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(54) **MULTI-DRUM WASHING MACHINE DRAINAGE CONTROL METHOD**

(57) A multi-drum washing machine drainage control method, the multi-drum washing machine at least comprising a first washing drum (1) and a second washing drum (2); the method comprising: when the first washing drum (1) reaches a drainage process, determining whether the second washing drum (2) is draining; if yes, then the first washing drum (1) waits for the second washing drum (2) to finish draining before starting to drain; and if not, then determining whether the first washing drum (1) waits for the second washing drum (2) to finish draining before starting to drain. Alternatively, when the first washing drum (1) reaches the drainage process, determining whether the second washing drum (2) is draining or dehydrating; if yes, then the first washing drum (1) waits for the second washing drum (2) to finish draining before starting to drain; and if not, then determining whether the first washing drum (1) waits for the second washing drum (2) to finish draining before starting to drain.

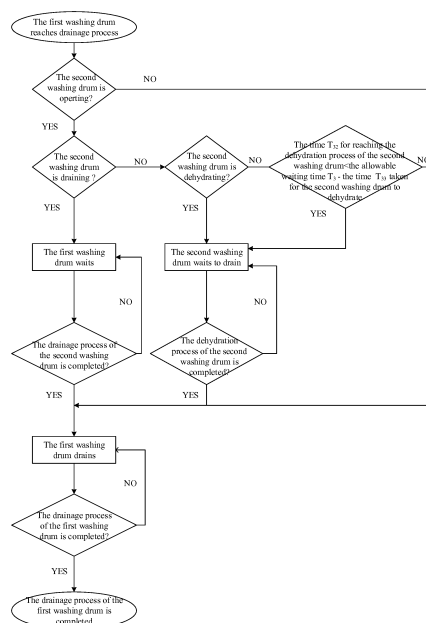


FIG 2

Description

FIELD OF THE INVENTION

[0001] The present disclosure relates to a field of washing, more particularly, to a drainage control method of a multi-drum washing machine.

BACKGROUND OF THE INVENTION

[0002] At present, most of the drum washing machines on sale in the market have only one washing drum. With the strengthening of people's health awareness, more and more users need to separate the different types of clothing to wash or to wash a small amount of clothing in a timely manner.

[0003] With the improvement of people's quality of life, people's health awareness has gradually increased, especially in the family clothing washing, more and more people wash clothes separately. If using the existing washing machine to take multiple laundry, the laundry time is hard to meet the requirements of the users. If buying two or more washing machines to wash separately at the same time, it will not only bring a great waste of energy and water resources but also occupy a large space, which is not suitable for home use. Therefore, the use of multi-drum washing machine will meet the needs above and solve the problem of energy, water and space waste.

[0004] A patent No. 201010117002.0 discloses a control method of a washing machine which comprises a first washing drum and a second washing drum. The method includes steps: receiving a first operation instruction for requiring a water supply or a drainage program to be executed in said first washing drum; determining whether or not a same operation instruction is being executed in said second washing drum. When the same operation instruction is being executed in the said second washing drum, it is determined that the first operation instruction cannot be executed. When the same operation instructions of the water supply and the drainage program are input at the same time in said first washing drum and said second washing drum, it is determined that said first washing drum or said second washing machine has a shorter remaining washing time. And the water supply or the drainage program is preferably executed in the washing drum having a relatively shorter remaining washing time.

[0005] A double-drum washing machine has a high center of gravity, which is unstable, so it has a higher requirement to vibration. However, the larger the overall weight of the washing machine, the smaller the vibration. During the dehydration process, the high-speed rotation of the drum will certainly bring vibration, and the drum with a higher center of gravity will produce larger vibration and noise which brings unnecessary trouble to the daily life. Sometime, one washing drum is draining while the other washing drum is dehydrating, if draining water

away, the vibration will increase. The water can be used as a counterweight if the water is not drained away. However, the situation is usually not that a washing drum is draining when the other washing drum is dehydrating. So it needs to be determined whether to wait the other washing drum drains.

[0006] In the view of foregoing, the present disclosure is proposed.

10 SUMMARY OF THE INVENTION

[0007] An object of the present disclosure is to overcome the shortcomings of the prior art, and provides a drainage control method of a multi-drum washing machine to reduce the vibration during the dehydration process.

[0008] In order to achieve such object, the technical scheme is adopted by the present disclosure as follows: a drainage control method of a multi-drum washing machine which at least comprises a first washing drum and a second washing drum. When the first washing drum reaches a drainage

process, it is determined whether or not the second washing drum is in a dehydration process at this time. If the second washing drum is in the dehydration process, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains.

[0009] If the second washing drum is not in the dehydration process at this time, it is determined whether or not to wait until the dehydration process of the second washing drum is completed, and then to drain.

[0010] To determine whether or not to wait until the dehydration process of the second washing drum is completed, and then to drain: a time for reaching the dehydration process of the second washing drum is T_{32} , a time taken for the second washing drum to dehydrate is T_{33} , and an allowable waiting time T_3 is set. If $T_{32} + T_{33} < T_3$, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. Otherwise, the water in the first washing drum is drained directly.

[0011] When the first washing is about to drain, it is determined whether or not the second washing drum is draining at this time. If the second washing drum is draining at the time, the first washing drum waits until the drainage of the second washing drum is completed, and drains. Otherwise, the water of the first washing drum is drained directly.

[0012] When the first washing drum reaches the drainage process, it is compared a time T_{12} for reaching a water supply process of the second washing drum and a time T_{11} for reaching a next drainage process of the first washing drum. If $T_{12} < T_{11}$, the first washing drum waits until the second washing drum supplies water. If $T_{12} \geq T_{11}$, the water in the first washing drum is drained directly.

[0013] It is determined whether or not the water in the first washing drum can be reused before comparing the

time T_{12} for reaching the water supply process of the second washing drum and the time T_{11} for reaching the next drainage process of the first washing drum. If no, the water in the first washing drum is drained directly. If yes, it is compared the time T_{12} for reaching the water supply process of the second washing drum and the time T_{11} for reaching the next drainage process of the first washing drum.

[0014] Or, it is determined whether or not the water in the first washing drum can be reused when the first washing drum waits until the second washing drum supplies water. If no, the water in the first washing drum is drained directly. If yes, the water in the first washing drum is drained into the second washing drum for reusing.

[0015] If the second washing drum is supplying water when the first washing drum reaches the drainage process, the time T_{12} for reaching the water supply process of the second washing drum is 0, and no need to wait.

[0016] Set an allowable waiting time T_1 , if $T_{12} < T_1$, the first washing drum waits until the second washing drum supplies water. If $T_{12} \geq T_1$, the water in the first washing drum is drained directly.

[0017] When the first washing drum reaches the drainage process, it is determined whether or not the process which the second washing drum is in progress or is about to be performed is a water supply for a last rinse. If yes, the water in the first washing drum is drained directly. If no, it is continued to be determined whether or not the water in the first washing drum can be reused.

[0018] When the second washing drum reaches the drainage process, it is determined whether or not the first washing drum is in the dehydration process at this time. If it is in the dehydration process, the second washing drum waits until the dehydration process of the first washing drum is completed, and then drains. If the first washing drum is not in the dehydration process at this time, it is determined whether or not to wait until the dehydration process of the first washing drum is completed, and then drains.

[0019] When the first washing drum reaches the drainage process, it is determined whether or not the second washing drum is operating at this time. If yes, it is determined whether or not the second washing drum is in the dehydration process or is about to execute the dehydration process. If no, the first washing drum directly executes the drainage process.

[0020] A drainage control method of a multi-drum washing machine is provided, and the multi-drum washing machine at least comprises a first washing drum and a second washing drum. When the first washing drum reaches a drainage process, it is determined whether or not the second washing drum is in a drainage process or in a dehydration process. If the second washing drum is in the drainage process or in the dehydration process, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. If the second washing drum is not in the drainage process or in the dehydration process, it is determined

whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then drains.

[0021] To determine whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then drains: a time for reaching the drainage process of the second washing drum is T_{31} , a time taken for the second washing drum to drain is T_{34} , a time taken for the second washing drum to dehydrate is T_{33} , and a time for reaching a next drainage process of the first washing drum is T_5 . If $T_5 < T_{31} + T_{34}$, the water in the first washing drum is drained directly. Otherwise, it is continued to be determined whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then drains.

[0022] To determine whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then drains: a time for reaching the drainage process of the second washing drum is T_{31} , a time taken for the second washing drum to drain is T_{34} , a time taken for the second washing drum to dehydrate is T_{33} . An allowable waiting time T_3 is set. If $T_{31} + T_{34} + T_{33} < T_3$, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. Otherwise, the water in the first washing drum is drained directly.

[0023] When the first washing drum reaches the drainage process, it is firstly determined whether or not the second washing drum is operating. If no, the first washing drum directly executes the drainage process. If yes, it is continued to be determined whether or not the second washing drum is in the drainage process or in the dehydration process.

[0024] If it is determined the first washing drums waits until the dehydration process of the second washing drum is completed, it is determined whether or not the second washing drum needs to supply water after the dehydration process is completed. If water supply is not required, the water in the first washing drum is drained directly. If water supply is required, it is determined whether or not the water in the first washing drum can be reused. If the water can be reused, the water in the first washing drum is drained into the second washing drum.

[0025] When the first washing drum reaches the drainage process and if the second washing drum is supplying water, it is determined whether or not the water in the first washing drum can be reused. If the water can be reused, the water in the first washing drum is drained into the second washing drum.

[0026] If the process which second washing drum is in or is about to perform is a water supply for a last rinse, the water in the first washing drum cannot be reused.

[0027] If the first washing drum is in the drainage of the last rinse, the water in the first washing drum cannot be reused.

[0028] The water in the first washing drum cannot be

reused, if the first washing drum is in a washing process when it drains, and the second washing drum is in a rinse process when it supplies water; or if the first and second washing drums are both in the washing process when the first washing drum drains and the second washing drum supplies water, and washing times of the first washing drum is less than washing times of the second washing drum; or if the first and second washing drums are both in the rinse process when the first washing drum drains and the second washing drum supplies water, and rinsing times of the first washing drum is less than rinsing times of the second washing drum; or if a turbidity of the water in the first washing drum exceeds a set value.

[0029] When the second washing drum reaches the drainage process, it is determined whether or not the first washing drum is in the drainage process or in the dehydration process at this time. If the first washing drum is in the drainage process or in the dehydration process, the second washing drum waits until the dehydration of the first washing drum is completed, and then drains. If the first washing drum is not in the drainage process or in the dehydration process, it is determined whether or not the second washing drum needs to wait until the dehydration process of the first washing drum is completed, and then drains.

[0030] By adopting the technical scheme of the present disclosure, it brings the following benefits:

1. When one washing drum of the washing machine of the present disclosure drains and if the other washing drum is in the dehydration process or will be in the dehydration process in a certain time, the first washing drum will not drain to increase the weight of the washing machine to reduce vibration. When one washing drum reaches drainage process and if the other washing drum is in the drainage or dehydration process, or will be in the drainage or dehydration process in a certain time, the first washing drum will not drain to increase the weight of the washing machine. It plays a role in increasing the counterweight to achieve vibration absorption effect when the second washing drum is dehydrating.
2. The present disclosure increases the determination process of waiting for drainage after dehydration, and reasonably arranges the working process of the two washing drums to realize the vibration reduction effect to the maximum extent.
3. The present disclosure determines whether or not one washing drum drains water to the other washing drum for water reuse according to the drainage waiting time when it reaches the drainage process. The present disclosure has a simple determination and control logic and has a higher stability in the actual washing process. At the same time, it makes full reuse of washing water and has a high practical value and is more effective to promote the application.
4. The present disclosure accurately determines that the water cannot be reused and ensures the washing

effect.

[0031] The following is further described in details with embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE INVENTION

[0032]

Fig. 1: A structural diagram of a double-drum washing machine of the present disclosure

Fig. 2: A flow chart of a control method of the present disclosure

Fig. 3: A flow chart of a control method of an embodiment of the present disclosure

Fig. 4: A flow chart of a control method of an embodiment of the present disclosure

Fig. 5: A flow chart of a control method of an embodiment of the present disclosure

Fig. 6: A flow chart of a control method of an embodiment of the present disclosure

[0033] Wherein: 1. A first washing drum, 2. A second washing drum.

