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(54) CLOTHES CLASSIFYING STORAGE DEVICE, WASHING MACHINE, AND CONTROL METHOD THEREFOR

(57) Disclosed are a clothes classification and storage device, a washing machine and a control method therefor. The clothes classification and storage device includes a controller, a driving mechanism and at least two clothes accommodating parts, where the driving mechanism is configured to drive the clothes accommodating parts to move under control of the controller and deliver any one clothes accommodating part to a set position for clothes throwing. Meanwhile, a washing machine with the above clothes classification and storage device and a control method therefor are proposed. The clothes classification and storage device has at least two clothes accommodating parts, so that clothes to be separately washed can be classified and placed in different clothes accommodating parts by a user, and each clothes accommodating part can be delivered to the set position through the driving mechanism for clothes throwing, thereby realizing automatic classification and throwing of clothes.

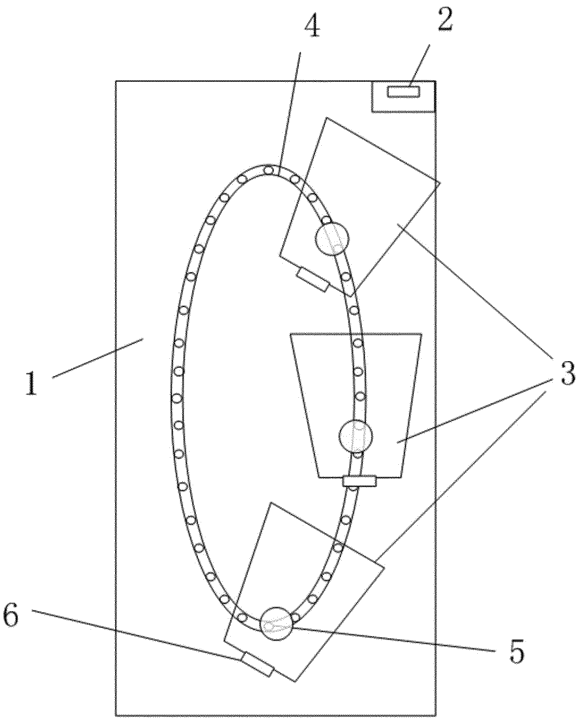


FIG. 1

EP 3 290 579 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of washing equipment, and particularly relates to a clothes classification and storage device, a washing machine with the device and a control method therefor.

BACKGROUND

[0002] With improvement of a human living standard, a technology of a washing machine is rapidly developed and the washing machine is also gradually popularized. Human living rhythm is faster and faster. Although the washing machine solves a clothes washing problem of people, people need to manually place clothes in the washing machine and then control the washing machine to wash clothes during washing. Moreover, many clothes are not suitable for mixed washing due to color loss, material and other reasons, and need to be washed repeatedly for many times. Processes of classification and storage of clothes, and throwing into the washing machine cause great trouble for users.

[0003] In view of above problems, a clothes classification and storage device is urgently needed, so as to solve problems of impossibility of classification and storage and impossibility of automatic throwing of clothes in an existing washing machine.

SUMMARY

[0004] One purpose of the present invention is to propose a clothes classification and storage device capable of classifying and storing clothes and automatically throwing the classified and stored clothes respectively.

[0005] Another purpose of the present invention is to propose a washing machine capable of realizing classification and storage, and automatic classification and washing of clothes.

[0006] Another purpose of the present invention is to propose a control method of a washing machine capable of realizing automatic classification and washing of clothes.

[0007] To achieve the purposes, on one hand, the present invention adopts the following technical solution:

[0008] A clothes classification and storage device includes a controller, a driving mechanism and at least two clothes accommodating parts, where the driving mechanism is configured to drive the clothes accommodating parts to move under control of the controller and deliver any one clothes accommodating part to a set position for clothes throwing.

[0009] Preferably, the driving mechanism includes a transmission mechanism and a turning mechanism; the at least two clothes accommodating parts are arranged on the transmission mechanism at intervals, and are capable of circularly moving according to an annular track under drive of the transmission mechanism; and the turning mechanism is capable of turning the clothes accommodating parts to pour out clothes accommodated in the clothes accommodating parts from the clothes classification and storage device.

[0010] Preferably, a position sensor connected with the controller is arranged between the transmission mechanism and the clothes accommodating parts; and when the position sensor detects that the clothes accommodating parts needing to perform clothes throwing is operated to a set position, the controller controls the transmission mechanism to stop operating and the turning mechanism turns the clothes accommodating parts delivered to the set position.

[0011] Preferably, each of the clothes accommodating parts is correspondingly provided with a weighing sensor connected with the controller; and the weighing sensors are configured to detect the weight of the clothes accommodating parts and transmit the detected weight information to the controller.

