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Lee et al.

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(54) **CLOTHING TREATMENT APPARATUS**

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(73) Assignee: **LG Electronics Inc.**, Seoul (KR)

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See application file for complete search history.

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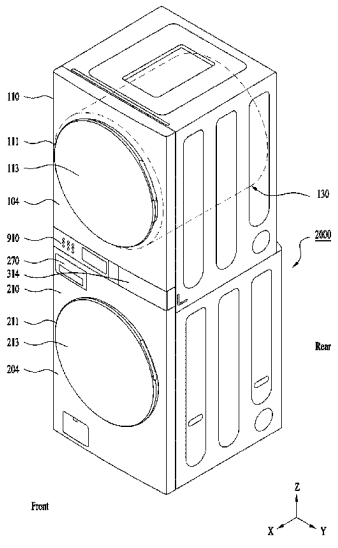
(57) **ABSTRACT**

A clothing treatment apparatus includes a first cabinet forming the outer appearance, a first drum of a cylindrical shape having open front and rear surfaces, a second cabinet located under the first cabinet, a tub located in the second cabinet; a second drum located in the tub to be rotatable and accommodating clothing, a first air suction duct for sucking the air in the first drum, a second air suction duct for sucking the air in the tub, a connection duct connected to the first air suction duct and the second air suction duct and including a heat exchanger for exchanging heat with the sucked air, a first exhaust duct for discharging the air, which has exchanged heat via the heat exchanger, to the first drum, and a second exhaust duct for discharging the air, which has exchanged heat via the heat exchanger, to the tub.

19 Claims, 6 Drawing Sheets



(51) **Int. Cl.**

D06F 37/26	(2006.01)
D06F 39/04	(2006.01)
D06F 58/10	(2006.01)
D06F 58/20	(2006.01)
D06F 58/22	(2006.01)

(52) **U.S. Cl.**

CPC ***D06F 58/10*** (2013.01); ***D06F 58/206*** (2013.01); ***D06F 58/22*** (2013.01)

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FIG. 1

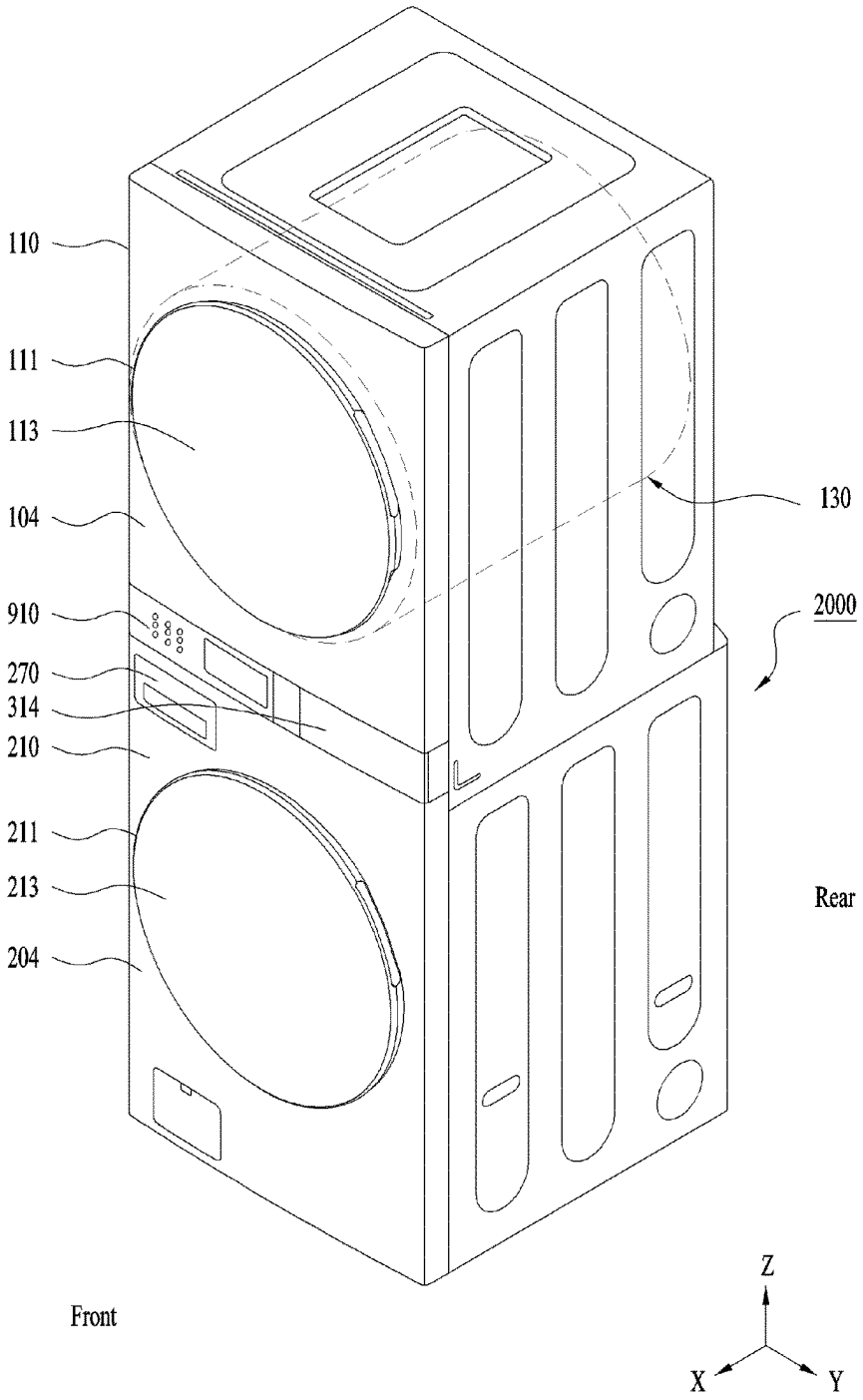

110
111
113
104
910
270
314
210
211
213
204
130
2000
Rear
Front
Z
X
Y

FIG. 2

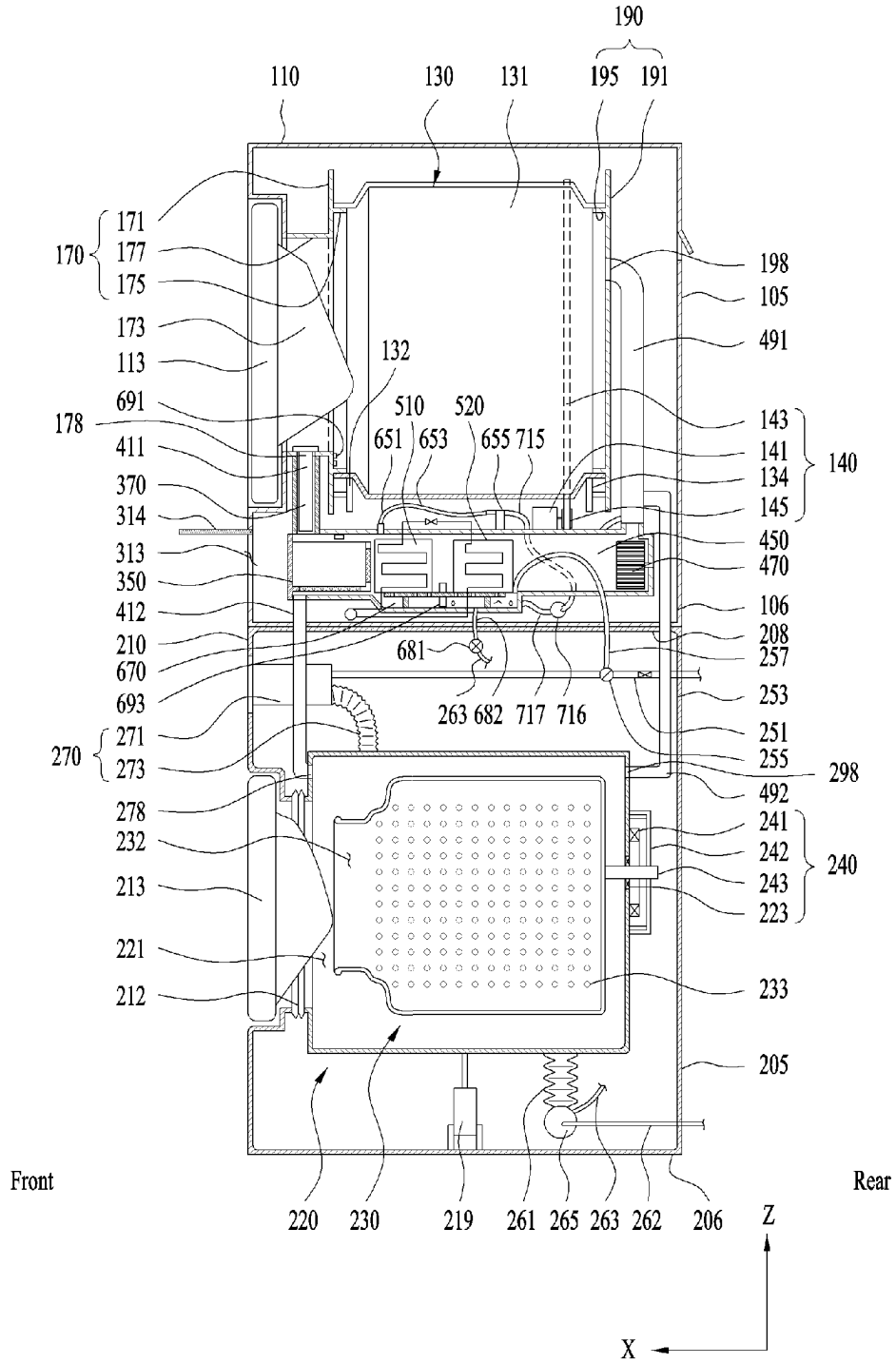

190
110
130
131
195
191
171
170
177
175
173
113
691
178
411
370
314
313
350
412
210
670
693
271
270
273
278
232
213
221
212
132
510
520
651
653
655
715
681
263
682
717
716
198
105
491
143
141
134
145
140
450
470
106
208
257
253
251
255
298
492
241
242
243
223
240
233
205
Front
Rear
220
230
219
261
265
263
262
206
Z
X

