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(54) **A METHOD FOR CONTROLLING A WASHING MACHINE FOR WASHING PARTICULAR ITEMS**

VERFAHREN ZUR STEUERUNG EINER WASCHMASCHINE ZUM WASCHEN BESTIMMTER
GEGENSTÄNDE

PROCÉDÉ DE COMMANDE D'UN LAVE-LINGE PERMETTANT DE LAVER DES ARTICLES
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Description(Field of the invention)

[0001] The object of the present invention is a method for controlling washing of particular garments in a Washing Machine.

(Background art)

[0002] As known, some kind garments, as for example jackets, some trousers, clothes and so on, are generally dry cleaned or at least washed in industrial washing machine. This because they are particularly delicate garments which can be irremediable damaged with a traditional washing program.

[0003] It clearly causes some problems for people who need to wash this delicate cloths: take them to the laundry and then go back to withdraw them after washing and ironing.

[0004] This is a drawback both under the point of view of comfort because to travel continuously to the laundry may not always be easy, and because it would be too much expensive to wash clothes in the laundry frequently.

[0005] Document EP 0 038 671 A2 relates to a method of washing textile articles that provides considerable saving in energy due to low temperatures of the washing liquid and to long durations of the mechanical agitation.

(Object and summary of the invention)

[0006] The aim of the present invention is to provide a control mode of a washing machine that allows the washing of delicate garments such as trousers, jackets, dresses etc.. without industrial washing machine.

[0007] This and other objects are achieved by a method for controlling a washing machine comprising the execution of a wash cycle as described in the appended claims.

[0008] The basic idea of the present invention is to provide a wash cycle whose temperatures are constantly kept at low heat and in which, the rotational movements of the garments inside the drum of the machine, are quite soft, and in the meantime a considerable amount of water is used.

[0009] In this way the Applicant believes achievable very satisfying results with reference to particular garments as previously said.

[0010] In particular object of the present invention is a method for controlling a washing machine comprising the execution of a wash cycle wherein:

- an amount of water of at least 20 litres is loaded in the machine's drum;
- an initial warming of the wash water is performed up to a reference temperature not exceeding 25° C;
- a series of rotational movements of said drum are

then performed at a speed not exceeding 35 rpm;

- a spin is then carried out with a speed not exceeding 100 rpm in order to obtain a satellization of the garments in the drum.

[0011] Preferably before said spin, and particularly after said series of rotational movements of said drum, at least a rinse step is performed, and preferably two rinse steps are performed.

[0012] Preferably the rotational movements of said drum last for a time comprised between 2 and 5 seconds.

[0013] Preferably the rotational movements of said drum are alternated to steps wherein said drum is substantially motionless.

[0014] Preferably the steps in which said drum is substantially motionless last for a time comprised between 20 and 40 seconds.

[0015] Preferably the speed of rotation of said spin is below 90 rpm.

[0016] Preferably each rinse step is followed by a step wherein said drum rotates at a speed not exceeding 35 rpm.

brief description of the drawings)

[0017] Some examples of preferred and advantageous embodiments are described for purely illustrative and not limiting purposes, with reference to the appended Figure 1, which shows a representative diagram of some features of the mode according to the invention.

(Detailed description of the invention)

[0018] The control method, object of the present invention, comprises, first of all, the step of providing a quantity of water of at least 20 litres, loaded in the drum of the washing machine.

[0019] As an example, the amount of water can be equal to 23 litres.

[0020] The water is later heated until a not particularly hot temperature, for example less or equal to 25°C.

[0021] A series of rotational movements of the machine drum are then performed at a speed not exceeding 35 rpm;

[0022] The rotation movements of said drum are advantageously alternated to steps wherein said drum is substantially motionless.

[0023] In the preferred embodiment, the steps wherein the drum is motionless, go on, at least 7-8 times longer than the ones of the rotational movements.

[0024] For example the rotational movements of said drum last for a time comprised between 2 and 5 seconds and the steps in which said drum is substantially motionless last for a time comprised between 20 and 40 seconds.

[0025] The features so far described allow to keep the garments in a condition of substantial floating inside the drum (thanks to the considerable amount of water load-

ed), and to practice a mechanical action on the same, due to the short rotational movements at reduced speed of the drum.