DETAILED DESCRIPTION OF THE INVENTION

[0034] As shown in Fig. 1, a double-drum washing machine which provides with a first washing drum 1 and a second washing drum 2 capable of independently performing washing steps. The first washing drum 1 and the second washing drum 2 can respectively and independently execute a water supply process, a washing process, a drainage process, a rinse process, a dehydration process in turn for clothes, which is to achieve the purpose of washing clothes. Preferably, the first washing drum and the second washing drum may also be separately provided with a drying means for executing a drying process after the dehydration process to achieve the purpose of drying the clothes in the first washing drum and/or the second washing drum. Preferably, the first washing drum is provided with a first heater for heating the washing water therein, and the second washing drum is provided with a second heater for heating the washing water therein. Thus, during the execution of the washing process, the washing water in the washing drum is subjected to a heat treatment to control the water temperature during the washing process and the washing effect is improved

[0035] In the present disclosure, the first washing drum is communicated with the second washing drum. The water in the first washing drum can be drained into the second washing drum for reuse under a certain condition, and the water in the second washing drum can be drained into the first washing drum for reuse under a certain condition. If the water doesn't meet the condition for reuse, it is drained away through a drainage pipe. Thus, it improves the water utilization and avoids the waste of water. At the same time, a control process is added to ensure

that the water is only be reused when the water is relatively clean, and ensure the washing effect.

Embodiment 1

[0036] As shown in Fig. 1, the drainage control method of a multi-drum washing machine. When the first washing drum reaches the drainage process, it is determined whether or not the second washing drum is in a dehydration process. If the second washing drum is in the dehydration process, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. The water in the first washing drum plays a role as a counterweight, thus it increases the overall weight of the washing machine to achieve the effect of vibration absorption.

[0037] If the second washing drum is not in the dehydration process, it is determined whether or not to wait until the dehydration process is completed, and drain. Thus can avoid the scenario that the second washing drum starts to dehydrate as soon as the first washing drum finished draining water. Under that scenario the water in the first washing drum cannot achieve the effect of vibration absorption, resulting waste.

[0038] To determine whether or not to wait until the dehydration process is completed, and then drain: a time for reaching the dehydration process of the second washing drum is T_{32} , a time taken for the second washing drum to dehydrate is T_{33} , an allowable waiting time is T_3 . If $T_{32} < T_3 - T_{33}$, which means it is within a range of the allowable waiting time, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. Otherwise, the water of the first washing drum is drained directly.

[0039] Since draining outlets of the first washing drum and the second washing drum are connected to a drainage outlet of the washing machine through a pipe line, and the entire washing machine has only one drainage outlet. When the two washing drums drain at the same time, it will cause contamination to clothes due to the water reflux caused by the pressure difference. And the speeds of drainage at the same time and at different times are essentially the same while they share the same drainage pipe, so the first washing drum and the second washing drum cannot drain at the same time. When the first washing drum is about to drain, it is determined whether or not the second washing drum is draining at this time. If the second washing drum is draining at this time, the first washing drum waits until the drainage process of the second washing drum is completed, and then drains. Otherwise, the water in the first washing drum is drained directly.

[0040] In order to reuse the water in the first washing drum, when the first washing drum reaches the drainage process, it is determined whether or not the water in the first washing drum can be reused. If no, the water in the first washing drum is drained directly. If yes, it is determined whether or not the second washing drum is sup-

plying water. If yes, the water in the first washing drum is drained into the second washing drum to reuse the water; if no, it is determined whether or not the first washing drum waits until the second washing drum supplies water.

[0041] To determine whether or not the first washing drum waits until the second washing drum supplies water: it is compared a time T_{12} for reaching a water supply process of the second washing drum and a time T_{11} for reaching a next drainage process of the first washing drum. If $T_{12} < T_{11}$, the first washing drum waits until a start of water supply process of the second washing drum, and the water in the first washing drum is drained into the second washing drum to reuse the water. If $T_{12} \geq T_{11}$, the water in the first washing drum is drained directly.

[0042] The determination process above may result in a longer waiting time, at this time, an allowable waiting time T_1 , which $T_1 < T_{11}$, can be set. If $T_{12} < T_1$, which means that it is within the range of the allowable waiting time, the first washing drum waits the start of the water supply process of the second washing drum, and the water in the first washing drum is drained into the second washing drum directly to reuse water. If $T_{12} \geq T_1$, which mean it is beyond the range of the allowable waiting time, and the water in the first washing drum is drained directly.

[0043] When it is determined whether or not the water in the first washing drum can be reused, the turbidity value or the bubble concentration value of the water in the first washing drum is detected. If the turbidity value or the bubble concentration value of the water is smaller than the set value, the water in the first washing drum can be reused. Otherwise the water in the first washing drum cannot be reused and is drained away directly.

[0044] When the first washing drum reaches the drainage process, it is determined whether or not the process of which the second washing drum is in progress or is about to be performed is a water supply for a last rinse. If yes, the water in the first washing drum is drained directly. If no, it is continued determined whether or not the water in the first washing drum can be reused.

[0045] The first washing drum and the second washing drum are only for the sake of convenience of the description, regardless of the order of the relationship. It is possible to determine whether or not the first washing drum is dehydrating at this time when the second washing drum is draining. If the first washing drum is dehydrating, the second washing drum waits after the dehydration of the first washing drum is completed, and drains. The water in the second washing drum plays the role as a counterweight which can increase the overall weight of the washing machine to achieve the effect of vibration absorption.

[0046] If the first washing drum is not draining at this time, it is determined whether or not to wait until the dehydration process is completed, and drain. Thus can avoid the scenario that the first washing drum starts to dehydrate as soon as the second washing drum finished draining water. Under that scenario the water in the second washing drum cannot achieve the effect of vibration

absorption, resulting waste.

[0047] When the first washing drum reaches the drainage process, it is determined whether or not the second washing drum is operating at this time. If yes, it is determined whether or not the second washing drum is in the dehydration process or is about to execute the dehydration process. If no, the first washing drum directly executes the drainage process.

[0048] As shown in Fig. 2, the control method of the present embodiment is:

- 1) the first washing drum reaching the drainage process,
- 2) determining whether or not the second washing drum is operating, if yes, executing step 3), if no, executing step 8),
- 3) determining whether or not the second washing drum is draining, if no, executing step 4), if yes, executing step 7),
- 4) determining whether or not the second washing drum is dehydrating, if no, executing step 5), if yes, executing step 6),
- 5) a time for reaching the dehydration process of the second washing drum being T_{32} , a time taken for the second washing drum to dehydrate being T_{33} , an allowable waiting time being set to T_3 , If $T_{32} < T_3 - T_{33}$, executing step 6), otherwise executing step 8),
- 6) the first washing drum waiting until the dehydration of the second washing drum is completed, executing step 8),
- 7) the first washing drum waiting until the drainage of the second washing drum is completed, executing step 8),
- 8) the first washing drum draining.

Embodiment 2

[0049] As shown in Fig. 5, Fig. 6, the drainage control method of the multi-drum washing machine of the present disclosure. When the first washing drum reaches the drainage process, it is determined whether or not the second washing drum is in a drainage process or in a dehydration process. If the second washing drum is in the drainage process or in the dehydration process, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. When the second washing drum is in the dehydration process, the water in the first washing drum remaining in the first washing drum, and said water in the first washing drum plays a role as a counterweight which increases the overall weight of the washing machine to achieve the effect of vibration absorption. That is, the drainage process and the dehydration process of the second washing drum are carried out successively, and the drainage process and the dehydration process are not interrupted by other processes.

[0050] If the second washing drum is not draining or dehydrating at this time, it is determined whether or not

the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. If the second washing drum is about to dehydrate, the first washing drum may wait until the dehydration process is completed, and then drain. Thus can avoid the scenario that the second washing drum starts to dehydrate as soon as the first washing drum just finished draining water or soon after the first washing drum completes the drainage. Under that scenario the water in the first washing drum cannot achieve the effect of vibration absorption, resulting waste. When the second washing drum is in the dehydration process, the water in the first washing drum remain in the first washing drum, said water in the first washing drum plays a role as a counterweight which increases the overall weight of the washing machine to achieve the effect of vibration absorption.

[0051] To determine whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then starts to drain: a time for reaching the drainage process of the second washing drum is T_{31} , a time taken for the second washing drum to drain is T_{34} , a time taken for the second washing drum to dehydrate is T_{33} , a time from a next drainage process of the first washing drum is T_5 . If $T_5 < T_{31} + T_{34}$, the water in the first washing drum is drained directly. The water in the first washing drum is utilized to achieve the vibration absorption of the dehydration when the water in the first washing drum is drained next time. Otherwise, the first washing drum is determined whether to need to wait until the dehydration process of the second washing drum is completed, and then drains. Thus can avoid the first washing drum having a too long washing time which caused by the first washing drum waiting too long for the completion of the dehydration process of the second washing drum. And if the next drainage process of the first washing drum can start before the dehydration process of the second washing drum, the present drainage of the first washing drum doesn't have to wait until the dehydration process of the second washing drum is completed. The water of the first washing drum plays a role as a counterweight which left in the first washing drum for next drainage process, and it can increase the overall weight of the washing machine to achieve vibration absorption.

[0052] To determine whether or not to wait until the dehydration process is completed, and then drain: a time for reaching the drainage process of the second washing drum is T_{31} , a time taken for the second washing drum to drain is T_{34} , a time taken for the second washing drum to dehydrate is T_{33} . An allowable waiting time T_3 is set, if $T_{31} + T_{34} + T_{33} < T_3$, which means it is within the range of the allowable waiting time, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. Otherwise, the water in the first washing drum is drained directly. An allowable waiting time is set, and if the drainage waiting time of the first washing drum exceeds the set allowable waiting time, the first washing drum no longer waits until the de-

hydration process of the second washing drum is completed. It can avoid the first washing drum waiting too long for drainage and cause the washing time of the first washing drum is too long. Thus can reasonably arrange the washing processes of the two washing drums.

[0053] When the first washing drum reaches the drainage process, it is determined whether or not the second washing drum is operating at this time. If yes, it is determined whether or not the second washing drum is in or is about to execute the dehydration or drainage process. If no, the first washing drum directly executes the drainage process.

[0054] Since draining outlets of the first washing drum and the second washing drum are connected to a drainage outlet of the washing machine through a pipe line, and the entire washing machine has only one drainage outlet. When the two washing drums drain at the same time, it will cause contamination to clothes due to the water reflux caused by the pressure difference. And the speeds of drainage at the same time and at different times are essentially the same while they share the same drainage pipe, so the first washing drum and the second washing drum cannot drain at the same time. At the same time, the drainage process and the dehydration process of the second washing drum are carried out successively, and the drainage process and the dehydration process are not interrupted by other processes. When the first washing drum is about to drain, it is determined whether or not the second washing drum is draining at this time. If the second washing drum is draining at this time, the first washing drum waits until the drainage process of the second washing drum is completed, and then drains. Otherwise, the water in the first washing drum is drained directly.

[0055] The dehydration is prone to vibration, especially if a clothing is uneven distribution, it will result in greater vibration and is prone to produce noise. While the vibration is too large likely to cause the connection of washing machine parts loose, resulting in failure. Two washing drums are provided in the present disclosure and when one of the washing drums is in dehydration process, the water in the other washing drum can be used to increase the overall weight of the washing machine to reduce vibration. When the first washing drum is about to drain, it is determined whether or not the second washing drum is dehydrating at this time. If the second washing drum is dehydrating at this time, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains, which reduces the vibration produced in the dehydration process of the second washing drum.

[0056] At the same time, the water in the washing drum can be reused. If it is determined the first washing drums waits until the dehydration process of the second washing drum is completed, it is determined whether or not the second washing drum needs to supply water after the dehydration process is completed. If water supply is not required, the water in the first washing drum is drained

directly. If water supply is required, it is determined whether or not the water in the first washing drum can be reused. If the water can be reused, the water in the first washing drum is drained into the second washing drum.

[0057] When the first washing drum reaches the drainage process and if the second washing drum is supplying water, it is determined whether or not the water in the first washing drum can be reused. If the water can be reused, the water in the first washing drum is drained into the second washing drum.

[0058] The water in the first washing drum cannot be reused, if the first washing drum is in a washing process when it drains and the second washing drum is in a rinse process when it supplies water; or if the first washing drum drains and the second washing drum are both in the washing process when the first washing drum drains and the second washing drum supplies water, and a number of washing times of the first washing drum is less than a number of washing times of the second washing drum; or if the first washing drum drains and the second washing drum are both in the rinse process when the first washing drum drains and the second washing drum supplies water, and the number of rinsing times of the first washing drum is less than the number of rinsing times of the second washing drum; or if a turbidity of the water in the first washing drum exceeds a set value.

[0059] When it is determined whether or not the water in the first washing drum can be reused, the turbidity value or the bubble concentration value of the water in the first washing drum is detected. If the turbidity value or the bubble concentration value of the water is smaller than the set value, the water in the first washing drum can be reused. Otherwise the water in the first washing drum cannot be reused and is drained away directly.

[0060] When the first washing drum reaches the drainage process, it is determined whether or not the process of which the second washing drum is in progress or is about to be performed is a water supply for a last rinse. If yes, the water in the first washing drum is drained directly. If no, it is continued to be determined whether or not the water in the first washing drum can be reused.

