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(54) **LAUNDRY TREATMENT DEVICE**

(57) A laundry treatment device (100), comprising: a cylinder assembly (10), provided with a first air inlet (101), a first air outlet (102) and a second air outlet (103), both the first air outlet (102) and the second air outlet (103) being formed on the upper part of the side wall of the cylinder assembly (10); and a laundry drying assembly (20), comprising an air duct assembly, a heating element (22) and a fan (23). The air duct assembly is provided with a second air inlet (2103) and a damper (241), and the damper (241) may be switched between a first position and a second position. In a state where the damper (241) is switched to the first position, the damper (241) closes the second air inlet (2103) and opens the first air outlet (102). In a state where the damper (241) is switched to the second position, the damper (241) opens the second air inlet (2103) and closes the first air outlet (102).

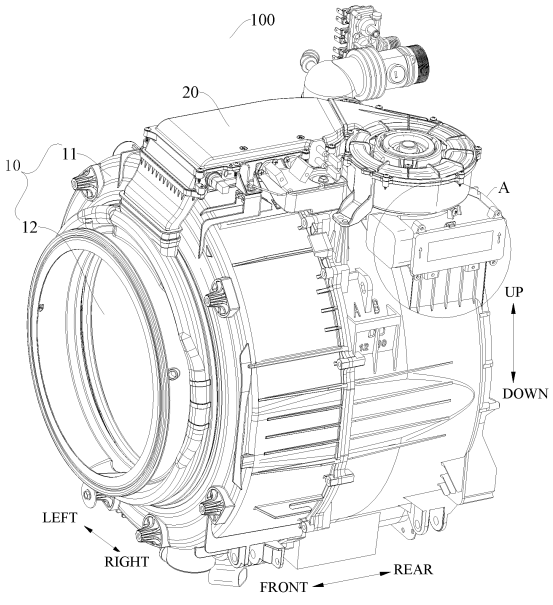


FIG. 1

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## Description

### CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This application is based on and claims priority to Chinese Patent Application Nos. 201920406286.1 and 201910238660.6, field on March 27, 2019, the entire contents of which are incorporated herein by reference.

### FIELD

**[0002]** This application relates to the technical field of clothes treatment, and in particular to a clothes treatment device such as a clothes dryer and an integrated washer-dryer.

### BACKGROUND

**[0003]** For an existing integrated washer-dryer, based on heat exchange between an outer drum and the outside air, hot and humid air in the drum condenses on a drum wall to form condensed water, thereby achieving the effect of clothes drying. However, since there is a small temperature difference between the outer drum and the air in the drum, even if a blower is added between the outer drum and a case, the temperature difference between the outer drum and the air in the drum cannot be effectively reduced.

**[0004]** A related art discloses a cycle + suction + discharge washing machine. During circulation of an airflow, part of the outside air can be sucked in through a suction opening, and then part of hot and humid air can be discharged from a discharge opening; however, at an initial stage of drying, the blower will suck in air from the outside, and then discharge part of air out of the drum, thus resulting in a slow heating-up in the initial stage; after the temperature rises in a later stage, still only a small part of the hot and humid air in the drum is discharged, and most of the hot and humid air still participates in the internal circulation. Therefore, the drying efficiency is still not high, and the energy consumption is still large.

**[0005]** For this reason, another related art discloses a washer-dryer with a condenser tube, but it still has the following shortcomings:

(1) Since the structure of the washer-dryer is more complicated than that of a dryer, the washer-dryer with a condenser tube (water-cooling) at the rear of the outer drum can have better drying efficiency, but it will inevitably make sacrifices in the volume of the drum, that is, it will affect the capacity of the clothes.
(2) Condensation is implemented in a water-cooling way, which causes waste of water and is not conducive to the reduction of energy consumption.
(3) Although the washer-dryer can achieve rapid temperature rise in the initial stage of drying, when the external circulation is required to discharge the hot air in the later stage, both a suction opening and a discharge opening are located on a circulation pipe, so that the hot and humid air just discharged will be sucked in immediately, which is not conducive to the improvement of drying efficiency.

### SUMMARY

**[0006]** The present disclosure is intended to solve at least one of the technical problems existing in the prior art. In view of this, an objective of the present disclosure is to provide a clothes treatment device which has high drying efficiency, low energy consumption and a large-capacity clothes treatment chamber.

**[0007]** The clothes treatment device according to an embodiment of the present disclosure includes: a drum assembly defining a clothes treatment chamber therein, the drum assembly having a first air inlet, a first air outlet and a second air outlet that are all in communication with the clothes treatment chamber, both the first air outlet and the second air outlet being provided at an upper part of a side wall of the drum assembly; and a clothes drying assembly including an air channel assembly communicating the first air inlet with the first air outlet, a heating member provided inside the air channel assembly, and a blower configured to guide air to flow, wherein the air channel assembly is provided with a second air inlet and a damper, and the damper can be switched between a first position and a second position; in a state where the damper is switched to the first position, the damper closes the second air inlet and opens the first air outlet, and in a state where the damper is switched to the second position, the damper opens the second air inlet and closes the first air outlet.

**[0008]** Compared with a same volume of a washer-dryer with a condenser tube in the related art, the clothes treatment device according to the embodiment of the present disclosure omits the condenser structure; in this way, the volume of the drum assembly can be increased, thereby increasing the capacity of the clothes treatment chamber; moreover, in the process of drying clothes, condensing water is not required, which saves water resources and reduces energy consumption. In the present disclosure, the heating member is mounted in the air channel assembly and the damper which can be switched between the first position and the second position is provided, so that the position of the damper can be switched according to the drying process; for example, in an initial stage of drying, the damper is switched to the first position, so that outside air enters the clothes treatment chamber and quickly takes away moisture of clothes; and in the middle and late stages of drying, the air damper is switched to the second position to increase the temperature in the clothes treatment chamber, thereby providing a drying effect. In another example, the damper is switched to the second position in the initial stage of drying to quickly increase the temperature inside the drum assembly; and in the middle and later stages of drying, the damper is switched to the first position to increase

the discharge speed of hot and humid air. In this way, the switch of different drying modes is realized, thus taking into account the energy consumption and drying efficiency, and achieving high capacity, low energy consumption and high efficiency.

**[0009]** According to an embodiment of the present disclosure, the damper is switched between the first position and the second position through the drive of a damper motor.

**[0010]** According to an embodiment of the present disclosure, in an axial direction of the drum assembly, the first air inlet is located at a front part of the drum assembly, and the first air outlet and the second air outlet are located at a rear part of the drum assembly.

**[0011]** According to an embodiment of the present disclosure, the second air inlet and the second air outlet are arranged in a circumferential direction of the drum assembly and spaced apart, and the second air inlet and the second air outlet are respectively located on two sides of an imaginary vertical plane passing through the central axis of the drum assembly.

**[0012]** According to an embodiment of the present disclosure, a flow area of the second air outlet is greater than 3000 $mm^2$.

**[0013]** According to an embodiment of the present disclosure, a flow area of the second air outlet is greater than 1500 $mm^2$.

**[0014]** According to an embodiment of the present disclosure, a flow area of the first air outlet is greater than 3000 $mm^2$.