FIG. 3

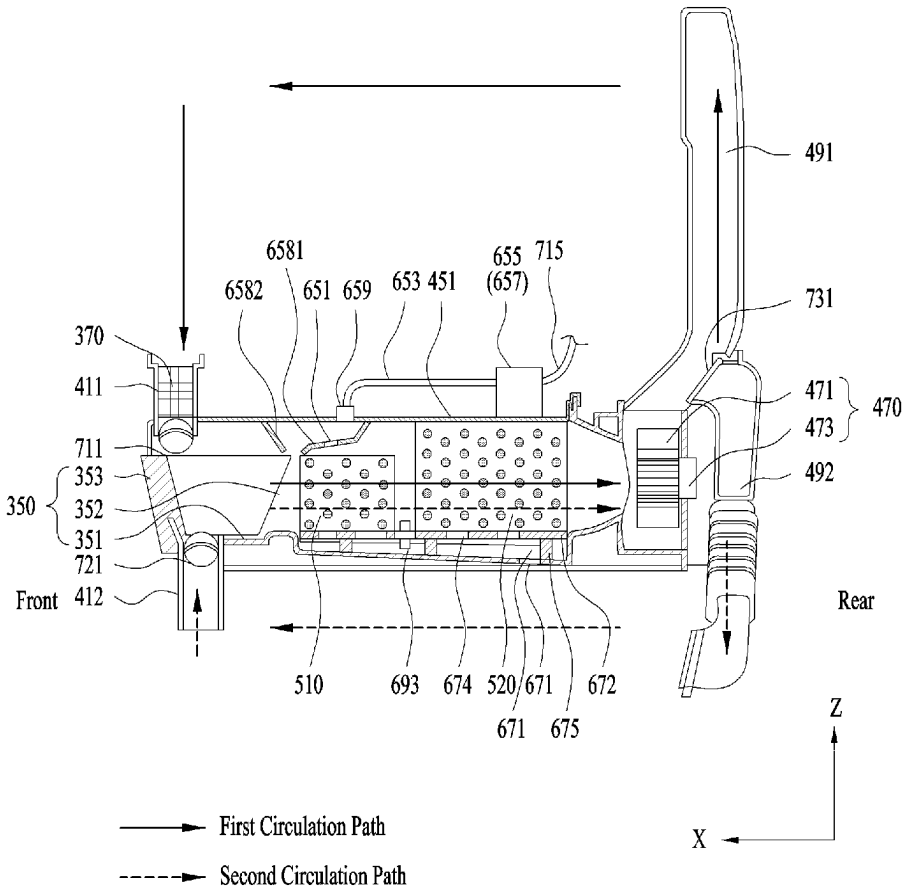
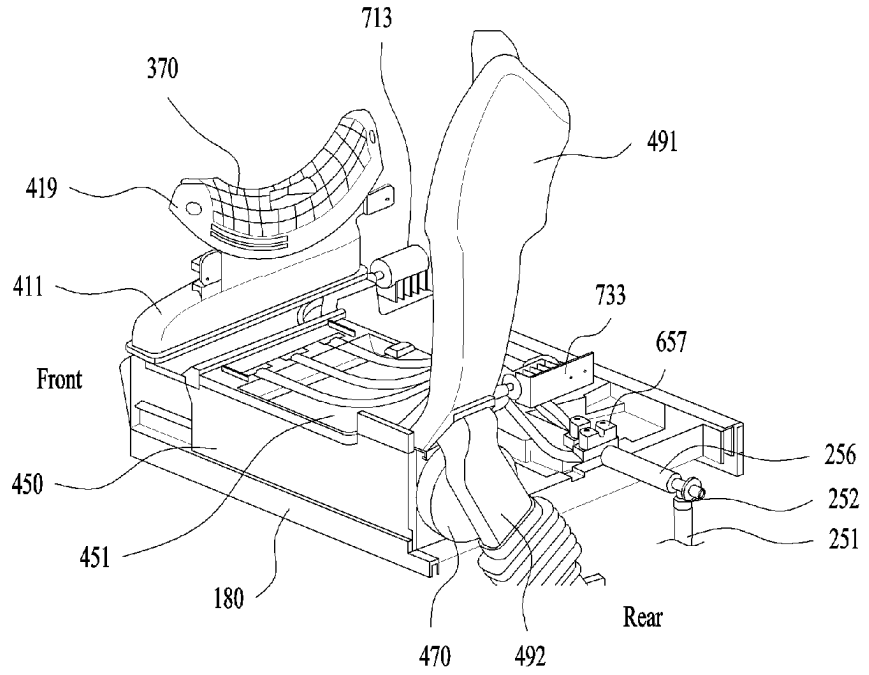
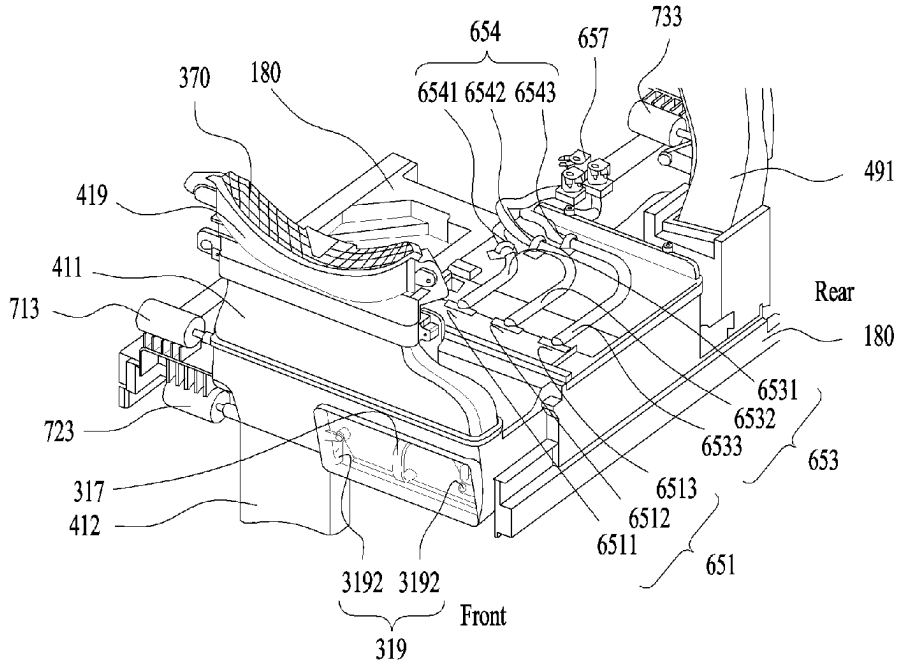

491
6581
6582
651
659
653
451
655
(657)
715
731
370
411
471
473
470
711
353
492
350
352
351
721
Front
412
Rear
510
693
674
520
671
672
671
675
Z
X
First Circulation Path
Second Circulation Path

FIG. 4

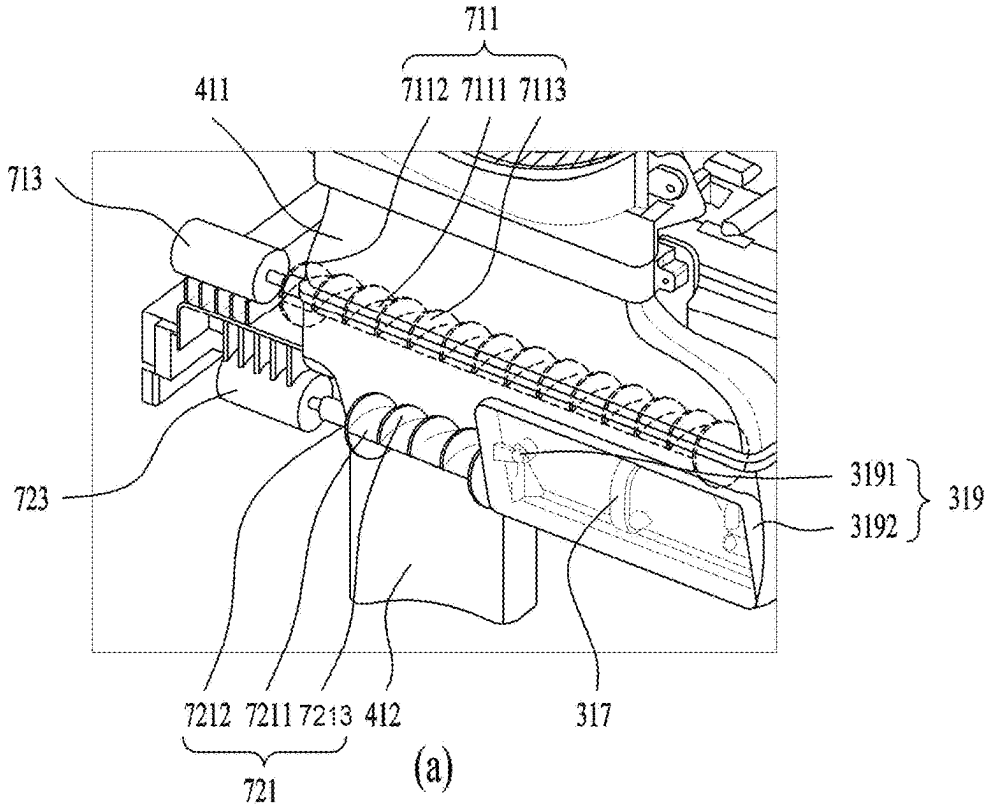

713
370
491
419
411
733
657
Front
256
450
252
451
251
180
Rear
470
492

(a)