[0061] When the first washing drum reaches the drainage process, it is determined whether or not the drainage is for the last rinse. If the drainage is for the last rinse, the water in the first washing drum is drained directly; if the drainage is not for the last rinse, it is determined whether or not the water in the first washing drum can be reused. Since the softener or antivirus agent may be added in the last rinse, and the second washing drum may not require the process, so that the laundry in the second washing drum is prevented from being affected. If the drainage is for the last rinse, the water in the first washing drum is drained away directly.

[0062] The first washing drum and the second washing drum are only for the sake of convenience of the description, regardless of the order of the relationship. It is possible to determine whether or not the first washing drum

is draining or dehydrating at this time when the second washing drum drains. If the first washing drum is draining or dehydrating, the second washing drum waits until the dehydration of the first washing drum is completed, and drains. The water in the second washing drum plays the role as a counterweight which can increase the overall weight of the washing machine to achieve the effect of vibration absorption.

[0063] If the first washing drum is not draining or dehydrating at this time, it is determined whether or not the second washing drum waits until the dehydration process of the first washing drum is completed, and then drains. Thus can avoid the scenario that the first washing drum starts to dehydrate as soon as the second washing drum finished draining water. Under that scenario the water in the second washing drum cannot achieve the effect of vibration absorption, resulting waste.

[0064] The control method of the present embodiment is:

- 1) the first washing drum reaching the drainage process;
- 2) determining whether or not the second washing drum is operating, if yes, executing step 3), if no, executing step 6);
- 3) determining whether or not the second washing drum is draining, if no, executing step 4), if yes, executing step 5);
- 4) determining whether or not the second washing drum is dehydrating, if no, executing step 6), if yes, executing step 5);
- 5) the first washing drum waiting until the dehydration of the second washing drum is completed, executing step 6);
- 6) the first washing drum draining.

[0065] Another control method of the present embodiment is:

- 1) the first washing drum reaching the drainage process;
- 2) determining whether or not the second washing drum is operating, if yes, executing step 3), if no, executing step 7);
- 3) determining whether or not the second washing drum is draining, if no, executing step 4), if yes, executing step 6);
- 4) determining whether or not the second washing drum is dehydrating, if no, executing step 5), if yes, executing step 6);
- 5) determining a time T_{31} for reaching the drainage process of the second washing drum, a time T_{34} taken for the second washing drum to drain, a time T_{33} taken for the second washing drum to dehydrate, a time T_5 for reaching a next drainage process of the first washing drum, if $T_5 < T_{31} + T_{34}$, executing step 7), otherwise, executing step 6);
- 6) the first washing drum waiting until the dehydration

of the second washing drum is completed, executing step 7);

7) the first washing drum draining.

5 **[0066]** Another control method of the present embodiment is:

- 1) the first washing drum reaching the drainage process;
- 2) determining whether or not the second washing drum is operating, if yes, executing step 3), if no, executing step 7);
- 3) determining whether or not the second washing drum is draining, if no, executing step 4), if yes, executing step 6);
- 4) determining whether or not the second washing drum is dehydrating, if no, executing step 5), if yes, executing step 6);
- 5) determining a time T_{31} for reaching the drainage process of the second washing drum, a time T_{34} taken for the second washing drum to drain, a time T_{33} taken for the second washing drum to dehydrate, setting an allowable waiting time T_3 , if $T_{31} + T_{34} + T_{33} < T_3$, executing step 6), otherwise, executing step 7);
- 6) the first washing drum waiting until the dehydration of the second washing drum is completed, executing step 7);
- 7) the first washing drum draining.

30 **[0067]** Another control method of the present embodiment is:

- 1) the first washing drum reaching the drainage process;
- 2) determining whether or not the second washing drum is operating, if yes, executing step 3), if no, executing step 8);
- 3) determining whether or not the second washing drum is draining, if no, executing step 4), if yes, executing step 7);
- 4) determining whether or not the second washing drum is dehydrating, if no, executing step 5), if yes, executing step 7);
- 5) determining a time T_{31} for reaching the drainage process of the second washing drum, a time T_{34} taken for the second washing drum to drain, a time T_{33} taken for the second washing drum to dehydrate, a time T_5 for reaching a next drainage process of the first washing drum if $T_5 < T_{31} + T_{34}$, executing step 8), otherwise, executing step 6);
- 6) determining a time T_{31} for reaching the drainage process of the second washing drum, a time T_{34} taken for the second washing drum to drain, a time T_{33} taken for the second washing drum to dehydrate setting an allowable waiting time T_3 , if $T_{31} + T_{34} + T_{33} < T_3$, executing step 7), otherwise, executing step 8);
- 7) the first washing drum waiting until the dehydration of the second washing drum is completed, executing

- step 8);
8) the first washing drum draining.

[0068] Another control method of the present embodiment is:

- 1) the first washing drum reaching the drainage process;
- 2) determining whether or not the second washing drum is operating, if yes, executing step 3), if no, executing step 12);
- 3) determining whether or not the second washing drum is draining, if no, executing step 4), if yes, executing step 7);
- 4) determining whether or not the second washing drum is dehydrating, if no, executing step 5), if yes, executing step 7);
- 5) determining a time T_{31} for reaching the drainage process of the second washing drum, a time T_{34} taken for the second washing drum to drain, a time T_{33} taken for the second washing drum to dehydrate, a time T_5 for reaching a next drainage process of the first washing drum, if $T_5 < T_{31} + T_{34}$, executing step 8), otherwise, executing step 6);
- 6) determining a time T_{31} for reaching the drainage process of the second washing drum, a time T_{34} taken for the second washing drum to drain, a time T_{33} taken for the second washing drum to dehydrate, setting an allowable waiting time T_3 , if $T_{31} + T_{34} + T_{33} < T_3$, executing step 7), otherwise, executing step 8);
- 7) the first washing drum waiting until the dehydration of the second washing drum is completed, executing step 8);
- 8) the first washing drum being about to drain;
- 9) determining whether or not to supply water to the second washing drum, if yes, executing step 10), if no, executing step 12);
- 10) determining whether or not the water of the first washing drum can be reused, if yes, executing step 11), if no, executing step 12);
- 11) the water in the first washing drum being drained into the second washing drum for reuse;
- 12) the water in the first washing drum being drained away.

Embodiment 3

[0069] The control method of the present embodiment increases the process of reusing the water of the first washing drum. As shown in Fig. 3, in the present embodiment, the drainage waiting time is used as the determination criterion to determine whether or not to reuse water. According to the drainage waiting time it is determined whether to wait for the water to be drained to another washing drum for reuse when the drainage process is reached. The method has a simple judgment and control logic, in the actual washing process, the control stability is high. At the same time, it achieves a full reuse of

water, and the practical value is high, which is more effective to promote and apply.

[0070] When the first washing drum and the second washing drum are both in the working state at the same time, the control method of water reuse is as follows:

A control method of water reuse of a multi-drum washing machine is provided. The multi-drum washing machine at least comprises a first washing drum and a second washing drum. When the first washing drum and the second washing drum are both in the working state at the same time and the first washing drum reaches the drainage process, it is compared a time T_{12} from a water supply process of the second washing drum and a time T_{11} for reaching a next drainage process of the first washing drum. If $T_{12} < T_{11}$, the first washing drum waits until a start of water supply process of the second washing drum. If $T_{12} \geq T_{11}$, the water in the first washing drum is drained directly.

[0071] It is determined whether or not the water in the first washing drum can be reused before comparing the time T_{12} for reaching the water supply process of the second washing drum and the time T_{11} for reaching the next drainage process of the first washing drum. If no, the water in the first washing drum is drained directly. If yes, it is compared the time T_{12} for reaching the water supply process of the second washing drum and the time T_{11} for reaching the next drainage process of the first washing drum.

[0072] Or, it is determined whether or not the water in the first washing drum can be reused when the first washing drum waits until the start of the water supply process of the second washing drum. If no, the water in the first washing drum is drained directly. If yes, the water in the first washing drum is drained into the second washing drum for reuse.

[0073] Specific:

step 1: when the first washing drum reaches the drainage process, it is determined whether or not the water in the first washing drum can be reused, if yes, execute step 2, if no, the water in the first washing drum is drained directly;

step 2: it is compared a time T_{12} for reaching a water supply process of the second washing drum and a time T_{11} for reaching a next drainage process of the first washing drum. If $T_{12} < T_{11}$, the first washing drum waits until a start of water supply process of the second washing drum and the water in the first washing drum is drained into the second washing drum to reuse. If $T_{12} \geq T_{11}$, the water in the first washing drum is drained directly. By adding the process of the determination of whether or not to wait, to a large extent it increases the water reuse probability of the first washing drum, and more water can be reused.

[0074] In step 1, if the second washing drum is supplying water when the first washing drum reaches the drainage process, the time T_{12} for reaching the water supply process of the second washing drum is 0, and no need to wait. The water in the first washing drum is drained into the second washing drum to reuse water. It is also possible to first determine whether or not the second washing drum is currently executing the water supply process before comparing the time T_{12} for reaching the water supply process of the second washing drum and the time T_{11} for reaching a next drainage process of the first washing drum. If the second washing drum is not subjected to the water supply process, then it is compared the time T_{12} for reaching the water supply process of the second washing drum and the time T_{11} for reaching a next drainage process of the first washing drum.

[0075] In step 2, an allowable waiting time T_1 is set, which $T_1 < T_{11}$. If $T_{12} < T_1$, the first washing drum waits until the second washing drum supplies water and the water in the first washing drum is drained into the second washing drum to reuse water. If $T_{12} \geq T_1$, the water in the first washing drum is drained directly. This step can avoid the first washing drum waiting too long and reasonably arrange the water reuse under the premise of ensuring the washing time of the first washing drum. Thus will not waste too much time of the first washing drum because of only considering water reuse. If the washing machine determines that the waiting time is too long and exceeds the set allowable waiting time, the water in the first washing drum is not reused. The determination makes the reuse of water more reasonable, optimizing the relationship between waiting time and water reuse.

[0076] In step 1, the turbidity value or the bubble concentration value of the water in the first washing drum is detected. If the turbidity value or the bubble concentration value of the water is smaller than the set value, the water in the first washing drum can be reused. Otherwise the water in the first washing drum cannot be reused and is drained away directly. Water can be reused when the turbidity value or bubble concentration value of the water is within the set range.

[0077] In step 1, when the first washing drum reaches the drainage process, it is determined whether or not the process of which the second washing drum is in progress or is about to be performed is a water supply for a last rinse. If yes, the water in the first washing drum is drained directly. If no, it is continued to be determined whether or not the water in the first washing drum can be reused. Thus to ensure that the water supplied in the last rinse process is clean water, which ensures that the effect of washing clothes after washing.

[0078] In step 2, when the water in the first washing drum is drained into the second washing drum, it is determined whether or not the second washing drum executes the water supply process for washing. If yes, the second washing drum first supplies water for washing the detergent box. After the completion of water supply for washing the detergent box of the second washing

drum, the water in the first washing drum is drained into the second washing drum. If no, the water in the first washing drum is drained into the second washing drum directly.

[0079] In step 2, when the water in the first washing drum is drained into the second washing drum, the height of the water level in the second washing drum is detected. If the water level in the second washing drum reaches the set water level value, there is water in the first washing drum, and the remaining water of the first washing drum is discharged directly. If the water in the first washing drum is entirely drained into the second washing drum, and the water level in the second washing drum does not reach the set water level value, then the second washing drum supplies clean water through an external water inlet.

[0080] When the water in the first washing drum is drained away directly, it is determined whether or not the second washing drum is executing the dehydration process. If yes, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. If no, a time for reaching the dehydration process of the second washing drum is T_{32} , a time taken for the second washing drum to dehydrate is T_{33} , an allowable waiting time T_3 is set. If $T_{32} + T_{33} < T_3$, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains. Otherwise, the water in the first washing drum is drained directly.

[0081] It is also possible to determine whether or not the water in the first washing drum can be reused by determining the washing state and the washing times. In step 1, the water in the first washing drum cannot be reused, if the first washing drum is in a washing process when it drains and the second washing drum is in a rinse process when it supplies water; or if the first washing drum and the second washing drum are both in the washing process when the first washing drum drains and the second washing drum supplies water, and a number of washing times of the first washing drum is less than a number of washing times of the second washing drum; or if the first washing drum and the second washing drum are both in the rinse process when the first washing drum drains and the second washing drum supplies water, and the number of rinsing times of the first washing drum is less than the number of rinsing times of the second washing drum.

[0082] When the second washing drum reaches the drainage process, it is determined whether or not the water in the second washing drum can be reused. If yes, comparing the time for reaching the water supply process of the first washing drum and the time for reaching the next drainage process of the second washing drum, it is determined whether or not the second washing drum waits until the first washing drum executes the water supply process.

