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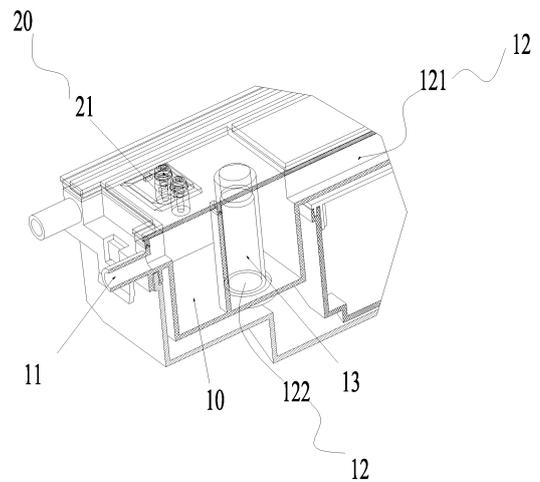
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(54) **CLEANING DEVICE, WASHING MACHINE, AND DETERGENT DELIVERY METHOD**

(57) Some embodiments of the present invention provide a cleaning device, a washing machine, and a detergent dispensing method. The cleaning device includes a first accommodation portion, a first detection portion and a control portion. The first accommodation portion has a water inlet portion and a water outlet portion. At least part of the first detection portion is disposed in the first accommodation portion. The first detection portion is configured to detect a flow speed of a liquid flowing into the first accommodation portion 10 from the water inlet portion. The control portion is electrically connected to the first detection portion. The control portion is configured to control a water inlet duration of the water inlet portion 11. At least part of the first detection portion is disposed in the first accommodation portion to detect a flow speed of a liquid flowing into the first accommodation portion, and then the control portion controls a water inlet duration of the water inlet portion of the first accommodation portion to control a total water inlet amount. This arrangement allows the washing machine to accurately control the water inlet amount, so that the water inlet amount of the washing machine and the detergent are fully integrated, thereby improving the washing effect of

the washing machine.



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Description

Cross Reference to Related Applications

[0001] The present application claims priority to Chinese Patent Application No. 201810804441.5, filed on July 20, 2018, entitled "Cleaning Device, Washing Machine, and Detergent Dispensing Method", the invention of which is hereby incorporated by reference in its entirety.

Technical Field

[0002] The present invention relates to a technical field of washing machine equipment, and more particularly, to a cleaning device, a washing machine, and a detergent dispensing method.

Background

[0003] A washing machine known to inventors cannot precisely control a amount of water inlet of the washing machine, and cannot detect a hardness of water quality. An automatic detergent dispensing portion of the washing machine known to inventors can only simply convert a dispensing amount of detergent according to a weight of laundry to complete automatic dispensing, but ignores an influence of the amount of water inlet and the hardness of water on the dispensing amount of detergent, which leads to a problem of poor washing effect.

Summary

[0004] Some embodiments of the present invention provide a cleaning device, a washing machine, and a detergent dispensing method, which are intended to solve the problem of poor washing effect of a washing machine in the conventional art.

[0005] Some embodiments of the present invention provide a cleaning device, which includes: a first accommodation portion, the first accommodation portion having a water inlet portion and a water outlet portion; a first detection portion, at least part of the first detection portion being disposed in the first accommodation portion, the first detection portion being configured to detect a flow speed of a liquid flowing into the first accommodation portion from the water inlet portion; and a control portion, electrically connected with the first detection portion, and configured to control a water inlet duration of the water inlet portion.

[0006] In some embodiments, the water outlet portion includes: a first water outlet, the first water outlet being provided on a cavity wall of the first accommodation portion; and a second water outlet, the second water outlet being provided on the cavity wall of the first accommodation portion, the second water outlet being adjacent to the first water outlet.

[0007] In some embodiments, the cleaning device fur-

ther includes: a siphon tube, one end of the siphon tube being communicated with the second water outlet, and the other end of the siphon tube being configured to drain residual water in the first accommodation portion.

[0008] In some embodiments, the first detection portion includes: a detection probe, the detection probe being disposed on an inner cavity wall of the first accommodation portion, the detection probe being electrically connected with the control portion, and the detection probe being configured to detect a flow speed and/or hardness of a liquid flowing through the water inlet portion.

[0009] Some embodiments of the present invention provide a cleaning device, which includes: a first accommodation portion, the first accommodation portion having a water inlet portion and a water outlet portion; a first detection portion, at least part of the first detection portion being disposed in the first accommodation portion, the first detection portion being configured to detect a flow speed and hardness of a liquid flowing into the first accommodation portion from the water inlet portion; a control portion, electrically connected with the first detection portion, and configured to control a water inlet duration of the water inlet portion and determine a total water inlet amount of the liquid; and a dispensing portion, the dispensing portion being electrically connected with the control portion, the control portion being able to control the dispensing portion to dispense detergent into the water outlet portion.

[0010] In some embodiments, the dispensing portion further includes: a weighing portion, connected with a washing barrel, electrically connected with the control portion, and configured to weigh laundry put into the washing barrel.

[0011] Some embodiments of the present invention, a washing machine is provided, which includes the above cleaning device.

[0012] In some embodiments, the washing machine includes: a weighing portion, connected with a washing barrel, electrically connected with the control portion, and configured to weigh laundry put into the washing barrel.

[0013] In some embodiments, the washing machine further includes: a dispensing portion, electrically connected with the control portion, and configured to dispense detergent into the water outlet portion.

[0014] In some embodiments, the dispensing portion includes: a second accommodation portion, adjacent to the first accommodation portion, communicated with the water outlet portion, and configured to store detergent.