[0012] Preferably, the clothes classification and storage device further includes a communication module; where the controller is in communication connection with a mobile terminal through the communication module; and the controller controls operation of the driving mechanism according to an external instruction received by the communication module.

[0013] On the other hand, the present invention adopts the following technical solution:

[0014] A washing machine includes a washing machine body capable of automatically opening a cover and the clothes classification and storage device described above, where a program controller of the washing machine body is in communication connection with the controller of the clothes classification and storage device; and the clothes classification and storage device is capable of throwing clothes in the clothes accommodating parts into an inner drum of the washing machine body.

[0015] On another hand, the present invention adopts the following technical solution:

[0016] In the above control method of the washing machine, each of the clothes accommodating parts of the clothes classification and storage device is correspondingly provided with a weighing sensor connected with the controller. When a weight detected by the weighing sensor reaches a preset value, the program controller of the washing machine body controls the washing machine body to open the cover. The controller controls the driving mechanism to deliver the clothes accommodating parts with the weight reaching the preset value to an opening of the inner drum and throw clothes in the clothes accommodating parts into the inner drum.

[0017] Preferably, the controller is in communication connection with a mobile terminal through the communication module. When a weight detected by the weighing sensor reaches a preset value, the controller firstly pushes a message to the mobile terminal through the communication module to inquire whether to wash clothes.

When the controller receives a confirmation signal transmitted by the mobile terminal, the program controller of the washing machine body controls the washing machine body to open the cover. The controller controls the driving mechanism to deliver the clothes accommodating parts with the weight reaching the preset value to an opening of the inner drum and throw clothes in the clothes accommodating parts into the inner drum.

[0018] Preferably, if the controller receives a signal of conducting no washing operation transmitted by the mobile terminal or does not receive a signal transmitted by the mobile terminal within a preset duration, the weighing sensor continues to detect the weight of the clothes accommodating parts, and continues to push a message to the mobile terminal when the weight of the clothes accommodating parts is increased, to inquire whether to wash clothes.

[0019] Preferably, after clothes in the clothes accommodating parts are thrown into the inner drum, the program controller controls the washing machine body to close the cover, and then is operated according to washing procedures corresponding to clothes types in the clothes accommodating parts.

[0020] The present invention has beneficial effects as follows:

[0021] The clothes classification and storage device provided in the present invention has at least two clothes accommodating parts. Clothes to be washed separately can be classified and placed in different clothes accommodating parts by a user. The clothes classification and storage device is convenient in use. Each clothes accommodating part can be delivered to the set position through the driving mechanism to throw clothes, thereby realizing automatic classification and throwing of clothes and greatly facilitating life of the user.

[0022] Since the washing machine provided in the present invention adopts the above clothes classification and storage device, classification and storage, and automatic classification and washing of clothes can be realized, ensuring convenient use.

[0023] In the above control method of the washing machine provided in the present invention, when the weight of the clothes accommodating parts reaches the preset value, the driving mechanism delivers the clothes accommodating parts to the opening of the inner drum of the washing machine to throw clothes, thereby realizing classification and storage, and automatic classification, throwing and washing of clothes.

BRIEF DESCRIPTION OF DRAWINGS

[0024]

Fig. 1 is a schematic structural diagram illustrating a clothes classification and storage device provided in device embodiment I of the present invention;

Fig. 2 is a schematic structural diagram illustrating a washing machine provided in device embodiment II of the present invention;

Fig. 3 is a flow chart illustrating a control method of a washing machine provided in method embodiment I of the present invention; and

Fig. 4 is a flow chart illustrating a control method of a washing machine provided in method embodiment II of the present invention.

In the figures: 1. Shell; 2. Controller; 3. Clothes basket; 4. Transmission mechanism; 5. Turning mechanism; 6. Weighing sensor; 7. Washing machine body; 8. Cover; 9. Inner drum; 10. Program controller.

DETAILED DESCRIPTION

[0025] The technical solution of the present invention will be further described below in combination with drawings through specific embodiments.

Device embodiment:

[0026] The present embodiment provides a clothes classification and storage device, as shown in Fig. 1, including a shell 1, and a controller 2, a driving mechanism and three clothes accommodating parts which are arranged in the shell 1. In the present embodiment, the clothes accommodating parts are clothes baskets 3. The driving mechanism is configured to drive the clothes baskets 3 to move under control of the controller 2 and deliver any one clothes basket 3 to a set position for clothes throwing.

[0027] The driving mechanism includes a transmission mechanism 4 and a turning mechanism 5. The three clothes baskets 3 are arranged on the transmission mechanism 4 at intervals, and can circularly move according to an annular track under drive of the transmission mechanism 4. The transmission mechanism 4 may be a conveyor belt, a conveying chain and other driving devices. The turning mechanism 5 is arranged at a bottom of each clothes basket 3, and can move with the clothes baskets 3 under drive of the transmission mechanism 4. The turning mechanism 5 includes a rotating shaft connected with the bottom of the clothes basket 3, and a motor for driving the rotating shaft to rotate. The motor drives the rotating shaft to rotate so as to drive the clothes baskets 3 to realize turning, thereby realizing throwing of clothes in the clothes basket 3.