**[0015]** According to an embodiment of the present disclosure, the damper is rotatably provided on the air channel assembly.

**[0016]** According to an embodiment of the present disclosure, the drum assembly includes: an outer drum, the first air outlet and the second air outlet being provided at an upper part of a side wall of the outer drum; and an inner drum rotatably provided in the outer drum and extending along an axial direction of the outer drum, the inner drum defining the clothes treatment cavity, the clothes treatment chamber being in communication with a gap between the outer drum and the inner drum, the first air outlet and the second air outlet being respectively in communication with the clothes treatment chamber through the gap.

**[0017]** In some embodiments, the first air inlet is provided on a front edge of the outer drum or a door seal on the outer drum.

**[0018]** According to an embodiment of the present disclosure, the air channel assembly includes: an air channel shell mounted at the upper part of the side wall of the drum assembly, an inner cavity of the air channel shell being in communication with the first air inlet; and a connection seat provided between the air channel shell and the drum assembly, the inner cavity of the air channel shell being in communication with the first air outlet through an inner cavity of the connection seat, the second air inlet and the damper being provided on the connection seat.

**[0019]** In some embodiments, the damper is provided on the inner cavity of the connection seat.

**[0020]** In some embodiments, the second air inlet is provided on a side of the connection seat.

**[0021]** In some examples, the connection seat includes: a base body provided between the air channel shell and the drum assembly, the inner cavity of the air channel shell being in communication with the first air outlet through an inner cavity of the base body, an opening being formed in a side of the base body, the damper being provided in the base body adjacent to the opening; and a limit plate detachably provided at the opening, the second air inlet being provided on the limit plate.

**[0022]** In some embodiments, the first air outlet is located below the connection seat, a bottom of the connection seat is provided with a first ventilation opening, the first ventilation opening is in communication with the first air outlet, and the damper can open or close the first air outlet by opening or closing the first ventilation opening.

**[0023]** In some embodiments, a bottom of the air channel shell has a mounting opening, a top of the connection seat has a second ventilation opening, and the second ventilation opening is in communication with the mounting opening.

**[0024]** In some embodiments, the air channel shell includes: an air channel base arranged above the drum assembly and the connection seat; an air channel cover plate covering a part of the air channel base; and a blower cover plate covering the other part of the air channel base, a fan of the blower being arranged between the blower cover plate and the air channel base.

**[0025]** In some examples, a side of the blower cover plate away from the air channel base has a downwardly recessed mounting recess for mounting a drive motor for driving the fan to rotate.

**[0026]** The additional aspects and advantages of the present disclosure will be set forth in part in the following description and become apparent in part from the following description or be understood through the practice of the present disclosure.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0027]** The above-described and/or additional aspects and advantages of the present disclosure will become apparent and readily understood from the description of embodiments in conjunction with the following accompanying drawings, where

FIG 1 is a perspective view of a clothes treatment device according to an embodiment of the present disclosure;

FIG 2 is an enlarged view of part A in FIG 1;

FIG. 3 is a side view of the clothes treatment device shown in FIG. 1;

FIG. 4 is a cross-sectional view of the clothes treat-

ment device shown in FIG. 3, wherein a damper is in a first position;
FIG. 5 is another cross-sectional view of the clothes treatment device shown in FIG. 3, wherein the damper is in a second position; and
FIG. 6 is an exploded view of an air channel assembly of the clothes treatment device shown in FIG. 1.

**[0028]** Reference numerals:

clothes treatment device 100,
drum assembly 10,
outer drum 11, first air inlet 101, first air outlet 102, second air outlet 103,
inner drum 12, clothes treatment chamber 121,
clothes drying assembly 20,
air channel shell 21, air channel 2101, first ventilation opening 2102, second air inlet 2103, air channel outlet 2104, second ventilation opening 2105, mounting opening 2106,
air channel base 211, fixing portion 2111, air channel cover plate 212, blower cover plate 213, connection seat 214, fixing lug 2141, base body 2142, limit plate 2143,
heating member 22,
blower 23, fan 231, drive motor 232,
damper 241, damper motor 242.

## DETAILED DESCRIPTION

**[0029]** Embodiments of the present disclosure will be described below in detail. Examples of the embodiments are illustrated in the accompanying drawings, where the same or similar reference numerals throughout the specification refer to the same or similar elements or elements having the same or similar functions. The embodiments described below with reference to the accompanying drawings are exemplary and are intended to be illustrative only and are not to be construed as limiting the scope of the present disclosure.

**[0030]** A clothes treatment device 100 according to an embodiment of the present disclosure will be described below with reference to FIGS. 1 to 6. The clothes treatment device 100 here may be configured as a clothes dryer or a washer-dryer.

**[0031]** As show in FIGS. 1 to 6, the clothes treatment device 100 according to the embodiment of the present disclosure includes a drum assembly 10 defining a clothes treatment chamber 121 therein, the drum assembly 10 has a first air inlet 101, a first air outlet 102 and a second air outlet 103 that are all in communication with the clothes treatment chamber 121, and both the first air outlet 102 and the second air outlet 103 are provided at an upper part of a side wall of the drum assembly 10. In this embodiment, an axial direction of the drum assembly 10 extends in a front-rear direction or extends obliquely relative to the front-rear direction.

**[0032]** Further, the clothes treatment device 100 further includes a clothes drying assembly 20. The clothes drying assembly 20 includes an air channel assembly, a heating member 22 and a blower 23 configured to guide air to flow. The air channel assembly has an air channel 2101, and the air channel has a first ventilation opening 2102, a second air inlet 2103 and an air channel outlet 2104. Both the first ventilation opening 2102 and the second air inlet 2103 can serve as an air channel inlet of the air channel 2101. The first ventilation opening 2102 is in communication with the first air outlet 102, the second air inlet 2103 is in communication with the outside, and the air channel outlet 2104 is in communication with the first air inlet 101. The air channel 2101 is provided inside with a damper 241 which can be switched between the first position and the second position.

**[0033]** The heating member 22 is arranged in the air channel 2101 to heat air in the air channel 2101. In order to effectively utilize the space in the air channel 2101, improve drying efficiency, and increase a contact area between airflow and the heating member 22, the heating member 22 is configured as a serpentine heating elbow.

**[0034]** In a state where the damper 241 is switched to the first position, the damper 241 closes the first air outlet 2102, that is, closes the first air outlet 102, and opens the second air inlet 2103 at the same time, so that the second air inlet 2103 and the air channel outlet 2104 are in communication. Outside air is guided by the blower 23 to enter the air channel 2101 from the second air inlet 2103. Hot air heated by the heating member 22 flows into the clothes treatment chamber 121 through the air channel outlet 2104 and the first air inlet 101. The hot air flows through wet clothes and is then discharged from the second air outlet 103 to the outside.

**[0035]** In a state where the damper 241 is switched to the second position, the damper 241 closes the second air inlet 2103 and opens the first ventilation opening 2102 at the same time, that is, opens the first air outlet 102, so that the first ventilation opening 2102 and the air channel outlet 2104 are in communication. Humid air in the clothes treatment chamber 121 is guided by the blower 23 to enter the air channel 2101 from the first ventilation opening 2102. Hot air heated by the heating member 22 flows into the clothes treatment chamber 121 through the air channel outlet 2104 and the first air inlet 101. The hot air flows through wet clothes and is then discharged from the first air outlet 102 and flows in the air channel 2101. The same operation is carried out round and round.