[0015] In some embodiments, the dispensing portion further includes: a dispensing tube, a first end of the dispensing tube being communicated with the second accommodation portion, and a second end of the dispensing tube being communicated with the water outlet portion.

[0016] In some embodiments, the dispensing portion further includes: a second detection portion, connected with the second accommodation portion, and the second

detection portion being configured to detect a storage amount of detergent in the second accommodation portion.

[0017] In some embodiments, the dispensing portion further includes: a dispensing pump, adjacent to the second accommodation portion, electrically connected with the control portion, and configured to deliver detergent in the second accommodation portion to the water outlet portion.

[0018] According to another aspect of the present invention, a detergent dispensing method of the washing machine is provided. The method is used for dispensing detergent to the above washing machine. The method includes the following steps. In step S10, after a weighing portion weighs laundry, a control portion controls a water inlet duration of a water inlet portion according to a weight of the laundry and a flow speed of a liquid detected by a first detection portion. In step S20, the control portion controls a dispensing pump to dispense a preset amount of detergent to a water outlet portion according to the hardness of the liquid detected by the first detection portion, a total water inlet amount of the liquid, and the weight of the laundry weighed by the weighing portion.

[0019] In some embodiments, step S10 includes: step S11, in which after the weighing portion weighs the laundry, the total water inlet amount is determined; step S12, in which the control portion determines a water inlet speed by a volume of a first accommodation portion and time spent in filling the first accommodation portion with the liquid; and step S13, in which the control portion determines a total water inlet duration required for a washing barrel through a total water inlet amount and a water inlet speed, and controls an opening time of the water inlet portion until the opening time of the water inlet portion is equal to the total water inlet duration required for the washing barrel.

[0020] By applying the technical solution of the present invention, at least part of the first detection portion is disposed in the first accommodation portion to detect a flow speed of a liquid flowing into the first accommodation portion, and then the control portion controls a water inlet duration of the water inlet portion of the first accommodation portion to control a total water inlet amount. This arrangement allows the washing machine to accurately control the water inlet amount, so that the water inlet amount of the washing machine and detergent are fully integrated, thereby improving the washing effect of the washing machine.

Brief Description of the Drawings

[0021] The accompanying drawings, which constitute a part of the present invention, are used to provide a further understanding of the present invention, and the exemplary embodiments of the present invention and the description thereof are used to explain the present invention, but do not constitute improper limitations to the present invention. In the drawings:

Fig. 1 illustrates a schematic cross-sectional structure diagram of an embodiment of a cleaning device according to some embodiments of the present invention;

Fig. 2 illustrates a schematic structure diagram of Embodiment 1 of a washing machine according to some embodiments of the present invention;

Fig. 3 illustrates a schematic structure diagram of Embodiment 2 of a washing machine according to some embodiments of the present invention;

Fig. 4 illustrates a first schematic flowchart of a working principle of a washing machine according to some embodiments of the present invention; and

Fig. 5 illustrates a second schematic flowchart of a working principle of a washing machine according to some embodiments of the present invention.

Description of the reference signs:

[0022] 10, first accommodation portion; 11, water inlet portion; 12, water outlet portion; 121, first water outlet; 122, second water outlet; 12, siphon tube; 20, first detection portion; 21, detection probe; 30, second accommodation portion; 40, dispensing portion; 41, dispensing tube; 42, dispensing pump; 43, second detection portion.

Detailed Description of the Embodiments

[0023] It is to be noted that in the case of no conflict, the features in the embodiments and the embodiments in the present invention may be combined with each other. The present invention is described below with reference to the drawings and in conjunction with the embodiments in detail.

[0024] It is to be noted that terms used herein only aim to describe specific implementation manners, and are not intended to limit exemplar implementations of this invention. Unless otherwise directed by the context, singular forms of terms used herein are intended to include plural forms. Besides, it will be also appreciated that when terms "contain" and/or "include" are used in the description, it is indicated that features, steps, operations, devices, assemblies and/or a combination thereof exist.

[0025] It is to be noted that the specification and claims of the present invention and the terms "first", "second" and the like in the drawings are used to distinguish similar objects, and do not need to describe a specific sequence or a precedence order. It will be appreciated that the terms used in such a way is exchanged under appropriate conditions, in order that the embodiments of the present invention described here can be implemented in, for example, a sequence other than sequences graphically shown or described here. In addition, terms "include" and "have" and any variations thereof are intended to cover non-exclusive inclusions. For example, it is not limited for processes, methods, systems, products or devices containing a series of steps or units to clearly list those

steps or units, and other steps or units which are not clearly listed or are inherent to these processes, methods, products or devices are included instead.

[0026] For ease of description, spatial relative terms such as "over", "above", "on an upper surface" and "upper" are used herein for describing a spatial position relation between a device or feature and other devices or features shown in the drawings. It will be appreciated that the spatial relative terms aim to contain different orientations in usage or operation besides the orientations of the devices described in the drawings. For example, if the devices in the drawings are inverted, devices described as "above other devices or structures" or "over other devices or structures" will be located as "below other devices or structures" or "under other devices or structures". Thus, an exemplar term "above" includes two orientations namely "above" and "below". The device is located in other different modes (rotated by 90 degrees or located in other orientations), and spatial relative descriptions used herein are correspondingly explained.

[0027] Exemplary implementations in accordance with the present invention will now be described in more detail with reference to the accompanying drawings. However, the exemplary implementations are embodied in many different forms and should not be construed as being limited to the implementations set forth herein. It is to be understood that the implementations are provided so that the invention of the present invention will be thorough and complete, and the concept of the exemplary implementations will be fully conveyed to those of ordinary skill in the art, in which the thicknesses of the layers and regions may be expanded for the sake of clarity, the same device is denoted by the same reference numerals, and the description thereof will be omitted.