[0083] The drainage outlet of the first washing drum is communicated with the second washing drum, and the

water in the first washing drum can be drained into the second washing drum to reuse. The drainage outlet of the first washing drum is provided with a holding valve, the water in the first washing drum can flow through the holding valve into the second washing drum. The second washing drum is provided with an inlet valve and the clean water can flow into the second washing drum through the inlet valve. The control method is as follows:

- 1) The first washing drum reaches the drainage process,
- 2) It is determined whether or not the water in the first washing drum can be reused, if yes, execute step 3), if no, execute step 6),
- 3) A time T_{11} for reaching a next drainage process of the first washing drum, a time T_{12} for reaching a water supply process of the second washing drum, if $T_{12} < T_{11}$, execute step 4), if $T_{12} \geq T_{11}$, execute step 6),
- 4) The first washing drum waits until the second washing drum supplies water, execute step 5),
- 5) The water in the first washing drum is drained into the second washing drum,
- 6) The water in the first washing drum is drained away directly.

[0084] The control method can also add a process of determining whether or not the second washing drum is supplying water before comparing the time for reaching the next drainage process of the first washing drum and the time for reaching executing the water supply process of the second washing drum. The control method is as follows:

- 1) The first washing drum reaches the drainage process,
- 2) It is determined whether or not the water in the first washing drum can be reused, if yes, execute step 3), if no, execute step 7),
- 3) It is determined whether or not the second washing drum is executing the water supply process, if no, execute step 4), if yes, execute step 6),
- 4) It is determined a time T_{11} for reaching a next drainage process of the first washing drum, a time T_{12} for reaching a water supply process of the second washing drum, if $T_{12} < T_{11}$, execute step 5), if $T_{12} \geq T_{11}$, execute step 7),
- 5) The first washing drum waits until the second washing drum supplies water, execute step 6),
- 6) The water in the first washing drum is drained into the second washing drum,
- 7) The water in the first washing drum is drained away directly.

[0085] The control method may also include determining whether or not the first washing drum have enough time to wait the second washing drum supplying water, the control method is as follows:

- 1) The first washing drum reaches the drainage process,
- 2) It is determined whether or not the water in the first washing drum can be reused, if yes, execute step 3), if no, execute step 8),
- 3) It is determined whether or not the second washing drum is executing the water supply process, if no, execute step 4), if yes, execute step 7),
- 4) It is determined a time T_{11} for reaching a next drainage process of the first washing drum, a time T_{12} for reaching a water supply process of the second washing drum, if $T_{12} < T_{11}$, execute step 5), if $T_{12} \geq T_{11}$, execute step 8),
- 5) Set an allowable waiting time T_1 , if $T_{12} < T_1$, execute step 6), if $T_{12} \geq T_1$, execute step 8),
- 6) The first washing drum waits until the second washing drum supplies water, execute step 7),
- 7) The water in the first washing drum is drained into the second washing drum,
- 8) The water in the first washing drum is drained away directly.

[0086] If the water in the first washing drum is too dirty or water supply process of the second washing drum is for the last rinse, the water in the first washing drum cannot be reused as well. The control method is as follows:

- 1) The first washing drum reaches the drainage process,
- 2) The turbidity value or the bubble concentration value of the water in the first washing drum is detected to determine whether or not the turbidity value or the bubble density value is smaller than the set value, If yes, execute step 3), if no, execute step 9),
- 3) It is determined whether or not the second washing drum has only the last rinse left, if no, execute step 4), if yes, execute step 9),
- 4) It is determined whether or not the second washing drum is executing water supply process, if no, execute step 5), if yes, execute step 8),
- 5) It is determined a time T_{11} for reaching a next drainage process of the first washing drum, a time T_{12} for reaching a water supply process of the second washing drum, if $T_{12} < T_{11}$, execute step 6), if $T_{12} \geq T_{11}$, execute step 9),
- 6) Set an allowable waiting time T_1 , if $T_{12} < T_1$, execute step 7), if $T_{12} \geq T_1$, execute step 9),
- 7) The first washing drum waits until the second washing drum supplies water, execute step 8),
- 8) The water in the first washing drum is drained into the second washing drum,
- 9) The water in the first washing drum is drained away directly.

[0087] When the water in the first washing drum is drained into the second washing drum and if the water supply of the second washing drum is for washing, the detergent box need to be washed and water level need

to be detected. The control method is as follows:

- 1) The first washing drum reaches the drainage process,
- 2) The turbidity value or the bubble concentration value of the water in the first washing drum is detected to determine whether or not the turbidity value or the bubble density value is smaller than the set value. If yes, execute step 3), if no, execute step 12),
- 3) It is determined whether or not the second washing drum has only the last rinse left, if no, execute step 4), if yes, execute step 12),
- 4) It is determined whether or not the second washing drum is executing water supply process, if no, execute step 5), if yes, execute step 10),
- 5) It is determined a time T_{11} for reaching a next drainage process of the first washing drum, a time T_{12} for reaching a water supply process of the second washing drum, if $T_{12} < T_{11}$, execute step 6), if $T_{12} \geq T_{11}$, execute step 12),
- 6) Set an allowable waiting time T_1 , if $T_{12} < T_1$, execute step 7), if $T_{12} \geq T_1$, execute step 12),
- 7) It is determined whether or not the second washing drum is executing the water supply process for washing, if yes, execute step 8), if no, execute step 10),
- 8) The second washing drum first supplies water for washing the detergent box, after the completion of water supply for washing the detergent box of the second washing drum, execute step 9),
- 9) The first washing drum waits until the second washing drum supplies water, execute step 10),
- 10) The water in the first washing drum is drained into the second washing drum,
- 11) Detect the height of the water level in the second washing drum. When the water level in the second washing drum reaches the set water level value and if there is still water left in the first washing drum, the left water is drained away directly. If the water level in the second washing drum still not reaches the set water level value after the water in the first washing drum is entirely drained into the second washing drum, water from outside is flooded into the second washing drum through the water inlet.
- 12) The water in the first washing drum is drained away directly.

[0088] The first washing drum and the second washing drum of the present embodiment are only for the sake of convenience of the description, regardless of the order of the relationship. It may also to reuse the water in the second washing drum, the drainage outlet of the second washing drum is communicated with the first washing drum. The water in the second washing drum can be drained into the first washing drum for reuse. The drainage outlet of the second washing drum is provided with a holding valve and the water in the second washing drum can flow into the first washing drum through the holding valve. The first washing drum is provided with an inlet

valve, clean water from outside can flow into the first washing drum through the inlet valve. When one washing drum reaches the drainage process, it is determined whether or not the water of the washing drum is drained into the other washing drum for reuse. And when the other washing drum reaches the drainage process, it doesn't need to consider the water reuse of the other washing drum. It avoids causing an infinite loop of both washing drums waiting. The control method is as follows:

- 1) The second washing drum reaches the drainage process,
- 2) It is determined whether or not the water in the second washing drum can be reused, if yes, execute step 3), if no, execute step 6),
- 3) It is determined a time T_{11} for reaching a next drainage process of the second washing drum, a time T_{12} for reaching a water supply process of the first washing drum, if $T_{12} < T_{11}$, execute step 4), if $T_{12} \geq T_{11}$, execute step 6),
- 4) The second washing drum waits until the first washing drum supplies water, execute step 5),
- 5) The water in the second washing drum is drained into the first washing drum,
- 6) The water in the second washing drum is drained away directly.

[0089] The control method can also add a process of determining whether or not the first washing drum is supplying water before comparing the time for reaching the next drainage process of the second washing drum and the time for reaching executing the water supply process of the first washing drum. The control method is as follows:

- 1) The second washing drum reaches the drainage process,
- 2) It is determined whether or not the water in the second washing drum can be reused, if yes, execute step 3), if no, execute step 7),
- 3) It is determined whether or not the first washing drum is executing the water supply process, if no, execute step 4), if yes, execute step 6),
- 4) It is determined a time T_{11} for reaching a next drainage process of the second washing drum, a time T_{12} for reaching a water supply process of the first washing drum, if $T_{12} < T_{11}$, execute step 5), if $T_{12} \geq T_{11}$, execute step 7),
- 5) The second washing drum waits until the first washing drum supplies water, execute step 6),
- 6) The water in the second washing drum is drained into the first washing drum,
- 7) The water in the second washing drum is drained away directly.

[0090] The control method may also include determining whether or not the second washing drum have enough time to wait the first washing drum supplying wa-

ter, the control method is as follows:

- 1) The second washing drum reaches the drainage process,
- 2) It is determined whether or not the water in the second washing drum can be reused, if yes, execute step 3), if no, execute step 8),
- 3) It is determined whether or not the first washing drum is executing the water supply process, if no, execute step 4), if yes, execute step 7),
- 4) It is determined a time T_{11} for reaching a next drainage process of the second washing drum, a time T_{12} for reaching a water supply process of the first washing drum, if $T_{12} < T_{11}$, execute step 5), if $T_{12} \geq T_{11}$, execute step 8),
- 5) Set an allowable waiting time T_1 , if $T_{12} < T_1$, execute step 6), if $T_{12} \geq T_1$, execute step 8),
- 6) The second washing drum waits until the first washing drum supplies water, execute step 7),
- 7) The water in the second washing drum is drained into the first washing drum,
- 8) The water in the second washing drum is drained away directly.

[0091] If the water in the second washing drum is too dirty or water supply process of the first washing drum is for the last rinse, the water in the second washing drum cannot be reused. The control method is as follows:

- 1) The second washing drum reaches the drainage process,
- 2) The turbidity value or the bubble concentration value of the water in the second washing drum is detected to determine whether or not the turbidity value or the bubble concentration value is smaller than the set value, if yes, execute step 3), if no, execute step 9),
- 3) It is determined whether or not the first washing drum has only the last rinse left, if no, execute step 4), if yes, execute step 9),
- 4) It is determined whether or not the first washing drum is executing the water supply process, if no, execute step 5), if yes, execute step 8),
- 5) It is determined a time T_{11} for reaching a next drainage process of the second washing drum, a time T_{12} for reaching a water supply process of the first washing drum, if $T_{12} < T_{11}$, execute step 6), if $T_{12} \geq T_{11}$, execute step 9),
- 6) Set an allowable waiting time T_1 , if $T_{12} < T_1$, execute step 7), if $T_{12} \geq T_1$, execute step 9),
- 7) The second washing drum waits until the first washing drum supplies water, execute step 8),
- 8) The water in the second washing drum is drained into the first washing drum,
- 9) The water in the second washing drum is drained away directly.

[0092] When the water in the second washing drum is

drained into the first washing drum and if the water supply of the first washing drum is for washing, the detergent box needs to be washed and water level needs to be detected. The control method is as follows:

- 1) The second washing drum reaches the drainage process,
- 2) The turbidity value or the bubble concentration value of the water in the second washing drum is detected to determine whether or not the turbidity value or the bubble concentration value is smaller than the set value. If yes, execute step 3), if no, execute step 12),
- 3) It is determined whether or not the first washing drum only has water supply for the last rinse left, if no, execute step 4), if yes, execute step 12),
- 4) It is determined whether or not the first washing drum is executing any process, if no, execute step 5), if yes, execute step 10),
- 5) It is determined a time T_{11} for reaching a next drainage process of the second washing drum, a time T_{12} for reaching a water supply process of the first washing drum, if $T_{12} < T_{11}$, execute step 6), if $T_{12} \geq T_{11}$, execute step 12),
- 6) Set an allowable waiting time T_1 , if $T_{12} < T_1$, execute step 7), if $T_{12} \geq T_1$, execute step 12),
- 7) It is determined whether or not the first washing drum executes the water supply process, if yes, execute step 8), if no, execute step 10),
- 8) The first washing drum first supplies water for washing the detergent box, after the completion of water supply for washing the detergent box of the first washing drum, execute step 9),
- 9) The second washing drum waits until the first washing drum supplies water, execute step 10),
- 10) The water in the second washing drum is drained into the first washing drum,
- 11) Detect the height of the water level in the first washing drum. When the water level in the first washing drum reaches the set water level value and if there is still water left in the second washing drum, the left water is drained away directly. If the water level in the first washing drum does still not reach the set water level value after the water in the second washing drum is entirely drained into the first washing drum, water from outside is flooded into the first washing drum through the water inlet,
- 12) The water in the first washing drum is drained away directly.

Embodiment 4

[0093] As shown in Fig. 4, the present embodiment uses the waiting time of the water supply as criterion to determine whether or not to reuse the water. According to the waiting time of water supply, it is determined whether to reuse water drained from the other washing drum when one washing drum reaches the water supply proc-

ess. The method has a simple judgment and control logic; the control stability is high in the actual washing process. At the same time, it achieves a full reuse of water, and the practical value is high, which is more effective to promote and apply.