**[0036]** Compared with a same volume of a washer-dryer with a condenser tube in the related art, the clothes treatment device 100 according to the embodiment of the present disclosure omits a condenser structure; in this way, the volume of the drum assembly 10 can be increased, thereby increasing the capacity of the clothes treatment chamber 121; moreover, in the process of drying clothes, condensing water is not required, which saves water resources and reduces energy consumption.

**[0037]** In addition, according to the present disclosure,

the heating member 22 is mounted in the air channel assembly and the damper 241 which can be switched between the first position and the second position is provided, so that the position of the damper 241 can be switched according to the drying process; for example, in an initial stage of drying, the damper 241 is switched to the first position, so that outside air enters the clothes treatment chamber 121 and quickly takes away moisture of clothes; and in the middle and late stages of drying, the damper 241 is switched to the second position to increase the temperature in the clothes treatment chamber 121, thereby providing a drying effect. In another example, the damper 241 is switched to the second position in the initial stage of drying and switched to the first position in the middle and later stages of drying; in this way, the switch of different drying modes is realized, thus taking into account the energy consumption and drying efficiency, and achieving high capacity, low energy consumption and high efficiency.

**[0038]** According to an embodiment of the present disclosure, the damper 241 is switched between the first position and the second position through the drive of a damper motor 242. For example, the damper motor 242 can drive the damper to pivotally rotate between the first position and the second position.

**[0039]** As shown in FIGS. 4 and 5, in this embodiment, in order to ensure higher working efficiency in a working mode when the damper 241 is switched to the first position, a flow area S1 of the second air inlet 2103 is set to be greater than 3000 $mm^2$, thus achieving a better dehumidification and cooling effect in the clothes treatment chamber 121.

**[0040]** In order to ensure higher working efficiency in a working mode when the air door 241 is switched to the second position, a flow area S2 of the second air outlet 103 is set to be greater than 1500 $mm^2$, and a flow area S3 of the first air outlet 102 is set to be greater than 3000 $mm^2$. In this way, the temperature of the drum assembly 10 can be quickly increased, thereby increasing the drying speed.

**[0041]** According to an embodiment of the present disclosure, in an axial direction of the drum assembly 10, the first air inlet 101 is located at a front part of the drum assembly 10, and the first air outlet 102 and the second air outlet 103 located at a rear part of the drum assembly 10.

**[0042]** In this embodiment, the axial direction of the drum assembly 10 extends in the front-rear direction, a front end surface of the drum assembly 10 has a clothes access opening, and the first air inlet 101 is provided at a top of an outer peripheral wall of the drum assembly 10 adjacent to the clothing access opening, or the first air inlet 101 is provided at a top of a door seal of the drum assembly 10. The first air outlet 102 and the second air outlet 103 are provided at a top of an outer peripheral wall of the drum assembly 10 adjacent to a rear end surface of the drum assembly 10, that is, the first air outlet 102 and the second air outlet 103 are provided at a position in the middle-rear part of the drum assembly 10.

**[0043]** Thus, the first air inlet 101, the first air outlet 102, and the second air outlet 103 are arranged in the above manner, which can increase a distance between the first ventilation opening 2102 and the air channel outlet 2104 and a distance between the second air inlet 2103 and the air channel outlet 2104. In this way, the flowing time of moist air (discharged from the clothes treatment chamber 121) in the air channel 2101 can be increased, the heating time of the heating member 22 to the airflow is prolonged, and the moist air just discharged can be prevented from being sucked in immediately, which is beneficial to improving the drying efficiency.

**[0044]** In some embodiments, in the axial direction of the drum assembly 10, the second air outlet 103 is provided at the front of the first air outlet 102, that is, the distance between the first air outlet 102 and the first air inlet 101 is increased. Therefore, the length of an internal circulation path of the airflow is prolonged, and the heating time of the heating member 22 to the airflow inside the air channel is prolonged, thereby improving the drying efficiency.

**[0045]** As shown in FIGS. 4 and 5, according to an embodiment of the present disclosure, the second air inlet 2103 and the second air outlet 103 are arranged in the circumferential direction of the drum assembly 10 and spaced apart, and the second air inlet 2103 and the second air outlet 103 are respectively located on two sides of an imaginary vertical plane Y passing through the central axis of the drum assembly 10.

**[0046]** As a result, the position of the drum assembly 10 in the circumferential direction is effectively used to ensure that the second air inlet 2103 and the second air outlet 103 are separated by a certain distance. In a working mode where the damper 241 is switched to the first position, the clothes treatment device 100 can prevent hot and humid air, discharged from the clothes treatment chamber 121, from being sucked into the air channel 2101 again, which is beneficial to improving the efficiency of drying clothes.

**[0047]** According to an embodiment of the present disclosure, the damper 241 is rotatably provided on the air channel assembly. In this embodiment, the damper motor 242 is connected to a rotating shaft of the damper 241, thereby driving the damper 241 to rotate between the first position and the second position. When the damper 241 rotates to the first position, the damper 241 extends along a horizontal plane to close the first ventilation opening 2102; when the damper 241 rotates to the second position, the damper 241 extends along a vertical surface to close the second air inlet 2103. The structure and control are simple.

**[0048]** According to an embodiment of the present disclosure, the drum assembly 10 includes an outer drum 11 and an inner drum 12. The inner drum 12 is rotatably provided in the outer drum 11 and extends along an axial direction of the outer drum 11. The inner drum 12 defines a clothes treatment chamber 121 in communication with

a gap between the outer drum 11 and the inner drum 12.

**[0049]** Both the first air outlet 102and the second air outlet 103 are provided at an upper part of a side wall of the outer drum 11 and are in communication with the clothes treatment chamber 121 through the gap.

**[0050]** In a state where the damper 241 is switched to the first position, outside air is guided by the blower 23 to enter the air channel 2101 from the second air inlet 2103. Hot air heated by the heating member 22 flows into the clothes treatment chamber 121 through the air channel outlet 2104 and the first air inlet 101, and then enters into the clothes treatment chamber 121 to dry clothes, and finally is discharged to the outside through the second air outlet 103. The same operation is carried out round and round.

**[0051]** In a state where the damper 241 is switched to the second position, humid air in the clothes treatment chamber 121 is guided by the blower 23 to enter the air channel 2101 from the first ventilation opening 2102. Hot air heated by the heating member 22 enters the gap through the air channel outlet 2104 and the first air inlet 101, and then flows into the clothes treatment chamber 121 to dry the clothes. Finally, the hot air flows through wet clothes and is then discharged from the first air outlet 102 and flows in the air channel2101. The same operation is carried out round and round.

**[0052]** In some embodiments, the first air inlet 101 is provided on a front edge of the outer drum 11 or a door seal on the outer drum 11. By arranging the first air inlet 101 on the front edge of the outer drum 11, the length of the air channel 2101 can be increased, thereby improving the drying efficiency; by arranging the first air inlet 101 on the door seal on the outer drum 11, the length of the air channel 2101 can be increased and the drying efficiency is accordingly improved on the one hand, and on the other hand, there is no need to form holes in the outer drum 11, which simplifies the structure and processing procedures of the outer drum 11 and reduces the cost.

