboradores; Rua José Bonifácio, 93- 9º Piso, 01003-901 São Paulo - SP (BR).
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- (84) Estados Designados (a menos que se indique lo contrario, para todo tipo de protección regional disponible): ARIPO (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Euroasiática (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Europea (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, 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).
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— con el informe de búsqueda internacional
- [Continúa en la siguiente página]

(54) Título: DISPOSICION DE ACCIONAMIENTO PARA UNA MAQUINA LAVARROPAS



(57) Resumen: Una disposición de accionamiento para una máquina lavarropas del tipo que comprende un tanque (10); un cesto (20); un eje tubular (30) vertical, inferior y rotatoriamente vinculado a una estructura (E); un eje central (40) vinculado rotatoriamente en el interior del eje tubular (30) y que tiene un extremo superior (40b) que lleva un impulsor (50) y un extremo inferior (40a) acoplado rotatoriamente a un motor eléctrico (60). La disposición de accionamiento comprende un resorte helicoidal (80) montado apretadamente alrededor del eje tubular (30) y del eje central (40), acoplándolos en una operación de centrifugado de la máquina; un manguito cilíndrico (90) vinculado rotatoriamente a la estructura (E) alrededor del resorte helicoidal (80) y que es fijado rotatoriamente a un extremo inferior (81) de este último; una cinta de freno (95) montada apretadamente alrededor del manguito cilíndrico (90) y que tiene una condición inoperante, en la cual libera al manguito cilíndrico (90) para girar conjuntamente con el resorte helicoidal (80) y con los ejes tubular (30) y central (40) durante la operación de centrifugado, y una condición operativa, en la cual tiene su giro bloqueado en dicho sentido, bloqueando el giro del manguito tubular (90) y del resorte helicoidal (80), de modo de desacoplar rotatoriamente los ejes tubular (30) y central (40); y un dispositivo accionador (100) selectivamente accionado para alterar las condiciones operativa e inoperante de la cinta de freno (95).

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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

"DISPOSICIÓN DE ACCIONAMIENTO PARA UNA MÁQUINA LAVARROPAS"

Campo de la Invención

La presente invención se relaciona con una disposición de accionamiento para un lavarropas del tipo que comprende una estructura en la cual hay fijado un tanque cilíndrico vertical, dimensionado para contener una carga de líquido de lavado y en cuyo interior está montado un cesto perforado, generalmente cilíndrico y diseñado para recibir la ropa a ser lavada, vinculado vertical y rotatoriamente a la estructura de la máquina por medio de un eje tubular y que aloja un impulsor montado en el extremo superior de un eje central vertical, vinculado al interior del eje tubular y acoplado a una unidad motriz, responsable del accionamiento rotatorio y selectivo del impulsor y del cesto en diferentes fases de operación de la máquina.

Ámbito de la invención

En las máquinas lavarropas del tipo mencionado, las operaciones de lavado de ropa contenida en el cesto son realizadas por el giro del impulsor, generalmente en uno y otro sentido, por un cierto número de vueltas y una cierta velocidad determinada, teniéndose en cuenta el movimiento al cual es sometida la ropa y el líquido de lavado, para obtener una eficiencia de lavado deseada, y el desgaste de la ropa en función del movimiento al cual es sometida.

Estas máquinas permiten también la realización de una operación de centrifugado para retirar el agua de la ropa, cuando el cesto y el impulsor tienen su eje acoplados y girando en un mismo sentido, en una rotación que puede ser igual o mayor que la aplicada al impulsor en las operaciones de lavado.

En estas máquinas conocidas, el cesto usualmente necesita ser trabado para no girar con relación al tanque y a la estructura de la máquina durante la operación de lavado, en la cual el impulsor es hecho girar en uno u otro sentido, para mover el líquido de lavado y la ropa sumergida en él. Para esto, son conocidos los dispositivos de traba electromagnéticos, accionados automáticamente para mantener el cesto trabado a la estructura durante el lavado y para liberarlo para que gira en el momento del centrifugado. Además de este dispositivo de traba de cesto, estas máquinas también necesitan un dispositivo de acoplamiento, generalmente también electromagnético, del eje tubular del cesto al eje central del impulsor, para que el cesto pueda ser girado conjuntamente con el impulsor durante la operación de centrifugado de la ropa.

El uso de dos dispositivos de traba electromagnéticos, uno del cesto a la estructura y el otro del cesto al impulsor, también constituye un factor de aumento del costo final de la máquina. Aún en el caso que se utilice un dispositivo de traba unidireccional tipo "wrap spring" (resorte envolvente) entre el

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cesto y la estructura, existe la necesidad de trabar el cesto en el otro sentido por otro medio como, por ejemplo, un cojinete de enganche unidireccional que constituye también un elemento de aumento en el costo.

Si no existe la traba de rotación del cesto a la estructura en cualquiera de los sentidos de giro del impulsor, el cesto pasa a girar conjuntamente con el impulsor por el propio arrastre del líquido de lavado y de la ropa. En esta situación, el líquido de lavado pasa a girar en velocidad creciente, creando un torbellino y subiendo hasta posiblemente rebalsar sobre el borde superior del tanque.

El cumplir con las exigencias de reducción de costo de la máquina y de las condiciones operativas, constituye uno de los problemas a ser resueltos en las máquinas lavarropas conocidas.

Con miras a eliminar las desventajas y deficiencias de las máquinas, se propuso una solución objeto de la solicitud de patente PI0204385-8 del mismo solicitante, según la cual el eje central del impulsor es alternativa y rotatoriamente accionado por el motor, en un primer sentido de giro, durante un primer tiempo de giro, y en un segundo sentido de giro, durante un segundo tiempo de giro sustancialmente menor que el primer tiempo de giro, durante una operación de lavado de la máquina, donde el eje tubular del cesto es constante y rotatoriamente trabado en relación a la estructura en dicho primer sentido de

giro y mantenido rotatoriamente libre en el segundo sentido de giro, teniendo dicho cesto su eje tubular trabado rotatoriamente al eje central del impulsor cuando este último es accionado por el motor en el segundo sentido de giro, durante una operación de centrifugado de la máquina.

En la mencionada solución anterior del mismo solicitante, el trabado del eje tubular a la estructura de la máquina es efectuado en forma simple y unidireccional, por un dispositivo de traba tipo "wrap spring" (resorte envolvente), utilizando un primer resorte que garantice el trabado del cesto contra la rotación en dicho primer sentido en cualquier etapa de operación de la máquina, quedando el cesto libre de girar, aisladamente, en dicho segundo sentido, durante la etapa de lavado y, conjuntamente con el impulsor, en el mismo segundo sentido, durante la etapa de centrifugado. El control de giro libre del cesto en el segundo sentido, en la fase de lavado, es efectuado por la limitación de tiempo.

Por otra parte, para acoplar el eje tubular del cesto al eje central del impulsor, durante la etapa de centrifugado, la solución propuesta en PI0204385-8 utiliza un dispositivo de acoplamiento que comprende un segundo resorte helicoidal montado alrededor de una extensión axial del eje tubular y que tiene un primer extremo fijado al eje central y un segundo extremo fijado a un manguito cilíndrico, vinculado

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rotatoriamente a la estructura, alrededor del segundo resorte, girando dicho manguito cilíndrico conjuntamente con dicho resorte y con el eje central. Una cinta de freno está montada apretadamente alrededor del manguito cilíndrico y diseñada para tener su rotación bloqueada selectivamente durante la operación de centrifugado, reduciendo la rotación del manguito cilíndrico y produciendo así el apriete del segundo resorte sobre el eje tubular, acoplándolo rotatoriamente al eje central y permitiendo que el cesto gire conjuntamente con el impulsor en la operación de centrifugado.

En esta construcción anterior, un dispositivo electromagnético (solenóide), fijado a la estructura, es energizado durante la operación de centrifugado, para que su perno accionador bloquee el giro de la cinta de freno conjuntamente con el manguito cilíndrico, para que este promueva el apriete del segundo resorte sobre el eje tubular del cesto.

A pesar de garantizar una operación correcta y automática del lavarropas con un costo aceptable, esta solución anterior también presenta una característica a ser mejorada, debido al hecho que, en la operación de centrifugado, el dispositivo electromagnético tiene que permanecer energizado, para producir el bloqueo del giro de la cinta de freno sobre el manguito cilíndrico, con una fuerza suficiente como para garantizar el

ajuste apretado del segundo resorte sobre el eje tubular. Además, durante el centrifugado, la cinta de freno permanece en contacto de fricción y desgaste con el manguito cilíndrico, en una región que es susceptible a la presencia de aceite, dificultando el acoplamiento.

Descripción resumida de la invención

Debido a la deficiencia comentada más arriba, la presente invención tiene como finalidad proveer una disposición de accionamiento para un lavarropas del tipo mencionado más arriba y que presenta una solución constructiva simple, de costo relativamente reducido y que garantice un eficiente acoplamiento entre el eje central del impulsor y el eje tubular del cesto durante la operación de centrifugado, sin quedar sometido a desgaste prematuro y a los efectos negativos de la presencia de aceite en la región de acoplamiento.

La finalidad mencionada se logra con una disposición de accionamiento para una máquina lavarropas, del tipo que comprende un tanque fijado a una estructura; un cesto dispuesto en el interior del tanque; un eje tubular vertical, inferior y rotatoriamente vinculado a la estructura y que tiene un extremo inferior y un extremo superior fijado al cesto; un eje central vinculado rotatoriamente en el interior del eje tubular y que tiene un extremo superior interno al cesto y que lleva un



impulsor y un extremo inferior acoplado rotatoriamente a una unidad motora fijada a la estructura.

De acuerdo con la presente invención, la disposición de accionamiento comprende un resorte helicoidal montado apretadamente alrededor de extensiones axialmente adyacentes del eje tubular y del eje central, acoplándolos rotatoriamente cuando el eje central gira en un sentido, en una operación de centrifugado de la máquina; un manguito cilíndrico vinculado rotatoriamente a la estructura alrededor del resorte helicoidal y que es fijado rotatoriamente a un extremo inferior de este último; una cinta de freno montada apretadamente alrededor del manguito cilíndrico y que tiene una condición inoperante, en la cual libera al manguito cilíndrico para girar conjuntamente con el resorte helicoidal y con los ejes tubular y central, en el mencionado sentido, durante la operación de centrifugado, y una condición operativa, en la cual tiene su giro bloqueado en dicho sentido, frenando e interrumpiendo el giro del manguito tubular y del resorte helicoidal en dicho sentido de giro y abriendo radialmente el resorte helicoidal, de modo de desacoplar rotatoriamente los ejes tubular y central; y un dispositivo accionador montado en la estructura y selectivamente accionado de una posición de reposo, en la cual lleva la cinta de freno a la condición operativa, a una



posición accionada en la cual la cinta de freno es llevada a la condición inoperante.

Con la construcción mencionada, los ejes central y tubular permanecen acoplados normalmente entre sí por el resorte helicoidal en su condición operativa de reposo, apretada sobre dichos ejes y conectada al manguito cilíndrico que queda libre de girar conjuntamente con el resorte y los dos ejes en la operación de centrifugado, cuando el dispositivo accionador permanece en la posición accionada, para liberar el giro de la cinta de freno conjuntamente con el manguito cilíndrico. Así, para acoplar los ejes se usa solamente la fuerza de apriete del resorte helicoidal. En la operación de lavado, el dispositivo accionador es mantenido en la posición de reposo, en la cual mantiene la cinta en la condición operativa, con su giro bloqueado por el dispositivo accionador provocando el frenado y la interrupción de giro del manguito cilíndrico y abriendo resorte helicoidal con relación al eje central, y en menor medida, al eje tubular, permaneciendo estacionario conjuntamente con el manguito cilíndrico. En esta condición, no habrá ningún deslizamiento friccional entre la cinta de freno y el manguito cilíndrico.

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Breve descripción de los dibujos

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

La figura 1 es una vista en corte vertical, diametral y esquemática de un lavarropas del tipo aquí considerado;

La figura 2 es una vista en corte diametral y simplificado de la región de vinculación del impulsor y del cesto, en la cual hay montado un dispositivo de traba automático y unidireccional del cesto con relación a la estructura del lavarropas y también en la cual hay montado un medio de embrague para el acoplamiento rotatorio relativo entre el eje central del impulsor y el eje tubular del cesto, durante la operación de centrifugado;

La figura 3 es una vista en perspectiva de una cinta de freno montada alrededor de un manguito cilíndrico, en el interior del cual está montado un resorte helicoidal; y

La figura 4 es una vista en corte transversal ampliado en la región de acoplamiento rotatorio de los ejes central del impulsor y tubular del cesto, estando dicho corte tomado según la línea IV-IV de la figura 2 e ilustrando el dispositivo accionador en la condición de reposo, desenergizado.

Descripción de la invención

Según lo ilustrado en la figura 1, la invención en cuestión se aplica a una máquina lavarropas del tipo que comprende una estructura "E" que define generalmente un gabinete prismático en el interior del cual es fijado, por cualquier medio adecuado, un tanque 10 vertical y generalmente cilíndrico, cerrado en la parte inferior por una pared de fondo 11, abierto en la parte superior y dimensionado para contener una carga de líquido de lavado. Debe entenderse que el tanque 10 puede estar construido de modo de definir, en sí mismo, la porción superior de la estructura E.

En el interior del tanque 10 hay montado coaxialmente un cesto 20, perforado y también generalmente cilíndrico, provisto de una pared de fondo 21, abierto en la parte superior, diseñado para contener la ropa a ser lavada y que tiene su pared de fondo 21 fijada centralmente al extremo superior 30b de un eje tubular 30 que se proyecta verticalmente hacia abajo y hacia fuera del tanque 10, para ser sostenido por un par de cojinetes 31, 32 montados en un soporte de vinculación 12 fijado a la pared de fondo 11 del tanque 10 o incorporado a esta última en una sola pieza. Este montaje del cesto 20 permite que gire libremente alrededor de su eje geométrico longitudinal y apoyado en el eje tubular 30.

El pasaje del eje tubular 30 por la pared de fondo 11 del tanque 10 es efectuado con la ayuda de un retén 13 montado en dicha pared de fondo 11.

En el interior del eje tubular 30 está conectado, generalmente por medio de tacos 41, 42, un eje central 40 en cuyo extremo superior 40b está fijado un impulsor 50 en forma de disco ubicado sobre la pared de fondo 21 del cesto 20, manteniendo con esta un pequeño alejamiento axial.

El extremo inferior 40a del eje central 40 se proyecta hacia fuera del eje tubular 30, para recibir una polea impulsada 43 acoplada operativamente, a través de una correa 44, a una polea motora 45 fijada al eje de un motor eléctrico 60 montado a la estructura "E" de la máquina, generalmente por fijación directa o indirecta a la pared de fondo 11 del tanque 10. La fijación de la polea motora 45 al eje del motor 60 puede ser efectuada por interferencia, utilizándose ranuras producidas en dicho eje, de modo de garantizar la fijación y la transmisión de torque entre las dos partes, no requiriéndose la utilización de elementos adicionales de fijación como, por ejemplo, tuercas.

Esta construcción lleva a una motorización y una transmisión muy simples y de costo relativamente reducido en comparación con las motorizaciones de velocidad variable y las

transmisiones con variación de velocidad comandada automáticamente en función de la operación requerida.

De acuerdo con un aspecto de la invención, ilustrado en la figura 2 a modo de ejemplo, la máquina lavarropas comprende un dispositivo de traba 70 para tratar el eje tubular 30 con relación a la estructura "E", más específicamente con relación al soporte de vinculación 12, en un único sentido de giro de dicho eje tubular 30. En una forma constructiva preferida de la invención, el dispositivo de traba 70 comprende un resorte helicoidal 71 montado alrededor del eje tubular 30, de modo de asentarse deslizablemente sobre este último cuando el dispositivo de traba 70 está en una condición inoperante, teniendo dicho resorte helicoidal 71 un extremo que se proyecta radialmente hacia fuera, para permanecer encajado constantemente y trabado en un alojamiento 15 provisto en el soporte de vinculación 12.

Esta construcción permite un trabado extremadamente simple y barato del cesto en un primer sentido de giro, pero no promueve trabado alguno en el sentido opuesto.

Así, cuando la máquina está operando en la condición de lavado, el impulsor 50 es girado en el primer sentido por cierto tiempo, tendiendo a provocar el giro del cesto 20 en el mismo sentido. Mientras tanto, el dispositivo de traba 70 impide que el cesto 20 gire en dicho primer sentido y, en

consecuencia, se forma un torbellino por desviación conjunta del líquido de lavado, de la carga de ropa, del cesto 20 y del impulsor 50.

Mientras tanto, cuando el impulsor 50 tiene su giro interrumpido e invertido hacia un segundo sentido opuesto al primero, el cesto 20 es forzado por el líquido de lavado a girar también, en la misma velocidad y en dicho segundo sentido en el cual no tiene lugar trabado alguno sobre el cesto 20.

Para evitar que el nivel de líquido de lavado suba excesivamente con la aceleración rotatoria del cesto 20, la invención provee un procedimiento operativo particular que es el de producir una asimetría en los tiempos de giro del impulsor 50 en uno y otro sentido.

Debido a que el cesto 20 es llevado a girar libremente en dicho segundo sentido de giro, tendiendo a elevar el nivel del líquido de lavado por la formación de un torbellino en el interior del cesto 20, el accionamiento del impulsor 50 en este segundo sentido de giro es efectuado por un segundo tiempo de giro sustancialmente inferior al del primer tiempo de giro.

Debe entenderse que el dispositivo de traba 70 aquí descrito e ilustrado es meramente un ejemplo, ya que la disposición de accionamiento en cuestión puede ser utilizada conjuntamente con otras soluciones constructivas para trabar el eje tubular del cesto en la operación de lavado.

Para permitir que el cesto 20 gire con el impulsor 50 en el segundo sentido de giro, durante la operación de centrifugado, la máquina está provista con una disposición de accionamiento que comprende un medio de embrague C, generalmente electromagnético, asociado operativamente al eje tubular 30 y al eje central 40.

En la construcción ilustrada en la figura 2 a modo de ejemplo, el medio de embrague C comprende un resorte helicoidal 80, que constituye un segundo resorte en los medios de accionamiento de la máquina, estando dicho resorte helicoidal 80 montado apretadamente alrededor de extensiones axialmente adyacentes del eje tubular 30 y del eje central 40, realizándose el dimensionamiento del resorte helicoidal 80 de modo de garantizar, cuando está en una condición normal de reposo, el acoplamiento rotatorio seguro entre el eje central 40 y el eje tubular 30 en un sentido de giro que corresponde al de una operación de centrifugado de la máquina.

Así, cuando la máquina realiza una operación de centrifugado, el resorte helicoidal 80 se mantiene asentado apretadamente alrededor de los ejes tubular 30 y central 40, haciendo que ambos ejes giren conjuntamente en dicho sentido de centrifugado que es contrario al de accionamiento del dispositivo de traba 70 que actúa entre el eje tubular 30 del cesto 20 y la estructura "E" de la máquina, impidiendo el giro

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del cesto en otro sentido de giro denominado primer sentido de giro en la presente memoria descriptiva.

La disposición de accionamiento comprende también un manguito cilíndrico 90, construido en cualquier material adecuado como por ejemplo material sintético, vinculado rotatoriamente a la estructura "E" alrededor del resorte helicoidal 80, manteniendo una cierta holgura radial con relación a este último y estando fijado rotatoriamente a un extremo inferior 81 del resorte helicoidal 80. En la construcción ilustrada, el extremo inferior 81 del resorte helicoidal 80 es doblado radialmente hacia fuera e insertado en un orificio radial correspondiente efectuado en la pared del manguito cilíndrico 90, garantizando el trabado rotatorio entre el resorte helicoidal 80 y el manguito cilíndrico 90, pero permitiendo una cierta desviación radial del extremo inferior 81 del resorte helicoidal 80 en el interior del orificio radial del manguito cilíndrico 90. Con esta disposición, el resorte helicoidal 80 puede moverse radialmente, manteniendo su extremo inferior 81 acoplado al manguito cilíndrico 90.