654
657
733
370
180
6541 6542 6543
491
419
411
Rear
713
180
6531
6532
723
6533
653
317
6513
412
6512
6511
651
3192 3192
Front
319

(b)

FIG. 5


711
411
7112 7111 7113
713
723
3191
3192
319
7212 7211 7213 412
317
721
(a)

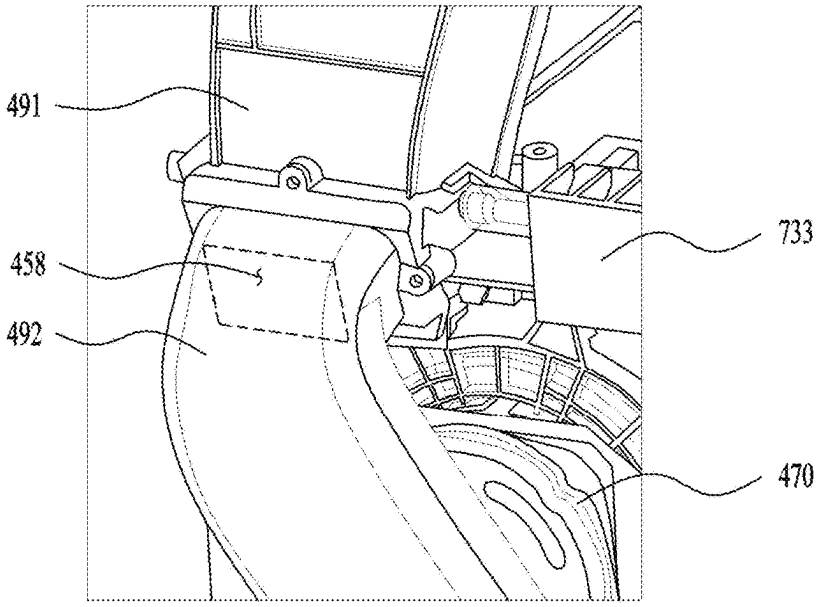
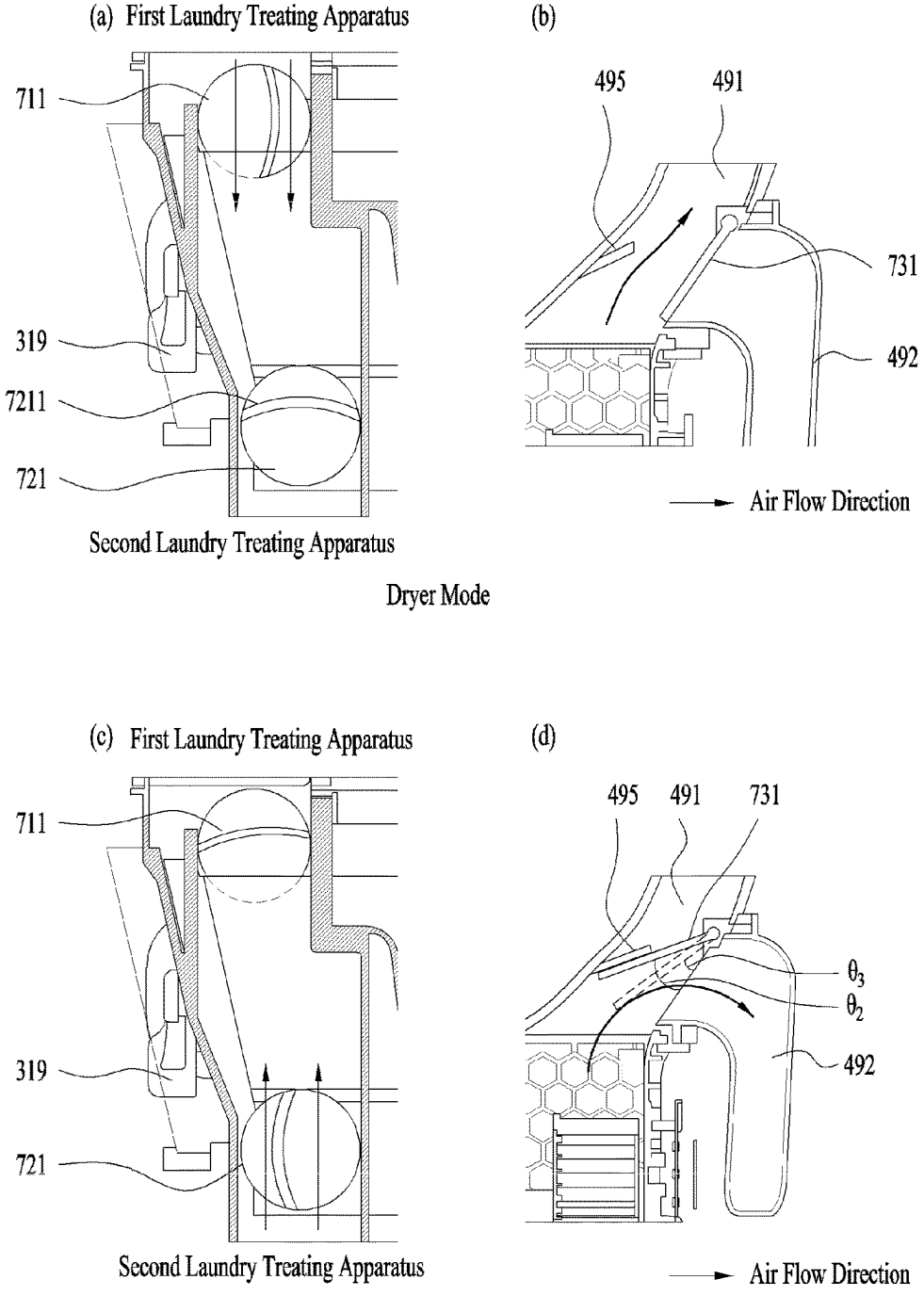

491
458
492
733
470
(b)

FIG. 6


(a) First Laundry Treating Apparatus
(b)
711
319
7211
721
495
491
731
492
Air Flow Direction
Second Laundry Treating Apparatus
Dryer Mode
(c) First Laundry Treating Apparatus
(d)
711
319
721
495
491
731
θ3
θ2
492
Air Flow Direction
Second Laundry Treating Apparatus
Washer Mode

CLOTHING TREATMENT APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a National Stage application under 35 U.S.C. § 371 of International Application No. PCT/KR2021/002190, filed on Feb. 22, 2021, which claims the benefit of Korean Application No. 10-2020-0029128, filed on Mar. 9, 2020. The disclosures of the prior applications are incorporated by reference in their entirety.

TECHNICAL FIELD

The present disclosure relates to a laundry treating apparatus, and more particularly to an integrated laundry treating apparatus in which a washing machine that simultaneously implements a washing function and a drying function and a dryer that performs a drying function are stacked.

BACKGROUND ART

In general, a laundry treating apparatus is an apparatus for processing various tasks related to laundry, and is a concept including a washing machine for washing laundry, a dryer for drying wet laundry, and a refresher for removing odors or wrinkles from laundry.

A conventional washing machine includes a cabinet defining an outer appearance, a tub provided inside the cabinet to store water, a drum rotatably provided inside the tub to store laundry, and a driver for rotating the drum.

In particular, washing machines are classified into top-loading and front-loading washing machines according to a posture of the drum. In the case of the front-loading washing machine, unlike the top-loading washing machine, the drum is laid down, and accordingly, laundry is put into the drum through a front side of the washing machine. Such a front-loading washing machine has a smaller size and has a larger washing capacity than a top-loading washing machine, has high washing performance, and does not cause tangling of laundry, and thus is widely used.

In addition to these washing machines, front-loading dryers have been developed and widely used. A washing machine and a dryer are mostly used together at home or a laundry. In particular, a plurality of washing machines and dryers are used together in a laundry, and washing machines or dryers may be used in combination in pairs. In this case, in order to reduce an installation area, a dryer may be stacked and used above the washing machine. In addition, an all-in-one washing machine equipped with a dryer on the top and a washing machine on the bottom is used in one cabinet.

However, there is a problem in that the height to a laundry inlet of the dryer is too large even in the case of a simply stacked laundry treating apparatus or an integrated washing machine. That is, for a short user, it may be difficult to load or take out laundry from the dryer. In addition, although the washing machine and the dryer perform the same drying function, the drying capacity is different, and thus there is a problem in that parts need to be used separately to provide respective drying functions.

Chinese Laid-Open Patent Publication No. 104928883A discloses a stack-type integrated washing machine to implement drying functions in a washing machine and a dryer, respectively. However, due to different drying capacities of the washing machine and dryer, two condensers are used. In the end, there is a problem that an internal space is not capable of being used efficiently by using separate parts.