**[0053]** In some embodiments, the air channel assembly includes an air channel shell 21 mounted at the top of the outer drum 11, and an inner cavity of the air channel shell 21 is in communication with the first air inlet 101. In this embodiment, the air channel shell 21 is mounted at the top of the outer drum 11, at least a part of the air channel shell 21 extends along the axial direction of the drum assembly 10, and the air channel shell 21 defines a part of the air channel 2101 therein.

**[0054]** Further, the air channel assembly further includes a connection seat 214 provided between the air channel shell 21 and the drum assembly 10. The inner cavity of the air channel shell 21 is in communication with the first air outlet 102 through the inner cavity of the connection seat 214. The connection seat 214 defines the other part of the air channel 2101. The second air inlet 2103 and the damper 241 are provided on the connection seat 214.

**[0055]** Thus, by providing the connection seat 214, the air channel shell 21 can be supported, the top space of the outer drum 11 can be effectively used to facilitate communication with the outside, and a carrier is also provided for mounting the second air inlet 2103 and the damper 241.

**[0056]** In some examples, the damper 241 is provided in the inner cavity of the connection seat 214, and the second air inlet 2103 is provided on the side of the connection seat 214. The connection seat 214 has a simple structure and is easy to process and manufacture. The connection seat 214 can be configured to support the air channel shell 21 and also provide a carrier for the second air inlet 2103 to facilitate communication with the outside, and to provide space for mounting the damper 241, thereby realizing a modular design and facilitating assembly and disassembly.

**[0057]** In some examples, the air channel shell 21 includes an air channel base 211, an air channel cover plate 212, and a blower cover plate 213. The air channel cover plate 212 covers a part of the air channel base 211 so that the air channel cover plate 212 and the air channel base 211 define a part of the air channel 2101. The blower cover plate 213 covers the other part of the air channel base 211, so that the blower cover plate 213 and the air channel base 211 define the other part of the air channel 2101. It can be understood that, in this embodiment, the connection seat 214 defines the rest part of the air channel 2101.

**[0058]** The blower 23 includes a fan 231 and a drive motor 232. The fan 231 is provided between the blower cover plate 213 and the air channel base 211, and the drive motor 232 is provided outside the blower cover plate 213 to drive the fan 231 to rotate. In this embodiment, the top of the blower cover plate 213 has an inwardly recessed mounting recess, the drive motor 232 is provided in the mounting recess, and a motor shaft of the drive motor 232 passes through a bottom wall of the mounting recess to be connected with the fan 231.

**[0059]** The air channel base 211 has a side coaming extending along its circumferential direction. A groove is formed at the top of the side coaming to mount a seal ring (not shown). The air channel cover plate 212 and the blower cover plate 213 cover over the air channel base 211, and the air channel base 211 and the air channel cover 212, and tight connection between the air channel base 211 and the air channel cover plate 212 and between the air channel base 211 and the blower cover plate 213 is realized through the seal ring.

**[0060]** As shown in FIGS. 4 to 6, in some embodiments, the first air outlet 102 is located below the connection seat 214, the bottom of the connection seat 214 has a first ventilation opening 2102, the first ventilation opening 2102 forms an air channel inlet of the air channel 2101, and the damper 241 opens and closes the first air outlet 102 by opening and closing the first ventilation opening 2102.

**[0061]** Specifically, when the damper 241 opens the first ventilation opening 2102, the first ventilation opening 2102 is in communication with the first air outlet 102,

thereby communicating the inner cavity of the connection seat 214 with the clothes treatment chamber 121; when the damper 241 closes the first ventilation opening 2102, the first ventilation opening 2102 and the first air outlet 102 are not in communication, thereby separating the inner cavity of the connection seat 214 from the clothes treatment chamber 121.

**[0062]** In some examples, a filter screen (not shown) is provided at the first ventilation opening 2102 to filter the air discharged from the first air outlet 102 to prevent lint in the clothes treatment chamber 121 from entering the air channel 2101. Optionally, a spraying member (not shown) is provided in the connection seat 214 to flush the filter screen at the first ventilation opening 2102 to prevent the lint from accumulating on the filter screen.

**[0063]** As shown in FIGS. 4 to 6, in some embodiments, the bottom of the air channel shell 21 has a mounting opening 2106, the top of the connection seat 214 has a second ventilation opening 2105, and the second ventilation opening 2105 is in communication with the mounting opening 2106, thereby ensuring the communication between the inner cavity of the connection seat 214 and the inner cavity of the air channel shell 21.

**[0064]** In some examples, the connection seat 214 includes a base body 2142 and a limit plate 2143. The base body 2142 is provided between the air channel shell 21 and the drum assembly 10. The inner cavity of the air channel shell 21 is in communication with the first air outlet 102 through the inner cavity of the seat body 2142. An opening is formed in a side of the base body2142. The damper 241 is provided in the base body 2142 adjacent to the opening. The limit plate 2143 is detachably provided at the opening, and the second air inlet 2103 is provided on the limit plate 2143.

**[0065]** In this way, the limit plate 2143 plays a limiting role on the damper 241. When the damper 241 rotates to the second position, the damper 241 is attached to the limit plate 2143 to close the second air inlet 2103.

**[0066]** FIGS. 2 and 6, the top of the connection seat 214 is provided with a fixing lug 2141 protruding upward, a fixing hole is formed in the fixing lug 2141, and a fixing portion 2111 is provided at the bottom of the air channel base 211 and provided with a connecting hole corresponding to the position of the fixing hole. The air channel base 211 is connected to the connection seat 214 by a fastener passing through the fixing hole and the connecting hole, and the connection is reliable.

**[0067]** In the description of the present disclosure, it is to be understood that the orientations or positional relationships, indicated by the terms "central", "longitudinal", "lateral", "length", "width", "thickness", "on", "under", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inside", "outside", "axial", "radial", "circumferential", and the like, are based on the orientations or positional relationships shown in the drawings and are only for the purpose of facilitating and simplifying the description of the present disclosure, rather than indicating or implying that the described device or element must have a particular orientation or must be constructed and operated in a particular orientation, and therefore they cannot to be construed as limiting the present disclosure.

**[0068]** Other configurations and operations of the clothes treatment device 100 according to the embodiment of the present disclosure are known to those of ordinary skill in the art and will not be described in detail here.

**[0069]** In the description of the present specification, the description with reference to the terms "one embodiment", "some embodiments", "exemplary embodiment", "example", "specific example", "some examples" or the like means specific features, structures, materials or characteristics described in connection with the embodiment or example are included in at least one embodiment or example of the present disclosure. In the present specification, the schematic representations of the above terms do not necessarily refer to the same embodiment. Moreover, the specific features, structures, materials, or characteristics described may be combined in a suitable manner in any one or more embodiments or examples.

**[0070]** While the embodiments of the present disclosure have been shown and described, it will be understood by those skilled in the art that the various modifications, changes, substitutions and variations of the embodiments may be made without departing from the spirit and scope of the invention. The scope of the invention is defined by the appended claims and their equivalents.