Alrededor del manguito cilíndrico 90 hay montada una cinta de freno 95, construida de cualquier material apropiado, que tiene generalmente un extremo 95a que se proyecta radialmente a lo largo del manguito cilíndrico 90, de modo de cooperar, selectivamente, con un dispositivo accionador 100, que será

descrito más adelante, para asumir una condición inoperante, en la cual libera al manguito cilíndrico 90 para que gire conjuntamente con el resorte helicoidal 80 y con los ejes tubular 30 y central 40 en dicho sentido de giro durante la operación de centrifugado, y una condición operativa, en la cual tiene su giro bloqueado en dicho sentido, frenando e interrumpiendo el giro del manguito cilíndrico 90 y del resorte helicoidal 80 en dicho sentido de giro. Cuando el manguito cilíndrico 90 es trabado por la cinta de freno 95, el resorte helicoidal 80 también es trabado rotatoriamente con lo cual, habiendo el eje central 40 iniciado su giro en el sentido de centrifugado, el resorte helicoidal 80 se abre en el sentido radial, aflojando su contacto de fricción no solamente con el eje central 40 sino también, generalmente en menor medida, con relación al extremo inferior 30a del eje tubular 30, permitiendo que el eje central 40 gire libremente en el interior del eje tubular 30, llevando apenas al impulsor 50, dado que el resorte helicoidal 80 y el manguito cilíndrico 90 permanecen estacionarios en función del accionamiento de la cinta de freno 95.

La cinta de freno 95 tiene su extremo 95a bloqueada selectivamente por un dispositivo accionador 100, montado en la estructura "E" y que es accionado de una posición de reposo, en la cual conduce la cinta de freno 95 a la condición operativa,

a una posición accionada, en la cual la cinta de freno 95 es llevada a la condición inoperante.

En la construcción preferida e ilustrada, el dispositivo accionador 100 comprende un accionador electromagnético (solenoides) provisto de un perno accionador 101 que es forzado constantemente por un resorte de retorno 102, para la condición de reposo del dispositivo accionador 100, en la cual el perno accionador 101 bloquea el giro de la cinta de freno 95, más específicamente por medio del bloqueo del giro de dicho extremo 95a de esta última, frenando e interrumpiendo el giro del manguito cilíndrico 90 y, en consecuencia, del resorte helicoidal 80, produciendo la apertura radial de este último y el desacoplamiento entre el eje central 40 del impulsor 50 y el eje tubular 30 del cesto 20.

La construcción descrita más arriba permite que, en la condición de reposo del dispositivo accionador 100, su resorte de retorno 102 mantenga al perno accionador 101 en una posición en la cual interfiere con el giro del extremo 95a de la cinta de freno 90, llevando al desacople entre el eje central 40 y el eje tubular 30, desacople éste necesario para que se realice la operación de lavado de la máquina.

En la operación de centrifugado, el dispositivo accionador 100 es energizado automáticamente para retener su perno accionador 101 desviado, de la posición de reposo, en la cual

interfiere con el giro de la cinta de freno 95, a la posición operativa, o sea, a la posición accionada y recogida, en la cual deja de actuar sobre la cinta de freno 95, que asume la condición inoperante, en la cual gira conjuntamente con el manguito cilíndrico 90, y permitiendo que el resorte helicoidal 80 permanezca en su condición de reposo, en la cual se mantiene montada apretadamente alrededor del eje tubular 30 y del eje central 40, manteniéndolos acoplados entre sí para que se realice la operación de centrifugado de la máquina.

Como puede observarse, cuando se energiza el dispositivo accionador electromagnético 100, la fuerza electromagnética es suficiente para recoger el perno accionador 101 contra la acción constante del resorte de retorno 102, el cual está dimensionado para producir la desviación del perno accionador 101 a la posición de reposo, cuando el dispositivo accionador electromagnético 100 es desenergizado.

El dispositivo accionador electromagnético 100 es generalmente desenergizado automáticamente cuando el lavarropas pasa a realizar operaciones de lavado, en las cuales el eje central 40 y el impulsor 50 son accionados por el motor 60 en una condición desacoplada del eje tubular 30 del cesto 20. Según se ha mencionado más arriba, la desenergización del dispositivo accionador electromagnético 100 hace que el resorte de retorno 102 impulse el perno accionador 101 a la posición de



reposo, en la cual interfiere con la cinta de freno 95, de modo de bloquear la rotación de esta última y también del resorte helicoidal 80 acoplado a ella, produciendo la apertura del resorte helicoidal 80 y el desacople entre los ejes central 40 y tubular 30 durante la operación de lavado.

También de acuerdo con la construcción ilustrada el eje central 40 incorpora una prolongación cilíndrica 46 adyacente y externa al extremo inferior 30a del eje tubular 30 y que presenta un diámetro externo sustancialmente igual al diámetro externo de dicho extremo inferior 30a del eje tubular 30. Esta construcción permite que dicho extremo inferior 30a del eje tubular 30 y dicha prolongación cilíndrica 46 del eje central 40 definan las extensiones axialmente adyacentes de estos dos ejes, alrededor de las cuales es montado el resorte helicoidal 80 que está construido preferiblemente con sustancialmente un único diámetro a lo largo de su extensión axial, de modo de apretar simultáneamente los dos ejes cuando la máquina efectúa la operación de centrifugado.

A pesar de haberse ilustrado solamente una realización de la invención, debe entenderse que podrán efectuarse modificaciones de forma y de disposición relativa de los elementos, sin apartarse del concepto constructivo definido en las reivindicaciones anexas.

S'

REIVINDICACIONES

1. Disposición de accionamiento para una máquina lavarropas, del tipo que comprende un tanque (10) fijado a una estructura (E); un cesto (20) dispuesto en el interior del tanque (10); un eje tubular (30) vertical, inferior y rotatoriamente vinculado a la estructura (E) y que tiene un extremo inferior (30a) y un extremo superior (30b) fijado al cesto (20); un eje central (40) vinculado rotatoriamente en el interior del eje tubular (30) y que tiene un extremo superior (40b) interno al cesto (20) y que lleva un impulsor (50) y un extremo inferior (40a) acoplado rotatoriamente a un motor eléctrico (60) fijado a la estructura (E), estando la disposición de accionamiento caracterizada por comprender un resorte helicoidal (80) montado apretadamente alrededor de extensiones axialmente adyacentes del eje tubular (30) y del eje central (40), acoplándolos rotatoriamente cuando el eje central (40) gira en un sentido, en una operación de centrifugado de la máquina; un manguito cilíndrico (90) vinculado rotatoriamente a la estructura (E) alrededor del resorte helicoidal (80) y que es fijado rotatoriamente a un extremo inferior (81) de este último; una cinta de freno (95) montada apretadamente alrededor del manguito cilíndrico (90) y que tiene una condición inoperante, en la cual libera al manguito cilíndrico (90) para girar conjuntamente con el resorte helicoidal (80) y con los ejes

tubular (30) y central (40), en el mencionado sentido, durante la operación de centrifugado, y una condición operativa, en la cual tiene su giro bloqueado en dicho sentido, frenando e interrumpiendo el giro del manguito tubular (90) y del resorte helicoidal (80) en dicho sentido de giro y abriendo radialmente el resorte helicoidal (80), de modo de desacoplar rotatoriamente los ejes tubular (30) y central (40); y un dispositivo accionador (100) montado en la estructura (E) y selectivamente accionado de una posición de reposo, en la cual lleva la cinta de freno (95) a la condición operativa, a una posición accionada en la cual la cinta de freno (95) es llevada a la condición inoperante.

2. Disposición de acuerdo con la reivindicación 1, caracterizada porque el dispositivo accionador (100) comprende un accionador electromagnético provisto de un perno accionador (101) forzado constantemente por un resorte de retorno (102), a la condición de reposo del dispositivo accionador (100), en la cual el perno accionador (101) bloquea el giro de la cinta de freno (95) llevada por el manguito cilíndrico (90), bloqueando el giro de este último.

3. Disposición de acuerdo con la reivindicación 2, caracterizada porque la cinta de freno (85) tiene un extremo opuesto (95a) que se proyecta radialmente a lo largo del manguito cilíndrico (90), para ser enganchado por el perno



(101) cuando el dispositivo accionador (100) está en una posición de reposo.

4. Disposición de acuerdo con la reivindicación 2, caracterizada porque el dispositivo accionador electromagnético (100) es desenergizado automáticamente cuando la máquina lavarropas pasa a realizar operaciones de lavado, en las cuales el eje central (40) y el impulsor (50) son accionados por el motor (60), en una condición desacoplada del eje tubular (30).

5. Disposición de acuerdo con la reivindicación 1, caracterizada porque el eje central (40) incorpora una prolongación cilíndrica (30a) del eje tubular (30) y presenta un diámetro externo sustancialmente igual al diámetro externo de dicho extremo inferior (30a) del eje tubular (30), definiendo dicho extremo inferior (30a) y dicha prolongación cilíndrica (46) las extensiones axialmente adyacentes de los ejes tubular (30) y central (40), alrededor de las cuales está montado el resorte helicoidal (80).

RESUMEN

DISPOSICIÓN DE ACCIONAMIENTO PARA UNA MÁQUINA LAVARROPAS, del tipo que comprende un tanque (10); un cesto (20); un eje tubular (30) vertical, inferior y rotatoriamente vinculado a una estructura (E); un eje central (40) vinculado rotatoriamente en el interior del eje tubular (30) y que tiene un extremo superior (40b) que lleva un impulsor (50) y un extremo inferior (40a) acoplado rotatoriamente a un motor eléctrico (60). La disposición de accionamiento comprende un resorte helicoidal (80) montado apretadamente alrededor del eje tubular (30) y del eje central (40), acoplándolos en una operación de centrifugado de la máquina; un manguito cilíndrico (90) vinculado rotatoriamente a la estructura (E) alrededor del resorte helicoidal (80) y que es fijado rotatoriamente a un extremo inferior (81) de este último; una cinta de freno (95) montada apretadamente alrededor del manguito cilíndrico (90) y que tiene una condición inoperante, en la cual libera al manguito cilíndrico (90) para girar conjuntamente con el resorte helicoidal (80) y con los ejes tubular (30) y central (40) durante la operación de centrifugado, y una condición operativa, en la cual tiene su giro bloqueado en dicho sentido, bloqueando el giro del manguito tubular (90) y del resorte helicoidal (80), de modo de desacoplar rotatoriamente los ejes tubular (30) y central (40); y un dispositivo accionador (100)

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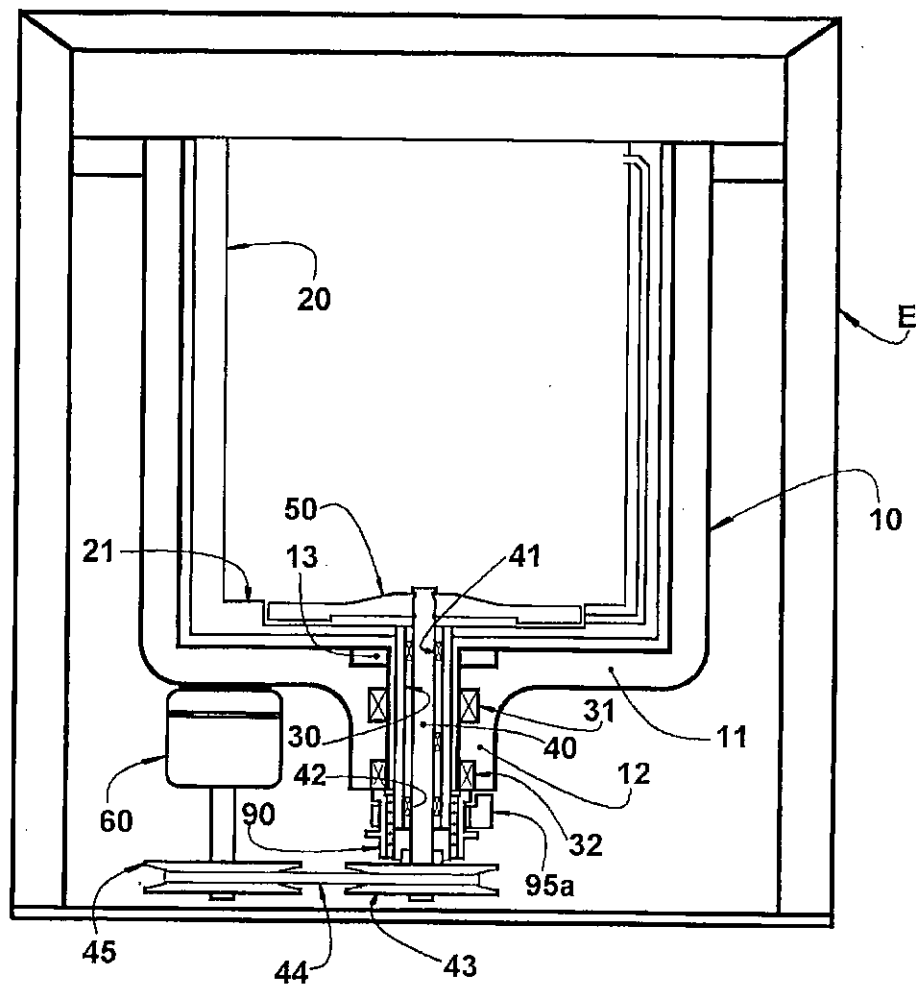


FIG. 1

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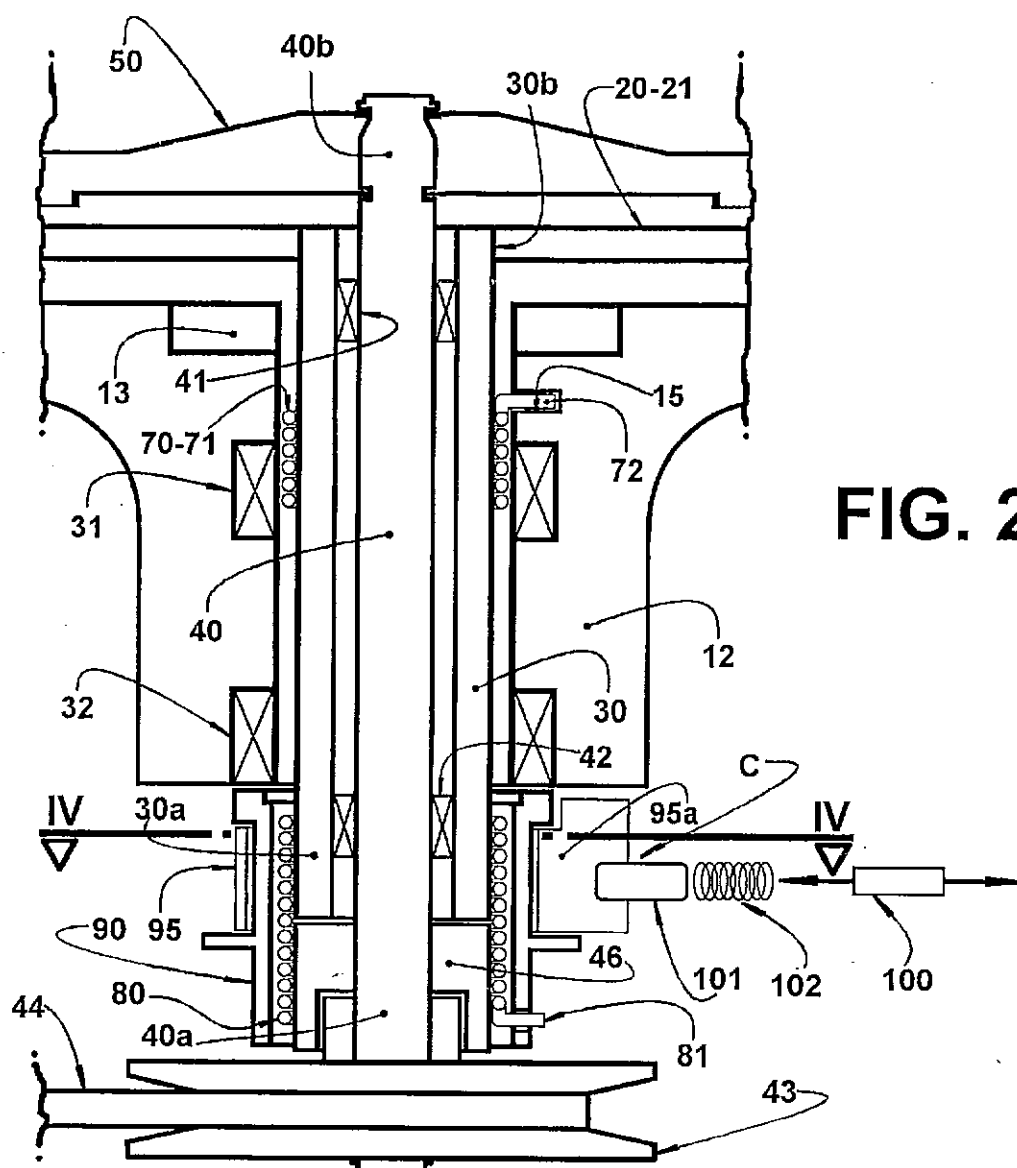


FIG. 2

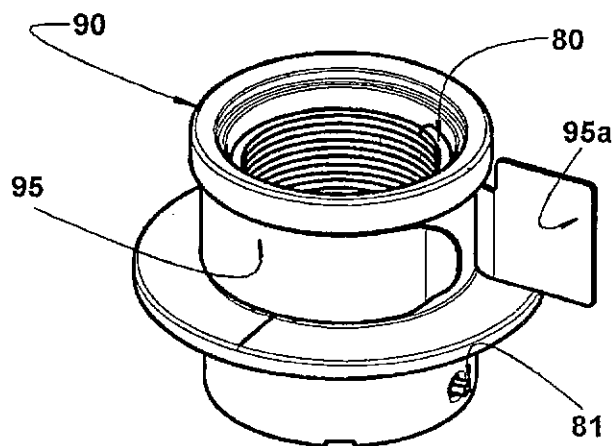
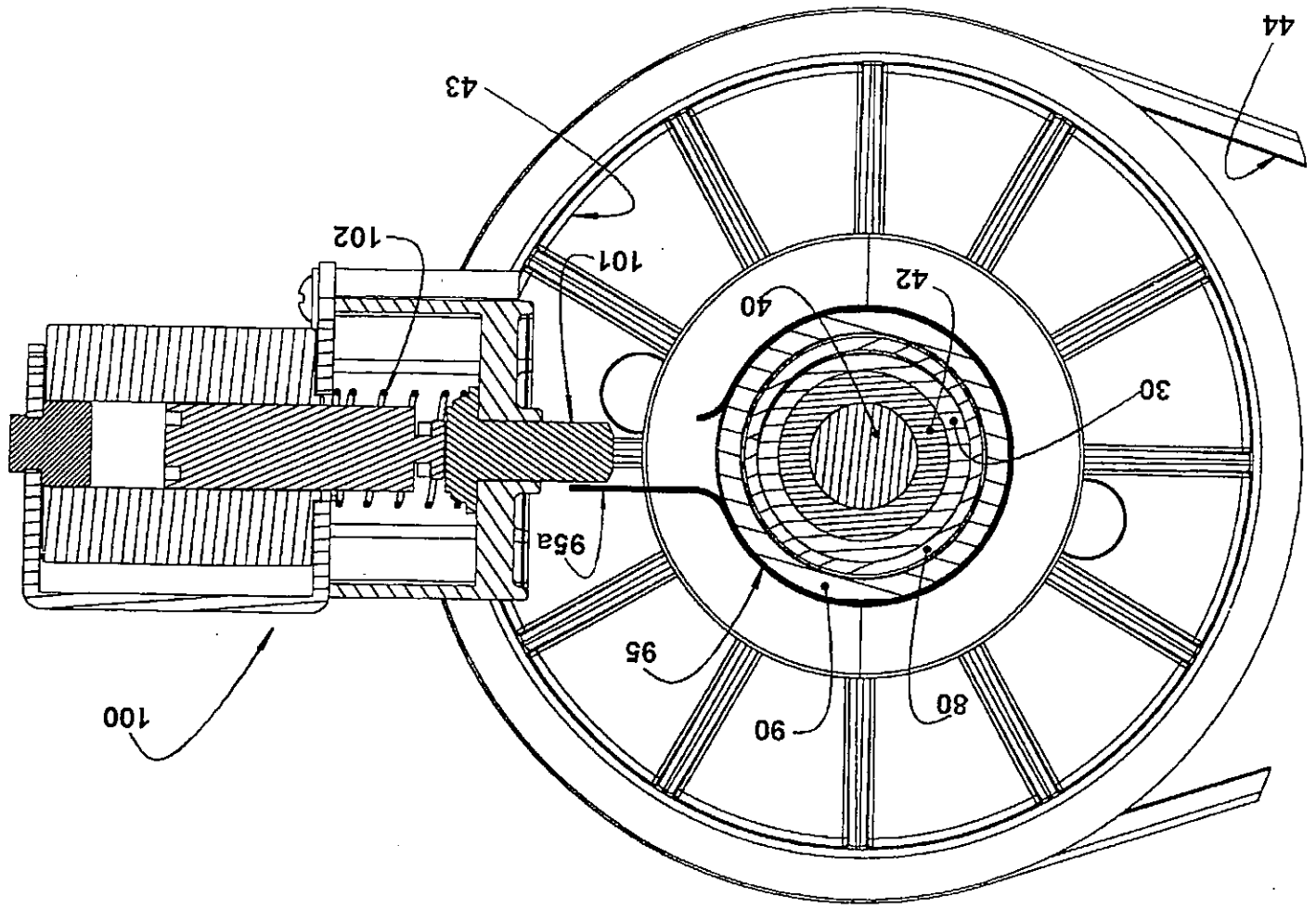