[0028] As shown in Fig. 1 to Fig. 5, some embodiments of the present invention provide a cleaning device.

[0029] In some embodiments, as shown in Fig. 1, the cleaning device includes a first accommodation portion 10, a first detection portion 20 and a control portion. The first accommodation portion 10 has a water inlet portion 11 and a water outlet portion 12. At least part of the first detection portion 20 is disposed in the first accommodation portion 10. The first detection portion 20 is configured to detect a flow speed of a liquid flowing into the first accommodation portion 10 from the water inlet portion 11. The control portion is electrically connected with the first detection portion 20. The control portion is configured to control the water inlet portion 11 to be opened or closed.

[0030] Some embodiments of the present invention, at least part of the first detection portion is disposed in the first accommodation portion to detect a flow speed of a liquid flowing into the first accommodation portion, and then the control portion controls a water inlet duration of the water inlet portion of the first accommodation portion, so as to control a total water inlet amount. This arrangement allows the washing machine to accurately control a water inlet amount, so that the water inlet amount of

the washing machine and detergent are fully integrated, thereby improving a washing effect of the washing machine.

[0031] In some embodiments, the water outlet portion 12 includes a first water outlet 121 and a second water outlet 122. The first water outlet 121 is provided on a cavity wall of the first accommodation portion 10. The second water outlet 122 is provided on the cavity wall of the first accommodation portion 10. The second water outlet 122 is adjacent to the first water outlet 121. The first water outlet 121 is configured to introduce the liquid entered from the water inlet portion 11 into a washing barrel. When water inlet ends, the water inlet portion 11 is closed, and the second water outlet is configured to remove residual liquid in the first accommodation portion from the second water outlet. This arrangement allows the liquid in the first accommodation portion to be fully discharge into the washing barrel, so that the water inlet amount of the washing machine is accurately controlled.

[0032] In some embodiments, the cleaning device further includes a siphon tube 13. One end of the siphon tube 13 is communicated with the second water outlet 122, and the other end of the siphon tube 13 is configured to discharge residual water in the first accommodation portion 10. This arrangement allows the residual liquid in the first accommodation portion to be discharged from one end of the siphon tube to the other end when the water inlet ends, and then into the washing barrel, so that the washing machine accurately controls the water inlet amount.

[0033] In some embodiments, the first detection portion 20 includes a detection probe 21. The detection probe 21 is disposed on an inner cavity wall of the first accommodation portion 10. The detection probe 21 is electrically connected with the control portion. The detection probe 21 is configured to detect a flow speed or hardness of a liquid flowing through the water inlet portion 11. Of course, the detection probe also simultaneously detects the flow speed and hardness of a liquid flowing through the water inlet portion 11. This arrangement allows the detection probe to transmit detected information to the control portion, and the control portion opens or closes the water inlet portion 11 according to the detected information.

[0034] In some embodiments, the cleaning device includes a first accommodation portion 10, a first detection portion 20, a control portion and a dispensing portion 40. The first accommodation portion 10 has a water inlet portion 11 and a water outlet portion 12. At least part of the first detection portion 20 is disposed in the first accommodation portion 10. The first detection portion 20 is configured to detect a flow speed and hardness of a liquid flowing into the first accommodation portion 10 from the water inlet portion 11. The control portion is electrically connected with the first detection portion 20. The control portion is configured to control a water inlet duration of the water inlet portion 11 and determine a total water inlet amount of the liquid. The dispensing portion 40 is elec-

trically connected with the control portion. The control portion is able to control the dispensing portion 40 to dispense detergent into the water outlet portion 12. The control portion controls a dispensing pump 42 to dispense a preset amount of detergent to the water outlet portion 12 according to the hardness of the liquid detected by the first detection portion 20 and a total water inlet amount of the liquid.

[0035] In some embodiments, the dispensing portion further includes: a weighing portion, connected with a washing barrel, electrically connected with the control portion, and configured to weigh laundry put into the washing barrel. The weighing portion weighs the laundry to initially calculate a total water inlet amount required. The control portion controls the dispensing pump 42 to dispense a preset amount of detergent to the water outlet portion 12 according to the hardness of the liquid detected by the first detection portion 20, a total water inlet amount of the liquid, and the weight of the laundry weighed by the weighing portion.

[0036] The cleaning device of the above embodiments also is used in a technical field of washing machine equipment, that is, some embodiments of the present invention provide a washing machine. The air conditioner includes a cleaning device. The cleaning device is the cleaning device of the above embodiments.

[0037] In some embodiments, the washing machine includes a weighing portion, connected with a washing barrel, electrically connected with the control portion, and configured to weigh laundry put into the washing barrel. This arrangement allows the weighing portion to feed back an obtained information to the control portion in time after weighing the laundry, and the control portion controls the water inlet amount of the water inlet portion 11 according to the weight of the laundry.

[0038] As shown in Fig. 2 and Fig. 3, the washing machine further includes a dispensing portion 40. The dispensing portion 40 is electrically connected with the control portion, and the dispensing portion 40 is configured to dispense detergent into the water outlet portion 12. The control portion accurately dispenses a required dosage of detergent into the washing barrel according to the weight of the laundry, the total water inlet amount and a hardness of water quality.

[0039] In some embodiments, the dispensing portion 40 includes a second accommodation portion 30. The second accommodation portion 30 is adjacent to the first accommodation portion 10. The second accommodation portion 30 is communicated with the water outlet portion 12. The second accommodation portion 30 is configured to store detergent. This arrangement facilitates the second accommodation portion 30 to transport the stored detergent into the first accommodation portion 10, so that detergent and the liquid in the first accommodation portion 10 are fully mixed and flow into the washing barrel.