## Claims

**1.** A clothes treatment device, comprising:

a drum assembly defining a clothes treatment chamber, and having a first air inlet, a first air outlet and a second air outlet that are all in communication with the clothes treatment chamber, both the first air outlet and the second air outlet being arranged at an upper part of a side wall of the drum assembly; and

a clothes drying assembly comprising: an air channel assembly communicating the first air inlet with the first air outlet, a heating member arranged inside the air channel assembly, and a blower configured to guide air to flow,

wherein the air channel assembly has a second air inlet and a damper, and the damper is switchable between a first position where the damper closes the second air inlet and opens the first air outlet and a second position where the damper opens the second air inlet and closes the first air outlet.

**2.** The clothes treatment device according to claim 1, wherein the damper is driven by a damper motor to switch between the first position and the second position.

3. The clothes treatment device according to claim 1, wherein in an axial direction of the drum assembly, the first air inlet is located at a front part of the drum assembly, and the first air outlet and the second air outlet are located at a rear part of the drum assembly.

4. The clothes treatment device according to any of claims 1 to 3, wherein the second air inlet and the second air outlet are arranged in a circumferential direction of the drum assembly and spaced apart from each other, and the second air inlet and the second air outlet are located on two sides of an imaginary vertical plane passing through a central axis of the drum assembly.

5. The clothes treatment device according to any of claims 1 to 4, wherein a flow area of the second air inlet is greater than 3000 $mm^2$.

6. The clothes treatment device according to any of claims 1 to 5, wherein a flow area of the second air outlet is greater than 1500 $mm^2$.

7. The clothes treatment device according to any of claims 1 to 6, wherein a flow area of the first air outlet is greater than 3000 $mm^2$.

8. The clothes treatment device according to any of claims 1 to 7, wherein the damper is rotatably arranged on the air channel assembly.

9. The clothes treatment device according to any of claims 1 to 8, wherein the drum assembly comprises:

an outer drum, the first air outlet and the second air outlet being arranged at an upper part of a side wall of the outer drum; and
an inner drum rotatably arranged in the outer drum and extending along an axial direction of the outer drum, the inner drum defining the clothes treatment cavity, the clothes treatment chamber being in communication with a gap between the outer drum and the inner drum,
wherein the first air outlet and the second air outlet are both in communication with the clothes treatment chamber through the gap.

10. The clothes treatment device according to claim 9, wherein the first air inlet is arranged on a front edge of the outer drum or a door seal on the outer drum.

11. The clothes treatment device according to any of claims 1 to 10, wherein the air channel assembly comprises:

an air channel shell mounted at the upper part of the side wall of the drum assembly, and having an inner cavity in communication with the first air inlet; and
a connection seat arranged between the air channel shell and the drum assembly, the inner cavity of the air channel shell being in communication with the first air outlet through an inner cavity of the connection seat, and the second air inlet and the damper being arranged on the connection seat.

12. The clothes treatment device according to claim 11, wherein the damper is arranged in the inner cavity of the connection seat.

13. The clothes treatment device according to claim 11 or 12, wherein the second air inlet is arranged on a side of the connection seat.

14. The clothes treatment device according to any of claims 11 to 13, wherein the connection seat comprises:

a base body arranged between the air channel shell and the drum assembly, the inner cavity of the air channel shell being in communication with the first air outlet through an inner cavity of the base body, an opening being formed in a side of the base body, and the damper being arranged in the base body and adjacent to the opening; and
a limit plate detachably arranged at the opening, the second air inlet being arranged in the limit plate.

15. The clothes treatment device according to any of claim 11 to 14, wherein the first air outlet is located below the connection seat, a bottom of the connection seat has a first ventilation opening in communication with the first air outlet, and the damper opens or closes the first air outlet by opening or closing the first ventilation opening.

16. The clothes treatment device according to any of claims 11 to 15, wherein a bottom of the air channel shell has a mounting opening, and a top of the connection seat has a second ventilation opening in communication with the mounting opening.

17. The clothes treatment device according to any of claims 11 to 16, wherein the air channel shell comprises:

an air channel base arranged above the drum assembly and the connection seat;
an air channel cover plate covering a part of the air channel base; and
a blower cover plate covering another part of the air channel base, a fan of the blower being arranged between the blower cover plate and the

air channel base.

**18.** The clothes treatment device according to claim 17, wherein a side of the blower cover plate facing away from the air channel base has a mounting recess downwardly recessed and configured to mount a drive motor for driving the fan to rotate.