FIG. 3

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FIG. 4



PATENT COOPERATION TREATY

16 OUT 2006

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

ARNAUD, Antonio M.P.
Rua José Bonifacio, 93
9th Floor
01003-901 Sao 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)

02/10/2006

Applicant's or agent's file reference

WHIM438

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/BR2006/000123

International filing date

(day/month/year)

26/06/2006

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

PATENT COOPERATION TREATY

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Handwritten mark

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/BR2006/000123

International filing date (day/month/year)
26.06.2006

Priority date (day/month/year)
28.06.2005

International Patent Classification (IPC) or both national classification and IPC
INV. D06F37/40

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



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.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference WHIM438	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/BR2006/000123	International filing date (day/month/year) 26/06/2006	(Earliest) Priority Date (day/month/year) 28/06/2005
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 4 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. 2
☒ 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/BR2006/000123

63

A. CLASSIFICATION OF SUBJECT MATTER

INV. D06F37/40

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/081573 A1 (HAN JIN C) 21 April 2005 (2005-04-21)	1,5
A	page 2, paragraphs 25-28; page 3, paragraphs 32, 39, 41, 42; abstract; figures	2-4
X	US 2003/034054 A1 (LEE JOON-YEOP ET AL) 20 February 2003 (2003-02-20)	1,5
A	page 1, paragraphs 6-9, 14,15; page 2, paragraph 49 - page 3, paragraph 62; figures 2,4	2-4
A	US 2003/051516 A1 (LEE TAE HEE ET AL) 20 March 2003 (2003-03-20)	1-5
	page 1, paragraphs 2-8; page 2, paragraphs 16-19; abstract; figures	
	-/--	

☒ 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

21 September 2006

Date of mailing of the international search report

02/10/2006

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

International application No

PCT/BR2006/000123

64

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 969 341 A (BURK ET AL) 13 November 1990 (1990-11-13) the whole document -----	1-5

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/BR2006/000123

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2005081573	A1	21-04-2005	CN 1609332 A	27-04-2005
			JP 2005125078 A	19-05-2005
US 2003034054	A1	20-02-2003	JP 3501754 B2	02-03-2004
			JP 2002102588 A	09-04-2002
US 2003051516	A1	20-03-2003	CN 1408934 A	09-04-2003
			JP 2003088697 A	25-03-2003
			KR 2003024964 A	28-03-2003
US 4969341	A	13-11-1990	AU 646360 B2	17-02-1994
			AU 3109393 A	25-03-1993
			AU 638483 B2	01-07-1993
			AU 6203790 A	18-07-1991
			BR 9004670 A	10-09-1991
			CA 2024365 A1	06-07-1991
			MX 171953 B	24-11-1993
			NZ 235111 A	25-06-1992

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/BR2006/000128

66

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.
PCT/BR2006/000123

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

1. Statement

Novelty (N)	Yes: Claims	2-4
	No: Claims	1,5
Inventive step (IS)	Yes: Claims	2-4
	No: Claims	1,5
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1. Reference is made to the following documents:
D1 = US-A-2005/081573.
2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
 - 2.1 Document D1 discloses (the references in parentheses applying to this document):
A driving arrangement (power transmission unit) for a laundry machine (washing machine) of the type comprising a tub (water tub (11)) affixed to a structure (cabinet (10)); a basket (rotary tub (12)) disposed inside the tub; a vertical tubular shaft (hollow spin-drying shafts (23a), (23b)) inferiorly and rotatively mounted in the structure and having a lower end and an upper end affixed to the basket; a central shaft (first and second washing shafts (21) and (22)) rotatively mounted inside the tubular shaft and having an upper end inside the basket and carrying an impeller (pulsator (16)) and a lower end rotatively coupled to an electric motor (drive motor (17)) affixed to the structure, said driving arrangement comprises a helical spring (clutch spring (53)) tightly mounted around the axially adjacent extensions of both said tubular shaft and said central shaft, coupling them rotatively upon rotation of the central shaft; a cylindrical sleeve (cylindrical sleeve (54)) rotatively mounted in the structure around said helical spring and being rotatively affixed to the latter (e.g. see: figure 2); a brake area (performing the same function as the brake band of claim 1) formed around said cylindrical sleeve (fin-like protrusions; see figure 2) and having an inoperative condition, in which it releases said cylindrical sleeve to rotate jointly with said helical spring and with the tubular and central shafts, and an operative condition, in which said brake area has its rotation blocked, braking and interrupting the rotation of both said cylindrical sleeve and said helical spring and radially opening the helical spring, in order to rotatively disengage the tubular and central shafts; an actuating device (clutch lever (30)) mounted in the structure and selectively driven from a rest position, in which it conducts the brake area jointly with the sleeve and the spring to the operative condition, to a driven position, in which said brake area is conducted to the inoperative condition.
All the features of claim 1 are therefore known from D1.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)

International application No. 

PCT/BR2006/000123

3. The additional features of claim 5 are also known from D1.



US 20030034054A1

(19) United States

(12) Patent Application Publication

Lee et al.

(10) Pub. No.: US 2003/0034054 A1

(43) Pub. Date: Feb. 20, 2003

(54) WASHING MACHINE AND ITS WASHING METHOD

(76) Inventors: Joon-Yeop Lee, Seoul (KR); Ki-Su Lee, Suwon-City (KR)

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WASHINGTON, DC 200051202

(21) Appl. No.: 09/726,529

(22) Filed: Dec. 1, 2000

(30) Foreign Application Priority Data

Sep. 19, 2000 (KR)..... 2000-54981

Publication Classification

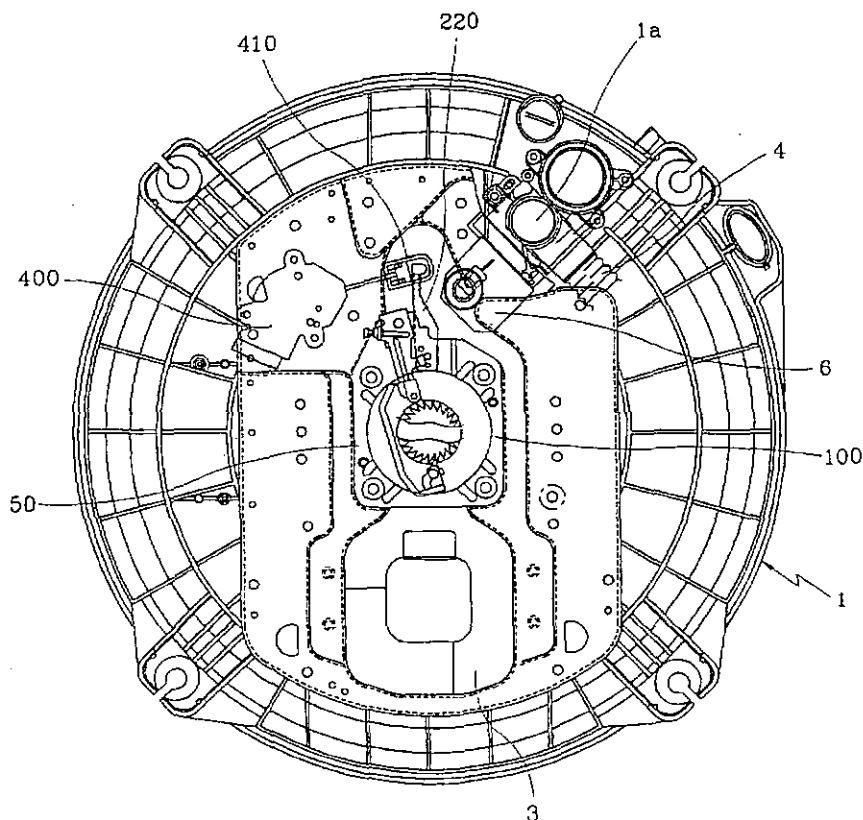
(51) Int. Cl.⁷ B08B 9/093

(52) U.S. Cl. 134/22.18; 134/23; 68/12.24

(57) ABSTRACT

A washing machine adopting a clutch structure wherein a power switching motor for controlling a brake band and a

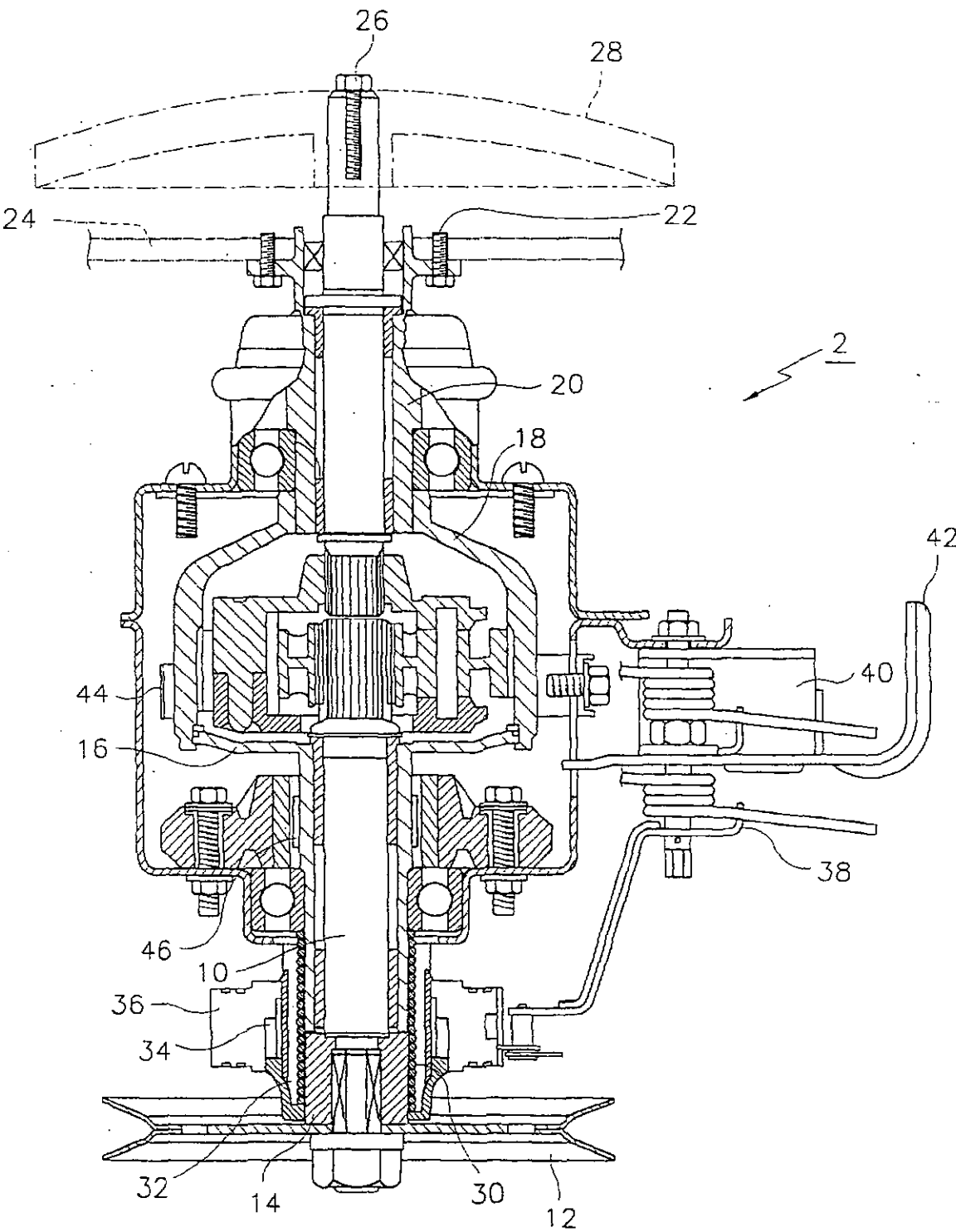
clutch lever in multi-stage is separately applied from a drainage motor, such that various kinds of water currents can be embodied according to the multi-control of the power switching motor and a washing method adequate to needs of cloth protection and coping with varying cloths can be provided to thereby enable to protect damage of cloths in advance, the washing machine comprising: a spin-dry tub rotably disposed in a water tub and connected to a drum and a gear case via a power line; a pulsator rotably disposed in a spin-dry tub and connected to a driving shaft coupling and a driving shaft via power line; a brake band for braking and releasing the rotation of the drum; a clutch spring for disconnecting and connecting the power of the driving shaft coupling and the gear case; and power switching motor for controlling in multi-stage operations of clutch spring and the brake band, the washing method comprising: a first water current control method wherein pulsator only rotates in forward/backward direction; a second water current control method wherein a spin-dry tub repeats forward/backward rotations in opposition to those of the pulsator; a third water current control method wherein the pulsator and the spin-dry tub rotates in forward direction only; and a fourth water current control method wherein the second water current control is alternatively operated under the third water current control state.



