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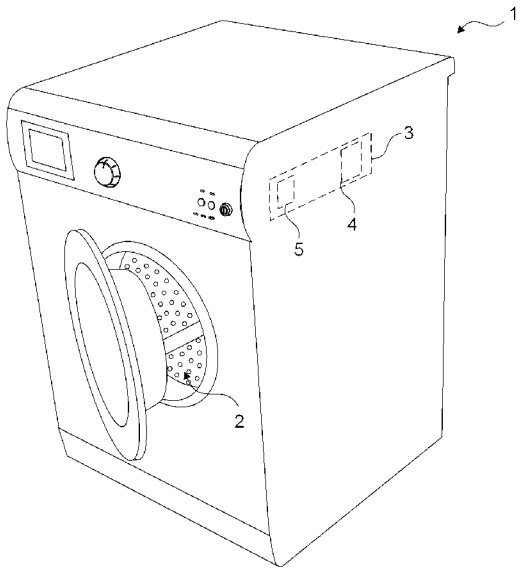
(54) **Title**: A WASHING MACHINE HAVING SPIN-DRYING FUNCTION

Figure 1



(57) **Abstract**: The washing machine (1) of the present invention comprises a drum (2) wherein the laundry to be washed is disposed, and a control unit (3) which performs the washing program, consisting of pre-washing, main washing, rinsing and spin-drying steps, at the spin speed determined by the producer according to the washing program that is selected by the user.

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Description

A WASHING MACHINE HAVING SPIN-DRYING FUNCTION

[0001] The present invention relates to a washing machine having spin-drying function.

[0002] In washing machines, the washing program consists of pre-washing, main washing, rinsing and spin-drying steps. In the spin-drying step, the drum is rotated at a certain speed and thus, the laundry adhering to the drum wall by the centrifugal effect is provided to be dried by removing the water the laundry comprises. In conventional washing machines, the spin-drying speed is determined generally by the user. In the washing machines wherein the spin speed is not changed by the user, users prefer the spin speed determined by the producer in the washing program and the spin-drying step is performed at the spin speed determined by the producer. However, depending on the parameters such as the ambient temperature and the wash water temperature, the need for drying the laundry is different at the beginning of the spin-drying step. Therefore, while a spin speed that is less than required causes the laundry not to be dried, a spin speed that is more than required causes the laundry to wear out and wrinkle since such a spin speed increases the mechanical movement inside the drum.

[0003] In the state of the art Japanese Patent Application No JP54128857, the revolutionary speed of the motor is controlled by controlling the open-air temperature of the washing machine.

[0004] In the state of the art Japanese Patent Application No JP4073095, months are determined by using real time data and the washing program time is determined according to the change in the mains water temperature by month.

[0005] In the state of the art Japanese Patent Application No JP4256789, the speed of revolution of the motor is controlled by controlling the water temperature that changes seasonally.

[0006] In all these embodiments, performing of the washing program independently of the user selection, by considering the ambient parameters such as the ambient temperature and the mains water

temperature is explained.

[0007] The aim of the present invention is the realization of a washing machine, the spin-drying performance of which is improved.

[0008] The washing machine realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a control card which changes the spin speed in the memory for each washing program according to the current month determined by the date counter.

[0009] Thus, the laundry is provided to be dried at the spin speed predetermined by the producer for the washing program that is selected considering the drying speed of the laundry that depends on the air temperature of the month, in which the washing program will be performed. Thus, for example, the spin speed for June and the spin speed for December, which are predetermined by the producer for the same washing program and saved in the memory, differ from each other.

[0010] For each washing program, the spin speed data, predetermined by the producer according to the data of each month, are saved in the memory. The spin speed values are saved in the memory as look-up table for each washing program and for each month. Thus, the spin speed determined for each washing program is updated as the month changes.

[0011] In an embodiment of the present invention, in the summer months, the spin-drying step is performed at the spin speed which is the lowest for the washing program selected by the user.

[0012] In another embodiment of the present invention, in the winter months, the spin-drying step is performed at the spin speed which is the highest for the washing program selected by the user.

[0013] By means of the present invention, considering the laundry dryness that changes due to seasonal temperature differences, the drying process is provided to be performed at spin speeds predetermined by the producer according to the months for each washing program.

[0014] A washing machine realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0015] Figure 1 – is the schematic view of a washing machine.