DISCLOSURE

Technical Problem

An object of the present disclosure is to simultaneously use a dryer and a washing machine by sharing a connection duct (or a drying module) included in a heat exchanger required for drying functions of a dryer and a washing machine.

An object of the present disclosure is to reduce production cost using a common connection duct.

An object of the present disclosure is to independently or selectively perform a drying function using a common connection duct.

An object of the present disclosure is to conveniently allow a user to easily access an entrance of a dryer by reducing the overall height using a common connection duct.

Technical Solution

To overcome the aforementioned object, an embodiment of the present disclosure is to provide a laundry treating apparatus using one common drying module for an independent or selective drying function in an upper dryer and a lower washing machine.

To this end, according to an embodiment of the present disclosure, a laundry treating apparatus includes a first cabinet defining an outer appearance, a first drum with a cylindrical shape having open front and rear surfaces, a second cabinet disposed below the first cabinet, a tub disposed inside the second cabinet, a second drum rotatably provided inside the tub to accommodate laundry, a first intake duct for sucking air of the first drum, a second intake duct for sucking air of the tub, a connection duct including a heat exchanger connected to the first intake duct and the second intake duct to exchange heat with the sucked air, a first exhaust duct for discharging the air heat-exchanged through the heat exchanger to the first drum, and a second exhaust duct for discharging the air heat-exchanged through the heat exchanger to the tub.

The first cabinet and the second cabinet may be integrally formed.

The laundry treating apparatus may further include a first opening/closing unit for opening and closing the first intake duct, a second opening/closing unit for opening and closing the second intake duct, and a third opening/closing unit for branching the first exhaust duct and the second exhaust duct, wherein, by independently opening and closing the first opening/closing unit, the second opening/closing unit, and the third opening/closing unit, the first intake duct, the connection duct, and the first exhaust duct may form a first circulation path to circulate air of the first drum or the second intake duct, the connection duct, and the second exhaust duct may form a second circulation path to circulate air of the tub.

The first opening/closing unit may be disposed between the first intake duct and the connection duct, and the second opening/closing unit may be disposed between the second intake duct and the connection duct.

The laundry treating apparatus may further include a first purifier disposed in the connection duct to filter a foreign substance before air sucked from the first intake duct and the second intake duct is heat-exchanged, and the first purifier

may be detachable from the connection duct through a filter insertion hole provided at a bottom of the first cabinet or a top front surface of the second cabinet.

The first opening/closing unit may be disposed between the first intake duct and an upper part of the first purifier, and the second opening/closing unit may be disposed between the second intake duct and first purifier.

The first opening/closing unit may include a first blocker for opening and closing the first intake duct; and a first opening/closing driver connected to the first blocker and opening and closing the first intake duct by rotating the first blocker, where the second opening/closing unit may include a second blocker for opening and closing the second intake duct, and a second opening/closing driver for opening and closing the second intake duct by rotating the second blocker.

The first blocker may include a first main body formed in a left-to-right side longer than a front-to-rear side with respect to a front surface of the first cabinet and having a curved surface on the front-to-rear side, and a first sub-body with a circular shape coupled to each of both ends in left and right directions of the first main body.

The first opening/closing driver may have a rotation shaft connected to the first sub-body in a longitudinal direction of the first main body.

A thickness of a cross-section of the first main body may increase toward a center.

The first blocker may further include a plurality of first reinforcing ribs protruding from a convex curved surface among curved surfaces of the first main body, and a size of the plurality of first reinforcing ribs may be equal to or smaller than a size of a portion of the first sub-body, positioned toward a direction of the convex curved surface.

The second blocker may include a second main body formed in a left-to-right side longer than a front-to-rear side with respect to a front surface of the first cabinet and having a curved surface on the front-to-rear side, and a second sub-body with a circular shape coupled to each of both ends in left and right directions of the second main body, wherein a thickness of a cross-section of the second main body may increase toward a center.

The second opening/closing driver may have a rotation shaft connected to the second sub-body in a longitudinal direction of the second main body.

The second blocker may further include a plurality of second reinforcing ribs protruding from a convex curved surface among curved surfaces of the first main body, and a size of the plurality of second reinforcing ribs may be equal to or smaller than a size of a portion of the second sub-body, positioned toward a direction of the convex curved surface.

A length in a left and right direction of the first blocker may be longer than a length in a left and right direction of the second blocker.

The first exhaust duct may further include a communication hole for connection with the second exhaust duct, and the connection duct may be connected to the first exhaust duct, and the first exhaust duct may be connected to the second exhaust duct through the communication hole.

The third opening/closing unit may include a third blocker for opening and closing the first exhaust duct and the second exhaust duct, and a third opening/closing driver for rotating the third blocker for opening and closing the first exhaust duct and the second exhaust duct.

The first exhaust duct may further include a guide disposed at a position at which the third blocker rotates inside to close the first exhaust duct and stopping rotation of the third blocker.

The first exhaust duct may further include a blower fan for discharging heat-exchanged air to the first exhaust duct or the second exhaust duct, and the communication hole may be disposed above the blower fan.

The third opening/closing unit may include a third blocker for opening and closing the first exhaust duct or the second exhaust duct, and a third opening/closing driver for rotating the third blocker to be positioned at a first position at which the third blocker opens and closes the second exhaust duct, a second position at which the third blocker opens and closes the first exhaust duct, and a third position at which the third blocker is opened by a predetermined angle to open the first exhaust duct and the second exhaust duct, and the first circulation path or the second circulation path may be selectively formed or both the first circulation path and the second circulation path are formed.

Advantageous Effects

According to the present disclosure, drying functions of a dryer and a washing machine may be simultaneously used by sharing a connection duct required in the drying functions of the dryer and the washing machine.

According to the present disclosure, production cost may be reduced using a common connection duct.

According to the present disclosure, drying functions may be independently or selectively performed using a common connection duct.

According to the present disclosure, the overall height may be lowered using a common connection duct to provide user convenience.

DESCRIPTION OF DRAWINGS

FIG. **1** is a diagram showing an example of a laundry treating apparatus.

FIG. **2** is a diagram showing one cross-section of a laundry treating apparatus.

FIG. **3** is a diagram showing an example of a circulation duct including a common connection duct including a heat exchanger.

FIG. **4**(*a*) shows an example in which a first exhaust duct and a second exhaust duct are connected. FIG. **4**(*b*) shows an example in which a first intake duct and a second intake duct are connected to a filter part provided in a connection duct.

FIG. **5**(*a*) shows an example of a first opening/closing driver and a second opening/closing driver between a first intake duct and a connection duct and between a second intake duct and a connection duct. FIG. **5**(*b*) shows an example of a third opening/closing driver for opening and closing a third blocker disposed between a first exhaust duct and a second exhaust duct.

FIGS. **6**(*a*) and **6**(*b*) show an example in which a first intake duct is opened through a first blocker, a second intake duct is closed through a second opening/closing unit, and a second exhaust duct is closed through a third opening/closing unit when air of a first drum is circulated.

FIGS. **6**(*c*) and **6**(*d*) show an example in which a first intake duct is closed through a first opening/closing unit, a second intake duct is opened through a second opening/closing unit, and a first exhaust duct is closed through a third blocker when air of a tub is circulated.

BEST MODE

Hereinafter, an exemplary embodiment of the present disclosure will be described in detail with reference to the

accompanying drawings. The configuration or control method of a device to be described below is only for explaining an embodiment of the present disclosure, not for limiting the scope of the present disclosure, and the same reference numbers used throughout the specification refer to the same components.

Unlike that shown in FIG. **1**, a first cabinet **110** and a second cabinet **210** may be integrally formed. That is, a first lower panel **106** of the first cabinet **110** and a second upper panel **208** of the second cabinet are not stacked to face each other, but without the first lower panel **106** and the second upper panel **208**, the first cabinet **110** and the second cabinet **210** may be integrally formed, and then may be partitioned with a partition base (not shown) between a first drum **130** and a tub **220**. In addition, the partition base (not shown) may be disposed under the first drum **130** to support various components. That is, the partition base may be the first lower panel **106** and may simultaneously function as a base **180** (FIG. **4**) to which various components are coupled and supported.

FIG. **1** shows that a control panel **910** is disposed between a first door **113** and a second door **213**. Alternatively, however, the control panel **910** may include each of front panels **104** and **204** of the first cabinet **110** and the second cabinet **210**. A filter part **300** may be provided in a part of the control panel **910**. For the sake of aesthetics, when the control panel **910** is rotated to reveal a back side thereof, a through hole (not shown) into which a filter is to be inserted may be provided. In contrast, the first front panel **104** or the second front panel **204** may include the filter door **314**, and when a filter door **314** is opened, a filter insertion hole **313** (refer to FIG. **2**) into which a filter (not shown) is to be inserted may be provided.

FIG. **2** shows one cross section of a laundry treating apparatus **100** that is integrally configured. FIG. **2** shows an embodiment of the present disclosure. First, a first laundry treating apparatus **1000** may be disposed at an upper side and a second laundry treating apparatus **2000** may be disposed at a lower side. The first laundry treating apparatus **1000** may be a dryer, and the second laundry treating apparatus **2000** may be a laundry dryer having a drying function. This is only considering a weight, and unlike this, the upper and lower sides may be reversed. When the second laundry treating apparatus **2000** has a drying function, this means that when the amount of laundry to be dried is small or does not need to be completely dried, it may not be necessary to take out the laundry to be dried from the second laundry treating apparatus **2000** and move the laundry cumbersomely to the first laundry treating apparatus **1000**, thereby providing convenience of drying the laundry immediately.