71
22

FIG.2

prior art



72

FIG. 4

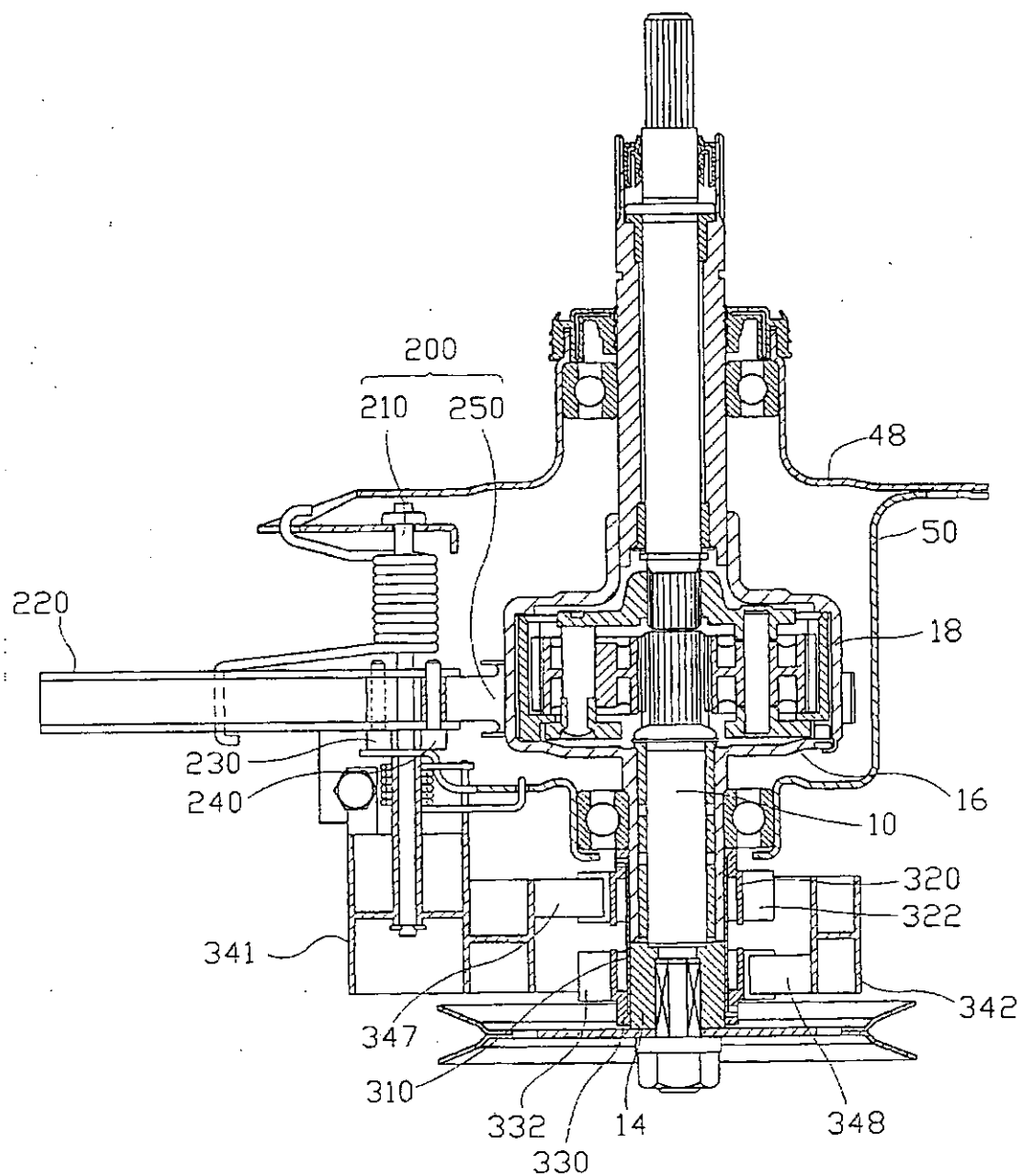


FIG. 7a

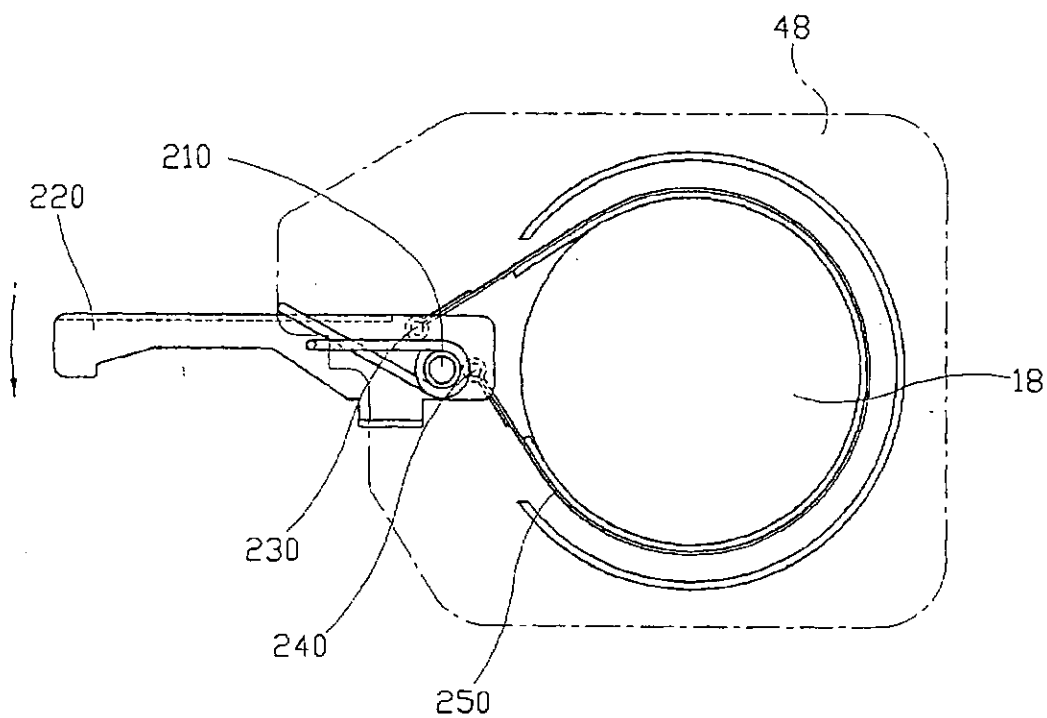
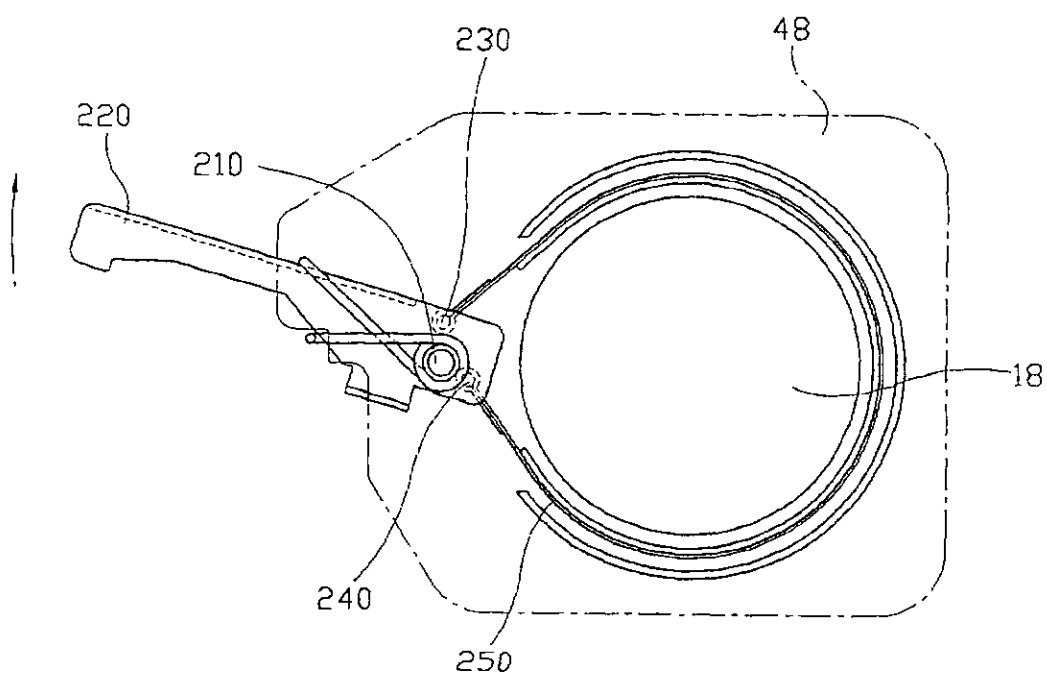


FIG. 7b



[Handwritten signature]

FIG. 9a

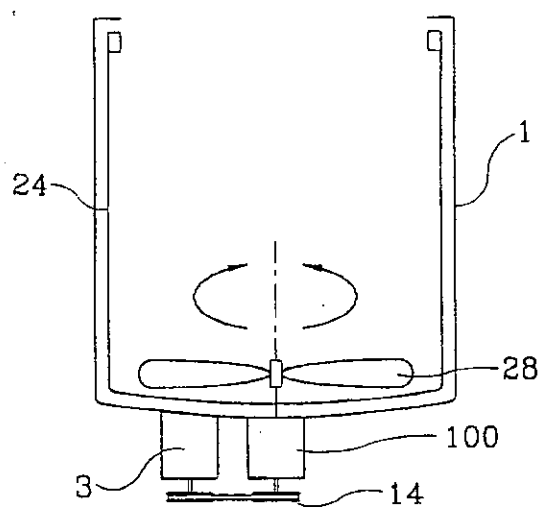
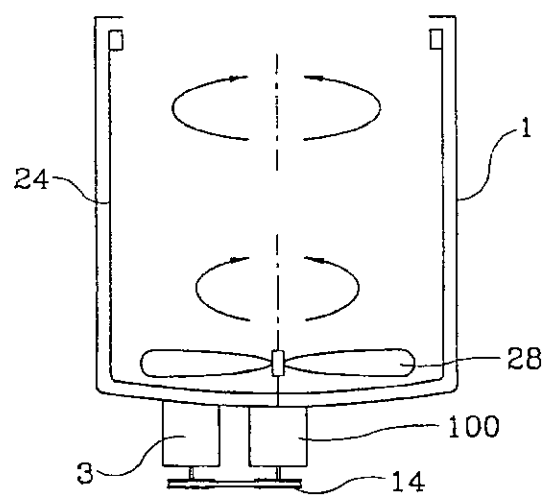


FIG. 9b



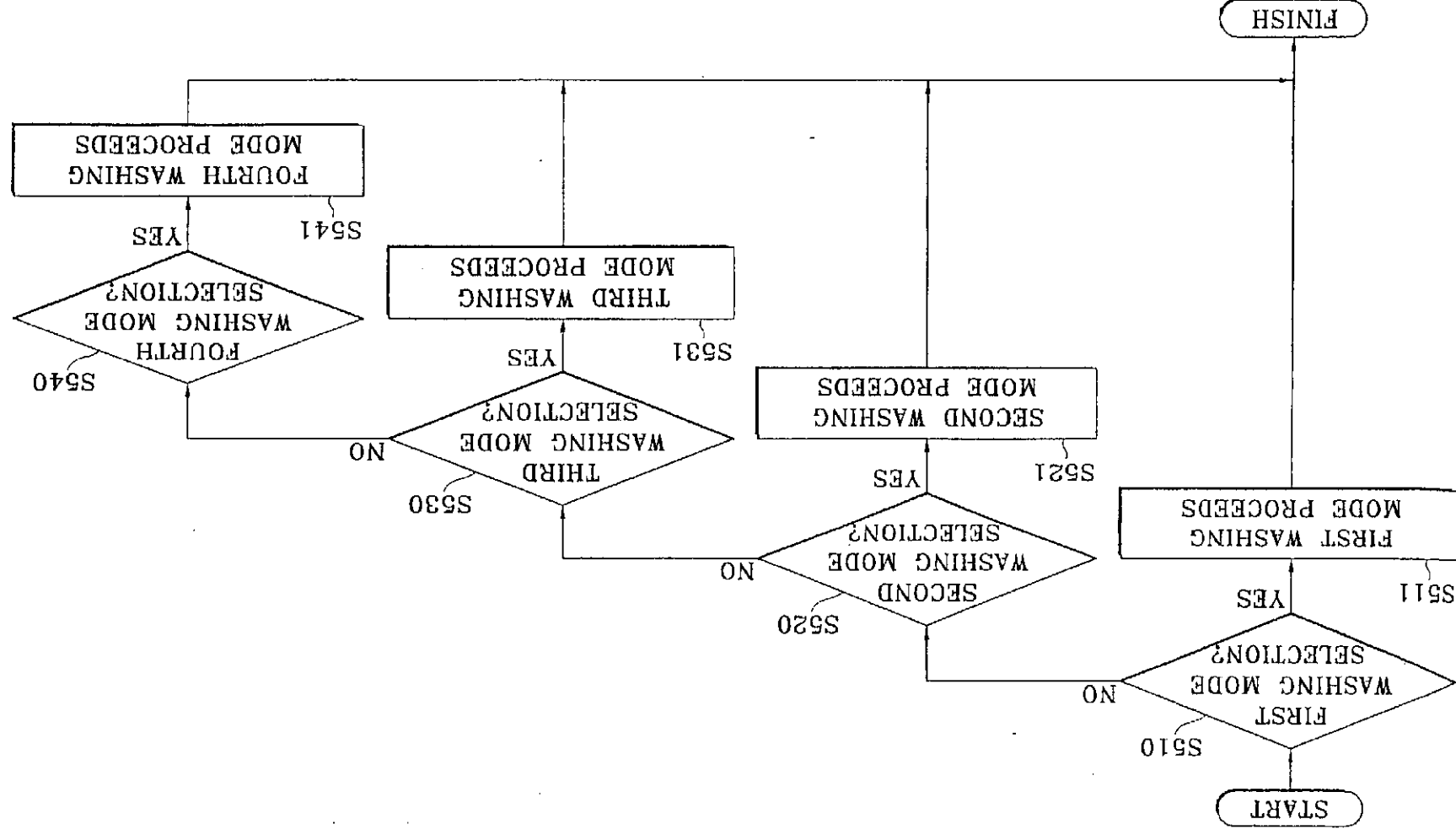


FIG. 10

[0018] It is another object of the present invention to provide a washing control method for embodying various water current according to the clutch structure and operation of drainage motor to cope with varying clothes and to make an adequate water current for protection of clothes thereby preventing in advance damage to the cloths.

[0019] In accordance with one object of the present invention, there is provided a fully automated washing machine, the washing machine comprising:

[0020] a spin-dry tub rotably disposed in a water tub and connected to a drum and a gear case via a power line;

[0021] a pulsator rotably disposed in the spin-dry tub and connected to a driving shaft coupling and a driving shaft via power line;

[0022] a brake band for braking and releasing the rotation of the drum;

[0023] a clutch spring for disconnecting and connecting the power of the driving shaft coupling and the gear case; and

[0024] power switching motor for controlling in multi-stage operations of clutch spring and the brake band.

[0025] In accordance with another object of the present invention, there is provided a washing method comprising:

[0026] a first washing mode wherein only a pulsator is repeated in forward and backward rotations while a power switching motor is inoperative;

[0027] a second washing mode wherein the pulsator and a spin-dry tub conversely repeat forward and backward rotations according to a first step control of the power switching motor;

[0028] a third washing mode therein the spin-dry tub and the pulsator repeat forward and backward rotation in one direction according to a second step control of the power switching motor; and

[0029] a fourth washing mode wherein the pulsator rotates in forward and backward rotations according to forward and backward rotations of a driving motor while the spin-dry tub repeats only forward rotation under the third washing mode.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] For fuller understanding of the nature and objects of the invention, reference should be made to the following detailed description taken in conjunction with the accompanying drawings in which:

[0031] FIG. 1 is a bottom view for illustrating relation among a driving motor, power transmission means, drainage motor and drainage hole according to the prior art;

[0032] FIG. 2 is a lateral sectional view for illustrating power transmission means according to the prior art;

[0033] FIG. 3 is a bottom view for illustrating relation among a driving motor, power switching motor, drainage hole, and drainage motor installed at a water tub according to the present invention;

[0034] FIG. 4 is a lateral sectional view for illustrating power transmission means according to the present invention;

[0035] FIG. 5 is a perspective view for illustrating a coupled state of brake part according to the present invention;

[0036] FIG. 6 is an exploded perspective view for illustrating a clutch part according to the present invention;

[0037] FIG. 7a is a plan for illustrating a brake band wound on a drum according to the present invention;

[0038] FIG. 7b is a plan for illustrating a brake band unwound from a drum according to the present invention;

[0039] FIG. 8a is a plan for illustrating a clutch part winding a clutch spring according to the present invention;

[0040] FIG. 8b is a plan for illustrating a clutch part unwound from a clutch spring according to the present invention;

[0041] FIG. 9a is a schematic drawing for illustrating formation of a first water current according to the present invention;

[0042] FIG. 9b is a schematic drawing for illustrating formation of a second water current according to the present invention;

[0043] FIG. 9c is a schematic drawing for illustrating formation of a third water current according to the present invention;

[0044] FIG. 9d is a schematic drawing for illustrating formation of a fourth water current according to the present invention; and

[0045] FIG. 10 is a washing flow chart according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0046] Preferred embodiments regarding clutch structure of a washing machine and washing control method according to the clutch structure of the present invention will now be described in detail with reference to the accompanying drawings.

[0047] As illustrated in FIG. 3, the washing machine according to the present invention is constituted by a driving motor 3 disposed at a bottom external side of a water tub 1 and power transmission means 100 centrally formed at a side of the bottom.

[0048] The power transmission means 100 is constituted at a predetermined location distanced therefrom by a drainage hole 1a connected to a drainage hose 4 for draining water in the water tub 1 and a drainage motor 6 for opening and closing the drainage hole 1a. The power transmission means 100 is further constituted by a power switching motor 400 for controlling the power transmission means 100 at two stages via a connecting bracket 410.

[0049] The power transmission means 100 includes, as illustrated in FIG. 4, a brake part 200 for controlling rotation of a drum 18 and a clutch part 300 for connecting and disconnecting power to a driving shaft coupling 14 connected to a washing axle line (by way of example, a driving

a second water current which is powerful and adequate to dirtier clothes, quilt and the like.

[0067] When the power switching motor 400 is activated to a second step while the drainage hole 1a is closed in the third washing mode, the brake lever 220 is operated to a direction shown in FIG. 7b by force pulled by the power switching motor 400 to urge the brake band 250 to be detached from the peripheral surface of the drum 18 to as much as a predetermined distance while the clutch spring 310 disposed within the upper/lower sleeves 320 and 330 are shrunk in its inner diameter by inherent resilience to be wound on the external circumference at a border between the driving shaft coupling 14 and the gear case 16 and the drum 18, gear case 16, clutch spring 310, driving shaft coupling 14 and driving shaft 10 are connected by one power line at the same time.

[0068] At this time, the drum 18 is released of its contact with the brake band 250 by operation where both ends of the brake band 250 are widened to mutually opposite directions, while the gear case 16 is electrically connected to the driving shaft 10 by the clutch spring 310 such that the spin-dry tub 24 and the pulsator 28 are simultaneously rotated only to forward direction each at the same speed to form a third weak water current for protection of clothes such as wool, lingerie and the like, as illustrated in FIG. 9c.

[0069] When the power switching motor 400 is activated at the second step while the drainage hole 1a is closed in the fourth washing mode, the brake lever 220 and the clutch lever 340 are activated in the same fashion as in the third washing mode, setting the drum 18 rotatively free and urging the gear case 16 to rotatively operate by receiving power from the driving shaft 10 via the clutch spring 310.

[0070] When the driving motor 3 is driven in the forward and backward directions under the above-mentioned state, the pulsator 28 is also rotated in the forward/backward directions while the spin-dry tub 24 repeats rotations to the forward direction only.

[0071] In other words, the forward rotational direction of the pulsator 28 is the same direction where the clutch spring 310 is wound on the external circumference at the border between the driving shaft coupling 14 and the gear case 16, such that, when the pulsator 28 is forwardly rotated, the spin-dry tub 24 connected to the gear case 16 and drum 18 via one power line is rotated in the same forward direction and at the same speed.

[0072] However, when the pulsator 28 is backwardly rotated, the clutch spring 310 wound on the external circumference at the border between the driving shaft coupling 14 and the gear case 16 is operated to an unwinding direction to disconnect the power to the driving shaft 10 and the gear case 16, such that, when the pulsator 28 is backwardly rotated, the spin-dry tub 24 cannot tag along in rotation with the pulsator 28 and the pulsator 28 is rotated only to one direction by inertia when the spin-dry tub 24 is forwardly rotated.

[0073] Successively, the spin-dry tub 24 is forwardly rotated at the same speed and in the same direction when the pulsator 28 is forwardly rotated, and repeats the idling fuzzy course when the pulsator 28 is backwardly rotated, such that a fourth water current stronger than the water current in the

third washing mode but weaker than the water current in the second washing mode can be formed.

[0074] Unlike the third washing mode, the fourth water current generates circulation or movement of cloths in the spin-dry tub 24 to increase washing efficiency by which damage to the clothes is decreased, such that the fourth water current is adequate to protection of cloths and washing of dirtier cloths.

[0075] The washing control method thus operated according to the present invention includes steps (S510, S520, S530, S540) for selecting one of a plurality of cloth or one of a plurality of washing courses, and steps (S511, S521, S531, S541) for controlling a water current according to the selected cloth or selected washing course.

[0076] The water current control method thus established is stored in a microcomputer and is embodied by a course selected by a user, the method comprising:

[0077] a first water current control method therein pulsator only rotates in forward/backward direction;

[0078] a second water current control method wherein a spin-dry tub repeats forward/backward rotations is opposition to those of the pulsator;

[0079] a third water current control method wherein the pulsator and the spin-dry tub rotates in forward direction only; and

[0080] a fourth water current control method wherein the second water current control is alternatively operated under the third water current control state.

[0081] By way of example, when a user selects a wool course (S530), a water current corresponding thereto is controlled (S531), and when a shirt course is selected (S520), a washing control step is taken where the second water current is controlled (S521).

[0082] As apparent from the foregoing, there is an advantage in the washing machine and its washing method thus described according to the present invention in that the washing machine has adopted a clutch structure wherein a power switching motor for controlling a brake band and a clutch lever in multi-state is separately applied from a drainage motor, such that various kinds of water currents can be embodied according to the multi-control of the power switching motor and a washing method adequate to needs of cloth protection and coping with varying cloths can be provided to thereby enable to protect damage of cloths in advance.

What is claimed is:

1. A fully automated washing machine, the machine comprising:

a spin-dry tub rotably disposed in a water tub and connected to a drum and a gear case via a power line;

a pulsator rotably disposed in the spin-dry tub and connected to a driving shaft coupling and a driving shaft via power line;

a brake band for braking and releasing the rotation of the drum;



US 20030051516A1

(19) **United States**

(12) **Patent Application Publication**

Lee et al.