[0026] In this way it is possible to obtain for delicate garments, satisfactory washing without causing any kind of damage.

[0027] Note that even the washing time contributes to the result above described: the series of rotational movements of the drum, for example, can have a duration of between 30 and 35 minutes, while the entire wash cycle can last up to 100 minutes about. Preferably, after said rotational movements of the drum, one or more rinsing steps are performed. In particular, two rinsing steps can be performed.

[0028] Preferably each rinse step is followed by a step where the drum is rotated at a speed not exceeding 35 rpm.

[0029] Finally, after the series of rotational movements of the drum, particularly after the rinse steps, a spin is carried out with a reduced speed not exceeding 100 rpm, in order to obtain a satellization of the garments in the drum.

[0030] According to this control method, the speed of rotation of the spin is below 90 rpm, for example is equal to 88 rpm.

[0031] In more detail, the spinning step is performed at a speed equal to, or very close, to the minimum speed, so that, the spin force used is able to balance the force of gravity acting on the garments in the drum.

[0032] In this way the laundry can be driven in rotation without suffering too intense mechanical stress which could damage its quality.

[0033] In order to perform a wash cycle in an appropriate way, in the drum is placed a limited amount of clothes. This quantity may be, for example, less than 2 kg, and in particular not more than 1.5 Kg.

[0034] Figure 1 shows explicative charts representing the execution of the washing method according to the invention.

[0035] The horizontal axis represents time, the ordinate axis represents the water consumption of the machine (A), the electrical power absorbed by the machine (B), the wash water temperature (C) and the speed of rotation of the drum (D).

[0036] With reference to the water consumption, A1 is the water loaded at the start of washing, A2 and A3 identify the rinse steps performed at the end of the cycle.

[0037] The electrical power absorption in an early phase (line B) is necessary for the heating of the washing water up to the set temperature.

[0038] With reference to the temperature (line C) it can be noted an initial increase, a period of substantially constant temperature (during the series of movement of the drum) and a progressive decrease at the end of the cycle.

[0039] With reference to the drum rotational speed, D1 identifies the number of rotational movements at reduced speed, D2 identifies the movements associated with the rinse steps, and D3 the final step of spin/satellization.

Claims

1. A method for controlling a washing machine comprising the execution of a wash cycle wherein:

- an amount of water is prepared in the drum of the machine;
- an initial warming of the wash water is performed, up to a reference temperature not exceeding 25°C;

characterized in that:

- said amount of water is at least 20 litres;
- a series of rotational movements of said drum are then performed at a speed not exceeding 35 rpm;
- a spin is then carried out with a speed not exceeding 100 rpm thus obtaining a satellization of the laundry in the drum.

2. A method according to claim 1 wherein before said spin, and preferably after said series of rotation movements of said drum, at least a rinse step is performed, and preferably two rinse steps are performed.

3. A method according to claim 1 or 2, wherein the rotation movements of said drum last for a time comprised between 2 and 5 seconds.

4. A method according to any one of the preceding claims wherein the rotation movements of said drum are alternated to steps wherein said drum is substantially motionless.

5. A method according to claim 4, wherein the steps in which said drum is substantially motionless last for a time comprised between 20 and 40 seconds.

6. Method according to any one of the preceding claims, wherein the speed of rotation of said spin is below 90 rpm.

7. A method according to claim 2 or any one of the claims 3 to 6 when dependent from claim 2 wherein each rinse step is followed by a step wherein said drum rotates at a speed not exceeding 35 rpm.

8. Laundry washing machine comprising:

- a. operating means for executing at least one wash cycle;
- b. a control unit active on said operating means to control operation of the same;

characterised in that said control unit is configured to execute, in cooperation with said operating

means, the method according to any one of the preceding claims.

Patentansprüche

1. Verfahren zum Steuern einer Waschmaschine, das die Durchführung eines Waschzyklus umfasst, wobei:

- eine Wassermenge in der Trommel der Maschine vorbereitet wird;
- eine anfängliche Erwärmung des Waschwassers bis zu einer Bezugstemperatur durchgeführt wird, die 25 °C nicht überschreitet;

dadurch gekennzeichnet, dass:

- die Wassermenge mindestens 20 Liter beträgt;
- anschließend eine Reihe von Drehbewegungen der Trommel bei einer Geschwindigkeit, die 35 rpm nicht übersteigt, durchgeführt werden;
- anschließend ein Schleudervorgang mit einer Geschwindigkeit, die 100 rpm nicht übersteigt, durchgeführt wird, wodurch eine Satellisierung der Wäsche in der Trommel erreicht wird.