[0094] When the first washing drum and the second washing drum are both in the working state at the same time, the control method of water reuse is as follows:

A control method of water reuse of a multi-drum washing machine is provided, and the multi-drum washing machine at least comprises a first washing drum and a second washing drum. When the first washing drum and the second washing drum are both in the working state at the same time, the control method for water reuse is as follows: when the first washing drum reaches the drainage process, it is compared a time T_{22} for reaching a drainage process of the second washing drum and a time T_{21} for reaching a next water supply process of the first washing drum. If $T_{12} \geq T_{21}$, the first washing drum supplies clean water directly. If $T_{22} < T_{21}$, the first washing drum waits until a start of the drainage process of the second washing drum.

[0095] It is determined whether or not the water in the second washing drum can be reused before comparing the time T_{22} for reaching the drainage process of the second washing drum and the time T_{21} for reaching the next water supply process of the first washing drum. If no, the water in the first washing drum supplies clean water directly. If yes, it is compared the time T_{22} for reaching the drainage process of the second washing drum and the time T_{21} for reaching the next water supply process of the first washing drum. Or, it is determined whether or not the water in the second washing drum can be reused when the first washing drum waits until the start of the drainage process of the second washing drum. If no, the first washing drum supplies clean water directly. If yes, the water in the second washing drum is drained into the first washing drum for reuse.

Specific:

[0096]

step 1: when the first washing drum reaches the water supply process, it is compared the time T_{22} for reaching the drainage process of the second washing drum and the time T_{21} for reaching the next water supply process of the first washing drum. If $T_{22} \geq T_{21}$, the first washing drum supplies clean water directly. If $T_{22} < T_{21}$, the first washing drum waits until a start of the drainage process of the second washing drum, execute step 2;

Step 2: it is determined whether or not the water in the second washing drum can be reused. If yes, the water in the second washing drum is drained into the

first washing drum to reuse, if no, the first washing drum supplies clean water directly. By adding the process of the determination of whether or not to wait, to a large extent it increases the water reuse probability of the second washing drum, and more water can be reused.

[0097] In step 1, if the second washing drum is draining water when the first washing drum reaches the water supply process, the time T_{22} for reaching the drainage process of the second washing drum is 0, and no need to wait, and directly executes step 2. It is also possible to first determine whether or not the second washing drum is currently executing the drainage process before comparing the time T_{22} for reaching the drainage process of the second washing drum and the time T_{21} for reaching the next water supply process of the first washing drum. If the second washing drum is not subjected to the drainage process, then it is compared the time T_{22} for reaching the drainage process of the second washing drum and the time T_{21} for reaching the next water supply process of the first washing drum.

[0098] In step 1, an allowable waiting time T_2 is set, which $T_2 < T_{21}$. If $T_{22} < T_2$, the first washing drum waits until the second washing drum drains, and executes step 2. If $T_{22} \geq T_2$, the first washing drum supplies clean water directly. This step can avoid the first washing drum waiting too long and reasonably arrange the water reuse under the premise of ensuring the washing time of the first washing drum. Thus will not waste too much time of the first washing drum because of only considering water reuse. If the washing machine determines that the waiting time is too long and exceeds the set allowable waiting time, the first washing drum will not reuse the water in the second washing drum. The determination makes the reuse of water more reasonable, optimizing the relationship between waiting time and water reuse.

[0099] In step 2, the turbidity value or the bubble concentration value of the water in the second washing drum is detected. If the turbidity value or the bubble concentration value of the water is smaller than the set value, the water in the second washing drum can be reused. Otherwise the water in the second washing drum cannot be reused. Water can be reused when the turbidity value or bubble concentration value of the water is within the set range.

[0100] In step 1, when the first washing drum reaches the drainage process, it is determined whether or not the water supply process being executed is a water supply for a last rinse. If yes, the first washing drum supplies clean water directly. If no, it is continued to compare the time T_{22} for reaching the drainage process of the second washing drum and the time T_{21} for reaching the next water supply process of the first washing drum. Thus it is ensured that the water supplied-in in the last rinse process is clean water, which ensures that the effect of washing clothes after washing.

[0101] In step 2, when the water in the second washing

drum is drained into the first washing drum, it is determined whether or not the first washing drum executes the water supply process for washing. If yes, the first washing drum first supplies water for washing the detergent box. After the completion of water supply for washing the detergent box of the first washing drum, the water in the second washing drum is drained into the first washing drum. If no, the water in the second washing drum is drained into the first washing drum directly.

[0102] In step 2, when the water in the second washing drum is drained into the first washing drum, the height of the water level in the first washing drum is detected. If the water level in the first washing drum reaches the set water level value, there is water in the second washing drum, and the remaining water in the second washing tub is discharged directly. If the water in the second washing drum is entirely drained into the first washing drum, and the water level in the first washing tub does not reach the set water level value, then the first washing drum supplies clean water.

[0103] When the water in the second washing drum is drained away directly, it is determined whether or not the first washing drum is executing the dehydration process. If yes, the second washing drum waits until the dehydration process of the first washing drum is completed, and then drains. If no, it is determined a time for reaching the dehydration process of the first washing drum is T_{41} , a time taken for the first washing drum to dehydrate is T_{44} , and an allowable waiting time T_4 is set. If $T_{41} + T_{44} < T_4$, the second washing drum waits until the dehydration process of the first washing drum is completed, and then drains. Otherwise, the water of the second washing drum is drained directly.

[0104] It is also possible to determine whether or not the water in the first washing drum can be reused by determining the washing state and the washing times. In step 2, the water in the first washing drum cannot be reused, if the second washing drum is in a washing process when it drains and the first washing drum is in a rinse process when it supplies water; or if the first, second washing drums are both in the washing process when the second washing drum drains and the first washing drum supplies water, and washing times of the second washing drum is less than washing times of the first washing drum; or if the first, second washing drums are both in the rinse process when the second washing drum drains and the first washing drum supplies water, and washing times of the second washing drum is less than washing times of the first washing drum.

[0105] When the second washing drum reaches the water supply process, it is compared the time for reaching the drainage process of the first washing drum and the time for reaching the next water supply of the second washing drum, it is determined whether or not the second washing drum waits until the first washing drum drains.

[0106] The drainage outlet of the second washing drum is communicated with the first washing drum, and the water in the second washing drum can be drained into

the first washing drum to reuse. The drainage outlet of the second washing drum is provided with a holding valve, the water in the second washing drum can flow through the holding valve into the first washing drum. The first washing drum is provided with an inlet valve and the clean water can flow into the first washing drum through the inlet valve. The control method is as follows:

- 1) The first washing drum reaches the water supply process,
- 2) It is determined whether or not the water in the second washing drum can be reused, if yes, execute step 3), if no, execute step 6),
- 3) It is determined a time T_{21} for reaching a next water supply process of the first washing drum, a time T_{22} for reaching a drainage process of the second washing drum, if $T_{22} < T_{21}$, execute step 4), if $T_{22} \geq T_{21}$, execute step 6),
- 4) The first washing drum waits until the second washing drum drains, execute step 5),
- 5) The water in the second washing drum is drained into the first washing drum,
- 6) The first washing drum supplies clean water directly and the water in the second washing drum is drained away directly.

[0107] The control method can also add a process of determining whether or not the second washing drum is draining water before comparing the time T_{22} for reaching the drainage process of the second washing drum and the time T_{21} for reaching the next water supply process of the first washing drum. The control method is as follows:

- 1) The first washing drum reaches the water supply process,
- 2) It is determined whether or not the water in the second washing drum can be reused, if yes, execute step 3), if no, execute step 7),
- 3) It is determined whether or not the second washing drum is executing the drainage process, if no, execute step 4), if yes, execute step 6),
- 4) It is determined a time T_{21} for reaching a next water supply process of the first washing drum, a time T_{22} for reaching a drainage process of the second washing drum, if $T_{22} < T_{21}$, execute step 5), if $T_{22} \geq T_{21}$, execute step 7),
- 5) The first washing drum waits until the second washing drum drains, executes step 6),
- 6) The water in the second washing drum is drained into the first washing drum,
- 7) The first washing drum supplies clean water directly and the water in the second washing drum is drained away directly.

[0108] The control method may also include determining whether or not the first washing drum has enough time to wait the second washing drum draining, the con-

trol method is as follows:

- 1) The first washing drum reaches the water supply process,
- 2) It is determined whether or not the water in the second washing drum can be reused, if yes, execute step 3), if no, execute step 8),
- 3) It is determined whether or not the second washing drum is executing the drainage process, if no, execute step 4), if yes, execute step 7),
- 4) It is determined a time T_{21} for reaching a next water supply process of the first washing drum, a time T_{22} for reaching a drainage process of the second washing drum, if $T_{22} < T_{21}$, execute step 5), if $T_{22} \geq T_{21}$, execute step 8),
- 5) an allowable waiting time T_2 is set, if $T_{22} < T_2$, execute step 6), if $T_{22} \geq T_2$, execute step 8),
- 6) The first washing drum waits until the second washing drum drains, execute step 7),
- 7) The water in the second washing drum is drained into the first washing drum,
- 8) The first washing drum supplies clean water directly and the water in the second washing drum is drained away directly.

[0109] If the water in the second washing drum is too dirty or water supply process of the first washing drum is for the last rinse, the water in the second washing drum cannot be reused. The control method is as follows:

- 1) The first washing drum reaches the water supply process,
- 2) It is determined whether or not the first washing drum has only the last rinse left, if no, execute step 3), if yes, execute step 9),
- 3) It is determined whether or not the second washing drum is executing drainage process, if no, execute step 4), if yes, execute step 7),
- 4) It is determined a time T_{21} for reaching a next water supply process of the first washing drum, a time T_{22} for reaching a drainage process of the second washing drum, if $T_{22} < T_{21}$, execute step 5), if $T_{22} \geq T_{21}$, execute step 9),
- 5) an allowable waiting time T_2 is set, if $T_{22} < T_2$, execute step 6), if $T_{22} \geq T_2$, execute step 9),
- 6) The first washing drum waits until the second washing drum supplies water, execute step 7),
- 7) The turbidity value or the bubble concentration value of the water in the second washing drum is detected to determine whether or not the turbidity value or the bubble density value is smaller than the set value, If yes, execute step 8), if no, execute step 9),
- 8) The water in the second washing drum is drained into the first washing drum,
- 9) The first washing drum supplies clean water directly and the water in the second washing drum is drained away directly.

[0110] When the water in the second washing drum is drained into the first washing drum and if the water supply of the first washing drum is for washing, the detergent box need to be washed and water level need to be detected. The control method is as follows:

- 1) The first washing drum reaches the water supply process,
- 2) It is determined whether or not the first washing drum has only the last rinse left, if no, execute step 3), if yes, execute step 12),
- 3) It is determined whether or not the second washing drum is executing drainage process, if no, execute step 4), if yes, execute step 7),
- 4) It is determined a time T_{21} for reaching a next water supply process of the first washing drum, a time T_{22} for reaching a drainage process of the second washing drum, if $T_{22} < T_{21}$, execute step 5), if $T_{22} \geq T_{21}$, execute step 12),
- 5) An allowable waiting time T_2 is set, if $T_{22} < T_2$, execute step 6), if $T_{22} \geq T_2$, execute step 12),
- 6) The first washing drum waits until the second washing drum drains water, execute step 7),
- 7) The turbidity value or the bubble concentration value of the water in the second washing drum is detected to determine whether or not the turbidity value or the bubble density value is smaller than the set value, if yes, execute step 8), if no, execute step 12),
- 8) It is determined whether or not the first washing drum is executing the water supply process for washing, if yes, execute step 9), if no, execute step 10),
- 9) The first washing drum first supplies water for washing the detergent box, after the completion of water supply for washing the detergent box of the first washing drum, execute step 10),
- 10) The water in the second washing drum is drained into the first washing drum,
- 11) It is detected the height of the water level in the first washing drum. When the water level in the first washing drum reaches the set water level value and if there is still water left in the second washing drum, the left water is drained away directly. If the water level in the first washing drum still not reaches the set water level value after the water in the second washing drum is entirely drained into the first washing drum, water from outside is flooded into the first washing drum through the water inlet.
- 12) The first washing drum supplies clean water directly and the water in the second washing drum is drained away directly.

[0111] The first washing drum and the second washing drum of the present embodiment are only for the sake of convenience of the description, regardless of the order of the relationship. It may also to reuse the water in the first washing drum, the water inlet of the second washing

drum is communicated with the drainage outlet of the first washing drum. The water in the first washing drum can be drained into the second washing drum for reuse. The drainage outlet of the first washing drum is provided with a holding valve and the water of the first washing drum can flow into the second washing drum through the holding valve. The second washing drum is provided with a water inlet, clean water from outside can flow into the second washing drum through the water inlet. When one washing drum reaches the water supply process, it is determined whether or not the water in the other washing drum is drained into the washing drum for reuse. And when the other washing drum reaches the water supply process, it doesn't need to consider the water reuse of the washing drum. It avoids causing an infinite loop of both washing drums waiting.