(10) Pub. No.: **US 2003/0051516 A1**

(43) Pub. Date: **Mar. 20, 2003**

(54) **WASHING MACHINE HAVING FLOATAGE CLUTCH**

(30) **Foreign Application Priority Data**

Sep. 19, 2001 (KR)..... 57840/2001

(76) Inventors: Tae Hee Lee, Seoul (KR); Jin Woong Kim, Gwangmyung-si (KR); Si Moon Jeon, Seoul (KR)

Publication Classification

(51) Int. Cl.⁷ **D06F 37/40**

(52) U.S. Cl. **68/23.6**

Correspondence Address:

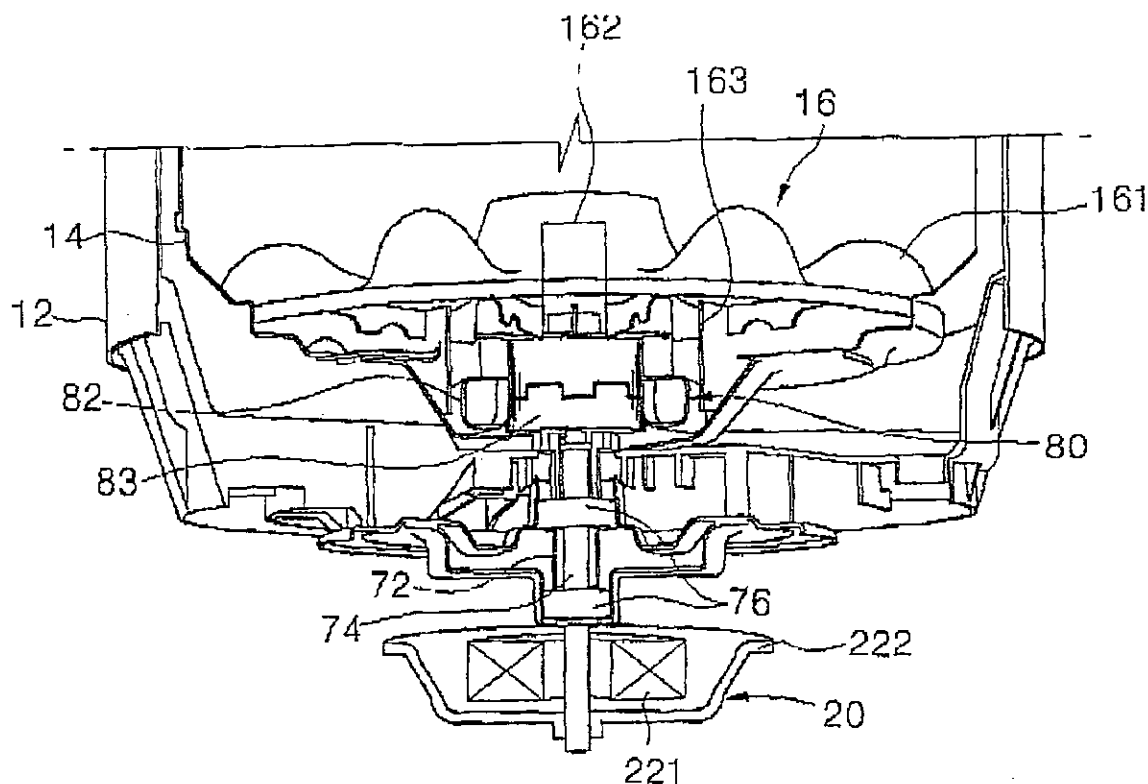
**BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747 (US)**

(57) **ABSTRACT**

The present invention relates a washing machine of direct drive pulsator manner that is directly connected to a motor. In this washing machine, the conversion of cleansing/dehydrating processes can be smoothly achieved by a floatage clutch capable of being actuated by floatage and gravity to be induced during the supply/drain of water.

(21) Appl. No.: **10/059,313**

(22) Filed: **Jan. 31, 2002**



29

FIG. 2

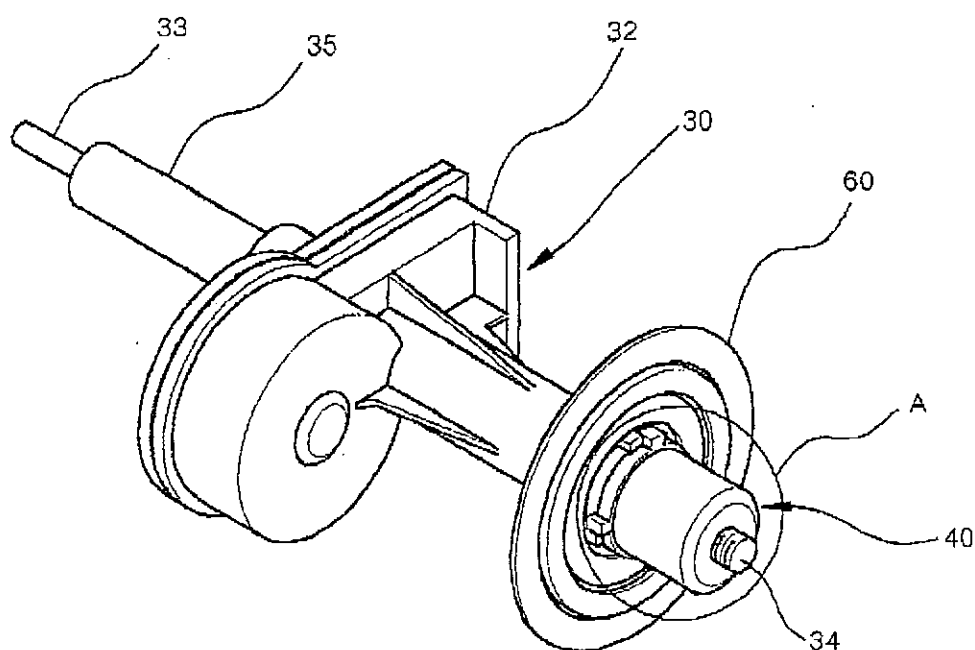
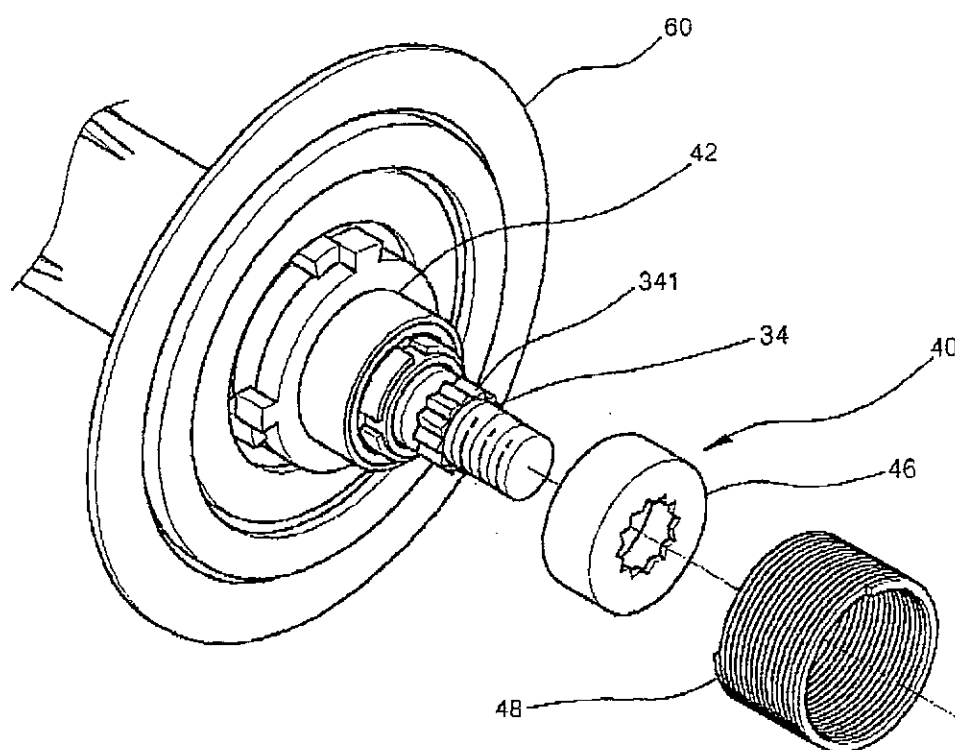
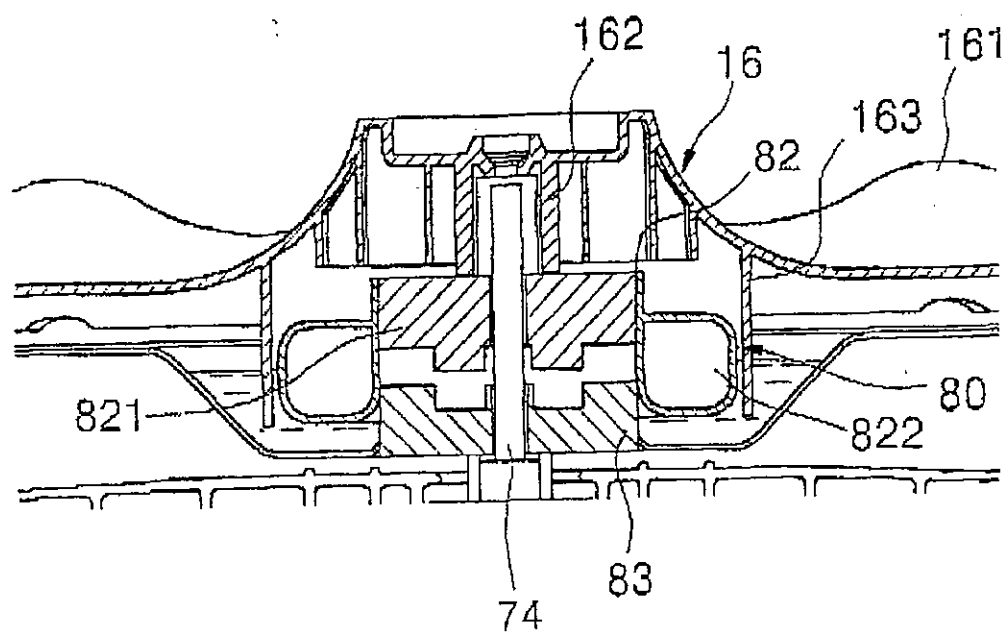


FIG. 3



30

FIG. 6



[0016] First of all, in the cleansing step, the pulley 44 is rotated in clockwise direction by the driving force of the driving motor 20, and then the spring block 46 connected with the pulley 44 and the lower pulsator shaft 34 coupled with the serration portion of the spring block 46 are rotated. At this time, the one-way spring 48 loosened, and since the brake disk 60 and the brake frictional portion 62 are in tightly contact with each other, so the gear box 32 is in a fixed state. In addition, as the lower pulsator shaft 34 is rotated, the first gear 54 engaged with the second gear 56 and the second gear 56 within the gear box 32 are rotated, and at the same time, the eccentric crank 52 disposed on the same rotating axial line of the first gear 54 is actuated.

[0017] In this case, the eccentric crank 52 is linearly reciprocated about the rotating axial line due to the structural feature thereof then the upper pulsator shaft 33 can be reciprocated by the pinion gear 50 engaged with the rack gear portion 521 of the eccentric crank 52, and consequently the pulsator 16 can be achieved in the forward and backward rotation.

[0018] Additionally, in the dehydrating step, the driving motor 20 is rotated in counterclockwise direction in opposite to the cleansing step, and the spring block 46 connected with the pulley 44 and the lower pulsator shaft 34 coupled with the spring block 46 are rotated in counterclockwise direction. In this case, the one-way spring 48 is fastened so that the spring block 46 and the spin shaft block 42 can be coupled, and the brake disk 60 and the brake frictional part 62 are separated by the operation of the position adjustment mechanism. Therefore, the gear box 32 and the spin shaft 35 are rotated with the spin shaft block 42. Since, the upper pulsator shaft 33 is rotated in the same direction, then the cleansing basket 14 and the pulsator 16 are rotated at the same time to perform a dehydrating work.

[0019] According to the related pulsator type washing machine, because the pulsator 16 is rotated in forward and backward to generate the complex water stream, the effect of cleansing is relatively high. And, the conversion from the cleansing step to the dehydrating step is automatically performed due to the conversion of operating direction of the driving motor 20 and the linking structure of the transmission 30 and the clutch mechanism 40.

[0020] However, substantial problems exist in this related construction. First of all, the structures of the transmission 30 and the clutch mechanism 40 for transferring the driving force of the driving motor 20 to the pulsator 16 and the cleansing basket 14 have complex structures, which deteriorates the productivity of the washing machine. Also, since the cleansing work is performed only by the simple forward and backward rotation of the pulsator 16, it is impossible to achieve various cleansing operations suitable for the feature of the laundry, thereby deteriorating a merchant ability of the washing machine.

SUMMARY OF THE INVENTION

[0021] The present invention has been made to overcome the above-described problems. Accordingly, it is an object of the present invention to provide a washing machine having a floatage clutch, which can smoothly switch the power transmission in the conversion from the cleansing step to the dehydrating step by using the floatage thereof, and which can secure the stability of the switching process.

[0022] To achieve the above objects, there is provided a washing machine comprises a water tub; a cleansing basket rotatably contained within the water tub; a pulsator rotatably mounted on the bottom surface of the cleansing basket, having a wing part for forming a water stream, and a hub part disposed in the center of the wing part; a motor for generating a driving force required to rotate the cleansing basket and the pulsator; a transmission for transmitting the driving force of the motor to the cleansing basket and the pulsator, having a hollow dryer shaft integrated to the cleansing basket; and a washing shaft mounted to penetrate the hollow dryer shaft, whose upper end of the transmission is fixed to the hub part of the pulsator, and whose lower end thereof is connected with the motor; and a floatage clutch for allowing the cleansing basket to selectively cooperate with the pulsator by being intermittently actuated depending on the existence and nonexistence of water, having a float engaged with the washing shaft to be capable of moving up and down due to the supply/drain of the water, and a fixed member fixed to the upper end of the hollow dryer shaft to be separated from and coupled with the float at the lower side thereof.

[0023] The shielding means is shaped as a ring to be protruded at the bottom of the wing part of the pulsator exceeding the cleansing basket downwardly, and includes a water blocking part surrounding the float.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a cross sectional view illustrating the construction of a related washing machine.

[0025] FIG. 2 is a perspective view illustrating the construction of a transmission of the related washing machine.

[0026] FIG. 3 is an exploded perspective view illustrating the construction of a clutch mechanism of the related washing machine.

[0027] FIG. 4 is a perspective view illustrating the construction of gear means applied in the transmission of the related washing machine.

[0028] FIG. 5 is a perspective view illustrating the construction of essential parts of a washing machine in accordance with an embodiment of the present invention,

[0029] FIG. 6 is a state view illustrating the operation of the floatage clutch applied in the embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0030] An embodiment of the present invention will now be described in more detail with reference to FIG. 5 and FIG. 6. In the following description, same drawing reference numerals are endowed in the same parts with the related construction.

[0031] First, FIG. 5 shows a washing machine in accordance with the embodiment of the present invention. The washing machine includes a water tub 12, a cleansing basket 14 contained within the water tub 12, a pulsator 16 rotatably mounted in the cleansing basket 14, a transmission 70 for controlling the rotating direction of the pulsator 16 and the cleansing basket 14; and a floatage clutch 80 for allowing the cleansing basket 14 to selectively cooperate with the pulsa-

will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A washing machine comprising:

a water tub;

a cleansing basket rotatably contained within the water tub;

a pulsator rotatably mounted on the bottom surface of the cleansing basket, having a wing part for forming a water stream, and a hub part disposed in the center of the wing part;

a motor for generating a driving force required to rotate the cleansing basket and the pulsator

a transmission for transmitting the driving force of the motor to the cleansing basket and the pulsator, having a hollow dryer shaft integrated to the cleansing basket; and a washing shaft mounted to penetrate the hollow dryer shaft, whose upper end of the transmission is fixed to the hub part of the pulsator, and whose lower end thereof is connected with the motor; and

a floatage clutch for allowing the cleansing basket to selectively cooperate with the pulsator by being intermittently actuated depending on the existence and nonexistence of water, having a float engaged with the washing shaft to be capable of moving up and down due to the supply/drain of the water, and a fixed member fixed to the upper end of the hollow dryer shaft to be separated from and coupled with the float at the lower side thereof.

2. The washing machine of claim 1, where in the float 82 includes a hub portion 821 to be coupled with a serration portion of the washing shaft 74, and a tube portion 822 constructed around the hub portion 821, and the hub portion 821 of the float 82 is formed with a convex-concave shape bottom surface, and the tube portion 822 is shaped as a blinded hollow tube, and the fixed member 83 is formed with a convex-concave shape top surface to be engaged with the bottom surface of the hub portion 821 of the float 82.

3. The washing machine of claim 1, wherein further comprising shielding means on the one side of the floatage clutch for preventing a joint region between the float of the floatage clutch and the washing shaft from being contact with the water.

4. The washing machine of claim 3, wherein the shielding means is shaped as a ring to be protruded at the bottom of the wing part of the pulsator exceeding the cleansing basket downwardly, and includes a water blocking part surrounding the float.

5. The washing machine of claim 2, further comprising shilding means on the one side of the floatage clutch for preventing a joint region between the float of the floatage clutch and the washing shaft from being contact with the water.

6. The washing machine of claim 5, wherein the shilding means is shaped as a ring to be protruded at the bottom of the wing part of the pulsator exceeding the cleansing basket downwardly, and includes a water blocking, part surrounding the float.

* * * * *

United States Patent [19]

Burk et al.

[11] Patent Number: 4,969,341

[45] Date of Patent: Nov. 13, 1990

[54] AUTOMATIC WASHER BASKET AND AGITATOR DRIVE SYSTEM

[75] Inventors: Jeffrey L. Burk, Lincoln Township, Berrien County; Douglas E. Wood, Hagar Township, Berrien County, both of Mich.

[73] Assignee: Whirlpool Corporation, Benton Harbor, Mich.

[21] Appl. No.: 461,324

[22] Filed: Jan. 5, 1990

[51] Int. Cl.³ D06F 23/04; D06F 37/40

[52] U.S. Cl. 68/23,700; 192/46; 192/89 A; 192/108

[58] Field of Search 68/23.7; 192/46, 89 A, 192/108

[56] References Cited

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Primary Examiner—Philip R. Coe

Attorney, Agent, or Firm—Hill, Van Santen, Steadman & Simpson

[57] ABSTRACT

A clutch mechanism is provided for the drive system of an automatic washer having a vertical axis agitator, a concentrically mounted wash basket, and a motor drivingly connected to the agitator to selectively oscillate or rotate the agitator about a vertical axis. The clutch mechanism selectively drivingly connects the wash basket with the motor for simultaneous rotation of the wash basket with the agitator during a water extraction mode of the washer. The clutch mechanism includes a first clutch member drivingly connected to the motor, and a second clutch member drivingly connected to the wash basket and selectively axially actuable for driving engagement with the first clutch member. A stationary cam housing is located adjacent the second clutch member, and a rotatable ring is disposed between the cam housing and the second clutch member. Cam elements are provided between the ring and the cam housing for selectively actuating the second clutch member into driving engagement with the first clutch member upon rotation of the ring within the cam housing. Opposing engagement surfaces of the clutch members are provided with alternating radially extending splines and grooves having a generally sawtooth profile. The splines of one of the clutch members are provided with squared tips, and the grooves of the other clutch member are provided with squared recesses, so that the shape of the corresponding splines and recesses provide an easily achieved yet secure connection when the clutch members are drivingly engaged.