To this end, thus far, the case in which heat exchangers for drying are provided separately has been described, but the feature of the present disclosure relates to integration of the heat exchangers into one and sharing the heat exchangers with each other.

To emphasize a relationship of a second intake duct **412**, a second exhaust duct **492**, and a connection duct **450**, the second intake duct **412**, the second exhaust duct **492**, and the connection duct **450** are only shown before a detergent storage **270** and a first water supply pipe **271**, the detergent storage **270** and the first water supply pipe **271** may not be disconnected by the second intake duct **412** and the second exhaust duct **492**.

The laundry treating apparatus **100** may include the first cabinet **110** defining an outer appearance, the first drum **130** having a cylindrical shape with an open front and rear, the second cabinet **210** disposed below the first cabinet, the tub **220** disposed inside the second cabinet **210**, a second drum **230** rotatably provided inside the tub to accommodate laundry, a first intake duct **411** for sucking air of the first drum **130**, the second intake duct **412** for sucking air of the tub **220**, the connection duct **450** including a heat exchanger **500** connected to the first intake duct **411** and the second intake duct **412** to exchange heat with the sucked air, a first exhaust duct **491** for discharging the air heat-exchanged through the heat exchanger **500** to the first drum **130**, and the second exhaust duct **492** for discharging the air heat-exchanged through the heat exchanger **500** to the tub **220**.

First, the second laundry treating apparatus **2000** disposed at the lower side of the laundry treating apparatus **100** will be described. The second laundry treating apparatus **2000** may include the second cabinet **210** defining an outer appearance, the tub **220** provided inside the second cabinet **210** to store washing water and to perform a drying function, the second drum **230** rotatably provided inside the tub **220** to store laundry, and a second driver **240** for applying torque to the second drum **230** to rotate the second drum **230**.

The second cabinet **210** may include a second entrance **211** for loading and unloading laundry, and the second entrance **211** may be opened and closed by the second door **213** rotatably provided in the second cabinet **210**.

The tub **220** may include a tub entrance **221** connected to the second entrance **211** and may be fixed to the inside the second cabinet **210** by a tub support **219**. The tub support **219** may be a spring or a damper for absorbing vibration of the tub **220**.

A gasket **212** is disposed between the tub entrance **221** and the second entrance **211**, and the gasket **212** not only prevents washing water inside the tub **220** from being discharged to the outside, but also prevents vibration of the tub **220** from being transferred to the second cabinet **210**.

The tub **220** may receive water through a water supply **250**, and the water supply may include a first water supply pipe **251** connecting a water source (not shown) and the tub **220**, and a water supply valve **253** for opening and closing the first water supply pipe **251**. In addition, the tub **220** may define a circulation path including the heat exchanger **500** to dry laundry inside the second drum **230**.

Although the first water supply pipe **251** and the water supply valve **253** are connected to the second cabinet **210** and then connected to the first laundry treating apparatus **1000** through the second water supply pipe, this is only an example, and otherwise, after the first water supply pipe **251** and a second water supply pipe **257** are branched, the second water supply pipe **257** may be connected thereto through the first cabinet **110** (refer to FIG. **4**).

The detergent storage **270** for storing detergent may be further disposed in an upper portion of the tub **220**, and may include a detergent storage body **271** for storing detergent and a tub supply pipe **273** connecting the detergent storage body **271** to the tub.

In this case, the first water supply pipe **251** may connect a water source (not shown) and the detergent storage body **271**. Therefore, when water is supplied through the first water supply pipe **251**, the detergent stored in the detergent storage body **271** may be supplied to the tub **220**.

In addition, the water supply **250** may supply water passing through the water supply valve **253** to the detergent storage **270** along the first water supply pipe **251** by a first switching valve **255**, and may supply water to a condensate storage **670** disposed in a lower portion of the first laundry treating apparatus **1000** along the water supply pipe **257**. This is to clean the filter part **300** by directly storing the

water supplied for the second laundry treating apparatus **2000** in the condensate storage unit **670** and spraying the water to the filter part **300**.

In contrast, water supplied to the first laundry treating apparatus **1000** and the second laundry treating apparatus **2000** may be branched and connected to each other by using a Y-shaped branch pipe (not shown) in an external water source. In this case, the branch pipe (not shown) may be connected to the first water supply pipe **251** and a third water supply pipe **256** (refer to FIG. **3**), and water from the external water source may be supplied into the tub **220** through the first water supply pipe **251** or may be connected directly to a spray part **650** to be described later through the third water supply pipe **256**. Unlike the second water supply pipe **257**, the third water supply pipe **256** may be connected to a second switching valve **655** of the spray part **650** to be described later without going through the condensate storage **670**.

The water stored inside the tub **220** may be discharged to the outside of the second cabinet **210** through a drain **260**. The drain **260** may include a third drain pipe **263** for guiding the water inside the tub **220** to the outside of the second cabinet **210**, and a drain pump **265** connected to the third drain pipe **263**. In addition, the drain **260** may include a first drain pipe **261** through which water inside the tub **220** is connected to the drain pump **265**, and a second drain pipe **262** for guiding the drained water of the condensate storage **670** of the first laundry treating apparatus **1000** to the drain pump **265**.

The second drum **230** provided in the tub **220** may include a second drum entrance **231** connected to the tub entrance **221**. Accordingly, the user may put laundry into the second drum **230** or withdraw the laundry from the second drum **230** through the second entrance **211**, the tub entrance **221**, and the second drum entrance **231**.

A plurality of second drum through holes **233** connecting the inside of the second drum **230** to the tub **220** may be further provided on an outer peripheral surface of the second drum **230**. Therefore, the water stored in the tub **220** may be supplied to the laundry stored in the second drum **230** through the second drum through holes **233**, and the water contained in the laundry may be discharged to the tub **220** through the second drum through holes **233**.

The second drum **230** may be rotated by the second driver **240** provided outside the tub **220**, and the second driver **240** may include a second motor **246**, that is, a stator **242** fixed to a rear surface of the tub **220**, a rotor **241** rotated by electromagnetic action with the stator **242**, and a rotation shaft **243** connecting the rotor **241** to the rear surface of the second drum **230**. As such, in the second drum **230**, the rotation shaft **243** of the second motor **246** may be directly connected to the rear surface of the drum, unlike the first drum **130**.

The stator **242** may receive electric power from a power supply to form a rotating field, and the rotor **241** may rotate by the rotating field provided by the stator **242**. Since rotation of the rotor **241** is transmitted to the second drum **230** through the rotation shaft **243**, electric power may be supplied to the stator **242** to provide torque required for rotation of the second drum **230**.

The rotation shaft **243** may connect the second drum **230** and the rotor **241** through the rear surface of the tub **220**, and in this case, a bearing **223** for rotatably supporting the rotation shaft **243** may be further disposed on the rear surface of the tub **220**.

In order for the second laundry treating apparatus **2000** to implement a drying function, the tub **220** not only stores water but also circulates air and requires a circulation duct for heating and dehumidifying. To this end, the tub **220** requires a circulation path including the second intake duct **412** connected to the tub **220** to suck air of the tub **220**, the second exhaust duct **492** for discharging the heat-exchanged air back to the tub **220**, and the connection duct **450** that connects the intake duct **412** and the second exhaust duct **492** and in which the heat exchanger **500** is disposed.

To this end, the tub **220** may include a second air outlet **278** to connect the second intake duct **412** and the tub **220**, and may include a second air inlet **298** to connect the second exhaust duct **492** and the tub **220**. Air introduced into the tub **220** may flow into and out of the second drum through the second drum through holes **233** to dry the laundry.

The second intake duct **412** and the second exhaust duct **492** may be exclusive ducts connected to the tub **220**, but the connection duct **450** may also be used in the first laundry treating apparatus **1000** to be described later. That is, air sucked from the first intake duct **411** and the second intake duct **412**, which will be described later, may be dehumidified and heated by the heat exchanger **500** provided inside the connection duct **450**, and may then pass through a fan **470** and may be discharged through the first exhaust duct **491** and the second exhaust duct **492**.

The first laundry treating apparatus **1000** disposed at the upper side may include the first cabinet **110**, the first drum **130** that is rotatably provided inside the first cabinet to provide a space for storing laundry, the first intake duct **411**, the first exhaust duct **491**, and the connection duct **450**, which circulate air of the first drum **130**, and the heat exchanger **500** that is provided inside the connection duct **450** to dehumidify and heat air introduced into the circulation duct **400** and then to resupply the air to the first drum **130**.

The circulation duct **400** may include the first intake duct **411**, the second intake duct **412**, the connection duct **450**, the first exhaust duct **491**, and the second exhaust duct **492**. In addition, the heat exchanger **500** for heat exchange may be provided inside the circulation duct **400**, specifically, inside the connection duct **450**, and the fan **470** for circulating air using the circulation duct may be disposed therein. A filter for removing foreign substances from the circulated air may be provided in front of the heat exchanger.

The first cabinet **110** may include the first front panel **104** defining a front surface of the first laundry treating apparatus **1000**, a first rear panel **105** defining a rear surface of the first laundry treating apparatus, and a first upper panel **108** defining an upper surface of the first laundry treating apparatus.

The first front panel **104** may include a first entrance **111** connected to the first drum **130**, and the first entrance **111** may be provided to be opened and closed by the first door **113** that is rotatably coupled to the first cabinet **110**.