[0028] A position sensor connected with the controller 2 is arranged between the transmission mechanism 4 and the clothes baskets 3. One weighing sensor 6 connected with the controller 2 is correspondingly arranged for each clothes basket 3. The weighing sensors 6 are configured to detect weight of the clothes baskets 3 and transmit detected weight information to the controller 2.

[0029] The clothes classification and storage device has three clothes throwing modes as follows.

[0030] In throwing mode 1, the clothes classification and storage device is provided with a control panel, on which a user can operate to select a clothes basket 3 for throwing, and the controller 2 controls the transmission mechanism 4 to operate; when the position sensor detects that the clothes basket 3 for throwing clothes is operated to the set position, the controller 2 controls the transmission mechanism 4 to stop operating; and the turning mechanism 5 turns the clothes basket 3 delivered to the set position for clothes throwing.

[0031] In throwing mode 2, an action weight value is pre-stored in the controller 2; when a weight value detected by the weighing sensor 6 is equal to or greater than the action weight value, it indicates that the clothes basket 3 needs to throw clothes; the controller 2 controls the transmission mechanism 4 to operate; when the position sensor detects that the clothes basket 3 that needs to throw clothes is operated to the set position, the controller 2 controls the transmission mechanism 4 to stop operating; and the turning mechanism 5 turns the clothes basket 3 delivered to the set position to realize automatic throwing of clothes, wherein the action weight value may be one value, or each clothes basket 3 corresponds to one action weight value.

[0032] In throwing mode 3, the clothes classification and storage device further includes a communication module; the controller 2 can be in communication connection with a mobile terminal through the communication module; the mobile terminal is equipped with an APP capable of operating the clothes classification and storage device; the user can view current clothes weight through the mobile terminal, and can operate on the mobile terminal to realize control similar to the throwing mode 1. In addition, in the throwing mode 2, when a weight value detected by the weighing sensor 6 is equal to or greater than the action weight value, the controller 2 firstly pushes a message to the mobile terminal through the communication module to inquire whether to perform clothes throwing; if the user selects yes, the controller 2 controls clothes throwing operation; if the user selects no or no control instruction from the mobile terminal is received within a preset duration, clothes throwing is not performed, and the weight of the clothes basket 3 is continued to be detected; and when the weight of the clothes basket 3 is increased, the message is continued to be pushed to the mobile terminal.

[0033] The quantity of the clothes baskets 3 is not limited to three, and can be set according to specific classification needs. The transmission mechanism 4 and the turning mechanism 5 are also not limited to above structures as long as it can be realized that the movement of the clothes baskets 3 can be driven and the clothes baskets 3 can be delivered to the set position for clothes throwing.

Device embodiment II:

[0034] The present embodiment provides a washing machine, as shown in Fig. 2, including a washing machine body 7 and the clothes classification and storage device described in the device embodiment I. The washing machine body 7 is placed on a clothes throwing side of the clothes classification and storage device, wherein a cover 8 of the washing machine body 7 can be automatically opened and closed under control of a program controller of the washing machine body 7. The program controller 10 of the washing machine body 7 and the controller 2 of the clothes classification and storage device are in communication connection, and can mutually transmit information. The clothes classification and storage device can throw clothes in the clothes accommodating parts into an inner drum 9 of the washing machine body 7.

Method Embodiment I:

[0035] The present embodiment provides a control method of the washing machine described in the device embodiment II. As shown in Fig. 3, the control method includes following steps.

[0036] In step A1, an action weight value of the clothes classification and storage device is preset;

[0037] in step B1, the weighing sensor 6 respectively detects the current weight of the three clothes baskets 3;

[0038] in step C1, the controller 2 respectively judges whether the current weight of the three clothes baskets 3 are equal to or greater than the action weight value; if so, the controller 2 transmits information to the program controller 10 of the washing machine body 7; the program controller 10 controls the washing machine body 7 to open the cover 8; meanwhile, the controller 2 controls the transmission mechanism 4 to operate so as to deliver the clothes basket 3 with the weight reaching the preset value to an opening of the inner drum 9 and turn the clothes basket 3 to perform clothes throwing; otherwise, the control method is returned to step B1; and

[0039] in step D1, after the clothes basket 3 is turned for a preset duration, the clothes basket 3 goes to an initial state; and meanwhile, the program controller 10 controls the washing machine body 7 to close the cover 8 and then starts a washing procedure.

[0040] In step D1, the program controller 10 can control the washing machine body 7 to operate according to washing procedures corresponding to clothes types(such as cotton clothes, hemp clothes, large clothes and the like) in the clothes basket 3.