20 Claims, 2 Drawing Sheets

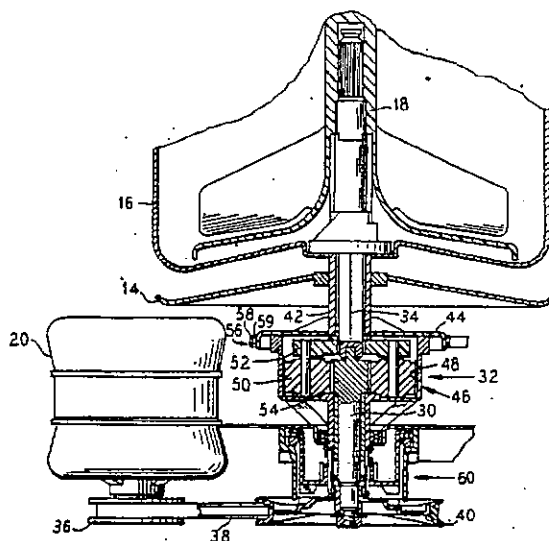


FIG. 5

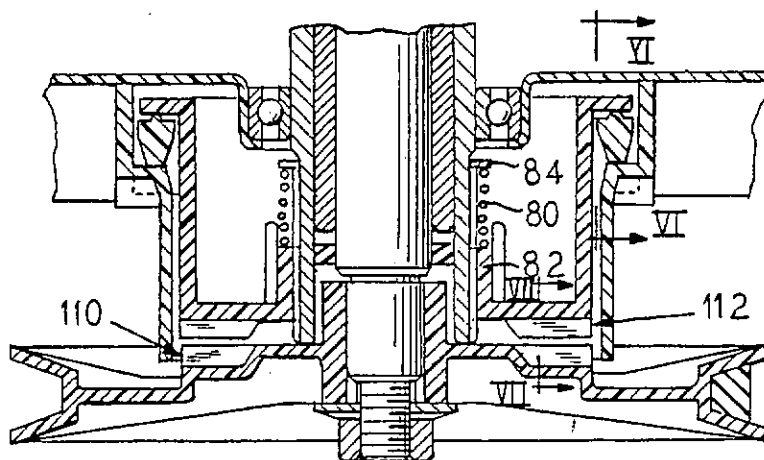


FIG. 8

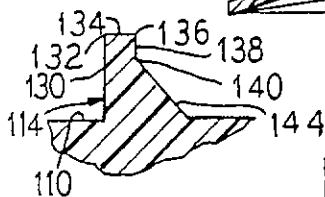


FIG. 7

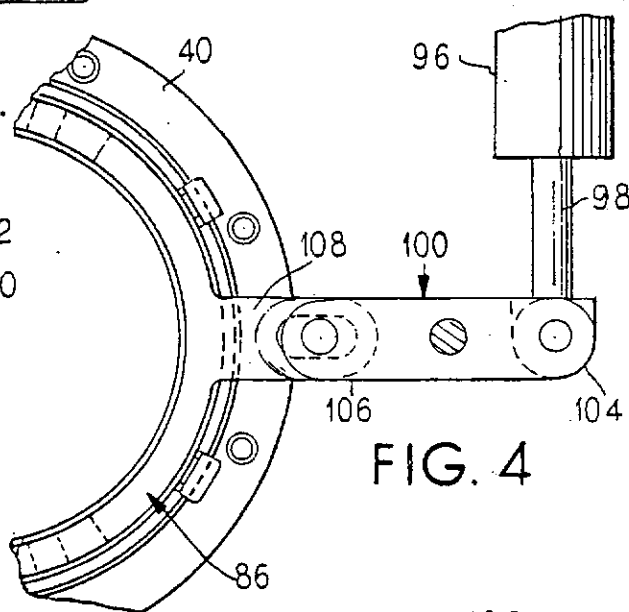
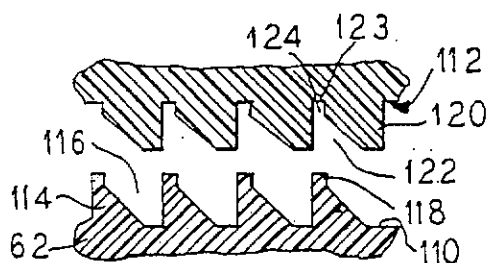


FIG. 4

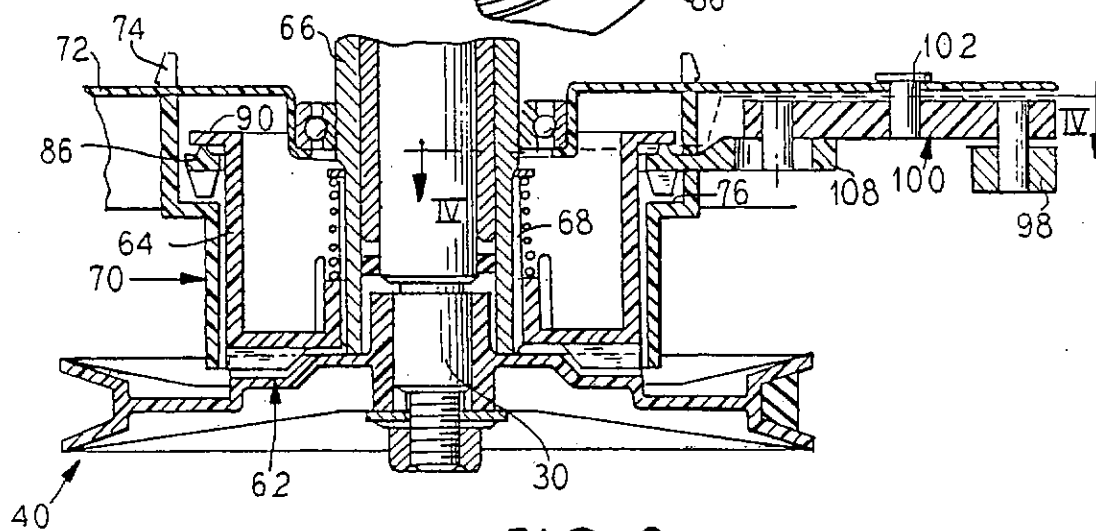


FIG. 3

receiving a load of materials to be washed and a vertical axis agitator 18. A motor 20 is provided which is drivingly connected to the agitator 18 to drive it in an oscillatory or rotary manner, and is also selectively connectable to the basket 16 for simultaneous rotation with the agitator 18. The assembly of the tub 14, wash basket 16, agitator 18, and motor 20 is mounted on a suspension system 22. A plurality of controls 26 are provided on a control console 28 for automatically operating the washer through a series of washing, rinsing, and liquid extracting steps.

The drive mechanism is shown in greater detail in FIG. 2, where it is seen that the motor 20 is connected through a drive shaft 30 to a gear arrangement, such as a planetary gear assembly 32, and to a vertical shaft 34 connected to the agitator 18. In this particular drive arrangement, the motor 20 may be a permanent split capacitor (PSC) motor, and is connected through a drive pulley 36 and a belt 38 to drive a driven pulley 40 affixed to the bottom of the drive shaft 30. The motor 20 may be reversely operated to provide oscillatory motion to the agitator. The wash basket 16 is connected to a spin tube 42, which is in turn connected to a hub surface 44 of a gear housing 46. The gear housing 46 includes an outer gear ring 48 which interacts with a plurality of planet gears 50. The vertical shaft 34 is connected to the planet gears 50 through the use of a connecting carrier plate 52, and a sun gear 54 is directly connected to the drive shaft 30.

When the washer is operating in the agitate mode, the motor 20 is operated in a reversing fashion which causes the drive shaft 30 to oscillate, thus driving the sun gear 54 in alternating opposite directions. The agitator 18 is therefore oscillated through its connection with the planet gears 50. The wash basket is held stationary during this operation, and to provide the means for holding the basket stationary, a band brake mechanism shown generally at 56 may be provided. The band brake mechanism 56 includes a brake band 58 having a high friction interior lining 59 which is engageable with at least a portion of the circumference of the hub 44 connected to the basket 16. The band brake 56 may be constructed and actuated as disclosed in commonly assigned and copending U.S. application No. 214,592, filed July 1, 1988, the specification of which is incorporated by reference herein.

Generally, in the agitate mode, the agitator 18 is oscillated through an angle of approximately 270° to 300° during each stroke. Often, it is desirable to hold the wash basket fixed relative to the wash tub during the agitate mode. This is accomplished by leaving the brake mechanism 56 in an "on" condition. However, during the water extraction step, the basket 16 is spun with the agitator 18. During this step the brake mechanism 56 is released from frictional engagement with the hub 44.

A clutch mechanism is required to provide a way of switching between oscillatory movement of the agitator relative to the basket, and spinning of the agitator with the basket. The present invention contemplates an improved and simplified clutch assembly 60, as shown in FIGS. 3 through 8. The clutch assembly 60 includes a clutch plate 62 integrated into the surface of the driven pulley 40, and a clutch slider 64. The clutch slider 64 is mounted for vertical movement on a cylindrical portion 66 of the gear housing 46 by means of vertical splines 68. A stationary cam housing 70 concentrically surrounds the clutch slider 64, and is secured to a mounting plate 72 of the washer 10 by a plurality of retaining tabs

74. The cam housing 70 also includes an inner annular rim 76 upon which are mounted a plurality of cam surfaces, shown in FIG. 6 as angularly spaced upwardly directed ramps 78. The clutch slider 64 is biased toward engagement with the clutch plate 62 by a spring or other resilient or elastic member 80, shown in FIG. 5 as being retained concentrically surrounding the cylindrical portion 66, between an inner cylinder 82 of the clutch slider 64 and a clip-ring spring abutment 84.

A rotatable ring 86, upon which are mounted angularly spaced, downwardly directed cam followers 88, is disposed between the annular rim 76 of the cam housing 70 and an abutment edge 90 of the clutch slider 64. Rotation of the ring 86 causes inclined surfaces 92 of the cam followers 88 to slide along inclined surfaces 94 of the cam housing 70 (FIG. 6). This rotation causes axial displacement of the clutch slider 64, due to contact between the ring 86 and the abutment edge 90 of the clutch slider 64. Rotation of the ring 86 may be achieved by an actuator 96 (for example, a solenoid actuator), acting through an actuator rod 98 to pivot a linkage 100 about a pivot pin 102. One end 104 of the linkage 100 is connected to the actuator rod 98, while another end 106 of the linkage 100 is connected to a lever arm 108 of the rotatable ring 86. Operation of the actuator 96 pivots the linkage 100, thus rotating the ring 86 and axially displacing the clutch slider 64.

Details of opposed engagement surfaces 110 and 112 of the clutch plate 62 and the clutch slider 64 are best illustrated in FIGS. 7 and 8. The engagement surface 110 of the clutch plate 62 includes a series of radially extending alternating splines 114 and grooves 116 disposed on the surface thereof. The splines 114 are provided with squared peaks 118. The engagement surface 112 of the clutch slider 64 includes a corresponding series of radially extending alternating splines 120 and grooves 122. The grooves 122, at their inner most portions 123, include square recesses 124 which are similar in size and dimension to the squared peaks 118 of the splines 114.

As can be seen in FIG. 8, each of the splines 114 includes a first surface 130 extending perpendicularly from the engagement surface 110 to a first predetermined point 132. A second surface 134 extends from the first predetermined point 132, parallel to the engagement surface 110, to a second predetermined point 136. A third surface 138 extends from the second predetermined point 136, downwardly toward the engagement surface 110 and parallel to the first surface 130, to a third predetermined point 140. A fourth surface 144 extends from the third predetermined point 140 outwardly and obliquely from the first surface 130, to the engagement surface 110.

As can be seen from FIG. 7, the grooves 122 of the clutch slider 64 correspond in shape to the splines 114 of the clutch plate 62, and the splines 120 of the clutch slider 64 correspond in shape to the grooves 116 of the clutch plate 62. During driving engagement of the clutch plate 62 and the clutch slider 64, the resilient or elastic member 80 urges the clutch slider 64 downwardly so that splines 114 are received in grooves 122 and splines 120 are received in grooves 116. This arrangement provides an easily achieved yet secure engagement between the clutch members.

Although the present invention has been described with reference to a specific embodiment, those of skill in the art will recognize that changes may be made thereto

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radially extending alternating first splines and first grooves disposed on said first engagement means and having a generally sawtooth profile;
 radially extending alternating second splines and second grooves disposed on said second engagement means and having a generally sawtooth profile;
 a squared tip at a peak of each of said first splines;
 a squared recess, corresponding in shape to said square peaks, at an innermost portion of each of said second grooves; and
 wherein, during driving engagement of said first and second engagement means, said first splines are received in said second grooves, and said first grooves receive said second splines.

14. An automatic washer according to claim 13, further wherein a ratio of a width of each of said square tips to a width of each of said splines is approximately 1/6.

15. An automatic washer according to claim 13, wherein said clutch means further comprises the following:
 said second engagement means being selectively axially actuable for driving engagement with said first engagement means;
 a stationary cam housing adjacent to said second engagement means;
 a rotatable ring disposed between said cam housing and said second engagement means; and
 cam means disposed between said ring and said cam housing for selectively actuating said second engagement means to drivingly engage said first engagement means upon rotation of said ring with respect to said cam housing.

16. A clutch mechanism including first and second clutch members defining parallel first and second opposed planar engagement surfaces being rotatable in a predetermined drive direction about a common axis perpendicular to said opposed engagement surfaces, said clutch members comprising the following:
 alternating first splines and first grooves on said first clutch member, axially protruding from a portion of said first opposed engagement surface, with each of said first splines including the following:

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a first side extending outwardly perpendicular to said engagement surface to a first predetermined point;
 a second side extending parallel to said engagement surface from said first predetermined point to a second predetermined point;
 a third side extending parallel to said first side from said second predetermined point toward said engagement surface to a third predetermined point; and
 a fourth side extending obliquely from said third predetermined point to said engagement surface;
 alternating second splines and second grooves on said second clutch member, wherein, during driving engagement of said first and second clutch members, said first splines are received in said second grooves, and said first grooves receive said second splines.

17. A clutch mechanism according to claim 16, further comprising the following:
 a stationary cam housing adjacent to said second clutch member;
 a rotatable ring disposed between said cam housing and said second clutch member; and
 cam means disposed between said ring and said cam housing for selectively actuating said second clutch member to drivingly engage said first clutch member upon rotation of said ring with respect to said cam housing.

18. A clutch mechanism according to claim 17, wherein said cam means further comprises the following:
 upwardly directed ramps on said cam housing; and
 cam follower means, attached to said ring, for interacting with said ramps to translate rotation of said ring into relative axial movement of said first and second clutch member.

19. A clutch mechanism according to claim 17, further comprising resilient means for biasing said second clutch member towards engagement with said first clutch member.

20. A clutch mechanism according to claim 17, further comprising actuation means for producing rotary motion of said rotatable ring relative to said cam housing.

* * * * *

PATENT COOPERATION TREATY

Rec.: 05/10/06
PCT/BR2006/000123 97

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 WHIM438	IMPORTANT NOTIFICATION
International application No. PCT/BR2006/000123	International filing date (day/month/year) 26 June 2006 (26.06.2006)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 28 June 2005 (28.06.2005)
Applicant WHIRPOOL S.A. et al	

- 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).
- (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.
- (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
28 June 2005 (28.06.2005)	PI0502810-8	BR	31 August 2006 (31.08.2006)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Simin Baharlou Facsimile No. +41 22 338 71 30 Telephone No. +41 22 338 99 32
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PCT REQUEST

Original (for SUBMISSION)

0	For receiving Office use only	
0-1	International Application No.	PCT / B R 2006 / 0 0 0 1 2 3
0-2	International Filing Date	26 JUN 2006 2 6 0 6 0 6
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	WHIM438
I	Title of Invention	DRIVING ARRANGEMENT FOR A LAUNDRY MACHINE
II	Applicant	
II-1	This person is	applicant only
II-2	Applicant for	all designated States except US
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II-9	Facsimile No.	(55) (11) 5586-6043

PCT REQUEST

Original (for SUBMISSION)

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III-3-7	State of residence	BR

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PCT REQUEST

Original (for SUBMISSION)

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.
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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	28 June 2005 (28.06.2005)
VI-1-2	Number	PI0502810-8
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)

PCT REQUEST

Original (for SUBMISSION)

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	15	-
IX-3	Claims	3	-
IX-4	Abstract	1	✓
IX-5	Drawings	3	-
IX-7	TOTAL	27	
	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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WHIM438

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PCT REQUEST

Original (for SUBMISSION)

[Handwritten signature]

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	26 JUN 2006 2 6 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	

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PCT (ANNEX - FEE CALCULATION SHEET)

Original (for SUBMISSION)

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0	For receiving Office use only	PCT / B R 2006 / 00 0123		
0-1	International Application No.			
0-2	Date stamp of the receiving Office			
0-4	Form PCT/RO/101 (Annex) PCT Fee Calculation Sheet			
0-4-1	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	WHIM438		
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	0		
12-5	Additional amount (X)	0 EQF		
12-6	Total additional amount i2	0 EQF		
12-7	i1 + i2 = i	2614.18 EQF		
12-12	EASY Filing reduction R	EQF-186.73		
12-13	Total International filing fee (i-R) l	⇒		2427.45
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	7142.31
12-19	Mode of payment	cash		

PCT

Original (for SUBMISSION)

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

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EMÍLIO SCATAMBURLO (1943-1992)

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OUR REF.: PT-1905/06

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 0502810-8
Applicant: MULTIBRÁS S.A. ELETRODOMÉSTICOS
Title: "DRIVING ARRANGEMENT FOR A LAUNDRY MACHINE"
PCT easy ref.: **WHIM438**

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.**".

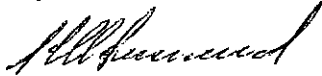
Please find attached the documents showing the change above-mentioned:

- 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

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,



Antonio M.P. Arnaud

PATENT COOPERATION TREATY

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
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Applicant's or agent's file reference

WHIM438

International application No.

PCT/BR2006/000123

International filing date
(day/month/year)

Applicant

WHIRLPOOL S.A.

Priority date

(day/month/year)

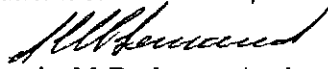
June 28, 2005

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

"DRIVING ARRANGEMENT FOR A LAUNDRY MACHINE"

Field of the Invention

The present invention refers to a driving arrangement for a laundry machine of the type comprising a structure in which is affixed a vertical cylindrical tub dimensioned to contain a load of washing liquid and in whose interior is mounted a perforated basket, generally cylindrical designed to receive the clothes to be washed, vertically and rotatively mounted in the machine structure by means of a tubular shaft and housing an impeller mounted to the upper end of a vertical central shaft, rotatively mounted in the tubular shaft and which is coupled to a motor unit responsible for the selective rotary drive of both the impeller and the basket in different steps of the machine operation.

Background of the Invention

In the laundry machines of the type mentioned above, the washing operations of the clothes contained in the basket are carried out by rotation of the impeller, generally in two opposite directions by a certain number of turns and at a certain given speed, taking into account the movement to be imparted to both the clothes and the washing liquid, in order to obtain a desired washing efficiency, as well as the wear to be imposed to the clothes due to the movement to which said clothes are submitted.

Such machines further allow a spinning operation to be carried out to extract the water from the clothes, when the basket and the impeller have their shafts coupled and rotated in the same direction, at a rotation that may be equal or superior to that applied to the impeller in the washing operations.

In these known machines, the basket usually requires to be locked, so as not to rotate in relation to both

the tub and the machine structure during the washing operation, in which the impeller is caused to rotate in one or in the opposite direction to move the washing liquid and the clothes immersed therein. For this purpose, there are known electromagnetic locking devices, which are automatically driven to keep the basket locked to the structure during washing and to release it to rotate during spinning. Besides this basket locking device, these machines also require a coupling device, generally also electromagnetic, for connecting the tubular shaft of the basket to the central shaft of the impeller, so that said basket can rotate jointly with the impeller during the spinning operation of the clothes.

The use of two electromagnetic locking devices, one for coupling the basket to the structure and the other for coupling the basket to the impeller, is also a factor that increases the final cost of the machine. Even in the case of using a unidirectional locking device of the wrap spring type between the basket and the structure, it is necessary to lock the basket in the opposite direction through other means, such as for example a unidirectional engaging bearing, which is also a cost-increasing element.

The basket, by not being rotatively locked to the structure in neither rotation direction of the impeller, is caused to rotate jointly with the impeller by action of the drag made by both the washing liquid and the clothes. In this situation, the washing liquid rotates in an increasing speed, creating a vortex and increasing its volume, until possibly flowing over the upper edge of the tub.

To comply with the requirements regarding cost reduction of the machine and the operational conditions, which are necessary to achieve an

efficient washing without causing excessive wear to the clothes, is one of the problems to be solved in the known laundry machines.

Aiming at eliminating the disadvantages and deficiencies of the machines, a solution disclosed in
5 Brazilian patent application PI0204385-8 has been proposed by the same applicant, according to which the central shaft of the impeller is alternatively and rotatively driven by the motor, in a first rotation
10 direction, during the first rotation time, and in a second rotation direction during a second rotation time, which is substantially shorter than the first rotation time, during a washing operation of the machine, the tubular shaft of the basket being
15 constantly and rotatively locked in relation to the structure in said first rotation direction and maintained rotatively free in the second rotation direction, said basket having its tubular shaft rotatively locked to the central shaft of the impeller
20 when the latter is driven by the motor in the second rotation direction, upon a spinning operation of the machine.

In said previous solution of the same applicant, the locking of the tubular shaft to the machine structure
25 is made in a simple way and in a single direction manner through a locking device of the wrap spring type, using a first spring which assures the locking of the basket against rotation in said first direction in any step of the machine operation, the basket
30 remaining free to rotate in said second direction during the washing step and jointly with the impeller in the same second direction upon the spinning step. The control of the free rotation of the basket in the second direction in the washing step is made by
35 limitation of time.