[0040] In addition, the dispensing portion 40 further includes a dispensing tube 41. A first end of the dispensing tube 41 is communicated with the second accommoda-

tion portion 30. A second end of the dispensing tube 41 is communicated with the water outlet portion 12. The second accommodation portion delivers detergent to the water outlet portion by the dispensing tube 41.

[0041] In some embodiments, the dispensing portion 40 further includes a second detection portion 43. The second detection portion 43 is connected with the second accommodation portion 30. The second detection portion 43 is configured to detect a storage amount of detergent in the second accommodation portion 30. The second detection portion 43 detects detergent stored in the second accommodation portion 30. When detergent in the second accommodation portion 30 is insufficient and the amount of detergent is lower than a preset value, the control portion will remind a user to add detergent through a warning light connected with the control portion.

[0042] In some embodiments, the dispensing portion 40 further includes a dispensing pump 42. The dispensing pump 42 is adjacent to the second accommodation portion 30. The dispensing pump 42 is electrically connected with the control portion. The dispensing pump 42 is configured to deliver detergent in the second accommodation portion 30 to the water outlet portion 12. This arrangement allows the control portion to control the dispensing pump to dispense detergent stored in the second accommodation portion 30 into the water outlet portion 12 in a set demand proportion according to the weight of the laundry, the total water inlet amount and the hardness of the water quality.

[0043] Some embodiments of the present invention provide a detergent dispensing method of the washing machine. The method includes the following steps. In step S10, after a weighing portion weighs laundry, a control portion controls a water inlet duration of a water inlet portion 11 according to a weight of the laundry and a flow speed of a liquid detected by a first detection portion 20. In step S20, the control portion controls a dispensing pump 42 to dispense a preset amount of detergent to a water outlet portion 12 according to the hardness of the liquid detected by the first detection portion 20, a total water inlet amount of the liquid, and the weight of the laundry weighed by the weighing portion. Step S10 includes: step S11, in which after the weighing portion weighs the laundry, the total water inlet amount is determined; step S12, in which the control portion determines a water inlet speed by the volume of a first accommodation portion 10 and time spent in filling the first accommodation portion 10 with the liquid; and step S13, in which the control portion determines a total water inlet duration required for a washing barrel through a total water inlet amount and a water inlet speed, and controls an opening time of the water inlet portion 11 until the opening time of the water inlet portion 11 is equal to the total water inlet duration required for the washing barrel.

[0044] In some embodiments of the present invention, the control portion controls the total water inlet duration of the water inlet portion 11 to accurately control the total water inlet amount. The first detection portion more ac-

curately controls the dosage of detergent by detecting the hardness of tap water.

[0045] In the art known to inventors, a liquid level detection technology in the washing barrel cannot eliminate a problem that errors caused by water absorption of clothes to cause inaccurate control of the water inlet amount. Moreover, the washing machine known to inventors ignores a hardness of tap water and cannot consider the consumption of ions (Ca, Mg, Cl, etc.) in the tap water on effective ingredients of detergent, so that a cleaning effect cannot be achieved. The technical solution of some embodiments in the present invention can control the dispensing amount of detergent by accurately converting physical quantities such as the weight of laundry, the total water inlet amount, and the hardness of the water quality to improve the washing effect, reduce the amount of detergent under a same washing effect, save washing costs, and reduce environmental pollution caused by discharged wastewater.

[0046] As shown in Fig. 2, the washing machine includes a water inlet detection module and a detergent dispensing module.

[0047] As shown in Fig. 1, the cleaning device includes a water inlet tube of the water inlet portion 11, the detection probe 21 of the first detection portion 20, a downstream water inlet channel at the first water outlet 121, the siphon 13, and the first accommodation portion 10. When the tap water is injected into the first accommodation portion 10 from the water inlet tube, the control portion controls the first accommodation portion 10 to be filled with water, and the liquid level starts to count from a contact with the detection probe 21. An elapsed time of contact is t , and due to a constant volume of the first accommodation portion 10, a water flow speed v is quickly calculated. By calculating the total amount of water U , $U/v=T$ is the total water inlet duration, and the total duration T is controlled to achieve the control of the total water inlet amount U . In addition, the detection probe 21 detects the water hardness while contacting water and detecting the water. Residual water in the first accommodation portion 10 will be drained away by the siphon tube 13, so as not to affect an accuracy of the next detection flow. There will always be water passing through the siphon tube 13 during the whole water inlet process, but a downstream of the siphon tube 13 is connected with the washing barrel without affecting the total water inlet amount.

[0048] As shown in Fig. 3, the washing machine further includes the second accommodation portion 30, the dispensing pump 42, the second detection portion 43, and the dispensing tube 41. The dispensing amount of detergent is determined according to several physical quantities such as the weight of the laundry, the total water inlet amount, and the hardness of the water by an intelligent algorithm. Detergent is sucked out by the dispensing pump 42 from the second accommodation portion 30 and dispensed into the dispensing tube 41. The dispensing tube 41 is connected with a channel of the water inlet

portion 11 or the water outlet portion 12 of the cleaning device, and achieves dispensing of detergent by means of water inlet flow. The second detection portion 43 detects whether the liquid level of detergent in the second accommodation portion 30 reaches a minimum liquid level threshold. When detergent in the second accommodation portion 30 is insufficient, a whole controller detects it to notify a user that detergent needs to be added.