The first front panel **104** may include a separate control panel (not shown). However, as described above, a control panel **910** for integrally controlling the first laundry treating apparatus **1000** and the second laundry treating apparatus **2000** may be disposed between the first drum **130** and the tub **220** in the front panels **104** and **204** of the first cabinet **110** and the second cabinet **210**. This is in consideration of user accessibility.

The control panel **910** may include an input unit (not shown) and a display unit (not shown). The input unit may include an electric power supply request unit for requesting electric power supply to the laundry treating apparatus **100**, a course input unit for allowing a user to select a desired course among a plurality of courses, and an execution

request unit for requesting start of the course selected by the user. The display unit may include at least one of a display panel for outputting a text and a figure, and a speaker for outputting a voice signal and sound.

When the first drum **130** is provided with a cylindrical first drum body **131** having open front and rear surfaces, a first support **170** for rotatably supporting a front surface of the first drum **130** and a second support **190** for rotatably supporting a rear surface of the first drum **130** may be provided inside the first cabinet **110**.

The first support **170** may include a first fixed body **171** fixed inside the first cabinet **110**, a first drum entrance **173** that is formed through the first fixed body **171** to connect the first entrance **111** to the inside of the first drum body **131**, and a first support body **175** that is provided on the first fixed body **171** and is inserted into a front surface (a first open surface) of the first drum body **131**.

The first fixed body **171** may be provided in any shape as long as the first drum entrance **173** and the first support body **175** are provided. The first support body **175** may be provided in a pipe shape protruding from the first fixed body **171** toward the first drum body **131**, and a diameter of the first support body **175** may be set to be greater than a diameter of the first drum entrance **173** and to be smaller than a diameter of a front surface of the first drum body **131**. In this case, the first drum entrance **173** may be disposed inside a space formed by the first support body **175**.

The first support **170** may further include a connection body **177** connecting the first entrance **111** and the first drum entrance **173**. The connection body **177** may be provided in a pipe shape extending from the first drum entrance **173** toward the first entrance **111**. The connection body **177** may be provided with a first air outlet **178** connected to the circulation duct **400**. The circulation duct **400** may include the first intake duct **411** that sucks air from the first drum **130**, the first exhaust duct **491** that discharges the air passing through the first intake duct **411** back to the first drum **130**, the connection duct **450** that connects the first intake duct **411** and the first exhaust duct **491** and includes the heat exchanger **500** therein, and the second intake duct **412** and the second exhaust duct **492** that are connected to the tub **220**.

As shown in FIG. **2**, the first air outlet **178** may be a passage for allowing air inside the first drum body **131** to move to the first intake duct **411**, and may be provided as a through hole formed through the connection body **177**.

As shown in FIG. **2**, the second support **190** may include a second fixed body **191** fixed inside the first cabinet **110**, and a second support body **195** provided on the second fixed body **191** and inserted into a rear surface (second open surface) of the first drum body **131**. The second support **190** may include a first air inlet **198** formed through the second fixed body **191** to connect the inside of the first drum body **131** to the inside of the first cabinet **110**. In this case, the circulation duct **400** may be provided to connect the first air outlet **178** and the first air inlet **198**.

The first drum body **131** of a cylindrical shape with an empty interior is capable of rotating through a first driver with various types, and FIG. **2** shows an example of the case in which a first driver **140** includes a first motor **141** fixed inside the first cabinet **110**, a pulley **145** rotated by the first motor **141**, and a belt **143** connecting a circumferential surface of the pulley **145** and a circumferential surface of the first drum body **131**.

In this case, the first support **170** may include a first roller **132** for rotatably supporting a circumferential surface of the first drum body **131**, and a second support **190** may include a second roller **134** for rotatably supporting the circumferential surface of the first drum body **131**.

The circulation duct **400** may include the first intake duct **411** connected to the first air outlet **178**, the second intake duct **412** connected to the second air outlet **278**, a first exhaust duct **490** connected to the first air inlet **198**, the second exhaust duct **492** connected to the second air inlet **298**, and the connection duct **450** connecting the first intake duct **411**, the second intake duct **412**, the first exhaust duct **491**, and the second exhaust duct **492**.

The heat exchanger **500** may be provided as a variety of devices for sequentially performing dehumidification and heating of air introduced into the circulation duct **400**, and FIG. **2** shows an example in which the heat exchanger **500** is a heat pump.

The heat exchanger **500** shown in FIG. **2** may include the fan **470** for moving air along the connection duct **450**, a first heat exchanger **510** (a heat absorber) for removing moisture from air introduced to the connection duct **450**, and a second heat exchanger **530** (a heater) provided inside the connection duct **450** to heat air passing through the first heat exchanger **510**.

The fan **470** may include an impeller **471** provided inside the circulation duct **400**, and a blower motor **473** for rotating the impeller **471**. The impeller **471** may be provided anywhere in the first exhaust duct **491**, the second exhaust duct **492**, or the connection duct **450**, and FIG. **2** shows an example in which the impeller **471** is provided in the first exhaust duct **491** (or when the impeller **471** is provided behind a second heat exchanger **520**).

Accordingly, according to another embodiment, the fan **470** may be disposed in front of the heat exchanger **500**, that is, between the filter part **300** and the first heat exchanger **510**.

The first heat exchanger **510** may include a plurality of metal plates disposed in a width direction (Y-axis direction) of the connection duct **450** or a height direction (Z-axis direction) of the connection duct, and the second heat exchanger **520** may include a plurality of metal plates disposed along the width direction of the connection duct or the height direction of the connection duct. The first heat exchanger **510** and the second heat exchanger **520** may be sequentially disposed in a direction toward the first exhaust duct **491** or the second exhaust duct **492** from the first intake duct **411** or the second intake duct **412** inside the connection duct **450**, and may be connected to each other through a refrigerant pipe **580** defining a circulation path of a refrigerant.

The refrigerant may move along the refrigerant pipe **580** by a compressor **570** disposed outside the circulation duct **400**, and the refrigerant pipe **580** may include an expander **550** for adjusting a pressure of the refrigerant passing through the second heat exchanger **520**.

The second heat exchanger **520** is a device for cooling the air and evaporating the refrigerant by transferring heat of air introduced into the first intake duct **411** or the second intake duct **412** to the refrigerant. The second heat exchanger **520** is a device for heating air and condensing the refrigerant by transferring heat of the refrigerant passing through the compressor **570** to the air. In this case, when passing through the first heat exchanger **510**, moisture contained in air may be collected on a bottom surface of the connection duct **450** along a surface of the first heat exchanger **510**.

In order to collect condensed water from air passing through the first heat exchanger **510**, the laundry treating apparatus **100** may include the condensate storage **670**. FIG. **2** shows an example of the case in which the condensate

storage **670** is disposed below the first heat exchanger **510** and the second heat exchanger **520** inside the condensate storage **670**. This is to move condensate by gravity without the aid of a mechanism or a mechanical device that forces movement of the condensate.

For explanation, referring to FIG. **3**, the condensate storage **670** may include a water collecting body **671** that is fixed to a bottom surface of the connection duct **450** and connected to the inside of the connection duct. To prevent the first heat exchanger **510** and the second heat exchanger **520** from contacting the water (condensate) stored in the water collecting body **671**, a heat exchanger support may be further provided inside the water collecting body **671**. The heat exchanger support may include a support plate **672** that is in contact with the first heat exchanger **510** and the second heat exchanger **520**, a spacer **675** maintaining a gap between the support plate **672** and a bottom surface of the water collecting body **671**, and a support plate through hole **674** formed through the support plate **672**.

The support plate through hole **674** may be provided only in a space in which the first heat exchanger **510** is supported among spaces provided by the support plate **672**, and may also be provided in each of a space in which the first heat exchanger **510** is supported, and a space in which the second heat exchanger is provided. When the support plate through hole **674** is also provided in a lower portion of the second heat exchanger **520**, it may be possible to discharge water moving to the second heat exchanger **520** along the support plate **672** to the water collecting body **671**. This is to prevent a decrease in heat transfer efficiency that occurs when the second heat exchanger **520** comes into contact with water, as in the first heat exchanger **510**.

In order to minimize stacking of foreign substances (lint, etc.) discharged from the first drum body **131** on the first heat exchanger **510** and the second heat exchanger **520**, the first laundry treating apparatus **1000** may further include the filter part **300** for filtering air. FIG. **2** shows an example of the case in which the filter part **300** includes a first purifier **350** provided in the connection duct **450** and a second purifier **370** is provided in the first intake duct **410**.

The filter part **300** may further include a third purifier (not shown) to filter foreign substances discharged from the tub **220** performing a drying function.

The second purifier **370** may be a device for filtering air introduced into the first intake duct **411** from the first drum body **131**, and the first purifier **350** may be a device disposed between the second purifier **370** and the first heat exchanger **510** and between the third purifier (not shown) and the first heat exchanger **510** to filter air passing through the second purifier **370**.

The first purifier **350** may be detachably provided in the connection duct **450**. In this case, the first front panel **104** of the first cabin may include a filter insertion hole **313** (refer to FIG. **2**) from which the first purifier **350** is drawn out (refer to FIG. **2**) and the filter door **314** for opening and closing the filter insertion hole **313**, and the connection duct **450** may include a duct through hole **315** (refer to FIG. **4**(*b*)) into which the first purifier **350** is inserted. Accordingly, a user may remove the foreign substances remaining in the first purifier **350** and may wash the first purifier after separating the first purifier **350** from the laundry treating apparatus as needed.