2. Verfahren nach Anspruch 1, wobei vor dem Schleudervorgang, und vorzugsweise nach der Reihe von Drehbewegungen der Trommel, mindestens ein Spülschritt durchgeführt wird und vorzugsweise zwei Spülschritte durchgeführt werden.

3. Verfahren nach Anspruch 1 oder 2, wobei die Drehbewegungen der Trommel über einen Zeitabschnitt, der zwischen 2 und 5 Sekunden umfasst, anhalten.

4. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Drehbewegungen der Trommel mit Schritten abgewechselt, in denen die Trommel im Wesentlichen bewegungslos ist.

5. Verfahren nach Anspruch 4, wobei die Schritte, in denen die Trommel im Wesentlichen bewegungslos ist, über einen Zeitabschnitt, der zwischen 20 und 40 Sekunden umfasst, anhalten.

6. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Geschwindigkeit der Drehung des Schleudervorgangs unter 90 rpm beträgt.

7. Verfahren nach Anspruch 2 oder einem der Ansprüche 3 bis 6, wenn von Anspruch 2 abhängig, wobei jeder Spülschritt von einem Schritt gefolgt wird, in dem sich die Trommel mit einer Geschwindigkeit dreht, die 35 rpm nicht übersteigt.

8. Waschmaschine für Wäsche, umfassend:

- a. Betriebsmittel zum Ausführen mindestens eines Waschzyklus;
- b. eine Steuereinheit, die auf den Betriebsmitteln aktiv ist, um den Betrieb selbiger zu steuern;

dadurch gekennzeichnet, dass die Steuereinheit konfiguriert ist, das Verfahren nach einem der vorhergehenden Ansprüche in Zusammenarbeit mit den Betriebsmitteln auszuführen.

Revendications

1. Procédé de commande d'une machine à laver comprenant l'exécution d'un cycle de lavage, dans lequel :

- une quantité d'eau est préparée dans le tambour de la machine ;
- un chauffage initial de l'eau de lavage est effectué jusqu'à une température de référence ne dépassant pas 25 °C ;

caractérisé en ce que :

- ladite quantité d'eau est d'au moins 20 litres ;
- une série de mouvements rotatifs dudit tambour est ensuite effectuée à une vitesse ne dépassant pas 35 tr/min ;
- un essorage est ensuite effectué à une vitesse ne dépassant pas 100 tr/min pour obtenir ainsi une satellisation du linge dans le tambour.

2. Procédé selon la revendication 1, dans lequel, avant ledit essorage, de préférence après ladite série de mouvements de rotation dudit tambour, au moins une étape de rinçage est effectuée, de préférence deux étapes de rinçage sont effectuées.

3. Procédé selon la revendication 1 ou 2, dans lequel les mouvements de rotation dudit tambour durent pendant une période de temps de 2 à 5 secondes.

4. Procédé selon l'une quelconque des revendications précédentes, dans lequel les mouvements de rotation dudit tambour sont alternés avec des étapes où ledit tambour est sensiblement immobile.

5. Procédé selon la revendication 4, dans lequel les étapes dans lesquelles ledit tambour est sensiblement immobile durent pendant une période de temps de 20 à 40 secondes.

6. Procédé selon l'une quelconque des revendications précédentes, dans lequel la vitesse de rotation dudit essorage se situe en dessous de 90 tr/min.

7. Procédé selon la revendication 2 ou selon l'une quel-

conque des revendications 3 à 6, dans la mesure où elles dépendent de la revendication 2, dans lequel chaque étape de rinçage est suivie d'une étape dans laquelle ledit tambour tourne à une vitesse ne dépassant pas 35 tr/min.