On the other hand, in order to couple the tubular shaft of the basket to the central shaft of the impeller during the spinning step, the solution proposed in BR PI0204385-8 uses a coupling device comprising a second helical spring mounted around an axial extension of the tubular shaft and which has a first end attached to the central shaft and a second end attached to a cylindrical sleeve that is rotatively mounted in the structure around the second spring, said cylindrical sleeve rotating jointly with said spring and the central shaft. A brake band is tightly mounted around the cylindrical sleeve and designed to have its rotation selectively blocked during the spinning operation, reducing the rotation of the cylindrical sleeve and thus promoting the tightening of the second spring around the tubular shaft, coupling it rotatively to the central shaft and allowing the basket to rotate jointly with the impeller in the spinning operation.

In this prior construction, an electromagnetic device (solenoid) secured to the structure is energized during the spinning operation, so that its actuating pin blocks the rotation of the brake band jointly with the cylindrical sleeve, so that the latter promotes the tightening of the second spring around the tubular shaft of the basket.

Although assuring a correct and automatic operation of the laundry machine at an acceptable cost, this prior art solution still presents a characteristic that needs to be improved, due to the fact that in the spinning operation the electromagnetic device must remain energized, so as to lock the rotation of the brake band around the cylindrical sleeve, with a force sufficient to assure the frictional tightness of the second spring around the tubular shaft. Moreover,

during the spinning, the brake band remains in a wearing frictional contact with the cylindrical sleeve in a region that is susceptible to the presence of oil, impairing the coupling.

5 Summary of the Invention

Due to the deficiency commented above, it is an object of the present invention to provide a driving arrangement for a laundry machine of the type discussed above, presenting a simple constructive solution with a relatively reduced cost and which may assure an efficient coupling between the central shaft of the impeller and the tubular shaft of the basket in the spinning operation, without being subject to premature wear and to the negative effects of the presence of oil in the coupling region.

The objective mentioned above is attained by a driving arrangement for a laundry machine of the type that comprises a tub attached to a structure; a basket disposed in the interior of the tub; a vertical tubular shaft inferiorly and rotatively mounted in the structure and which has a lower end and an upper end affixed to the basket; a central shaft rotatively mounted in the interior of the tubular shaft and having an upper end inside the basket and carrying an impeller, and a lower end rotatively coupled to a motor unit attached to the structure.

According to the present invention, the driving arrangement comprises a helical spring tightly mounted around the axially adjacent extensions of both the tubular shaft and the central shaft, rotatively coupling them upon rotation of the central shaft, in one direction, in a spinning operation of the machine; a cylindrical sleeve rotatively mounted in the structure around the helical spring and being rotatively affixed to a lower end of the latter; a

brake band tightly mounted around the cylindrical sleeve and having an inoperative condition, in which it releases the cylindrical sleeve to rotate jointly with the helical spring and with the central and tubular shafts, in said direction, in the spinning operation, and an operative condition, in which its rotation is blocked in said direction, braking and interrupting the rotation of both the tubular sleeve and the helical spring in said rotation direction and radially opening the helical spring, so as to rotatively disengage the tubular and central shafts; and an actuating device mounted to the structure and which is selectively driven from a rest position, in which it conducts the brake band to the operative condition, to a driven position, in which the brake band is conducted to the inoperative condition.

With the construction cited above, the tubular and central shafts remain usually coupled to each other through the helical spring in its rest operational condition, around said shafts and connected to the cylindrical sleeve, which remains free to rotate jointly with the spring and the two shafts in the spinning operation, when the actuating device remains in the driven position, in order to release the rotation of the brake band jointly with the cylindrical sleeve. Thus, in order to couple the shafts, only the tightening force of the helical spring is used. In the washing operation, the actuating device is kept in the rest position, in which it maintains the brake band in the operative condition, with its rotation blocked by the actuating device, making the cylindrical sleeve brake, interrupting its rotation and opening the helical spring in relation to the central shaft and, in a lesser extent, to the tubular shaft, remaining

stationary jointly with the cylindrical sleeve. In this condition, there is no frictional sliding between the brake band and the cylindrical sleeve.

Brief Description of the Drawings

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

Figure 1 is a schematic diametrical vertical sectional view of a laundry machine of the type considered
10 herein;

Figure 2 is a simplified enlarged diametrical sectional view of the region in which the impeller and the basket are rotatively mounted, and in which is mounted a device for automatically locking, in one
15 direction, said basket in relation to the structure of the laundry machine and in which is also mounted a clutch means for promoting a relative rotational coupling between the central shaft of the impeller and the tubular shaft of the basket during the spinning
20 operation;

Figure 3 is a perspective view of a brake band mounted around a cylindrical sleeve, in which interior the helical spring is mounted; and

Figure 4 is an enlarged cross-sectional view of the
25 region in which the central shaft of the impeller and the tubular shaft of the basket are rotatively coupled, taken according to line IV-IV in figure 2 and illustrating the actuating device in the rest, de-energized condition.

30 Description of the Invention

As illustrated in figure 1, the present invention is applied to a laundry machine of the type which comprises a structure E generally defining a prismatic cabinet within which is affixed, by any adequate
35 means, a vertical and generally cylindrical tub 10,

which is inferiorly closed by a bottom wall 11, superiorly opened, and dimensioned to contain a load of washing liquid. It should be understood that the tub 10 may be constructed to define, itself, the upper portion of the structure E.

Inside the tub 10 there is coaxially mounted a perforated and also generally cylindrical basket 20, which is provided with a bottom wall 21, superiorly opened and designed to contain the clothes to be washed, said bottom wall 21 being centrally attached to the upper end 30b of a tubular shaft 30, vertically projecting downwardly and outwardly from the tub 10 to be supported by a pair of bearings 31, 32 mounted to a bearing support 12 which is affixed to the bottom wall 11 of the tub 10 or incorporated to said bottom wall 11 in a single piece. This assembly of the basket 20 allows it to rotate freely around its longitudinal axis seated on the tubular shaft 30.

The passage of the tubular shaft 30 through the bottom wall 11 of the tub 10 is made with the aid of a retainer 13 mounted to said bottom wall 11.

Inside the tubular shaft 30, a central shaft 40 is rotatively mounted generally by means of bushings 41, 42, and to the upper end 40b of said central shaft is affixed an impeller 50 in the form of a disk positioned on the bottom wall 21 of the basket 20, maintaining from said bottom wall 21 a small axial spacing.

The lower end 40a of the central shaft 40 projects outwardly from the tubular shaft 30 to receive a driven pulley 43, which is operatively coupled, by means of a belt 44, to a drive pulley 45 affixed to the shaft of an electric motor 60 mounted to the structure E of the machine, usually by being generally directly or indirectly affixed to the bottom wall 11

of the tub 10. The fixation of the drive pulley 45 to the shaft of the motor 60 can be made by interference, using grooves produced in said shaft, in order to assure the fixation and the transmission of torque
5 therebetween, with no need of using additional fixation elements, such as nuts, for example.

This construction leads to a driving arrangement and transmission that are very simple and present a relatively reduced cost as compared to the driving
10 arrangements with variable speed and the transmissions in which the speed variation is automatically controlled as a function of the required operation.

According to an aspect of the invention, which is illustratively exemplified in figure 2, the laundry
15 machine comprises a locking device 70 for locking the tubular shaft 30 in relation to the structure E, more specifically in relation to the bearing support 12, in a single rotation direction of said tubular shaft 30.

In a preferred constructive form of the invention, the
20 locking device 70 comprises a helical spring 71, which is mounted around the tubular shaft 30, so as to slidably seat around the latter when the locking device 70 is in an inoperative condition, said helical spring 71 having an end 72 projecting radially
25 outwardly, in order to remain constantly fitted and locked in a housing 15 provided in the bearing support 12.

This construction provides an extremely simple and inexpensive locking of the basket in a first rotation
30 direction, but it does not promote any locking in the opposite direction.

Thus, when the machine is working in the washing condition, the impeller 50 is rotated in the first direction for a certain time, tending to make the
35 basket 20 rotate in the same direction. However, the

locking device 70 prevents the basket 20 from rotating in said first direction and consequently avoids the formation of a vortex by the joint displacement of the washing liquid, load of clothes, basket 20 and
5 impeller 50.

Nevertheless, when the impeller 50 has its rotation interrupted and inverted to a second direction opposite to the first one, the basket 20 is forced by the washing liquid to rotate also in the same speed
10 and in said second direction, in which no locking occurs relative the basket 20.

In order to prevent the level of the washing liquid from rising excessively with the rotational acceleration of the basket 20, the invention provides
15 a specific operational procedure which is to produce an asymmetry in the rotation times of the impeller 50 in said two directions.

Since the basket 20 is conducted to rotate freely in said second rotation direction, which tends to
20 increase the level of the washing liquid by formation of a vortex inside the basket 20, the drive of the impeller 50 in this second rotation direction is effected by a second rotation time substantially lower than the first rotation time.

It should be understood that the locking device 70 described and illustrated herein is merely exemplary, since the present driving arrangement can be used jointly with other constructive solutions for locking the tubular shaft of the basket in the washing
30 operation.

In order to allow the basket 20 to rotate with the impeller 50 in the second rotation direction during the spinning operation, the machine is provided with a driving arrangement that comprises a generally
35 electromagnetic clutch means C, which is operatively

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associated with both the tubular shaft 30 and the central shaft 40.

In the exemplary construction illustrated in figure 2, the clutch means C comprises a helical spring 80 which constitutes a second helical spring in the driving means of the machine, said helical spring 80 being tightly mounted around axially adjacent extensions of the tubular shaft 30 and the central shaft 40, the dimensioning of the helical spring 80 being carried out so as to assure, when in a normal rest condition, the safe rotational coupling between the central shaft 40 and the tubular shaft 30 in a rotation direction corresponding to the direction of a spinning operation of the machine.

Thus, whenever the machine performs a spinning operation, the helical spring 80 is maintained tightly seated around both the tubular shaft 30 and the central shaft 40, making said shafts to rotate jointly in said spinning direction, which is opposite to that in which the locking device 70 operates to lock the tubular shaft 30 of the basket 20 to the structure E of the machine, preventing the basket from rotating in the other rotation direction denominated as the first rotation direction in the present disclosure.

The driving arrangement further comprises a cylindrical sleeve 90, constructed in any adequate material, such as for example synthetic material, which is rotatively affixed in the structure E around the helical spring 80, maintaining a certain radial gap in relation to the latter and being rotatively affixed to a lower end 81 of the helical spring 80. In the illustrated construction, the helical end 81 of the helical spring 80 is radially bent outwardly and inserted in a corresponding radial bore made in the cylindrical sleeve 90, assuring the rotational locking

between the helical spring 80 and the cylindrical sleeve 90, but allowing a certain radial displacement of the lower end 81 of the helical spring 80 inside the radial bore of the cylindrical sleeve 90. With
5 this arrangement, the helical spring 80 can be radially moved, maintaining its lower end 81 coupled to the cylindrical sleeve 90.

Around the cylindrical sleeve 90 is mounted a brake band 95 constructed in any adequate material and
10 generally having an end 95a radially projecting away from the cylindrical sleeve 90, so as to selectively cooperate with an actuating device 100, to be described ahead, in order to assume an inoperative condition, in which the cylindrical sleeve 90 is
15 released to rotate jointly with the helical spring 80 and with both the tubular and central shafts 30,40 in said rotation direction during the spinning operation, and an operative condition, in which its rotation is blocked in said direction, braking and interrupting
20 the rotation of the cylindrical sleeve 90 and of the helical spring 80 in said rotation direction. When the cylindrical sleeve 90 is locked by the brake band 95, the helical spring 80 is also rotatively locked, whereby, when the central shaft 40 starts its rotation
25 in the spinning direction, said helical spring 80 is opened in the radial direction, loosening its frictional contact not only with the central shaft 40 but also, generally in a lesser extent, in relation to the lower end 30a of the tubular shaft 30, allowing
30 the central shaft 40 to rotate freely inside the tubular shaft 30, carrying only the impeller 50, while the helical spring 80 and the cylindrical sleeve 90 remain stationary as a function of the actuation of the brake band 95.

35 The brake band 95 has its end 95a selectively blocked

by an actuating device 100 mounted in the structure E and which is driven from a rest position, in which it conducts the brake band 95 to the operative condition, towards a driven position, in which the brake band 95 is conducted to the inoperative condition.

In the preferred illustrated construction, the actuating device 100 comprises an electromagnetic actuator (solenoid) provided with an actuating pin 101, which is constantly forced by a return spring 102, to the rest condition of the actuating device 100, in which the actuating pin 101 blocks the rotation of the brake band 95, more specifically by blocking the rotation of said end 95a thereof, braking and interrupting the rotation of the cylindrical sleeve 90 and, consequently, of the helical spring 80, producing the radial opening of the latter and disengaging the central shaft 40 of the impeller 50 from the tubular shaft 30 of the basket 20.

The construction described above allows, in the rest condition of the actuating device 100, its return spring 102 to maintain the actuating pin 101 in a position in which it interferes with the rotation of the end 95a of the brake band 90, disengaging the central shaft 40 and the tubular shaft 30, which disengagement is necessary for carrying out the washing operation of the machine.

During the spinning operation, the actuating device 100 is automatically energized to retain its actuating pin 101 displaced from the rest position, in which it interferes with the rotation of the brake band 95, to the operative position, that is to say, to a driven and retracted position, in which said actuating pin stops actuating onto the brake band 95, which assumes the inoperative condition, in which it rotates jointly with the cylindrical sleeve 90, and allowing the

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helical spring 80 to remain in its rest condition, in which it is kept tightly mounted around the tubular shaft 30 and the central shaft 40, maintaining them mutually coupled for performing the spinning operation
5 of the machine.

As it can be noted, upon energization of the electromagnetic actuating device 100, the electromagnetic force is sufficient to retract the actuating pin 101 against the constant action of the
10 return spring 102, which is dimensioned to produce the displacement of the actuating pin 101 to the rest position, when the electromagnetic actuating device 100 is deenergized.

The electromagnetic actuating device 100 is usually
15 automatically deenergized when the laundry machine begins to perform the washing operations, in which the central shaft 40 and the impeller 50 are driven by the motor 60 in a condition in which the tubular shaft 30 is disengaged from the basket 20.

20 As already mentioned above, the deenergization of the electromagnetic actuating device 100 makes the return spring 102 impel the actuating pin 101 to the rest position, in which said actuating pin interferes with the brake band 95, so as to block the rotation of the
25 latter and also of the helical spring 80 coupled thereto, opening the helical spring 80 and disengaging the tubular and central shafts 30,40 during the washing operation.

Still in accordance with the illustrated construction,
30 the central shaft 40 incorporates an adjacent cylindrical widening 46 external to the lower end 30a of the tubular shaft 30 and presenting an outer diameter substantially equal to the outer diameter of said lower end 30a of the tubular shaft 30. This
35 construction allows said lower end 30a of the tubular

shaft 30 and said cylindrical widening 46 of the central shaft 40 to define the axially adjacent extensions of both shafts, around which the helical spring 80 is mounted, which is preferably constructed
5 with substantially a single diameter along its axial extension, so as to simultaneously tighten both shafts upon the spinning operation of the machine.

While only one embodiment of the invention has been illustrated herein, it should be understood that
10 alterations can be made in the form and relative arrangement of the elements, without departing from the constructive concept defined in the appended claims.

CLAIMS

1. A driving arrangement for a laundry machine of the type comprising a tub (10) affixed to a structure (E); a basket (20) disposed inside the tub (10); a vertical tubular shaft (30) inferiorly and rotatively mounted in the structure (E) and having a lower end (30a) and an upper end (30b) affixed to the basket (20); a central shaft (40) rotatively mounted inside the tubular shaft (30) and having an upper end (40b) inside the basket (20) and carrying an impeller (50) and a lower end (40a) rotatively coupled to an electric motor (60) affixed to the structure (E), said driving arrangement characterized in that it comprises a helical spring (80) tightly mounted around the axially adjacent extensions of both the tubular shaft (30) and the central shaft (40), coupling them rotatively upon rotation of the central shaft (40), in one direction, in a spinning operation of the machine; a cylindrical sleeve (90) rotatively mounted in the structure (E) around the helical spring (80) and being rotatively affixed to a lower end (81) of the latter; a brake band (95) tightly mounted around the cylindrical sleeve (90) and having an inoperative condition, in which it releases the cylindrical sleeve (90) to rotate jointly with the helical spring (80) and with the tubular and central shafts (30), (40), in said direction in the spinning operation, and an operative condition, in which said brake band (95) has its rotation blocked in said direction, braking and interrupting the rotation of both the cylindrical sleeve (90) and the helical spring (80) in said rotation direction and radially opening the helical spring (80), in order to rotatively disengage the tubular and central shafts (30), (40); and an actuating device (100) mounted in the structure (E) and

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selectively driven from a rest position, in which it conducts the brake band (95) to the operative condition, to a driven position, in which the brake band (95) is conducted to the inoperative condition.

5 2. The driving arrangement, as set forth in claim 1, characterized in that the actuating device (100) comprises an electromagnetic actuator provided by an actuating pin (101) which is constantly forced by a return spring (102) to a rest condition of the
10 actuating device (100), in which the actuating pin (101) blocks the rotation of the brake band (95) carried by the cylindrical sleeve (90), blocking the rotation of the latter.

3. The driving arrangement, as set forth in claim 2,
15 characterized in that the brake band (95) comprises an opposite end (95a) radially projecting away from the cylindrical sleeve (90) to be coupled by the actuating pin (101) when the actuating device (100) is in a rest position.

20 4. The driving arrangement, as set forth in claim 2, characterized in that the electromagnetic actuating device (100) is automatically deenergized when the laundry machine carries out the washing operations, in which the central shaft (40) and the impeller (50) are
25 driven by the motor (60) in a condition in which they are disengaged from the tubular shaft (30).

5. The driving arrangement, as set forth in claim 1, characterized in that the central shaft (40) incorporates an adjacent cylindrical widening (46)
30 external to the lower end (30a) of the tubular shaft (30) and presenting an outer diameter substantially equal to the outer diameter of said lower end (30a) of the tubular shaft (30), said lower end (30a) and said cylindrical widening (46) defining the axially
35 adjacent extensions of the tubular and central shafts

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ABSTRACT

A driving arrangement for a laundry machine, of the type that comprises a tub (10); a basket (20); a vertical tubular shaft (30) inferiorly and rotatively mounted in a structure (E); a central shaft (40) rotatively mounted inside the tubular shaft (30) and having an upper end (40b) carrying an impeller (50) and a lower end (40a) rotatively coupled to an electric motor (60). The driving arrangement comprises: a helical spring (80) mounted around both the tubular shaft (30) and the central shaft (40), coupling them in a spinning operation of the machine; a cylindrical sleeve (90) rotatively mounted in the structure (E) around the helical spring (80) and being rotatively affixed to a lower end (81) of the latter; a brake band (95) tightly mounted around the cylindrical sleeve (90) and having an inoperative condition, in which it releases the cylindrical sleeve (90) to rotate jointly with the helical spring (80) and with both the tubular and the central shafts (30), (40) in the spinning operation, and an operative condition, in which it has its rotation blocked in said direction, blocking the rotation of both the cylindrical sleeve (90) and the helical spring (80), so as to rotatively disengage the tubular and central shafts (30), (40); and an actuating device (100) selectively driven to alter the operative and inoperative conditions of the brake band (95).