As shown in FIG. **3**, the first purifier **350** may include a first frame **353** inserted into the duct through hole **315** and disposed between the second purifier **370** and the first heat exchanger **510**, and filters **351** and **352** provided in the first frame **353** to filter a fluid (air and water) moving to the first heat exchanger **510** and the water collecting body **671**.

The first frame **353** may be provided in various forms depending on a shape of a cross-section (Y-Z plane, and X-Z plane) of the connection duct **450**, and FIG. **2** shows an example in which the first frame **353** has a shape similar to a hexahedron.

In this case, a first filter inlet for introducing air passing through the second purifier **370** into the first frame **353** may be provided on an upper surface of the first frame **353**, and a handle **317** protruding toward the filter insertion hole **313** may be provided on a front surface of the first frame **353**. The filters **515** and **517** may include a first filter **351** provided on a rear surface of the first frame **353** and a second filter **352** provided on a bottom surface of the first frame **353**. A rear surface of the first frame may refer to a surface facing the first heat exchanger **510** among spaces formed by the first frame **353**, and a bottom surface of the first frame may be set to be a surface directed toward the bottom surface of the connection duct **450** to face the filter inlet.

A second filter inlet for introducing air passing through the third purifier (not shown) into the first frame **353** may be provided in a lower surface of a first frame **354**.

The second purifier **370** may include a second frame **371** that is detachably inserted into the first intake duct **411** through the first air outlet **178**, and a third filter **373** provided in the second frame to filter air. Diameters of filter holes provided in the first filter **351** and the second filter **352** may be set to be smaller than a diameter of a filter hole provided in the third filter **373**. Thus, first, foreign substances having a relatively large size are filtered by the third filter, and then, foreign substances having a relatively small size may be filtered through the first filter **351** and the second filter **352** again.

As shown in FIG. **2**, the first laundry treating apparatus **1000** may further include the spray part **650** for washing the first purifier **350** using water stored in the water collecting body **671**, and the drain **260** for discharging water inside the water collecting body **671** to the outside of the water collecting body **671**.

As shown in FIG. **2**, the spray part **650** may be a device for washing at least one of the first filter **351**, the second filter **352**, and the first heat exchanger **510** by spraying water stored in the water collecting body **671** to the first purifier **350**. The spray part **650** may include the spray part **650** provided in the connection duct **450** to supply water to the first purifier **350**, and a water supply pump **716** for moving water stored in the water collecting body **671** to the spray part **650**.

The water supply pump **716** may be connected to the water collecting body **671** through a water supply pump connection pipe **717** and may be connected to the spray part **650** through a storage water supply pipe **715**.

The spray part **650** may be provided as a nozzle fixed to the connection duct **450** to spray water to the first filter **351** and the second filter **352**, or may also be provided as a nozzle for spraying water to each of the first filter **351**, the second filter **352**, and a front surface of the first heat exchanger **510**.

The reason for washing through the spray part **650** is to prevent foreign substances from being attached to the first filter **351**, the second filter **352**, and the first heat exchanger **510** to degrade filtration performance of a filter and heat exchange performance of the heat exchanger, and to prevent hygiene problems from being caused.

FIG. **3** shows an example in which the spray part **650** includes a connection duct through hole **652** formed through

the connection duct **450** and connected to a spray pipe **653**, a first guide **6581** for guiding supplied from the connection duct through hole **652** to the first filter **351**, and a second guide **6582** for guiding at least a portion of water supplied through the first guide **6581** to the front surface of the first heat exchanger **510**. In this case, the second guide **6582** may be a device for supplying water to the front surface of the first heat exchanger **510** through the first filter **351**. That is, the first filter **351** may be disposed between the first guide **6581** and the second guide **6582** when the first purifier **350** is fixed to the connection duct **450**, and the second guide **6582** may be an inclined surface that is inclined downward toward the first filter **351** from an upper surface of the connection duct **450**.

The first guide **6581** may further include a guide through hole **659**. The guide through hole **659** may be a hole formed through the first guide **6581** and may supply water introduced into the connection duct through hole **652** to a front region of the first heat exchanger **510** through the guide through hole **659**. The front region of the first heat exchanger may refer to a region positioned toward the first filter **351** based on a vertical line passing through the center of the first heat exchanger **510**.

The aforementioned laundry treating apparatus **100** may have an effect for washing the first purifier **350** and the first heat exchanger **510** through water stored in the water collecting body **671** during an operation of the heat exchanger **500**, but when the amount of the water stored in the collecting body **671** is small, there may be a problem in that washing of the first purifier **350** and the first heat exchanger **510** is not performed. This is because, when the amount of laundry put into the first drum body **131** is small, the amount of water collected in the water collecting body **671** during an operation of the heat exchanger **500** is small, and when the amount of water stored in the water collecting body is small, it is not possible to supply water with an amount sufficient to wash the purifier **350** and the first heat exchanger **510**.

To solve the above problem, the laundry treating apparatus **100** may supply water to the water collecting body **671** of the condensate storage **670** using an external water source required for the second laundry treating apparatus **2000**.

Referring to FIG. **2**, the water supply **250** may include the first water supply pipe **251** connected to an external water source and the water supply valve **253** for opening and closing the first water supply pipe **251**. The first water supply pipe **251** and the water supply valve **253** may be necessary for a washing function of the first laundry treating apparatus **1000**, but may be used to ensure the amount of water sufficient for washing the first purifier **350** of the filter part **300** and washing of the first heat exchanger. To this end, water passing through the water supply valve **253** may be supplied to the first laundry treating apparatus **1000** or the second laundry treating apparatus **2000** through the first switching valve **255**.

That is, the first switching valve **255** may be a valve for switching a water supply direction by selecting one of the tub **220** or the condensate storage **670**. A controller (not shown) may supply water to one of the second laundry treating apparatus **2000** and the first laundry treating apparatus **1000** through the first switching valve **255**. However, unlike this, while water is being supplied to the first laundry treating apparatus **1000**, water may be supplied to the second laundry treating apparatus **2000** when necessary.

A flow path when water is supplied to the water collecting body **671** of the condensate storage **670** through the first switching valve **255** will be described below. The second water supply pipe **257** may be disposed between the first switching valve **255** and the water collecting body **671**, and may connect the first switching valve **255** and the water collecting body **671**. Water passing through the first switching valve **255** may be supplied to the water collecting body **671** through the second water supply pipe **257**.

The water supplied as such may be used to wash the first heat exchanger **510** or the first purifier **350** of the filter part **300**, specifically, the first filter **351** and the second filter **352** using the spray part **650**.

A flow path of the spray part **650** will be described now, and may include the water supply pump **716** for supplying water stored in the water collecting body **671**, the water supply pump connection pipe **717** may be connected between the water collecting body **671** and the water supply pump **716**, and the spray part **650** and the water supply pump **716** may be connected by the storage water supply pipe **715**.

The spray part **650** may be installed above a connection duct upper plate **451** defining an upper body of a connection duct. The spray part **650** may include a spray nozzle **651** for spraying water for washing the first heat exchanger **510** or the first purifier **350**, and the spray pipe **653** connecting the spray nozzle **651** and the storage water supply pipe **715**.

Due to a compact structure of the laundry treating apparatus, the size of the water collecting body **671** of the condensate storage **670** may not be large. In this case, the capacity of the water supply pump **716** may be limited. To overcome this limitation and to evenly spray water to the first heat exchanger or the first purifier **350**, the spray nozzle **651** may be provided in a plural number, and thus may include the same number of the spray pipes **653** as the spray nozzles **651**. In order to spray water while maintaining a sufficient water pressure, it may be possible to selectively spray water into one of the plurality of the sprays pipe **653** rather than supplying water through each the spray pipe **653** at the same time.

In addition, when it is determined that a specific area of the first heat exchanger **510** or the filter part **300** has a high degree of contamination, only the area with a high degree of contamination may be washed via spraying.

In the first heat exchanger **510** or the first purifier **350**, when it is determined that an area washed by spraying water by a first spray nozzle **6511** has a high degree of contamination, a controller needs to wash only a corresponding part using the first spray nozzle **6511**.

If there are the plurality of spray nozzles **651**, water may be supplied through the corresponding spray pipe **653** by selecting each spray nozzle. In addition, the spray nozzles **651** may also sequentially spray water.

Referring to FIG. **3**, when there are three spray nozzles, water is first supplied to the first spray nozzle **6511** to spray water, when a predetermined time elapses, water is supplied to a second spray nozzle **6512** to spray water, and when a predetermined time elapses again, water is supplied to a third spray nozzle **6513** to spray water.

For the aforementioned spraying method, the storage water supply pipe **715** may be connected to the plurality of spray pipes **653** through the second switching valve **655** rather than being connected directly to the plurality of spray pipes **653**.

That is, the second switching valve **655** may switch a direction of water to supply water to each spray pipe for a preset time by the controller. For example, the second switching valve may be a three-way solenoid valve and the like.

Therefore, when water of the water collecting body **671** is not sufficient, the controller may control the first switching

valve **255** and the second water supply pipe to receive water of the condensate storage **670**, and, if necessary, may wash the first purifier **350** or the first heat exchanger **510** through the water supply pump **716**, the storage water supply pipe **715**, the second switching valve **655**, the spray pipe **653**, and the spray nozzle **651** using the water stored in the water collecting body **671**.

In contrast, water may be directly supplied to the spray part **650** through a branch pipe (not shown) without going through the water collecting body **671**, which will be described below with reference to FIG. **3**.