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8. Machine lave-linge comprenant :

- a. des moyens opératoires pour exécuter au moins un cycle de lavage ;
- b. une unité de commande active sur lesdits moyens opératoires pour commander le fonctionnement de ceux-ci ;

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caractérisée en ce que ladite unité de commande est configurée pour exécuter, en coopération avec lesdits moyens opératoires, le procédé selon l'une quelconque des revendications précédentes.

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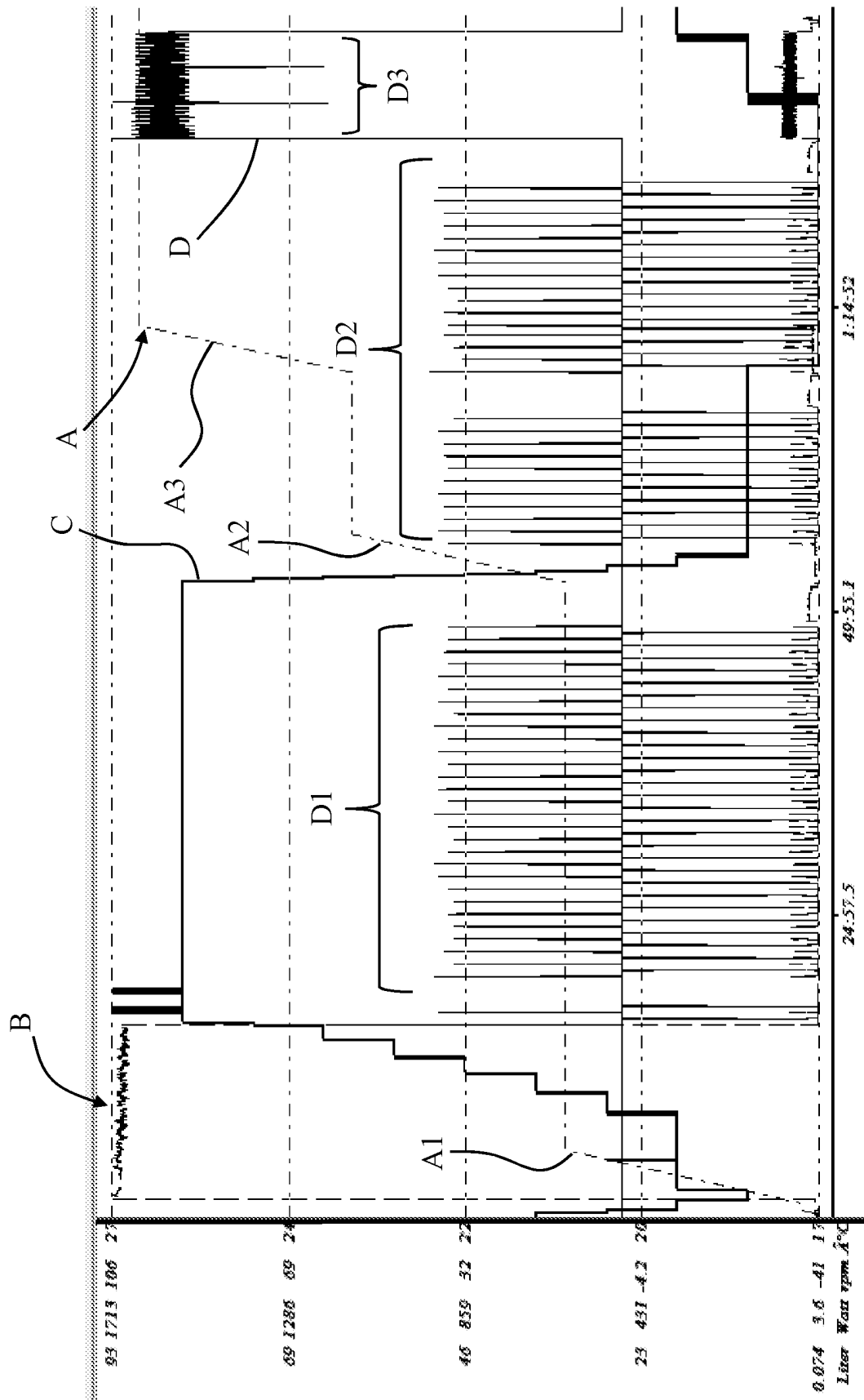


FIG. 1

REFERENCES CITED IN THE DESCRIPTION

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