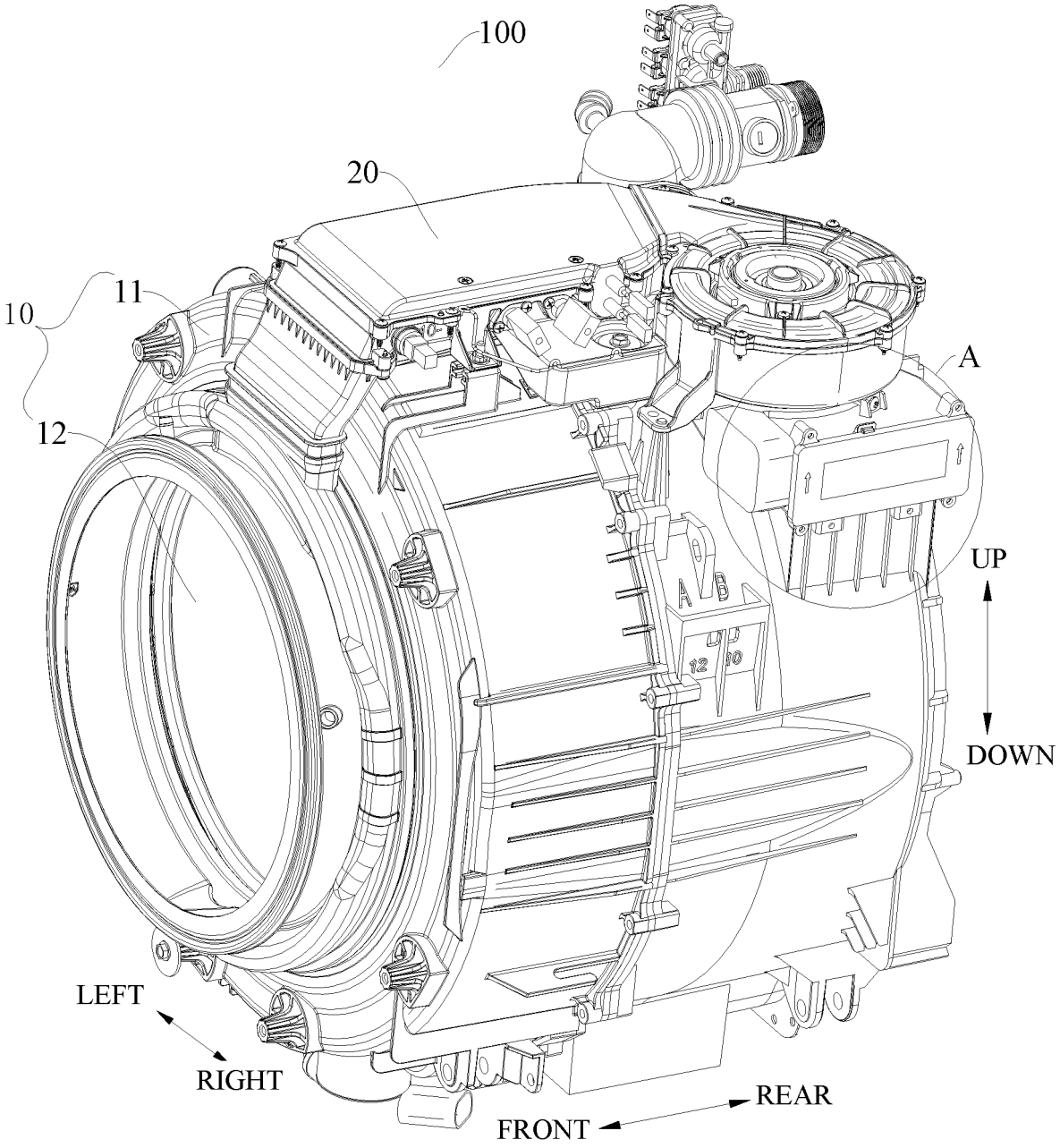



FIG. 1

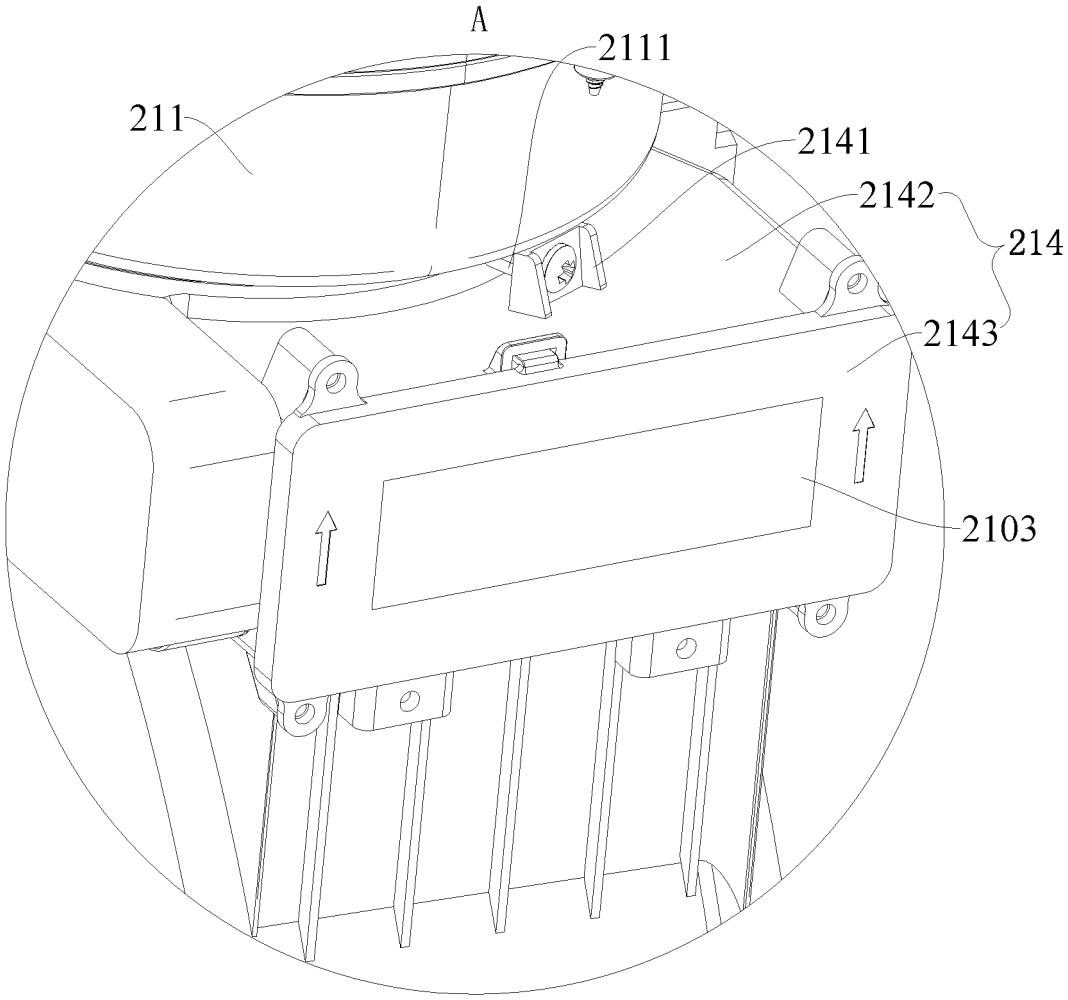



FIG. 2

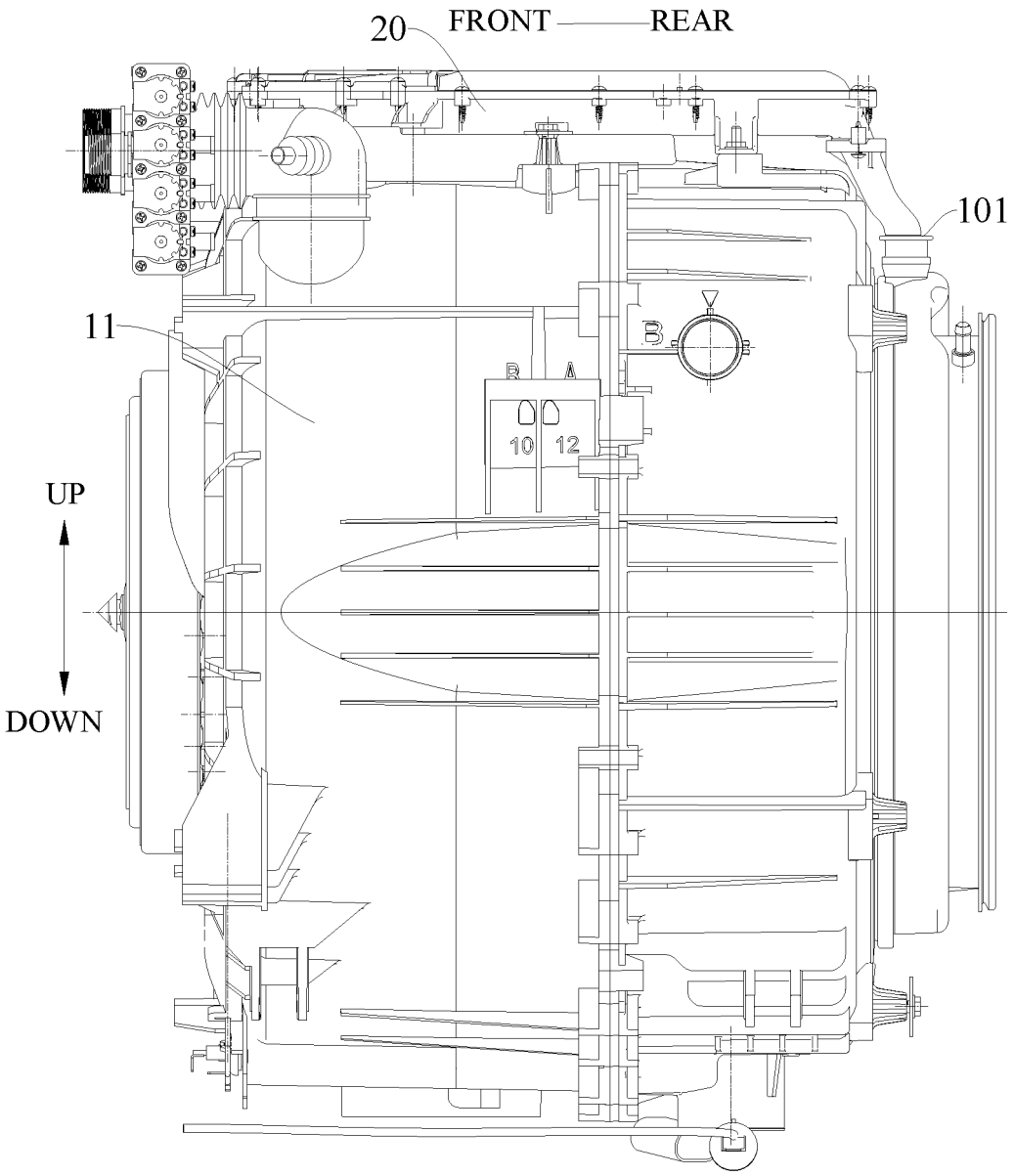