✓

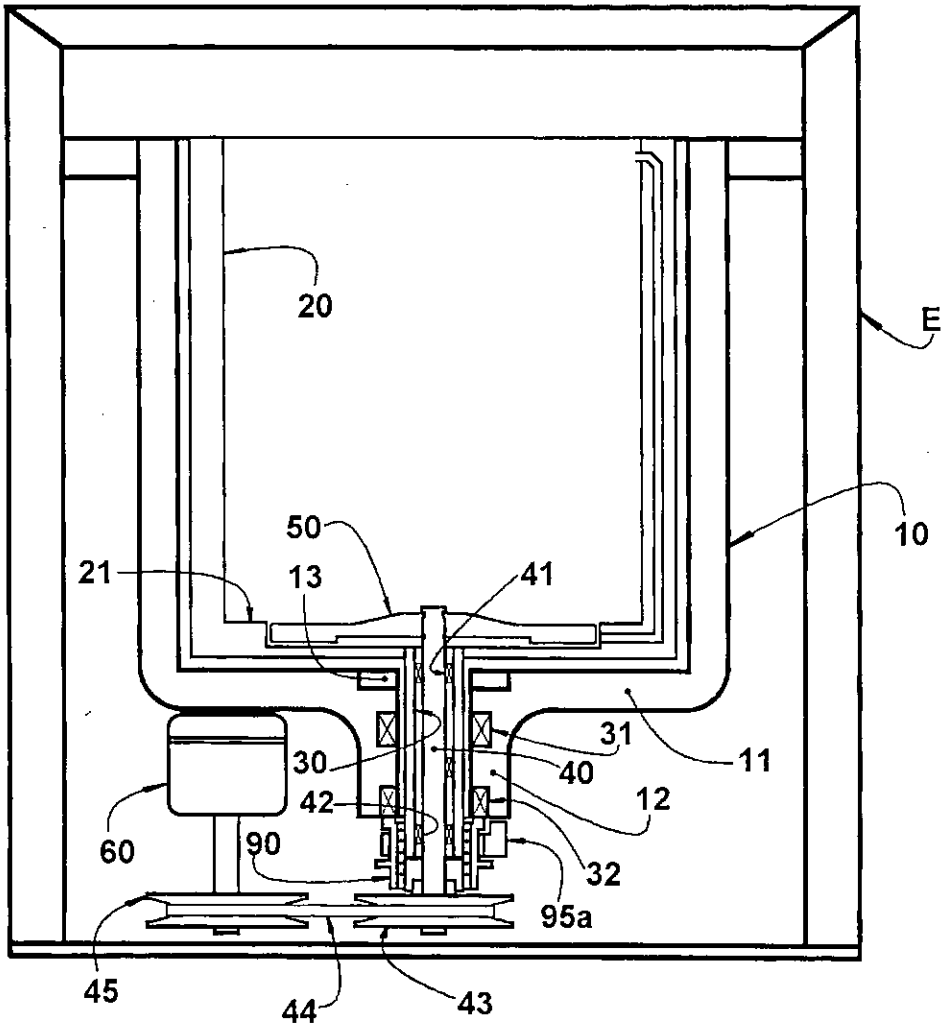


FIG. 1

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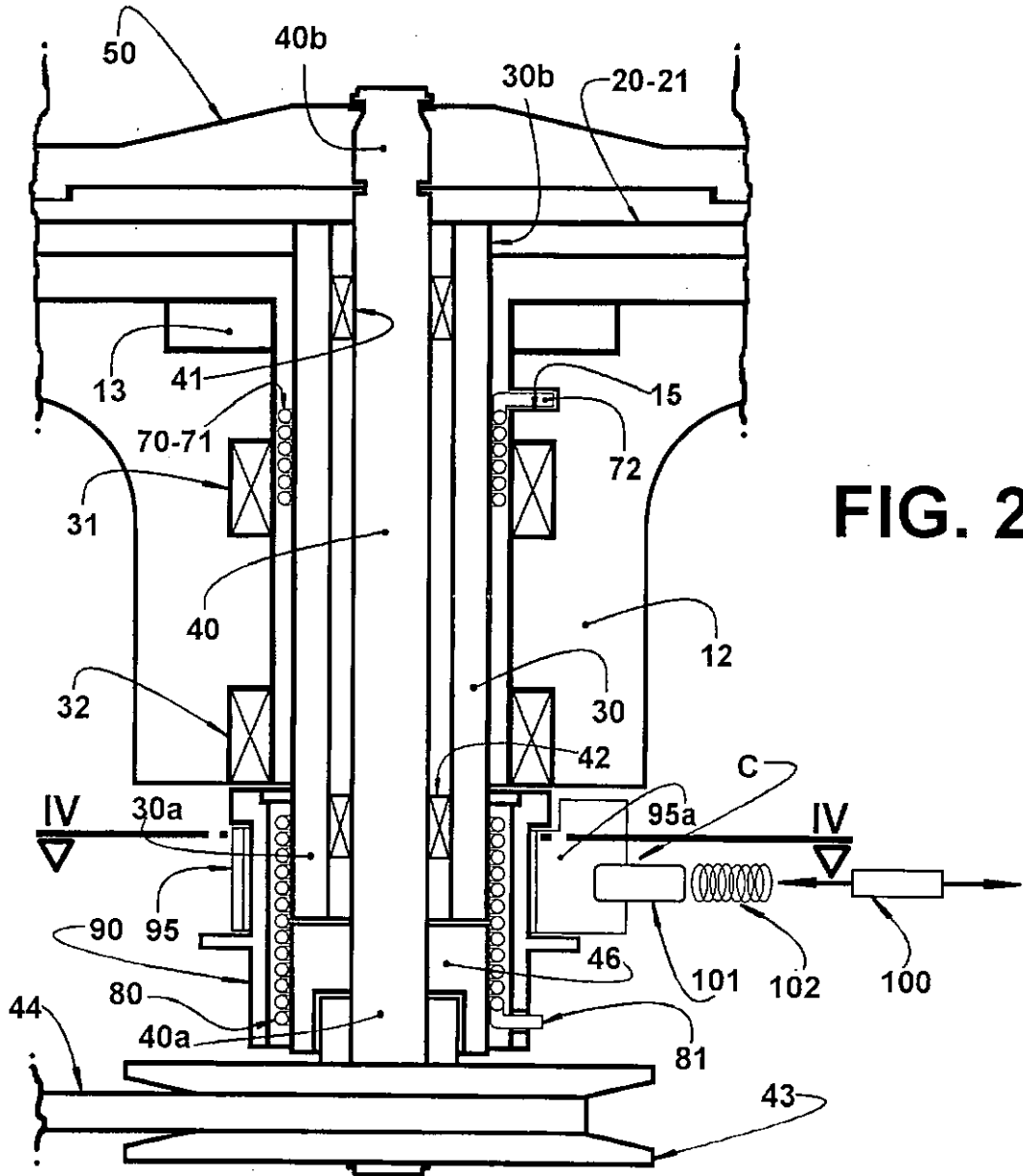


FIG. 2

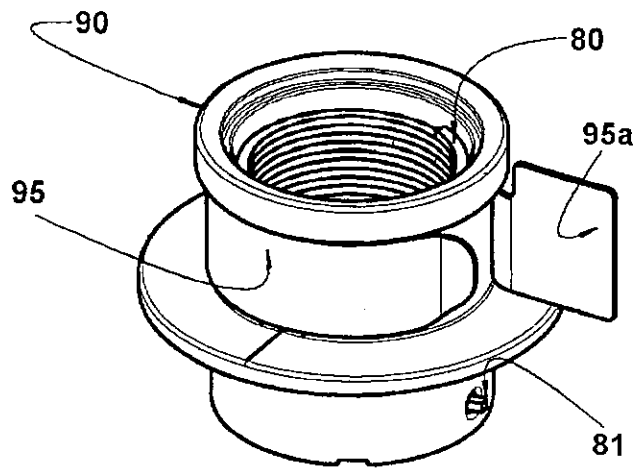
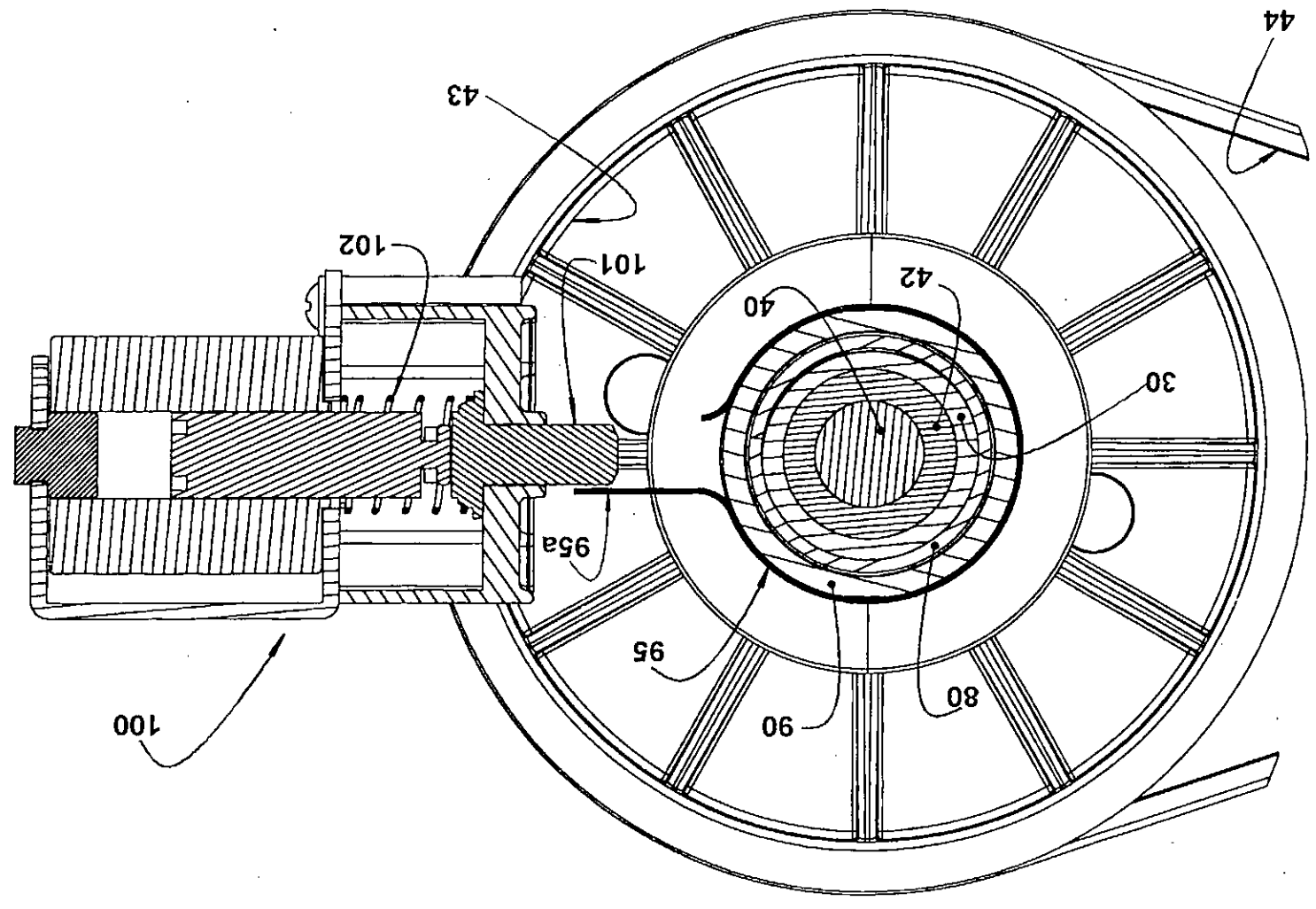


FIG. 3

720



BOGOTA - COLOMBIA

POWER OF ATTORNEY

I (We) Whirlpool S.A.

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

Hereby appoints **JUAN PABLO CADENA SARMIENTO** and/or **CARLOS H. PALÁCIO EASTMAN** and/or **MARTIN E. TORRES CARDÓZO**, of Bogotá, Colombia, my (our) true and lawful attorneys with special, ample and sufficient power to obtain from the Colombian administrative, judicial and police offices and authorities, in any instance, privileges of patents of invention, registration of trademarks, industrial designs and utility models; registration of commercial names, slogans and emblems, registration of copyright and contracts related thereto, certificates of obtainers of vegetables varieties, as well as extensions, renewals and recordal of assignments and changes of name, domicile and/or address related to the above; to prepare, prosecute and register licenses of any kind; to act as plaintiff or defendant in any instance or recourse, and before any judge, corporation, public official or authority in judicial, administrative and police actions, such as: oppositions to the registration of trademarks; caducity, cancellation and nullity actions; claim actions derived from the obtaining or exploitation of licenses, action of unfair competition; criminal proceedings, actions for payment of damages: claims or observations on patent applications, models, industrial designs and utility models; in the exercise of preventive measures and in other actions or similar proceedings.

To that effect they hereby empowered to file applications, formulate descriptions, amendments, protests, declarations, oppositions, cancellations, nullities, appeals and claims; to pay taxes, quotas and assessments prescribed by law, renounce or waive the rights granted or in the process of granting; to receive all kinds of documents and valuables, giving the respective release of receipt, and, in general, to take before said authorities the necessary steps to such effect, and any measures that they may deem pertinent to the safeguard of my (our) interest(s) with all the other necessary legal powers.

This power includes the faculty to ratify or confirm desist, settle and compromise on my (our) behalf, and to substitute this power in whole or in part and to revoke substitutions. At the same time I (We) hereby appoint **JUAN PABLO CADENA SARMIENTO** and/or **CARLOS H. PALACIO EASTMAN** and/or **MARTIN E. TORRES CARDOZO**, domiciled in Carrera 7 No. 71-21, Torre B, Piso 4, my (our) attorney(s) in fact, with powers to receive notifications and to designate judicial and extrajudicial attorneys.

Granted and signed in 17 SET. 2007

this day of 200

Signature _____



Name _____
Title _____

José Aurelio Drummond Jr.
Presidente

Presidente

27 NOV. 2007
 NOTARIO CUARENTA
 Bogotá, D.C., Colombia
 Norby Fernando Mora S.

NOTARIO CUALQUIER
Bogotá, D.C., Colombia
Norby Fernando Mora S

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.

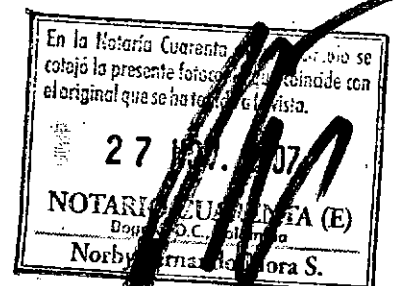
who is(are) known to me and who I attest executed the foregoing document and he (they) declared he (they) grant(s) the document for the uses and purposes therein expressed.

Notario Público (sello)

Notary Public (Seal)

LEGALIZACIÓN ANTE CONSUL COLOMBIANO ES REQUERIDA.

LEGALIZATION BEFORE THE COLOMBIAN CONSUL IS REQUIRED.





CONSULADO GENERAL DE COLOMBIA

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 JOSEILDA DA SILVA BARROSA quien como ESCRIBIENTE AUTORIZADO autenticó la firma del signatario del poder precedente, ejerce en la fecha las funciones indicadas y su firma corresponde a la registrada en este Consulado; Que la compañía WHIRLPOOL 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 precedente y cuya(s) firma(s) fue(ron) autenticada(s) ante

NOT. 13 SÃO Paulo - SP representante(s) legal(es) en este país.

El Cónsul no asume responsabilidad por el contenido del documento

São Paulo, 03.10.2007

DERECHOS US\$ 29,00 (VEINTINUEVE DOLARES)

PAGADO IMPUESTO DE TIMBRE

"Si está conforme con el servicio prestado, diríjase al Área de Quejas y Reclamos del Ministerio de Relaciones Exteriores, Carrera 6 Nº 5-46, Bogotá, D.C., Colombia; email: ciquelres@minrelex.gov.co"



CARLOS MAURICIO ACERO MONTEJO
CONSUL GENERAL

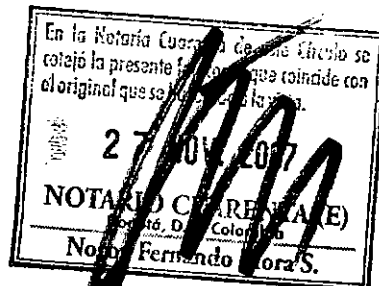
RECEBIDO
BOGOTÁ D.C.

2007 OCT 31 11:28

673430

Carlos Acero

RECEBIDO
BOGOTÁ D.C.



[Handwritten signature]

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.

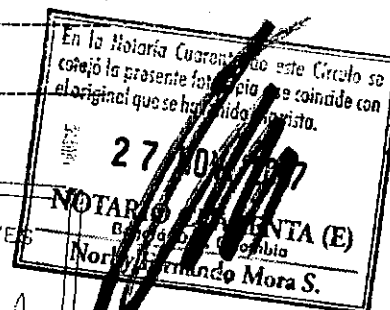
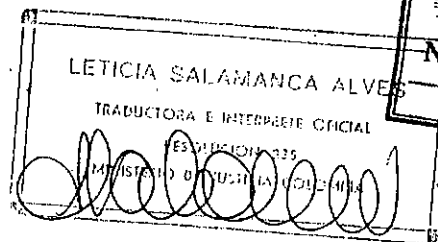
Firmado por Emerson M. Do Vale, Director y José Aurelio Drummond Jr. Presidente, el 17 de Septiembre, 2007

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.

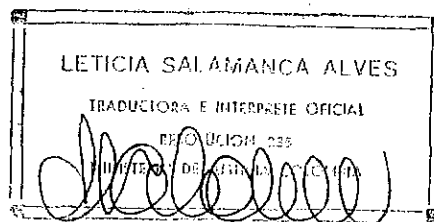
En hoja aparte aparece un sello del consulado General de Colombia en São Paulo No. 468 certificando la firma anterior. Dado en SPaulo el 03.10.2007 con la firma de Carlos Mauricio Acero Montejo, Cónsul General.

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. -----



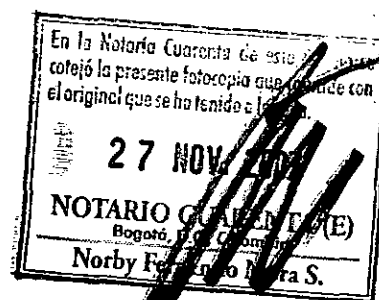
124

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



MINISTERIO DE JUSTICIA Y LEGISLACION
SECRETARIA DE ESTADO
DEPARTAMENTO DE JUSTICIA Y LEGISLACION

674311
Leticia Salamanca
SECRETARIA DE ESTADO
DEPARTAMENTO DE JUSTICIA Y LEGISLACION



MINISTERIO DE JUSTICIA Y LEGISLACION
SECRETARIA DE ESTADO
DEPARTAMENTO DE JUSTICIA Y LEGISLACION

2007 OCT 19 A 10:40
Jefe de Oficina de Asesoría
Bogotá D.C.



No. 07-136814- -00000-0000

Fecha: 2007-12-27 17:42:35 Dep. 2020 NUECREACION
Tra. 11 PATENTEIYII Eje: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 125



Industria y Comercio
SUPERINTENDENCIA

**REQUISITOS MINIMOS PARA ADMISION A TRAMITE
PCT**

PATENTE DE INVENCION ☒

MODELO DE UTILIDAD ☐

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

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 ☐

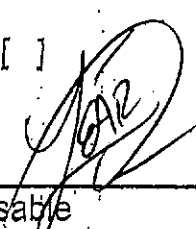
INCOMPLETA ☐

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 

Fecha 27 DIC. 2007

Carrera 13 No. 27-00 Piso 5, 7 y 10
Conmutador: 3 82 08 40
Fax: 350 52-20
E-mail: info@slc.gov.co
www.slc.gov.co
Bogotá, D.C., Colombia

424
126

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

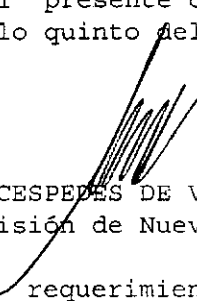
REFERENCIA	Radicación No.	7 136814
	Solicitud internacional	PCT/BR2006/000123
	Fecha inicio fase nacional	28/01/2008
	Trámite	11
	Evento	378
	Actuación	430
	Oficio No.	2316

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'