Method Embodiment II:

[0041] The present embodiment provides a control method of the washing machine described in the device embodiment II. As shown in Fig. 4, the control method includes following steps.

In step A2. an action weight value of the clothes classification and storage device is preset;

in step B2. the weighing sensor 6 respectively detects the current weight of the three clothes baskets 3;

in step C2. the controller 2 respectively judges whether the current weight of the three clothes baskets 3 are equal to or greater than the action weight value; if so, step D2 is conducted; otherwise, the control method is returned to step B2;

in step D2. the controller 2 pushes a message to the mobile terminal through the communication module to inquire whether to wash clothes; if the user selects yes, step F2 is conducted; and if the user selects no or there is no feedback from the user within a preset duration, step E2 is conducted;

in step E2. the current weight of the clothes basket 3 is continued to be detected; and when the current weight is increased, step D2 is conducted;

in step F2. the controller 2 transmits information to the program controller 10 of the washing machine body 7; the program controller 10 controls the washing machine body 7 to open the cover 8; meanwhile, the controller 2 controls the transmission mechanism 4 to operate so as to deliver the clothes basket 3 with the weight reaching the preset value to an opening of the inner drum 9 and turn the clothes basket 3 to perform clothes throwing; and

in step G2. after the clothes basket 3 is turned for a preset duration, the clothes basket 3 goes to an initial state; and meanwhile, the program controller 10 controls the washing machine body 7 to close the cover 8 and then starts a washing procedure.

[0042] Technical principles of the present invention are described above in combination with specific embodiments. These descriptions are only used to explain the principles of the present invention, and are not interpreted as limitations to a protection scope of the present invention in any way. Based on explanation herein, those skilled in the art can contemplate other specific embodiments of the present invention without contributing creative labor. These embodiments shall fall into the protection scope of the present invention.

Claims

1. A clothes classification and storage device, comprising a controller (2), a driving mechanism and at least two clothes accommodating parts (3), wherein the driving mechanism is configured to drive the clothes accommodating parts (3) to move under control of the controller (2) and deliver any one clothes accommodating part (3) to a set position for clothes throwing.

2. The clothes classification and storage device according to claim 1, wherein the driving mechanism comprises a transmission mechanism (4) and a turning mechanism (5); the at least two clothes accommodating parts (3) are arranged on the transmission mechanism (4) at intervals, and are capable of circularly moving according to an annular track under drive of the transmission mechanism (4); and the turning mechanism (5) is capable of turning the clothes accommodating parts (3) to pour out clothes accommodated in the clothes accommodating parts (3) from the clothes classification and storage device.

3. The clothes classification and storage device according to claim 2, wherein a position sensor connected with the controller (2) is arranged between the transmission mechanism (4) and the clothes accommodating parts (3); and when the position sensor detects that the clothes accommodating parts (3) needing to perform clothes throwing is operated to a set position, the controller (2) controls the transmission mechanism (4) to stop operating and the turning mechanism (5) turns the clothes accommodating parts (3) delivered to the set position.

4. The clothes classification and storage device according to claim 2, wherein each of the clothes accommodating parts (3) is correspondingly provided with a weighing sensor connected with the controller (2); and the weighing sensors are configured to detect the weight of the clothes accommodating parts (3) and transmit the detected weight information to the controller (2).

5. The clothes classification and storage device according to any one of claims 1-4, further comprising a communication module; wherein the controller (2) is in communication connection with a mobile terminal through the communication module; and the controller (2) controls operation of the driving mechanism according to an external instruction received by the communication module.

6. A washing machine, comprising a washing machine body (7) capable of automatically opening a cover (8) and the clothes classification and storage device of any one of claims 1-5, wherein a program controller (10) of the washing machine body (7) is in communication connection with the controller (2) of the clothes classification and storage device; and the clothes classification and storage device is capable of throwing clothes in the clothes accommodating

parts (3) into an inner drum (9) of the washing machine body (7).

7. A control method of the washing machine according to claim 6, wherein each of the clothes accommodating parts (3) of the clothes classification and storage device is correspondingly provided with a weighing sensor (6) connected with the controller (2), wherein when a weight detected by the weighing sensor (6) reaches a preset value, the program controller (10) of the washing machine body (7) controls the washing machine body (7) to open the cover (8); and the controller (2) controls the driving mechanism to deliver the clothes accommodating parts (3) with the weight reaching the preset value to an opening of the inner drum (9) and throw clothes in the clothes accommodating parts (3) into the inner drum (9).

8. The control method according to claim 7, wherein the controller (2) is in communication connection with a mobile terminal through the communication module; when a weight detected by the weighing sensor (6) reaches a preset value, the controller (2) firstly pushes a message to the mobile terminal through the communication module to inquire whether to wash clothes; when the controller (2) receives a confirmation signal transmitted by the mobile terminal, the program controller (10) of the washing machine body (7) controls the washing machine body (7) to open the cover (8); and the controller (2) controls the driving mechanism to deliver the clothes accommodating parts (3) with the weight reaching the preset value to an opening of the inner drum (9) and throw clothes in the clothes accommodating parts (3) into the inner drum (9).