[0112] The control method is as follows:

- 1) The second washing drum reaches the water supply process,
- 2) It is determined whether or not the water in the first washing drum can be reused, if yes, execute step 3), if no, execute step 6),
- 3) It is determined a time T_{21} for reaching a next water supply process of the second washing drum, a time T_{22} for reaching a drainage process of the first washing drum, if $T_{22} < T_{21}$, execute step 4), if $T_{22} \geq T_{21}$, execute step 6),
- 4) The second washing drum waits until the first washing drum drains, execute step 5),
- 5) The water in the first washing drum is drained into the second washing drum,
- 6) The second washing drum supplies clean water directly and the water in the first washing drum is drained away directly.

[0113] The control method can also add a process of determining whether or not the first washing drum is draining before comparing the time T_{22} for reaching the next drainage process of the second washing drum and the time T_{21} for reaching executing the next water supply process of the first washing drum. The control method is as follows:

- 1) The second washing drum reaches the water supply process,
- 2) It is determined whether or not the water in the first washing drum can be reused, if yes, execute step 3), if no, execute step 7),
- 3) It is determined whether or not the first washing drum is executing the drainage process, if no, execute step 4), if yes, execute step 6),
- 4) It is determined a time T_{21} for reaching a next water supply process of the second washing drum, a time T_{22} for reaching a drainage process of the first washing drum, if $T_{22} < T_{21}$, execute step 5), if $T_{22} \geq T_{21}$, execute step 7),
- 5) The second washing drum waits until the first

washing drum drains, execute step 6),

6) The water in the first washing drum is drained into the second washing drum,

7) The second washing drum supplies clean water directly and the water in the first washing drum is drained away directly.

[0114] The control method may also include determining whether or not the second washing drum has enough time to wait the first washing drum to drain, the control method is as follows:

- 1) The second washing drum reaches the water supply process,
- 2) It is determined whether or not the water in the first washing drum can be reused, if yes, execute step 3), if no, execute step 8),
- 3) It is determined whether or not the first washing drum is executing the drainage process, if no, execute step 4), if yes, execute step 7),
- 4) It is determined a time T_{21} for reaching a next water supply process of the second washing drum, a time T_{22} for reaching a drainage process of the first washing drum, if $T_{22} < T_{21}$, execute step 5), if $T_{22} \geq T_{21}$, execute step 8),
- 5) An allowable waiting time T_2 is set, if $T_{22} < T_2$, execute step 6), if $T_{22} \geq T_2$, execute step 8),
- 6) The second washing drum waits until the first washing drum drains, execute step 7),
- 7) The water in the first washing drum is drained into the second washing drum,
- 8) The second washing drum supplies clean water directly and the water in the first washing drum drains away directly.

[0115] If the water in the first washing drum is too dirty or water supply process of the second washing drum is for the last rinse, the water in the first washing drum cannot be reused. The control method is as follows:

- 1) The second washing drum reaches the water supply process,
- 2) It is determined whether or not the second washing drum has only the last rinse left, if yes, execute step 3), if no, execute step 9),
- 3) It is determined whether or not the first washing drum is executing the drainage process, if no, execute step 4), if yes, execute step 7),
- 4) It is determined a time T_{21} for reaching a next water supply process of the second washing drum, a time T_{22} for reaching a drainage process of the first washing drum, if $T_{22} < T_{21}$, execute step 5), if $T_{22} \geq T_{21}$, execute step 9),
- 5) An allowable waiting time T_2 is set, if $T_{22} < T_2$, execute step 6), if $T_{22} \geq T_2$, execute step 9),
- 6) The second washing drum waits until the first washing drum drains, execute step 7),
- 7) The turbidity value or the bubble concentration

value of the water in the first washing drum is detected to determine whether or not the turbidity value or the bubble density value is smaller than the set value. If yes, execute step 8), if no, execute step 9),
 8) The water in the first washing drum is drained into the second washing drum,
 9) The second washing drum supplies clean water directly and the water in the first washing drum is drained away directly.

[0116] When the water of the first washing drum is drained into the second washing drum and if the water supply of the second washing drum is for washing, the detergent box need to be washed and water level need to be detected. The control method is as follows:

- 1) The second washing drum reaches the water supply process,
- 2) It is determined whether or not the second washing drum only has water supply for the last rinse left, if no, execute step 3), if yes, execute step 12),
- 3) It is determined whether or not the first washing drum is executing the drainage process, if no, execute step 4), if yes, execute step 7),
- 4) It is determined a time T_{21} for reaching a next water supply process of the second washing drum, a time T_{22} for reaching a drainage process of the first washing drum, if $T_{22} < T_{21}$, execute step 5), if $T_{22} \geq T_{21}$, execute step 12),
- 5) An allowable waiting time T_2 is set, if $T_{22} < T_2$, execute step 6), if $T_{22} \geq T_2$, execute step 12),
- 6) The second washing drum waits until the first washing drum drains, execute step 7),
- 7) The turbidity value or the bubble concentration value of the water in the first washing drum is detected to determine whether or not the turbidity value or the bubble density value is smaller than the set value.,
 if yes, execute step 8), if no, execute step 12),
- 8) It is determined whether or not the second washing drum is executing the water supply process for washing, if yes, execute step 9), if no, execute step 10),
- 9) The second washing drum first supplies water for washing the detergent box,
 after the completion of water supply for washing the detergent box of the second washing drum, execute step 10),
- 10) The water in the first washing drum is drained into the second washing drum,
- 11) It is detected the height of the water level in the second washing drum. When the water level in the second washing drum reaches the set water level value and if there is still water left in the first washing drum, the left water is drained away directly. If the water level in the second washing drum still not reaches the set water level value after the water in the first washing drum is entirely drained into the second washing drum, water from outside is flooded

into the second washing drum through the water inlet,

12) The second washing drum supplies clean water directly and the water in the first washing drum is drained away directly.

[0117] While there has been shown several and alternate embodiments of the present disclosure, it is to be understood that various of variants and improvement can be made as would be known to one skilled in the art without departing from the underlying scope of the present invention as is discussed and set forth above and below including claims.

Claims

1. A drainage control method of a multi-drum washing machine which at least comprises a first washing drum and a second washing drum, wherein:

when the first washing drum reaches a drainage process, it is determined whether or not the second washing drum is in a dehydration process at this time,

if the second washing drum is in the dehydration process, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains;

if the second washing drum is not in the dehydration process at this time, it is determined whether or not the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains.

2. The drainage control method of the multi-drum washing machine according to claim 1, wherein: the process to determine whether or not the first washing drum waits until the dehydration process of the second washing drum is completed and then drains includes:

determining a time T_{32} for reaching the dehydration process of the second washing drum and a time T_{33} taken for the second washing drum to dehydrate is, and setting an allowable waiting time T_3 ,

if $T_{32} + T_{33} < T_3$, the first washing drum waiting until the dehydration process of the second washing drum is completed, and then draining,
 otherwise, water in the first washing drum being drained directly.

3. The drainage control method of the multi-drum washing machine according to claim 1 or 2, wherein: when the first washing reaches the drainage process, it is determined whether or not the second washing drum is draining at this time,

- if the second washing drum is draining at the time, the first washing drum waits until a drainage of the second washing drum is completed, and drains, otherwise, the water in the first washing drum is drained directly.
4. The drainage control method of the multi-drum washing machine according to any one of claims from 1 to 3, wherein: when the first washing drum reaches the drainage process, it is compared a time T_{12} for reaching a water supply process of the second washing drum and a time T_{11} for reaching a next drainage process of the first washing drum, if $T_{12} < T_{11}$, the first washing drum waits until the second washing drum supplies water, if $T_{12} \geq T_{11}$, the water in the first washing drum is drained directly.
 5. The drainage control method of the multi-drum washing machine according to claim 4, wherein: it is determined whether or not the water in the first washing drum can be reused before comparing the time T_{12} for reaching the water supply process of the second washing drum and the time T_{11} for reaching the next drainage process of the first washing drum, if no, the water in the first washing drum is drained directly, if yes, it is compared the time T_{12} for reaching the water supply process of the second washing drum and the time T_{11} for reaching the next drainage process of the first washing drum; or, it is determined whether or not the water in the first washing drum is reused when the first washing drum waits until the second washing drum supplies water, if no, the water in the first washing drum is drained directly, if yes, the water in the first washing drum is drained into the second washing drum for reusing.
 6. The drainage control method of the multi-drum washing machine according to claim 4 or 5, wherein: if the second washing drum is supplying water when the first washing drum reaches the drainage process, the time T_{12} for reaching the water supply process of the second washing drum is 0, and no need to wait.
 7. The drainage control method of the multi-drum washing machine according to any one of claims from 4 to 6 wherein: an allowable waiting time T_1 is set, $T_1 < T_{11}$, it is compared the time T_{12} for reaching the water supply process of the second washing drum and the allowable waiting time T_1 , if $T_{12} < T_1$, the first washing drum waits until the second washing drum supplies water, if $T_{12} \geq T_1$, the water in the first washing drum is drained directly.
 8. The drainage control method of the multi-drum washing machine according to any one of claims from 4 to 7 wherein: when the first washing drum reaches the drainage process, it is determined whether or not the process which the second washing drum is in progress or is about to be performed is a water supply for a last rinse, if yes, the water in the first washing drum is drained directly, if no, it is continued to be determined whether or not the water in the first washing drum can be reused.
 9. The drainage control method of the multi-drum washing machine according to any one of claims from 1 to 8 wherein: when the second washing drum reaches the drainage process, it is determined whether or not the first washing drum is in the dehydration process at this time, if it is in the dehydration process, the second washing drum waits until the dehydration process of the first washing drum is completed, and then drains, if the first washing drum is not in the dehydration process at this time, it is determined whether or not to wait until the dehydration process of the first washing drum is completed, and then drains.
 10. The drainage control method of the multi-drum washing machine according to any one of claims from 1 to 9 wherein: when the first washing drum reaches the drainage process, it is determined whether or not the second washing drum is operating at this time, if yes, it is determined whether or not the second washing drum is in the dehydration process or is about to execute the dehydration process, if no, the first washing drum directly executes the drainage process.
 11. A drainage control method of a multi-drum washing machine which at least comprises a first washing drum and a second washing drum, wherein:

when the first washing drum reaches a drainage process, it is determined whether or not the second washing drum is in a drainage process or in a dehydration process, if the second washing drum is in the drainage process or in the dehydration process, the first washing drum waits until the dehydration process of the second washing drum is completed, and then drains; if the second washing drum is not in the drainage process or in the dehydration process, it is determined whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then drains.
 12. The drainage control method of the multi-drum wash-

- ing machine according to claim 11, wherein: a process for determining whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then drains, comprises,
determining T_{31} a time for reaching the drainage process of the second washing drum, a time T_{34} taken for the second washing drum to drain, a time T_{33} taken for the second washing drum to dehydrate, and a time T_5 for reaching a next drainage process of the first washing drum,
if $T_5 < T_{31} + T_{34}$, the water in the first washing drum being drained directly, otherwise, continuing to be determined whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then drains.
- 13.** The drainage control method of the multi-drum washing machine according to claim 11 or 12, wherein: a process for determining whether or not the first washing drum needs to wait until the dehydration process of the second washing drum is completed, and then drains, comprises
determining the time T_{31} for reaching the drainage process of the second washing drum, the time T_{34} taken for the second washing drum to drain, and the time T_{33} taken for the second washing drum to dehydrate,
setting an allowable waiting time T_3 ,
if $T_{31} + T_{34} + T_{33} < T_3$, the first washing drum waiting until the dehydration process of the second washing drum is completed, and then draining,
otherwise, the water in the first washing drum being drained directly.
- 14.** The drainage control method of the multi-drum washing machine according to any one of claims from 11 to 13, wherein: when the first washing drum reaches the drainage process, it is firstly determined whether or not the second washing drum is operating,
if no, the first washing drum directly executes the drainage process,
if yes, it is continued to be determined whether or not the second washing drum is in the drainage process or in the dehydration process.
- 15.** The drainage control method of the multi-drum washing machine according to any one of claims from 11 to 14, wherein: if it is determined the first washing drums waits until the dehydration process of the second washing drum is completed, it is determined whether or not the second washing drum needs to supply water after the dehydration process is completed,
if water supply is not required, the water in the first washing drum is drained directly,
if water supply is required, it is determined whether or not the water in the first washing drum can be reused,
if the water can be reused, the water in the first washing drum is drained into the second washing drum.
- 16.** The drainage control method of the multi-drum washing machine according to any one of claims from 11 to 15, wherein: when the first washing drum reaches the drainage process and if the second washing drum is supplying water, it is determined whether or not the water in the first washing drum can be reused, if the water can be reused, the water in the first washing drum is drained into the second washing drum.
- 17.** The drainage control method of the multi-drum washing machine according to claim 15 or 16, wherein: if the process which second washing drum is in or is about to perform is a water supply for a last rinse, the water in the first washing drum cannot be reused.
- 18.** The drainage control method of the multi-drum washing machine according to claim 15 or 16, wherein: if the first washing drum is in a drainage of a last rinse, the water in the first washing drum cannot be reused.
- 19.** The drainage control method of the multi-drum washing machine according to claim 15 or 16, wherein: the water in the first washing drum cannot be reused, if the first washing drum is in a washing process when it drains, and the second washing drum is in a rinse process when it supplies water; or
if the first and second washing drums are both in the washing process when the first washing drum drains and the second washing drum supplies water, and washing times of the first washing drum is less than washing times of the second washing drum; or
if the first and second washing drums are both in the rinse process when the first washing drum drains and the second washing drum supplies water, and rinsing times of the first washing drum is less than rinsing times of the second washing drum; or
if a turbidity of the water in the first washing drum exceeds a set value.
- 20.** The drainage control method of the multi-drum washing machine according to any one of claims from 11 to 19, wherein: when the second washing drum reaches the drainage process, it is determined whether or not the first washing drum is in the drainage process or in the dehydration process at this time,
if the first washing drum is in the drainage process or in the dehydration process, the second washing drum waits until the dehydration of the first washing drum is completed, and then drains,
if the first washing drum is not in the drainage process or in the dehydration process, it is determined whether or not the second washing drum needs to wait until the dehydration process of the first washing

drum is completed, and then drains.