[0049] As shown in Fig. 4 and Fig. 5, the information obtained by weighing the laundry to be washed by the weighing portion is used to control the total water inlet amount. The total water inlet amount is determined by the flow speed of water inlet and the water inlet duration. After obtaining the weight of the laundry to be washed, the total water inlet amount, and the water hardness, the only algorithm is used to determine the amount of detergent needing to be dispensed by the washing machine finally.

[0050] In addition to the above, it is also to be noted that "one embodiment", "another embodiment", "an embodiment" and the like referred to in the specification refers to specific features, structures or characteristics described in connection with the embodiment are included in at least one embodiment of a general description of the present invention. The appearance of a same expression in various places in the specification does not necessarily refer to a same embodiment. Further, when a particular feature, structure, or characteristic is described in conjunction with any embodiment, it is claimed that such feature, structure, or characteristic is also included in a scope of the present invention.

[0051] In the above embodiments, descriptions of each embodiment are emphasized respectively, and parts which are not elaborated in detail in a certain embodiment refer to relevant descriptions of other embodiments.

[0052] The above embodiments of the present invention are not intended to limit the present invention. As will occur to those skilled in the art, the present invention is susceptible to various modifications and changes. Any modifications, equivalent replacements, improvements and the like made within the spirit and principle of the present invention shall fall within the scope of protection of the present invention.

Claims

1. A cleaning device, comprising:

a first accommodation portion (10), the first accommodation portion (10) having a water inlet portion (11) and a water outlet portion (12);
a first detection portion (20), at least part of the first detection portion (20) being disposed in the first accommodation portion (10), the first detection portion (20) being configured to detect a flow speed of a liquid flowing into the first accommodation portion (10) from the water inlet portion

- (11); and
a control portion, electrically connected with the first detection portion (20), and configured to control a water inlet duration of the water inlet portion (11).
2. The cleaning device according to claim 1, wherein the water outlet portion (12) comprises:
- a first water outlet (121), the first water outlet (121) being provided on a cavity wall of the first accommodation portion (10); and
a second water outlet (122), the second water outlet (122) being provided on the cavity wall of the first accommodation portion (10), the second water outlet (122) being adjacent to the first water outlet (121).
3. The cleaning device according to claim 2, further comprising:
a siphon tube (13), one end of the siphon tube (13) being communicated with the second water outlet (122), and the other end of the siphon tube (13) being configured to discharge residual water in the first accommodation portion (10).
4. The cleaning device according to claim 1, wherein the first detection portion (20) comprises:
a detection probe (21), the detection probe (21) being disposed on an inner cavity wall of the first accommodation portion (10), the detection probe (21) being electrically connected with the control portion, and the detection probe (21) being configured to detect a flow speed and/or hardness of a liquid flowing through the water inlet portion (11).
5. A cleaning device, comprising:
a first accommodation portion (10), the first accommodation portion (10) having a water inlet portion (11) and a water outlet portion (12);
a first detection portion (20), at least part of the first detection portion (20) being disposed in the first accommodation portion (10), the first detection portion (20) being configured to detect a flow speed and hardness of a liquid flowing into the first accommodation portion (10) from the water inlet portion (11);
a control portion, electrically connected with the first detection portion (20), and configured to control a water inlet duration of the water inlet portion (11) and determine a total water inlet amount of the liquid; and
a dispensing portion (40), the dispensing portion (40) being electrically connected with the control portion, the control portion being able to control the dispensing portion (40) to dispense detergent into the water outlet portion (12).
6. The cleaning device according to claim 5, wherein the dispensing portion further comprises: a weighing portion, connected with a washing barrel, electrically connected with the control portion, and configured to weigh laundry put into the washing barrel.
7. A washing machine, comprising the cleaning device according to any one of claims 1 to 6.
8. The washing machine according to claim 7, comprising:
a weighing portion, connected with a washing barrel, electrically connected with the control portion, and configured to weigh laundry put into the washing barrel.
9. The washing machine according to claim 7, further comprising:
a dispensing portion (40), the dispensing portion (40) being electrically connected with the control portion, and the dispensing portion (40) being configured to dispense detergent into the water outlet portion (12).
10. The washing machine according to claim 9, wherein the dispensing portion (40) comprises:
a second accommodation portion (30), the second accommodation portion (30) being adjacent to the first accommodation portion (10), the second accommodation portion (30) being communicated with the water outlet portion (12), and the second accommodation portion (30) being configured to store detergent.
11. The washing machine according to claim 10, wherein the dispensing portion (40) further comprises:
a dispensing tube (41), a first end of the dispensing tube (41) being communicated with the second accommodation portion (30), and a second end of the dispensing tube (41) being communicated with the water outlet portion (12).
12. The washing machine according to claim 10, wherein the dispensing portion (40) further comprises:
a second detection portion (43), the second detection portion (43) being connected with the second accommodation portion (30), and the second detection portion (43) being configured to detect a storage amount of detergent in the second accommodation portion (30).
13. The washing machine according to claim 10, wherein the dispensing portion (40) further comprises:
a dispensing pump (42), the dispensing pump (42) being adjacent to the second accommodation portion (30), the dispensing pump (42) being electrically connected with the control portion, and the dispensing pump (42) being configured to deliver detergent in the second accommodation portion (30) to the wa-

ter outlet portion (12).