9. The control method according to claim 8, wherein if the controller (2) receives a signal of conducting no washing operation transmitted by the mobile terminal or does not receive a signal transmitted by the mobile terminal within a preset duration, the weighing sensor (6) continues to detect the weight of the clothes accommodating parts (3), and continues to push a message to the mobile terminal when the weight of the clothes accommodating parts (3) is increased, to inquire whether to wash clothes.

10. The control method according to any one of claims 7-9, wherein after clothes in the clothes accommodating parts (3) are thrown into the inner drum (9), the program controller (10) controls the washing machine body (7) to close the cover (8), and then is operated according to washing procedures corresponding to clothes types in the clothes accommodating parts (3).

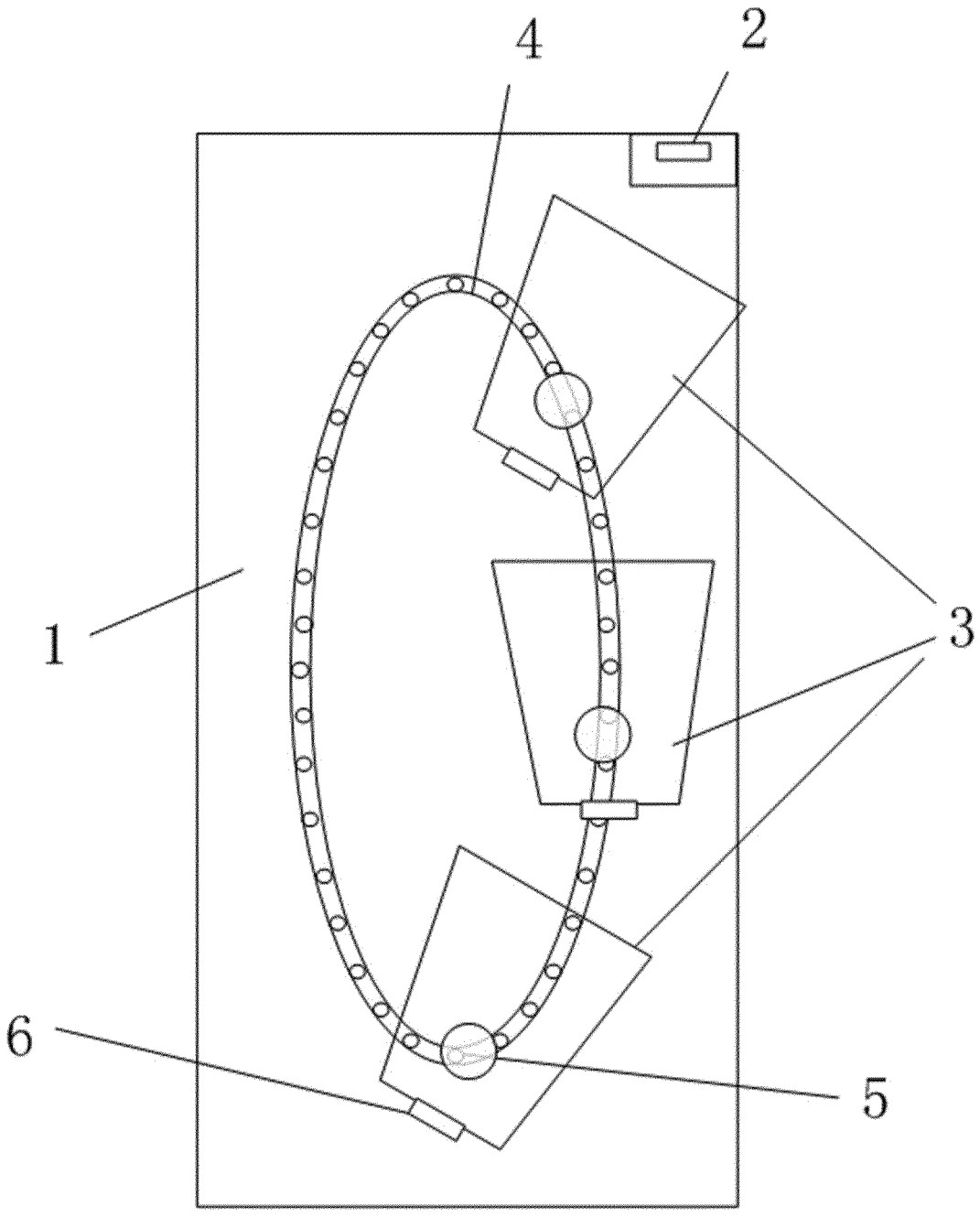


FIG. 1

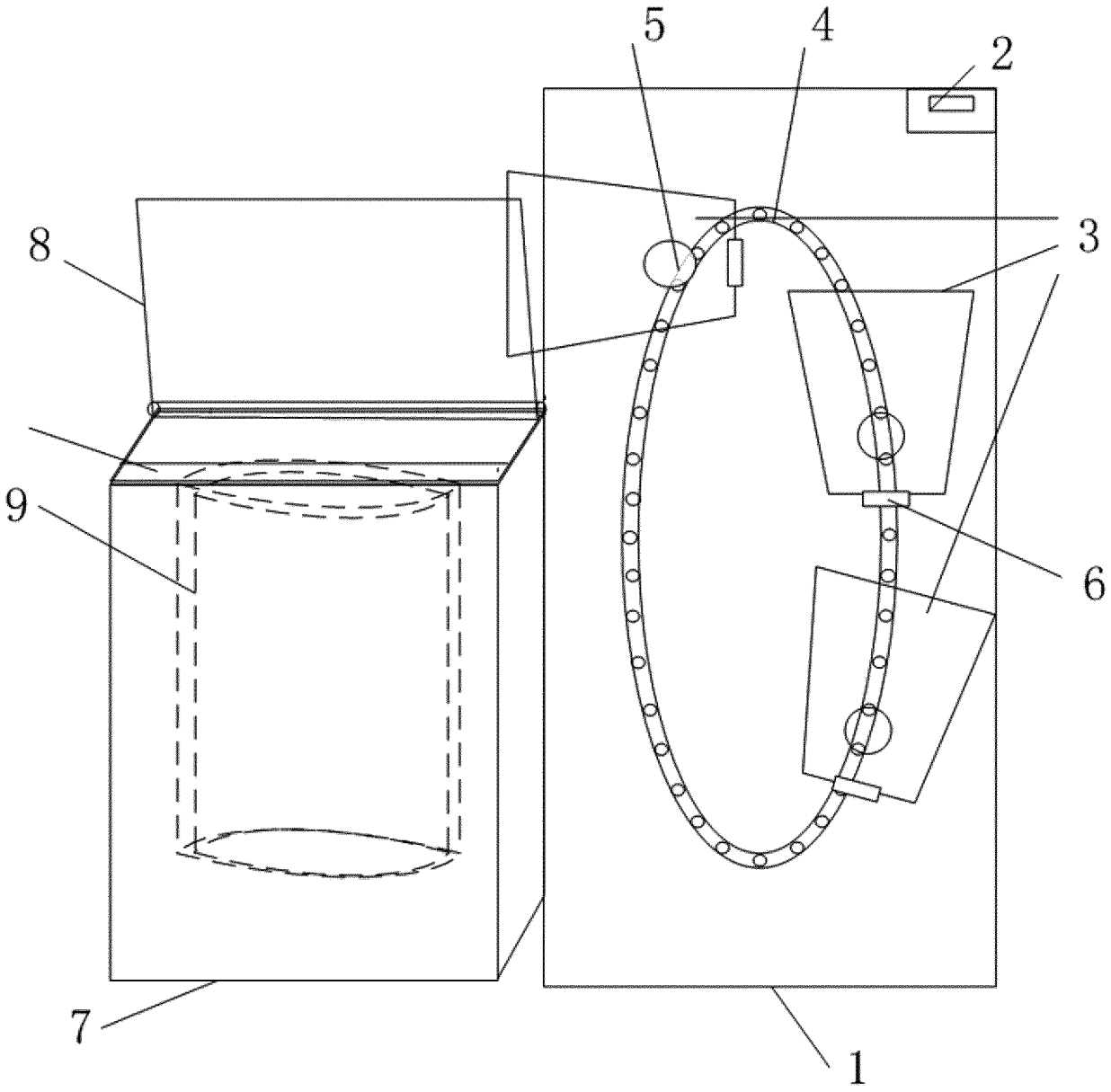


FIG. 2

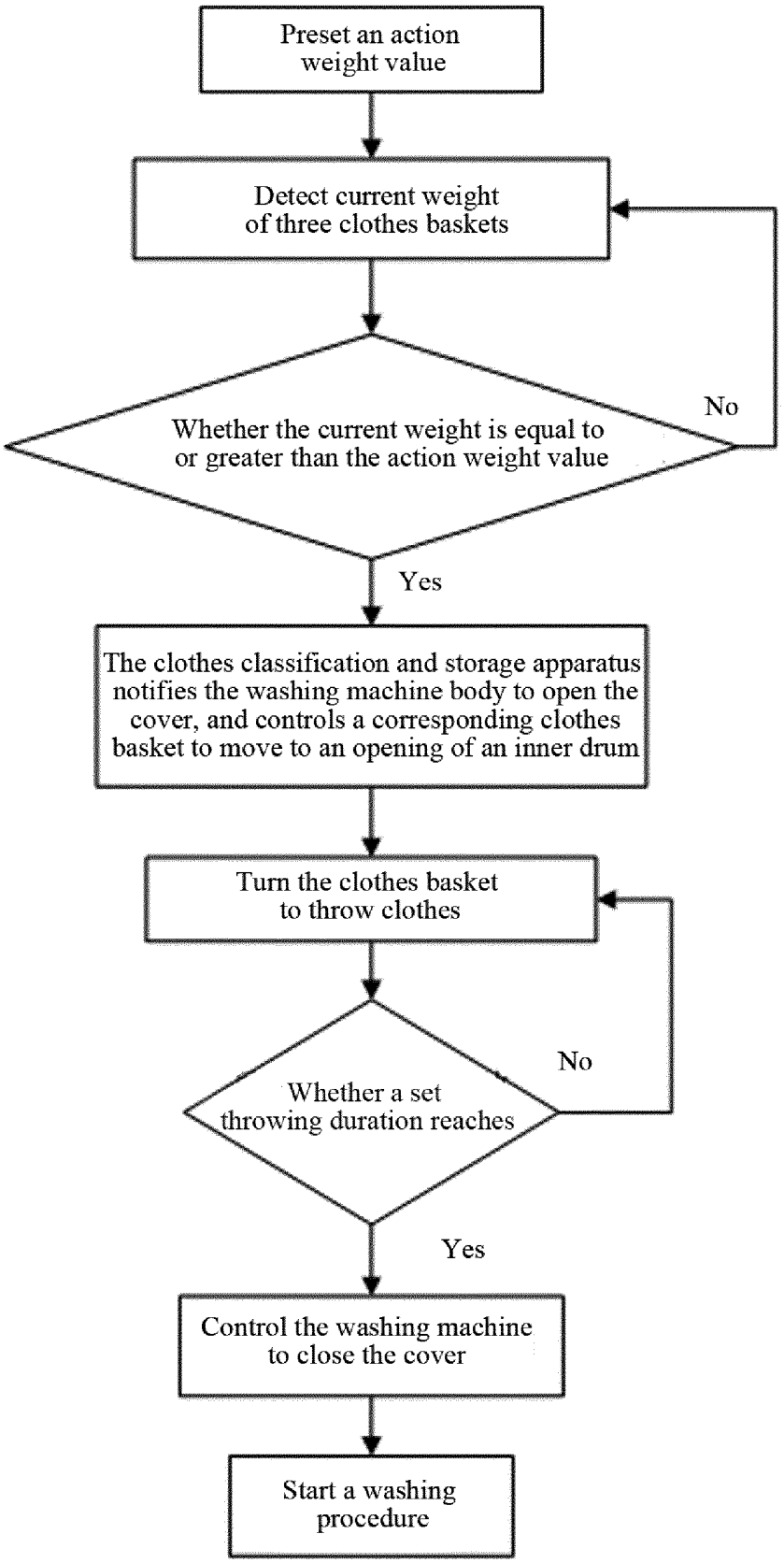

Preset an action weight value
Detect current weight of three clothes baskets
Whether the current weight is equal to or greater than the action weight value
No
Yes
The clothes classification and storage apparatus notifies the washing machine body to open the cover, and controls a corresponding clothes basket to move to an opening of an inner drum
Turn the clothes basket to throw clothes
Whether a set throwing duration reaches
No
Yes
Control the washing machine to close the cover
Start a washing procedure