[0016] The elements illustrated in the figures are numbered as follows:

1. Washing machine
2. Drum
3. Control unit
4. Date counter
5. Memory

[0017] The washing machine (1) of the present invention comprises a drum (2) wherein the laundry to be washed is disposed, a memory (5), and a control unit (3) which performs the washing program, consisting of pre-washing, main washing, rinsing and spin-drying steps, at the spin speed determined by the producer according to the washing program that is selected by the user.

[0018] The washing machine (1), furthermore, comprises a date counter (4) which controls the date data. According to the data of the current month detected by the date counter (4), the control unit (3) equalizes the data of the spin speed, which will be performed in the spin-drying step for the selected washing program, to the data of the spin speed, which will be performed on monthly basis and which are predetermined by the producer and saved in the memory (5). For each washing program, the spin speed data, predetermined by the producer according to the data of each month, are saved in the memory (5) (Figure 1).

[0019] Thus, being at different spin speeds in the warm summer months or in the cold winter months, the laundry is provided to be dried at the spin speed predetermined by the producer according to the current month for the selected washing program.

[0020] When the washing machine (1) is started to operate by selecting a washing program, the current month is determined by the date counter (4). According to the data of the month determined by the date counter (4), the control unit (3) detects the spin speed data, which is saved in the memory (5) priorly for the selected washing program. By the start of the spin-drying step in the washing program, the spin-drying process is completed by the spin-drying step being performed at the spin speed, which is saved in the memory (5) priorly for the selected washing program, according to the data

of the current month. For each washing program, the spin speed data corresponding to each month, are installed in the memory (5) as look-up table by the producer. Thus, the spin speed value, which is determined by the producer for each washing program and saved in the memory (5), is updated as the data of the month, in which the date the washing program will be performed is situated, changes in the date counter (4). However, if the user manually adjusts the spin speed, the washing machine (1) performs the spin-drying step according to this spin speed selected by the user.

[0021] For example, when the cotton laundry option is selected as the washing program by the user; if the spin speed determined by the producer for January for this program and saved in the memory (5) is 800 rpm, in the washing machine (1) of the present invention, the same washing program selected in July will perform the spin-drying step not at 800 rpm, but at the spin speed of 600 rpm which is saved priorly in the memory (5) by the producer for July for the cotton laundry washing program. If the same washing program is selected by the user in October, this time, the spin-drying step will be performed at the spin speed of 700 rpm which is saved priorly in the memory (5) by the producer for October for the washing program.

[0022] The spin speed that will be performed in the spin-drying step is saved in the memory (5) by the producer such that the spin speed will be lower, for example, for the summer months in which the air temperature is high in comparison to the spin speeds that are determined, for example, for the winter months in which the air temperature is low, considering that the laundry will dry faster in the summer months.

[0023] In another embodiment of the present invention, in the summer months, the spin-drying step is performed at the spin speed which is the lowest allowed for the washing program selected by the user.

[0024] In another embodiment of the present invention, in the winter months, the spin-drying step is performed at the spin speed which is the highest allowed for the washing program selected by the user.

[0025] Depending on the hemisphere in which the washing machine (1) will be

used, the spin speeds determined according to the months are different from each other. Thus, the spin speed of 1000 rpm, which is determined by the producer for the cotton laundry washing program for January for the Northern Hemisphere, is adjusted to the spin speed of 600 rpm by the producer for the Southern Hemisphere which corresponds to the July in the Northern Hemisphere.