14. A detergent dispensing method of a washing machine, used for dispensing detergent to the washing machine according to any one of claims 7 to 13, the method comprising the following steps: 5

step S10: after weighing laundry by a weighing portion, controlling, by a control portion, a water inlet duration of a water inlet portion (11) according to a weight of the laundry and a flow speed of a liquid detected by a first detection portion (20); and 10

step S20: controlling, by the control portion, a dispensing pump (42) to dispense a preset amount of detergent to a water outlet portion (12) according to the hardness of the liquid detected by the first detection portion (20), a total water inlet amount of the liquid, and the weight of the laundry weighed by the weighing portion. 20

15. The detergent dispensing method of the washing machine according to claim 14, wherein step S10 comprises: 25

step S11: after weighing the laundry by the weighing portion, determining the total water inlet amount;

step S12: determining, by the control portion, a water inlet speed by a volume of a first accommodation portion (10) and time spent in filling the first accommodation portion (10) with the liquid; and 30

step S13: determining, by the control portion, a total water inlet duration required for a washing barrel through a total water inlet amount and a water inlet speed, and controlling an opening time of the water inlet portion (11) until the opening time of the water inlet portion (11) is equal to the total water inlet duration required for the washing barrel. 40

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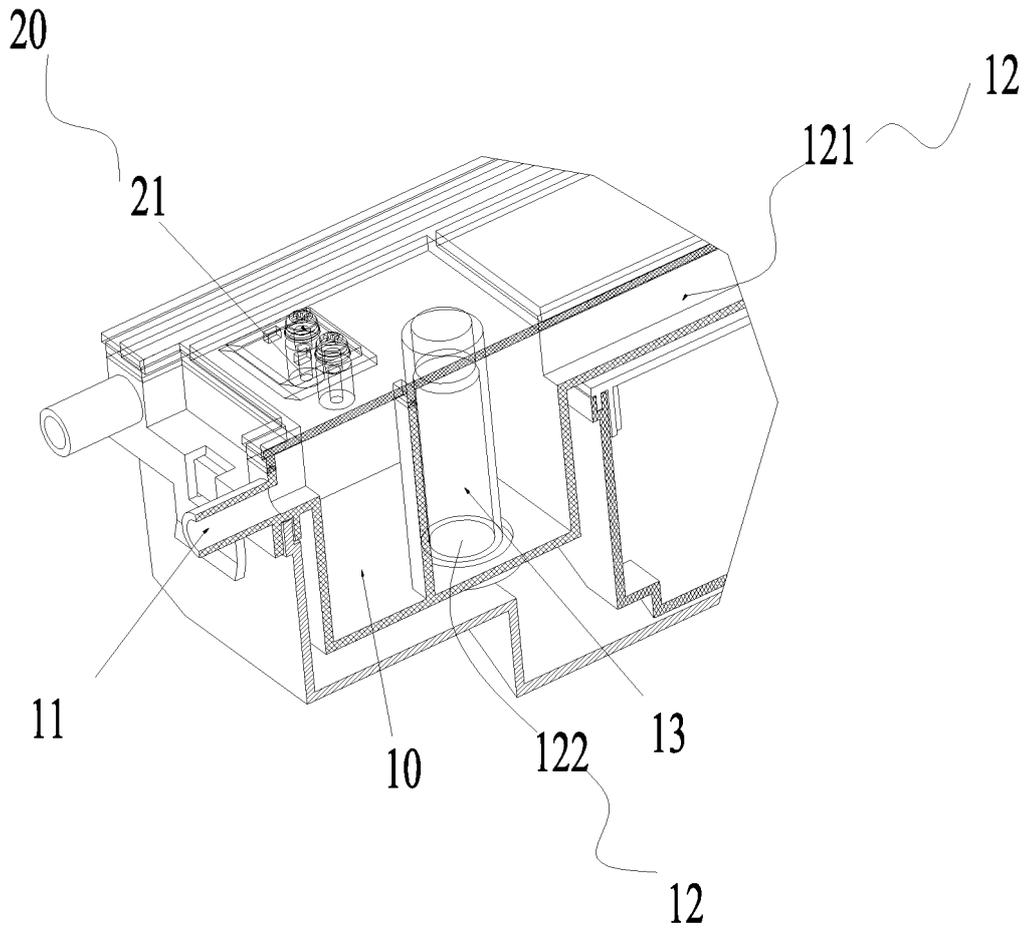