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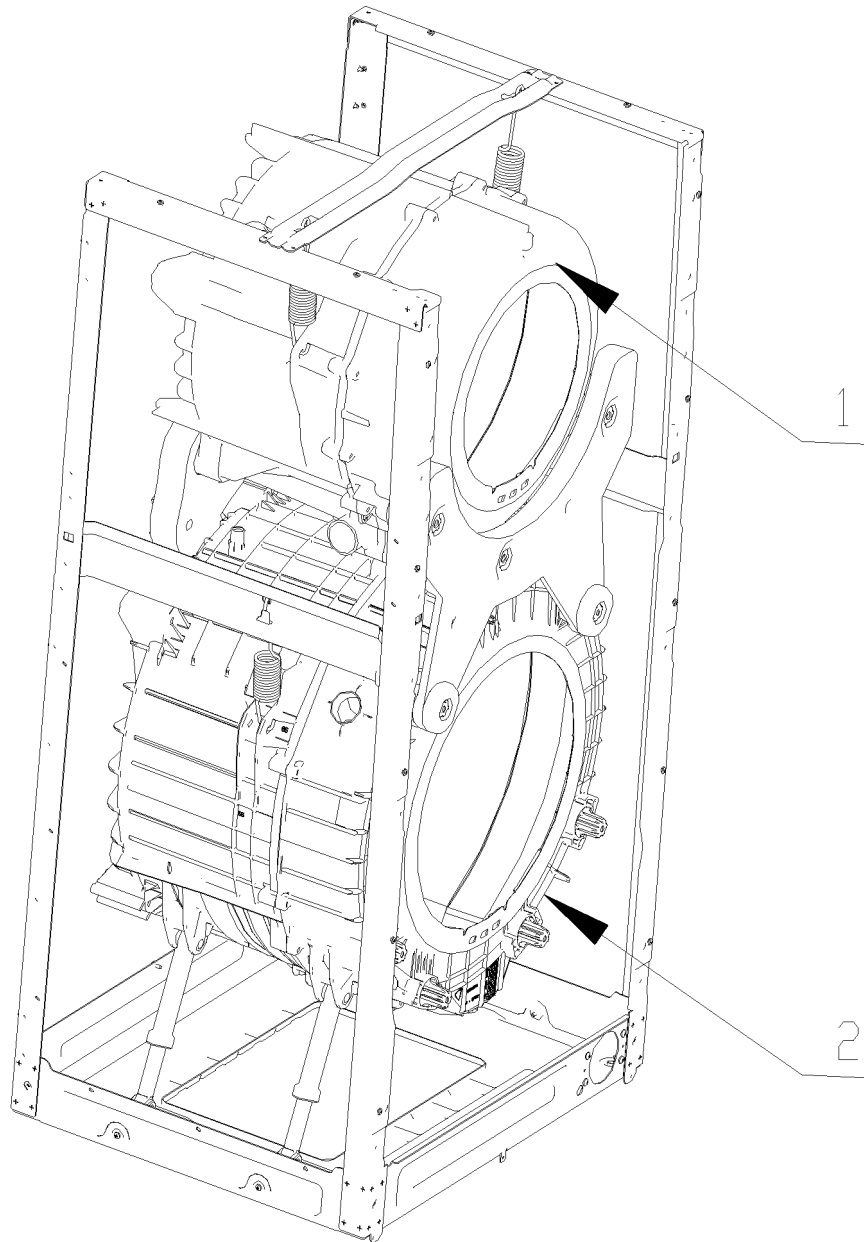