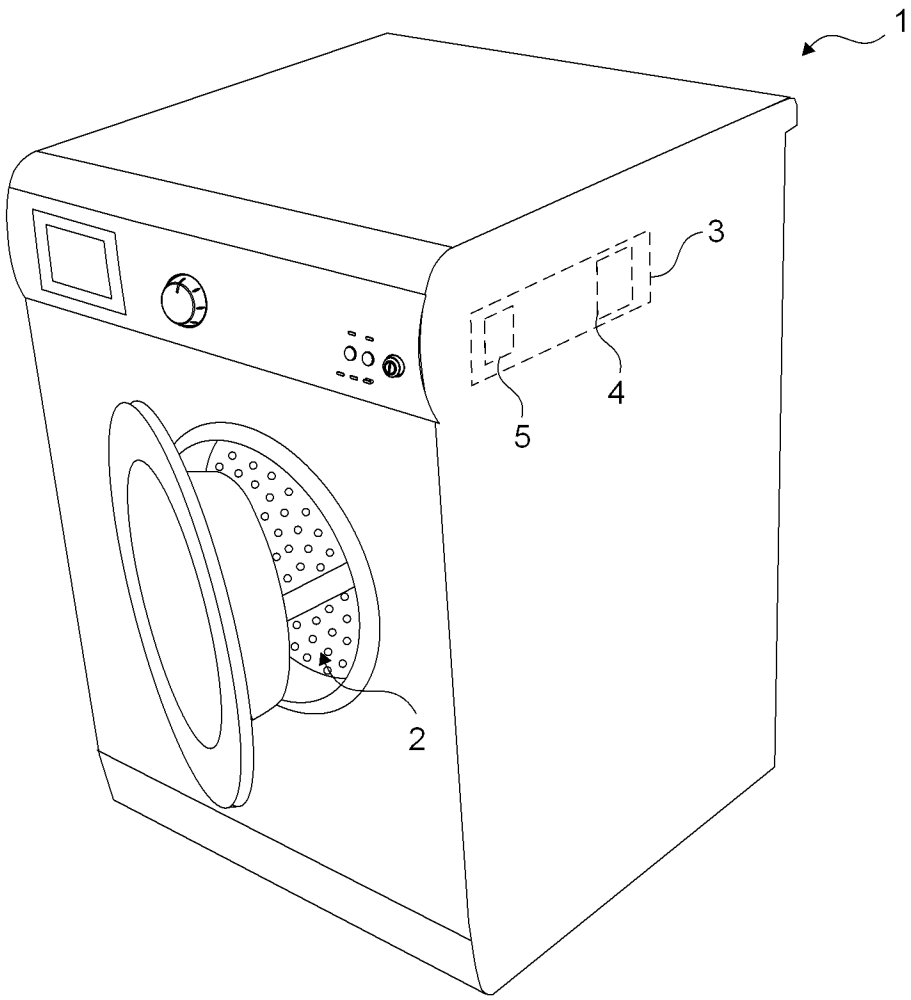
[0026] By means of the present invention, the spin speed changes according to the month in which the selected washing program will be operated. Thus, considering the laundry dryness that changes due to seasonal temperature differences, the drying process is provided to be performed at spin speeds predetermined by the producer according to the months for each washing program.

[0027] It is to be understood that the said present invention is not limited to the embodiments disclosed above and an expert in the technique can easily introduce different embodiments. These different embodiments should be considered within the scope of the claims of the present invention, too.

Claims

1. A washing machine (1) **comprising** a drum (2) wherein the laundry to be washed is disposed, a memory (5), and a control unit (3) which performs the washing program, consisting of pre-washing, main washing, rinsing and spin-drying steps, at the spin speed determined by the producer according to the washing program that is selected by the user, **characterized by**
   - a date counter (4) which controls the date data, and
   - the control unit (3) which, according to the data of the current month detected by the date counter (4), equalizes the data of the spin speed that will be performed in the spin-drying step for the selected washing program, to the data of the spin speed that will be performed on monthly basis and that are predetermined by the producer and saved in the memory (5).
2. A washing machine (1) as in Claim 1, **characterized by** the memory (5) wherein the spin speed, that is saved by the producer and that will be performed in the spin-drying step, is lower for the months in which the air temperature is high in comparison to the spin speeds that are determined for the months in which the air temperature is lower.
3. A washing machine (1) as in Claim 1, **characterized by** the memory (5) wherein the spin speed data, that are predetermined by the producer according to the data of each month for each washing program, are saved.
4. A washing machine (1) as in Claim 3, **characterized by** the memory (5) wherein the spin speed data, that correspond to each month, are installed as look-up table by the producer for each washing program.
5. A washing machine (1) as in Claim 3 or 4, **characterized by** the memory (5) wherein the spin speed value, that is determined by the producer for each washing program, is updated as the data of the month, in which the date the washing program will be performed is situated, changes.

Figure 1



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/066953

A. CLASSIFICATION OF SUBJECT MATTER
INV. D06F33/02 D06F39/00

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 04 073095 A (TOSHIBA CORP) 9 March 1992 (1992-03-09) cited in the application abstract	1-5
A	JP 54 128857 A (BROTHER IND LTD) 5 October 1979 (1979-10-05) abstract	1
Y	JP 04 105696 A (TOSHIBA AVE CORP) 7 April 1992 (1992-04-07) abstract	1-5
A	GB 2 247 515 A (KABUSHIKI KAISHA TOSHIBA) 4 March 1992 (1992-03-04) page 1, line 16 - page 4, line 17; figure 4	1

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1 596 991 A (GEORGE GOL) 3 September 1981 (1981-09-03) page 1, line 83 - page 3, line 35	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

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