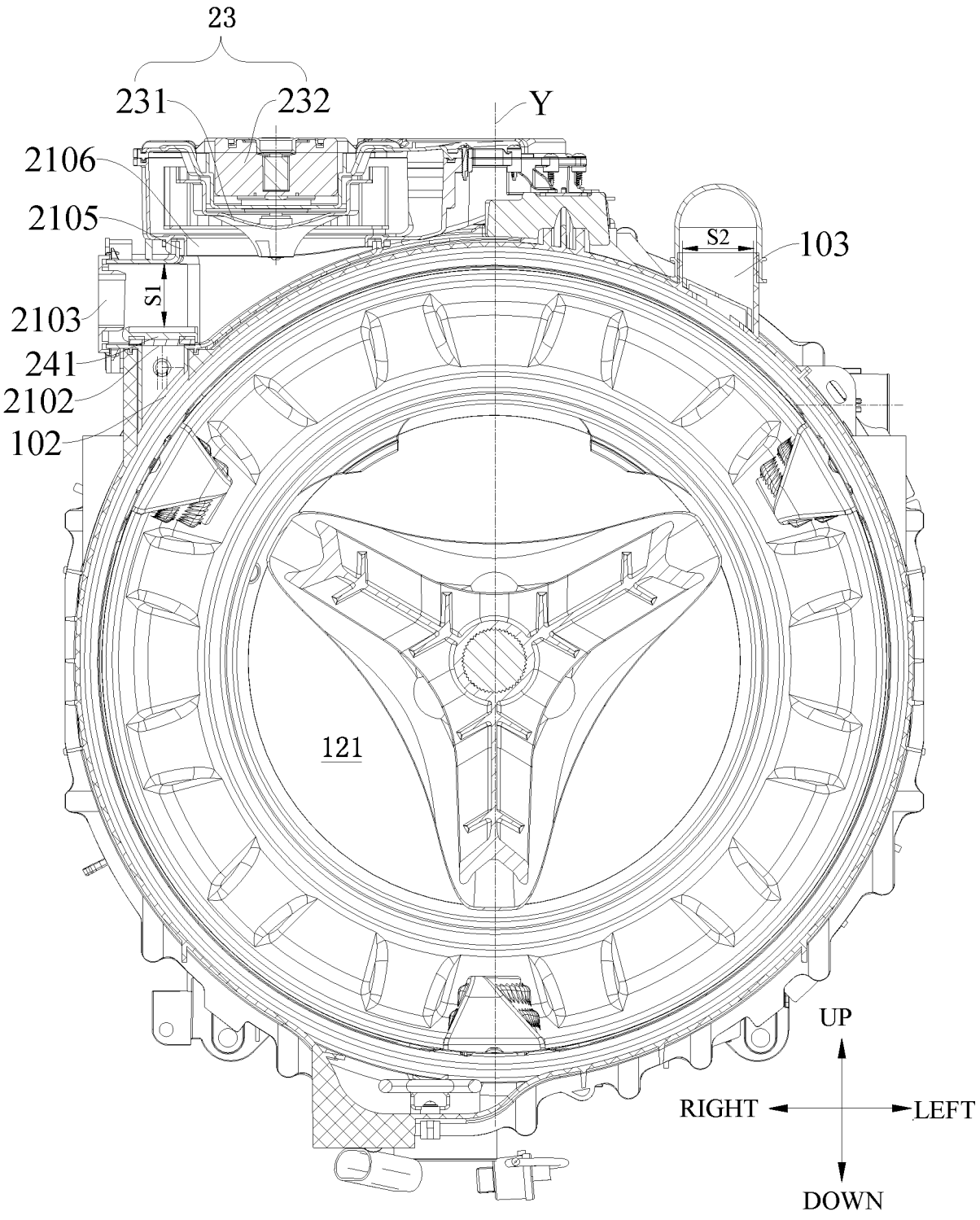



FIG. 3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S2
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LEFT
DOWN