FIG. 3

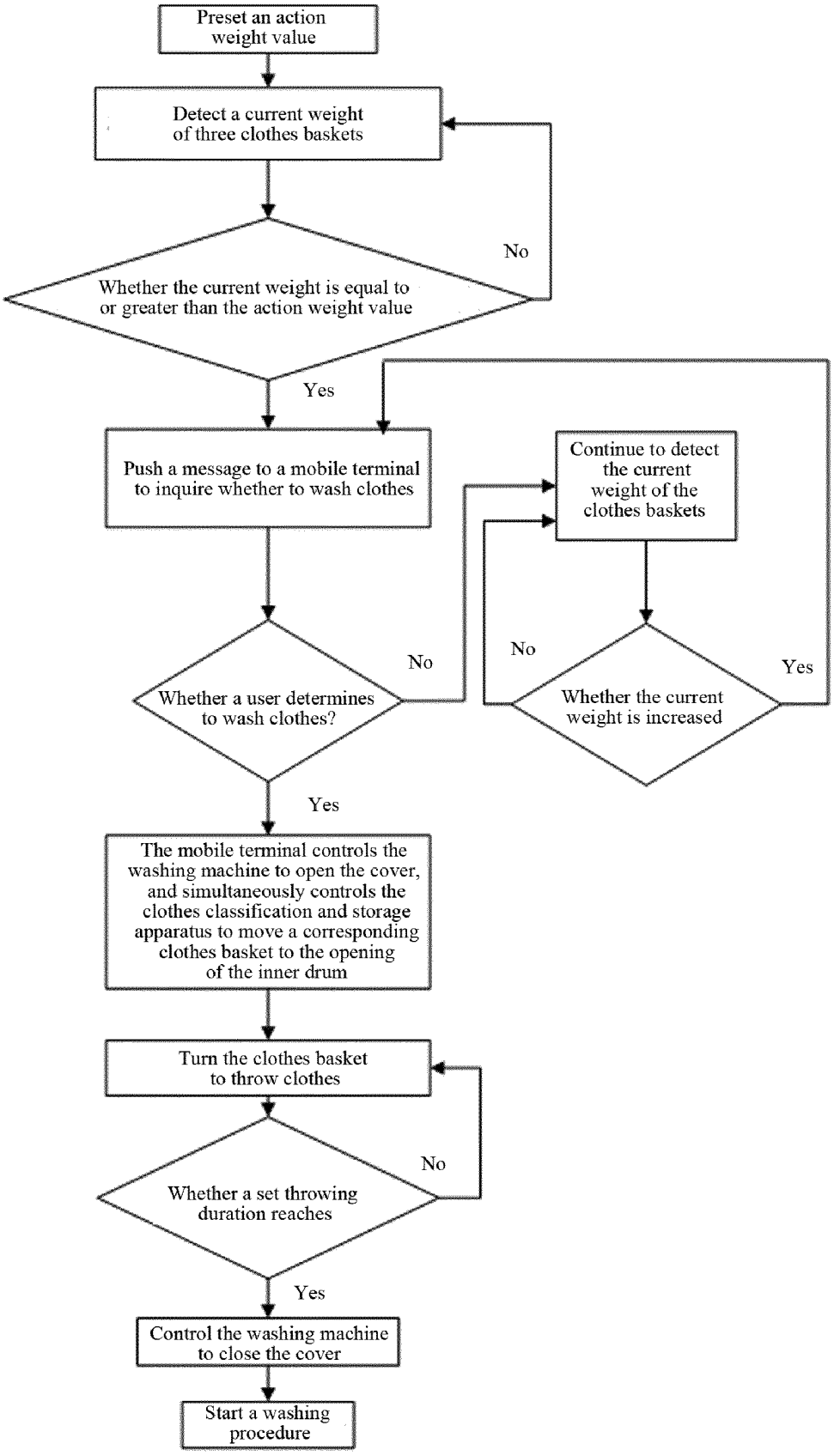

Preset an action weight value
Detect a current weight of three clothes baskets
Whether the current weight is equal to or greater than the action weight value
No
Yes
Push a message to a mobile terminal to inquire whether to wash clothes
Continue to detect the current weight of the clothes baskets
Whether a user determines to wash clothes?
No
Yes
Whether the current weight is increased
No
Yes
The mobile terminal controls the washing machine to open the cover, and simultaneously controls the clothes classification and storage apparatus to move a corresponding clothes basket to the opening of the inner drum
Turn the clothes basket to throw clothes
Whether a set throwing duration reaches
No
Yes
Control the washing machine to close the cover
Start a washing procedure

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2016/080656

A. CLASSIFICATION OF SUBJECT MATTER

D06F 95/00 (2006.01) i; D06F 33/02 (2006.01) i
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 practicable, search terms used)
CNABS; DWPI; SIPOABS: HAIER; deliver, basket, bucket, dirty clothes, classify, separate, cloth+, garment, fabric, laundry+, mov+, driv+, auto+, transfer+, transport+, control+, transmit+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 201873869 U (KUNSHAN WEIYU METAL PRODUCTION CO., LTD.), 22 June 2011 (22.06.2011), description, paragraphs [0033] and [0041], and figure 1	1-3, 5-6
Y	CN 201873869 U (KUNSHAN WEIYU METAL PRODUCTION CO., LTD.), 22 June 2011 (22.06.2011), description, paragraphs [0033] and [0041], and figure 1	4, 7-10
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PX	CN 104818596 A (SUZHOU SANTI INTELLIGENT TECHNOLOGY CO., LTD.), 05 August 2015 (05.08.2015), description, paragraphs [0014]-[0018], and figures 1-5	1-3, 5-6

☒ 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

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Date of the actual completion of the international search	Date of mailing of the international search report
06 July 2016 (06.07.2016)	**03 August 2016 (03.08.2016)**
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer **BAI, Ying** Telephone No.: (86-10) **62084625**

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2016/080656

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PY	CN 104818596 A (SUZHOU SANTI INTELLIGENT TECHNOLOGY CO., LTD.), 05 August 2015 (05.08.2015), description, paragraphs [0014]-[0018], and figures 1-5	4, 7-10
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Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2016/080656

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