Fig. 1

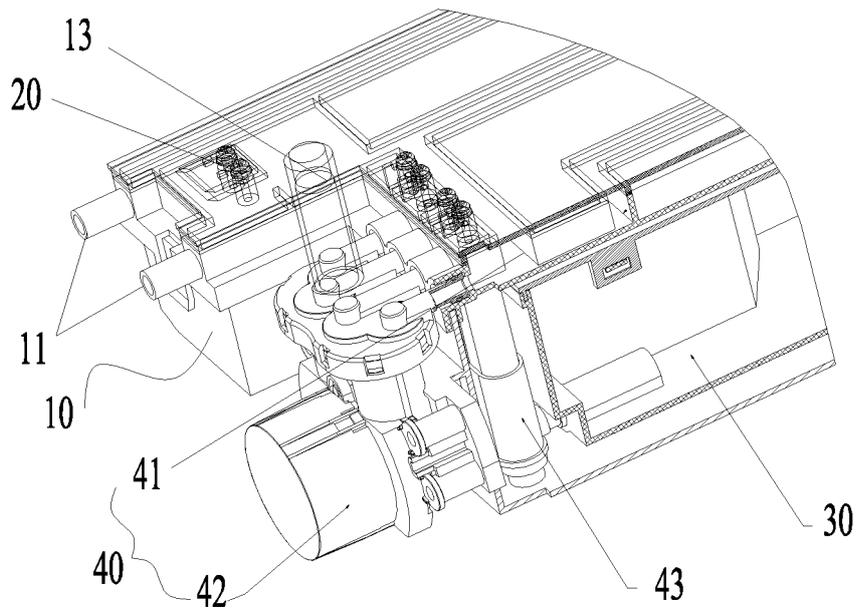


Fig. 2

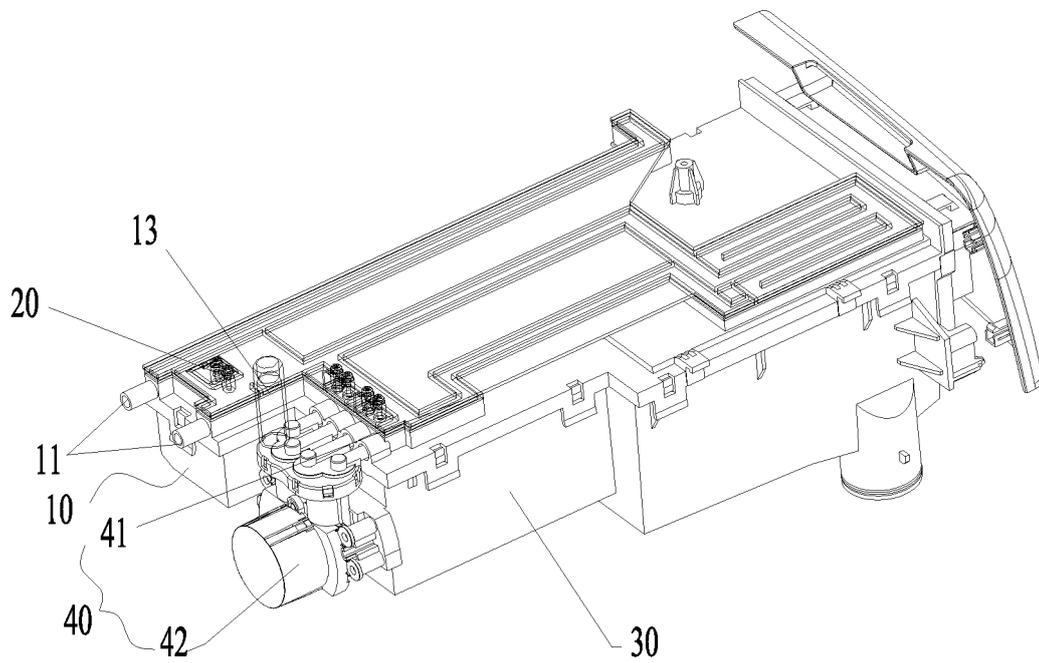


Fig. 3

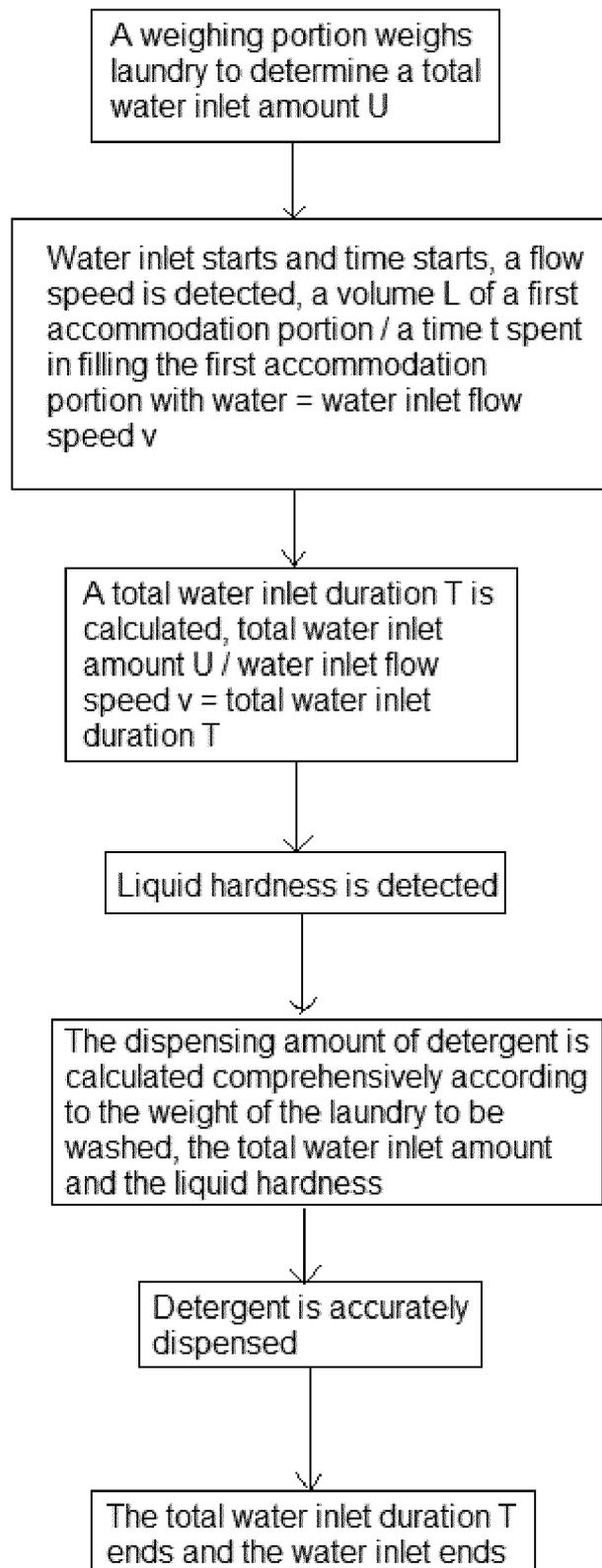


Fig. 4

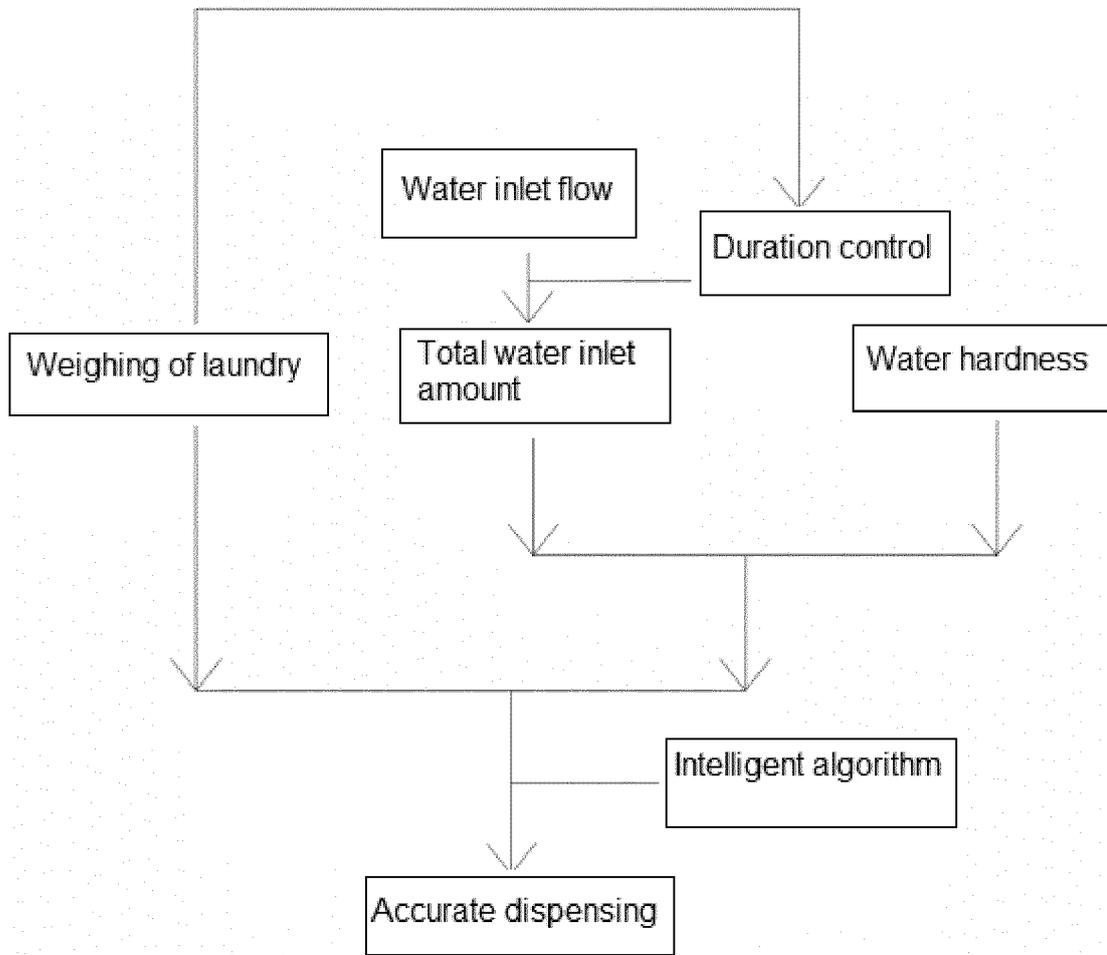


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/073967

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A. CLASSIFICATION OF SUBJECT MATTER		
D06F 39/08(2006.01)i; D06F 39/02(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)		
WPI; EPODOC; CNKI; CNABS; CNTXT: 检测, 探测, 监测, 传感, 感测, 测量, 测算, 获取, 获得, 得到, 采集, 水, 液体, 流速, 速度, 速率, 供水, 进水, 供给, 供应, 输水, 供液, 进液, 时长, 时间, 长短, 耗时, 用时, 流率, detect+, sens+, monitor+, measure +, water, liquid, liquor, speed, rate, velocity, supply+, feed+, intake+, feedwater, offer+, provide+, fill+, give+, time, hour		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 107237088 A (PANASONIC HOME APPLIANCES R&D CENTER (HANGZHOU) CO., LTD. ET AL.) 10 October 2017 (2017-10-10) description, paragraphs [0032]-[0061], and figures 1-4	1-15
Y	CN 101555656 A (REN, WENTAO) 14 October 2009 (2009-10-14) description, page 4, lines 10-14, and figures 1-7	1-15
Y	CN 107869026 A (DONGBU DAEWOO ELECTRONICS CORPORATION) 03 April 2018 (2018-04-03) description, paragraphs [0087] and [0088], and figures 1-4	1-15
Y	CN 102517850 A (HAIER GROUP CO., LTD. ET AL.) 27 June 2012 (2012-06-27) description, paragraphs [0062]-[0082], and figures 1-3	5, 6, 14, 15
PX	CN 108677457 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 19 October 2018 (2018-10-19) description, paragraphs [0036]-[0057], and figures 1-5	1-15
A	CN 205398988 U (PANASONIC HOME APPLIANCES R&D CENTER (HANGZHOU) CO., LTD. ET AL.) 27 July 2016 (2016-07-27) entire document	1-15
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		<input checked="" type="checkbox"/> See patent family annex.
* Special categories of cited documents:	"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	
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"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)	"&" document member of the same patent family	
"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		
Date of the actual completion of the international search	Date of mailing of the international search report	
03 April 2019	16 April 2019	
Name and mailing address of the ISA/CN	Authorized officer	
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No. PCT/CN2019/073967

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REFERENCES CITED IN THE DESCRIPTION

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