FIG. 4

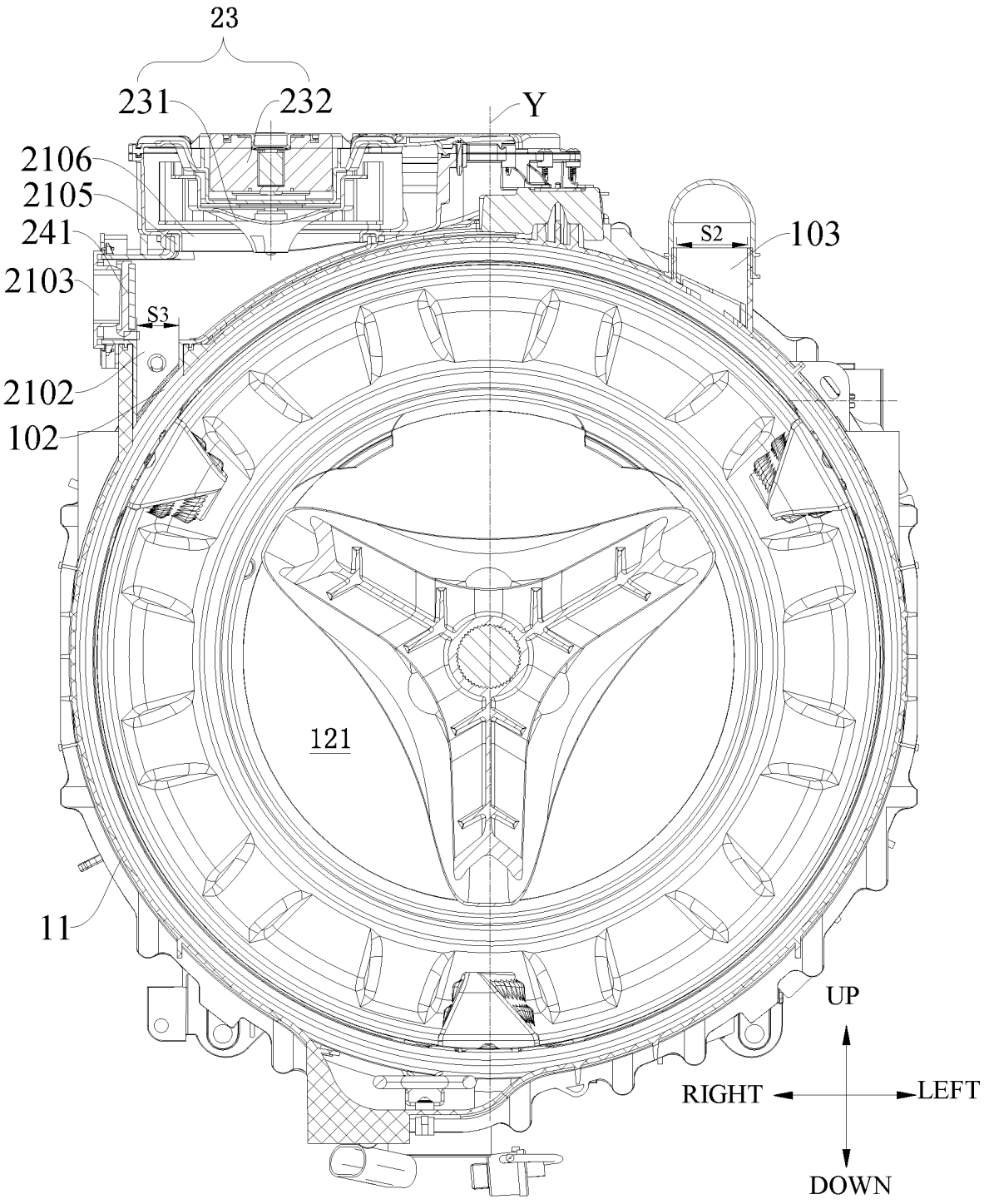
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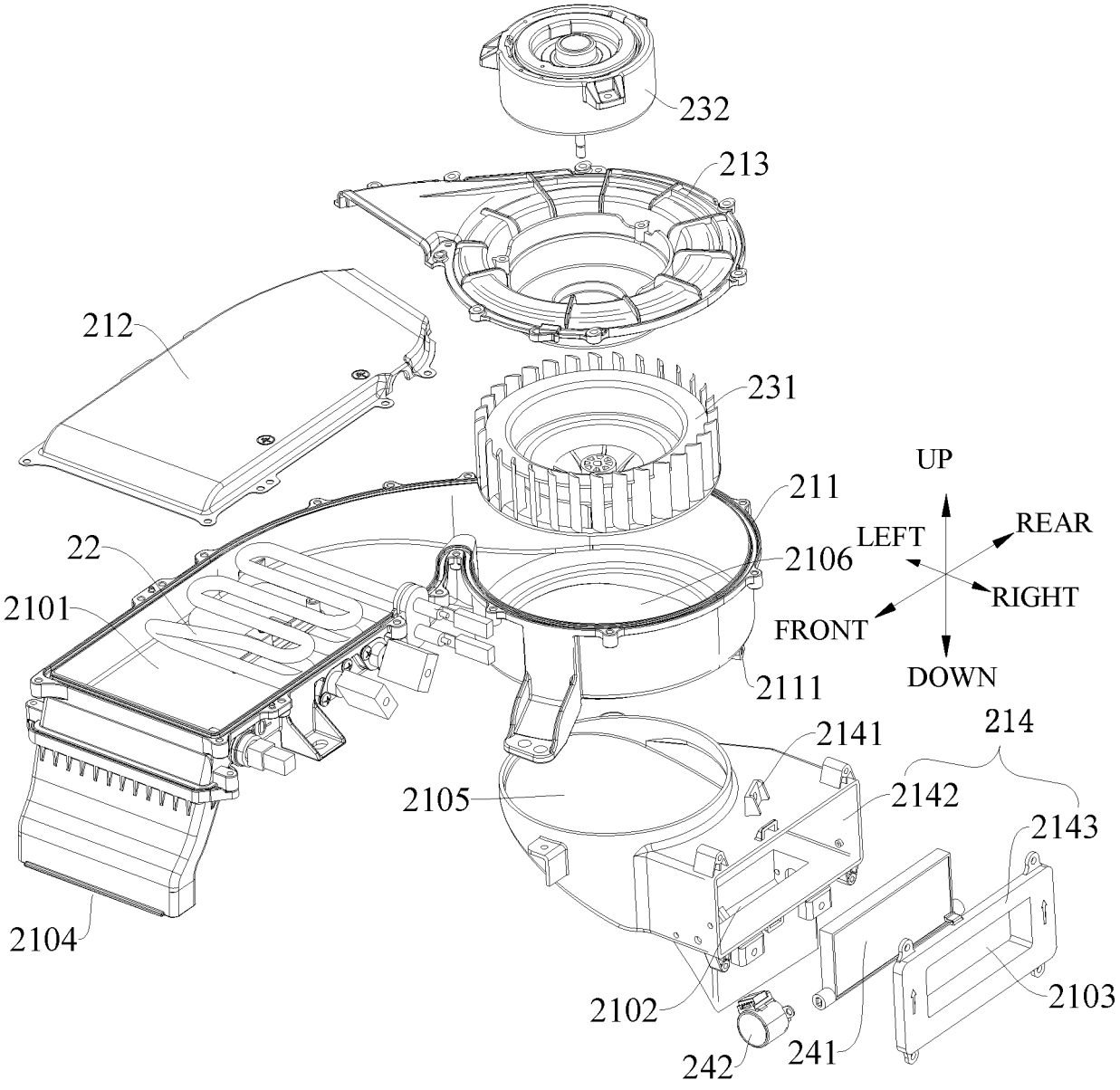
FIG. 5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2111
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2102
2103
242
241
UP
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REAR
RIGHT
FRONT
DOWN

FIG. 6

## INTERNATIONAL SEARCH REPORT

International application No.
**PCT/CN2019/096576**

**A. CLASSIFICATION OF SUBJECT MATTER**

D06F 58/10(2006.01)i; D06F 58/28(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)

D06F58/-

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)

DWPI, SIPOABS, CNPAT, CNKI: 干燥, 烘干, 干衣, 除湿, 干燥, 出风, 排气, 排风, 管道, 管路, 风道, 吹送, 进风口, 进气, 风门, 挡板, 切换, 关, 闭, 开, 换, 加热, 内, 外, 循环, dry+, gas+, air+, in+, out+, channel+, pip+, conduit+, stop+, shut+, control +, chang+, shift+, accommodat+, heat+, warm+.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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"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
"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
"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
"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
"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| **17 December 2019** | **02 January 2020** |
| Name and mailing address of the ISA/CN<br>**China National Intellectual Property Administration (ISA/CN)**<br>**No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088**<br>**China**<br>Facsimile No. **(86-10)62019451** | Authorized officer<br><br>Telephone No. |

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/096576

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**Information on patent family members**

International application No.
**PCT/CN2019/096576**

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