FIG. 1

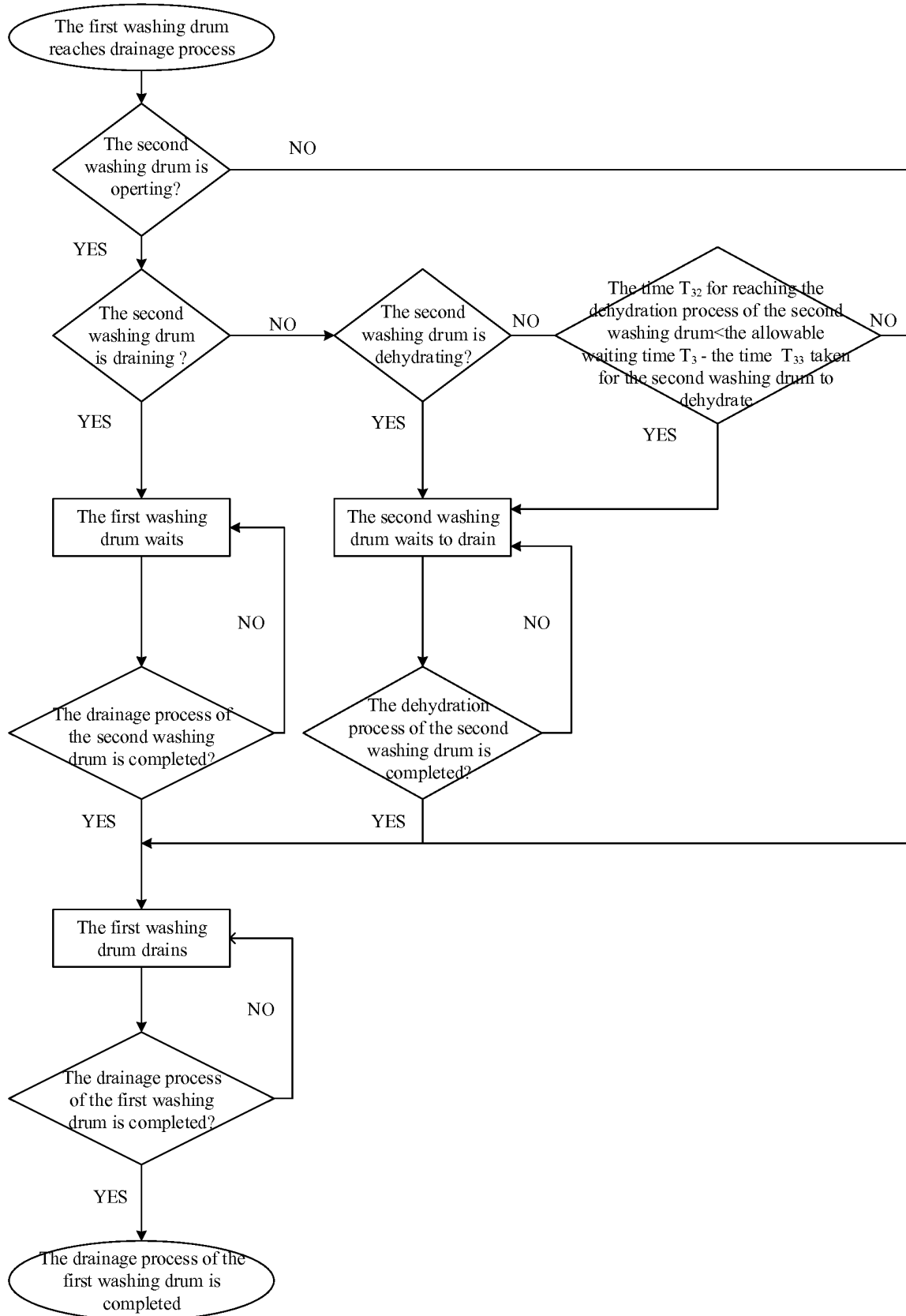


FIG. 2

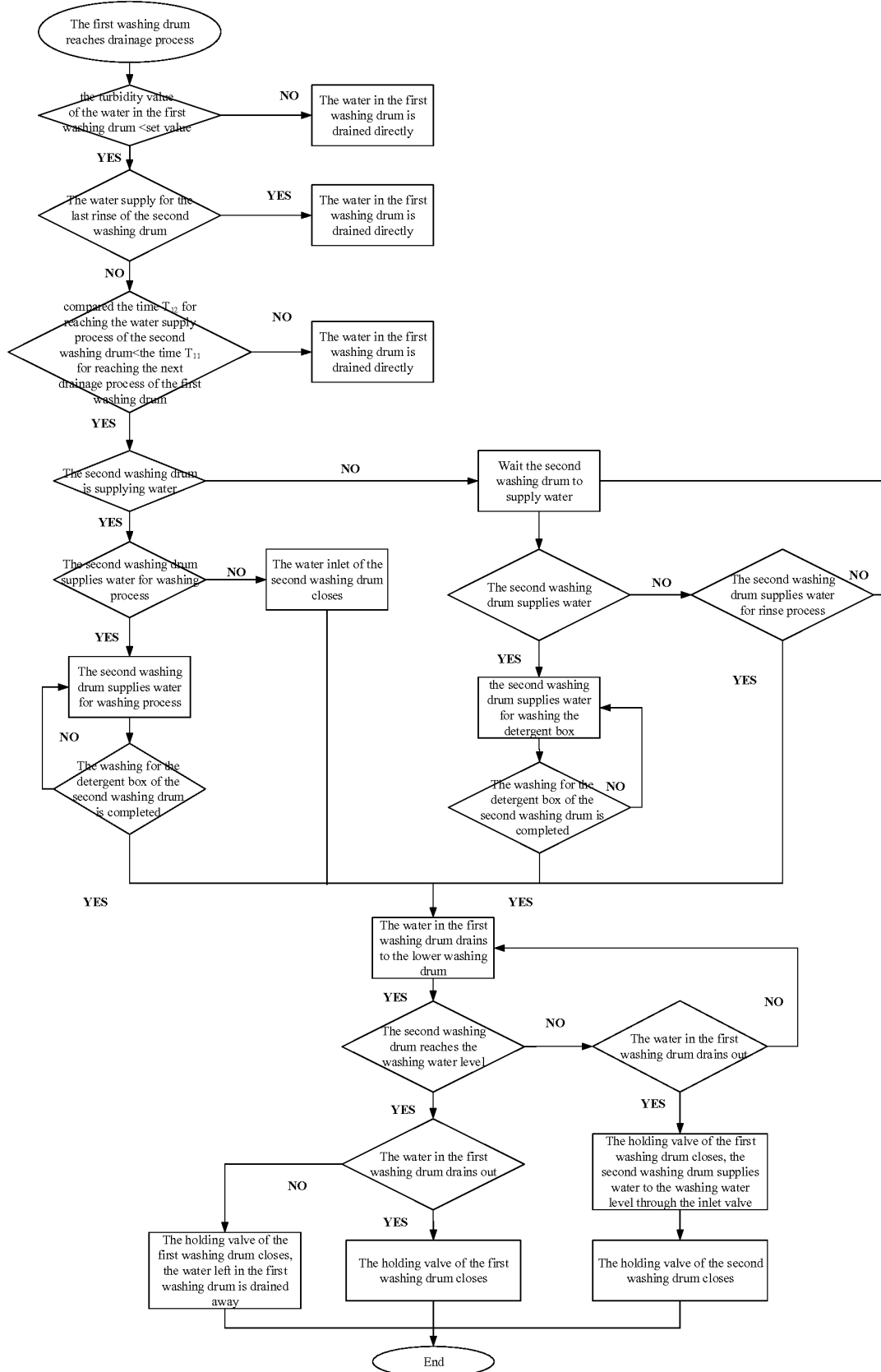


FIG. 3

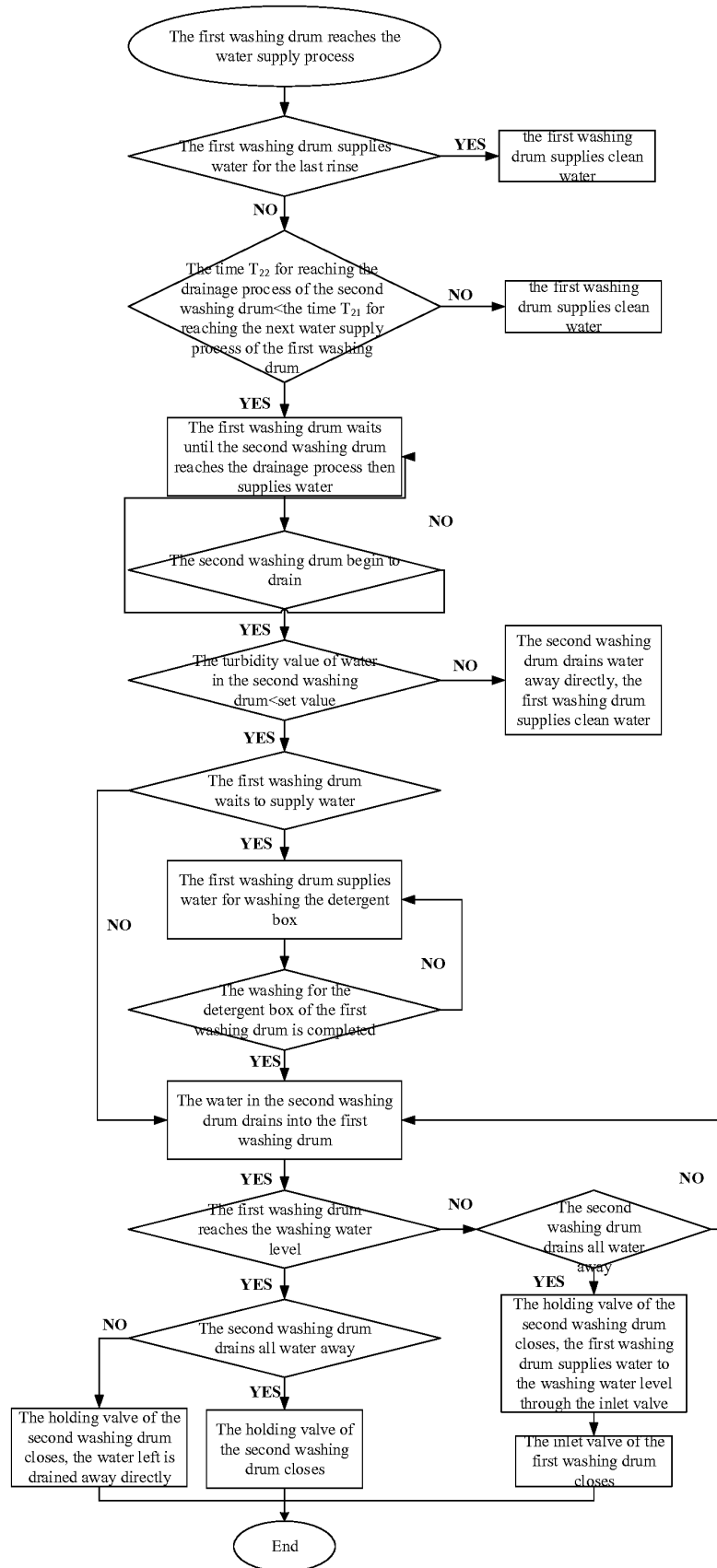


FIG. 4

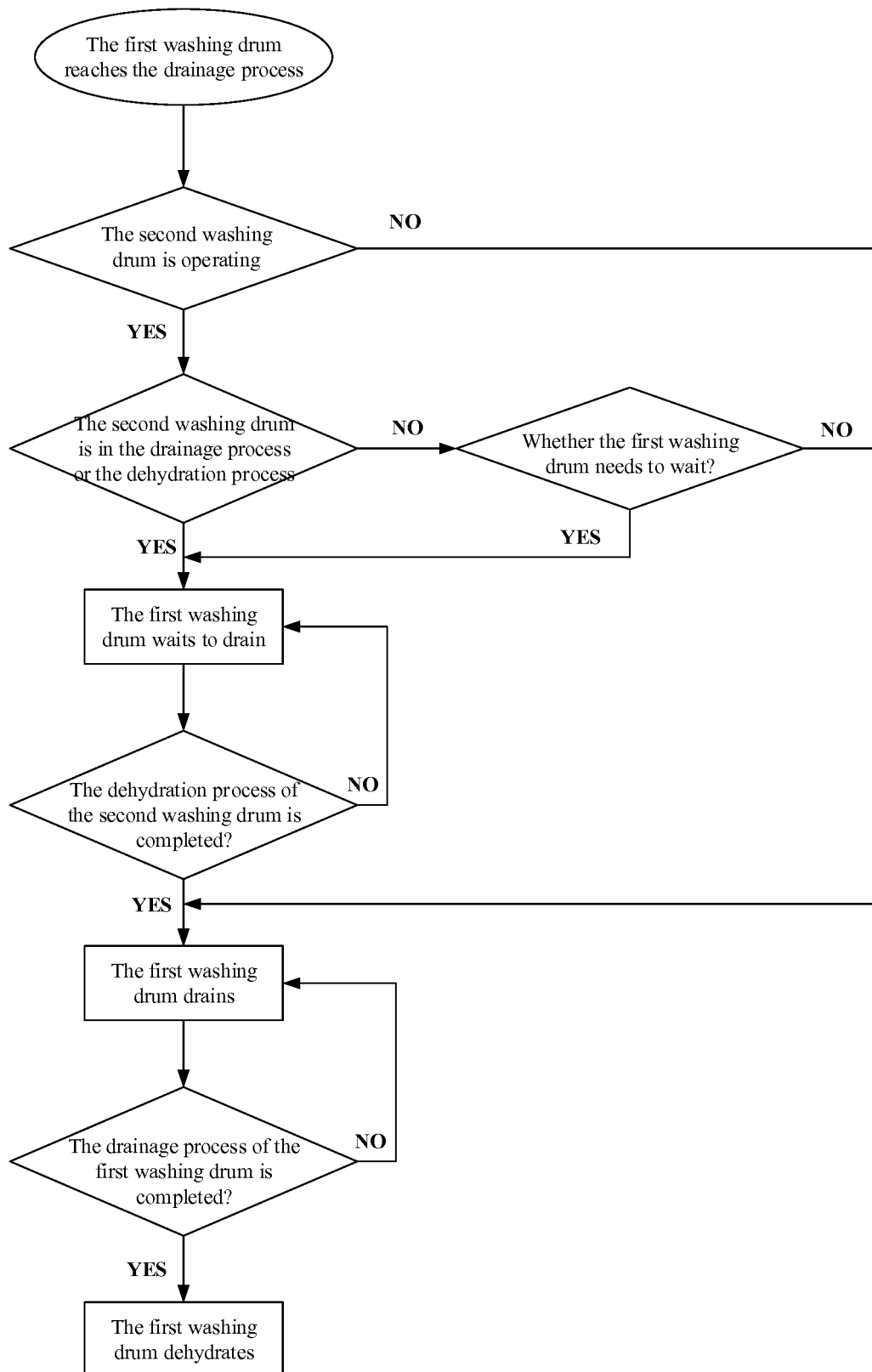


FIG. 5

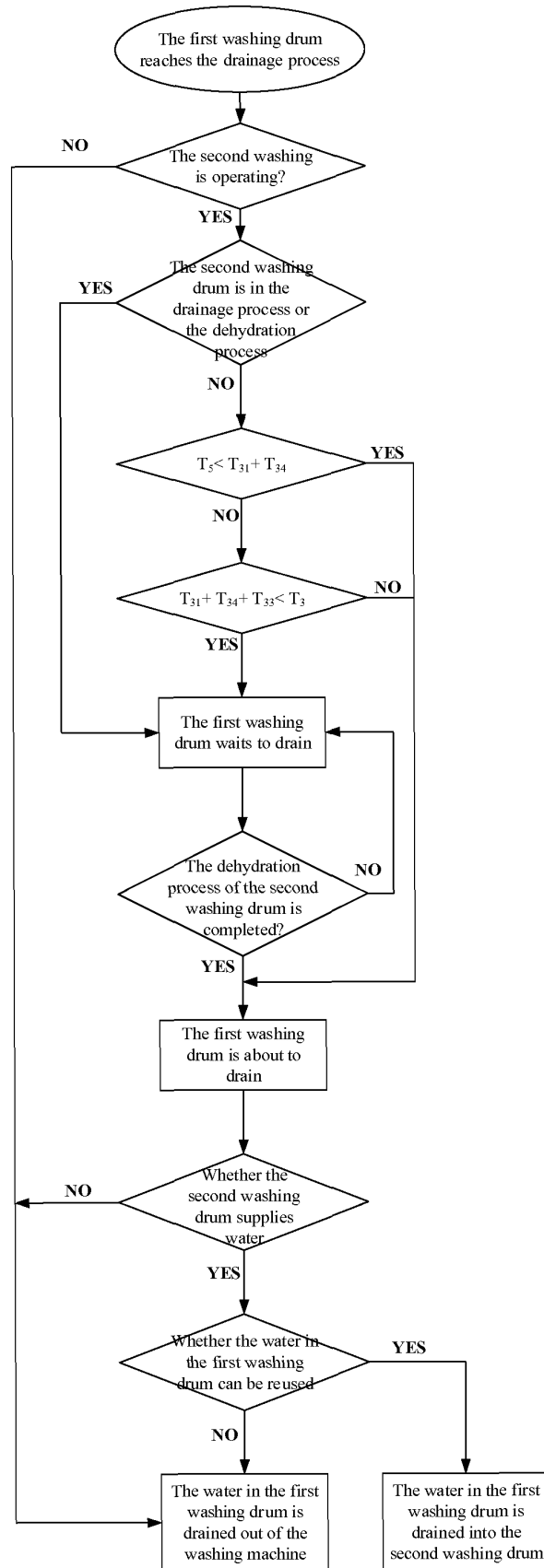


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2015/088593

A. CLASSIFICATION OF SUBJECT MATTER

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)

VEN; CNABS; CNTXT: second, composite, combine, stack, groove, spin-drying, sub+, sencond+, assistant, auxiliary +, small??, multipl+, mulripl+, two, double, supplement, twin, tub, bucket, roller, barrel, drum, cylinder, roller, water, drain+, discharg+, unwater+, dewater+, feed+, supply+, provid+, dispens+, Distribut+, spin+, dehydrat+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 103924417 A (HEFEI RONGSHIDA SANYO ELECTRIC CO., LTD.), 16 July 2014 (16.07.2014), description, paragraphs [0023]-[0031], and figures 1-2	1, 2, 9-14, 20
Y	CN 103924417 A (HEFEI RONGSHIDA SANYO ELECTRIC CO., LTD.), 16 July 2014 (16.07.2014), description, paragraphs [0023]-[0031], and figures 1-2	3, 15-19
Y	JP 5627299 A (SANYO ELECTRIC CO), 17 March 1981 (17.03.1981) abstract, and figures 1-3	3
Y	CN 202193989 U (QINGDAO HISENSE ELECTRONIC INDUSTRY HOLDING CO., LTD.), 18 April 2012 (18.04.2012), description, paragraphs [0016]-[0052], and figures 1-8	15-19
X	CN 103924416 A (HEFEI RONGSHIDA SANYO ELECTRIC CO., LTD.), 16 July 2014 (16.07.2014), description, paragraphs [0011]-[0015], and figures 1-2	1, 2, 9-14, 20

☒ Further documents are listed in the continuation of Box C.☒ 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
"A" document defining the general state of the art which is not considered to be of particular relevance	
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"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)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"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	"&" document member of the same patent family

Date of the actual completion of the international search

19 November 2015 (19.11.2015)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2015/088593

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 101876137 A (SAMSUNG ELECTRONICS CO., LTD.), 03 November 2010 (03.11.2010), the whole document	1-20

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/CN2015/088593

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 103924417 A	16 July 2014	None	
JP 5627299 A	17 March 1981	JP S5945398 B2	06 November 1984
CN 202193989 U	18 April 2012	None	
CN 103924416 A	16 July 2014	None	
CN 101876137 A	03 November 2010	US 2010275386 A1	04 November 2010
		KR 20100119451 A	09 November 2010

Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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