As shown in FIG. **2** or **3**, the laundry treating apparatus **100** may include a water level detector **693** for measuring a water level of the water collecting body **671** and transmitting the result to the controller. When the water level detector **693** is provided, the laundry treating apparatus may drain water stored in the water collecting body **671**, thereby preventing water of the water collecting body **671** from flowing back into the connection duct **450**. In addition, during washing of the filter part and/or the first heat exchanger through the spray part **650**, if water supply is larger than drainage due to clogging or high water pressure, a water level in the water collecting body **671** of the condensate storage **670** may go up to back flow without going down, thereby preventing a backflow problem in advance.

The water level detector **693** may be provided with any device that is capable of detecting a water level inside the water collecting body **671**, and FIG. **3** shows an example of a sensor including a plurality of electrodes (a plurality of electrodes that are electrically connected depending on a water level) with different lengths. In contrast, a water level may be determined by detecting the position of a floater that is provided on a bottom surface of the water collecting body **671** and ascends and descends according to the water level.

When the water level measured through the water level detector **693** is less than a preset reference water level, the controller provided in the laundry treating apparatus may open the water supply valve **253**, and may switch the first switching valve **255** to supply water to the water collecting body **671** through the second water supply pipe **257** and the storage water supply pipe **715**. The water supplied as such may be supplied to the spray part **650** using the water supply pump **716**.

As such, the laundry treating apparatus **100** may be capable of minimizing a problem that the first purifier **350** or the first heat exchanger **510** is not washed due to insufficient water of the water collecting body **671**. That is, this is to satisfy a reference water level for always ensuring washing performance to the maximum by supplementing water required for washing.

The above-described laundry treating apparatus may drain water stored in the water collecting body **671** only with the water level detector **693** through the drain **260**, or may control a time point at which water is supplied to the condensate storage **670** by controlling an operating time point and operating time period of the water supply valve **253** for opening and closing the first water supply pipe **251**.

Water sprayed through the spray part **650**, water condensed through the heat exchanger **500**, and water stored in the condensate storage **670** through the water supply **250** are all stored in the water collecting body **671**. Accordingly, according to a storage capacity of the water collecting body **671** while performing a drying function of the first laundry treating apparatus **1000**, only the condensate may exceed a full water level. In this case, it may be necessary to drain the water to prevent backflow of the stored water.

In addition, when the first purifier and/or the first heat exchanger are washed through the spray part **650**, the water level needs to go down because water of the condensate storage **670** is used. However, when drainage is blocked or water pressure is higher than drainage, a water level in the water collecting body **671** of the condensate storage **670** may not go down, and thus this may be determined through the water level detector **693** and water may be drained.

The drain **260** is described now with reference to FIG. **3**, and the drain **260** may include a drain hole **672** provided on a bottom surface of the water collecting body **671**, a drain valve **681** that is opened and closed by a controller to drain water of the water collecting body, a drain valve connecting pipe **682** connecting the drain valve **681** and the drain hole **672**, the first drain pipe **261** for draining water of the tub **220** to the drain pump **265**, the second drain pipe **262** for draining water discharged by the drain pump to the outside, and the third drain pipe **263** connecting the drain valve **681** and the drain pump **265**.

Here, the drain pump **265** does not simply refer to a pump used to transport water, but the drain pump **265** may include a drain pump housing (not shown) connected to the first drain pipe **261** or the third drain pipe **263** to provide a space for storing water, a drain pump impeller (not shown) rotatable inside the first housing, a drain pump motor (not shown) for rotating the drain pump impeller, and a drain pump outlet (not shown) formed through a circumferential surface of the drain pump housing and connected to the second drain pipe **262**.

Even if a water level of the water collecting body **671** is not high, it may be necessary to discharge water remaining in the water collecting body **671** of the condensate storage **670** when a washing process of the heat exchanger and the filter part is finished or a drying cycle is finished. This is to prevent hygiene and odor problems in the laundry treating apparatus **100** in advance. Even in this case, all remaining water may be discharged using the drain hole **672** formed in a bottom surface of the water collecting body **671**.

The laundry treating apparatus disclosed herein may further include a controller (not shown). The controller may be disposed anywhere as long as the controller is capable of controlling the laundry treating apparatus. In general, the controller may be installed invisibly behind the control panel **910**, but is not limited thereto. The controller may control rotation of the first drum **130** and the second drum **230**, may determine a dryness through a dryness detector **691**, and may wash the first heat exchanger **510** and/or the filter part **300** using the water supply valve **253**, the first switching valve **255**, the second switching valve **655**, and the water supply pump **716** of the water supply **250**. In addition, the water level may be measured through the water level detector **693** of the water collecting body **671**, the drain valve **681** may be opened when the water level is full, and after draining, the drain pump **265** may be controlled to discharge water to the outside.

In addition, as necessary, the controller (not shown) may control opening and closing of a first opening/closing unit **710**, a second opening/closing unit **720**, and a third opening/closing unit **730**, which will be described below, to circulate air of the first laundry treating apparatus **1000**, to circulate air for a drying cycle of the second laundry treating apparatus **2000**, or to circulate air at the both sides.

As shown in FIG. **2**, the laundry treating apparatus **100** may include dryness detectors **691** and **692** to determine a time to stop an operation of the heat exchanger **500** by determining the dryness of laundry. The dryness detectors **691** and **692** may include at least one of an electrode sensor

691 that is in contact with laundry to measure the amount of moisture contained in the laundry, and a humidity sensor 692 for measuring humidity of air flowing into the circulation duct 400 from the first drum 130.

As shown in FIG. 3, the electrode sensor 691 may include two electrodes that are fixed to the first fixed body 171 to be in contact with laundry inside the first drum body 131. As a dryness increases, the amount of moisture contained in the laundry may decrease (the electrical resistance of the laundry increases), and thus the laundry treating apparatus 100 may determine the dryness of the laundry by observing the electrical resistance measured when the two electrodes are connected by the laundry.

As the dryness of the laundry increases, the amount of moisture contained in air introduced into the circulation duct 400 may be reduced, and accordingly, the laundry treating apparatus 100 may determine the dryness of laundry by observing the humidity of the air introduced into the first intake duct 411 or the second intake duct 412 through the humidity sensor 692.

In order to determine the dryness of the laundry, unlike FIG. 3, a separate humidity sensor may be provided for each intake duct.

If the dryness that is measured through the dryness detector 691 after rotation of the first drum 130 is started to start a drying cycle is above a preset reference dryness, the controller may control the water supply 250 to supply water to the condensate storage 670 when the water level detector 693 determines the amount of water currently stored in the storage 670 to be insufficient. When the amount of the water is not insufficient, the spray part may spray water immediately, but the amount of water stored in the water collecting body is smaller than the amount for washing, water needs to be added during spraying. In this case, similarly, when the amount of water currently stored in the condensate storage 670 is determined to be insufficient through the water level detector 693, the controller may control the water supply 250 to supply water to the condensate storage 670.

Although not shown in the drawings, the laundry treating apparatus 100 may further include a laundry weight detector for determining the amount of laundry stored inside the first drum body 131. The laundry weight detector may be a device for transmitting the amount of current supplied to the first motor 141 of a driver to the controller to rotate the first drum body 131 at a constant number of revolutions, or may be a device for transmitting information on the number of revolutions of the first drum body 131 to the controller when supplying current with a constant magnitude to the first motor 141 for a predetermined period of time.

When the laundry weight detector is provided, the controller may predict the amount of condensate to be generated from laundry accommodated in the first drum by detecting the amount of laundry. When it is determined that the amount of the generated condensate is smaller than the amount required for washing the first purifier 350 or the first heat exchanger 510, the insufficient water may be added through an external water source before cleaning the first purifier 350 or the first heat exchanger 510.

If it is determined that the amount of water stored in the water collecting body 671 is greater than the amount of water required for washing the first purifier 350 or the first heat exchanger 510, that is, when the amount of water stored in the water collecting body 671 exceeds a preset reference water level through the water level detector 693, the controller may drain water by opening the drain valve 681.

FIG. 3 shows an example of a circulation duct including a common connection duct including a heat exchanger. As described above, the circulation duct 400 may include the first intake duct 411 connected to the first air outlet 178, the second intake duct 412 connected to the second air outlet 278, the first exhaust duct 491 connected to the first air inlet 198, the second exhaust duct 492 connected to the second air inlet 298, and the connection duct 450 connecting the first intake duct 411, the second intake duct 412, the first exhaust duct 491, and the second exhaust duct 492.

The heat exchanger 500 may be disposed inside the connection duct 450, and the connection duct 450 may include the fan 470 for circulating air of the tub 220 or the first drum 130. In addition, the filter part 300 for filtering foreign substances from the air of the tub 220 or the first drum 130 may be disposed inside the connection duct 450.

A structure for forming a circulation path by opening and closing the circulation duct 400 for forming a circulation path for performing a drying function of the first laundry treating apparatus 1000 and the second laundry treating apparatus 2000 will be described.

For this, the circulation duct 400 may further include the first opening/closing unit 710 for opening and closing the first intake duct 411, the second opening/closing unit 720 for opening and closing the second intake duct 412, and the third opening/closing unit 730 that is disposed at a connection portion between the first exhaust duct 491 and the second exhaust duct 492 and selectively branches the first exhaust duct 491 and the second exhaust duct 492.

By independently driving the first opening/closing unit 710, the second opening/closing unit 720, and the third opening/closing unit 730, the first intake duct 411, the connection duct 450, and the first exhaust duct 491 may form a first circulation path to circulate air of the first drum, or the second intake duct 412, the connection duct 450, and the second exhaust duct 492 may form a second circulation path to circulate air of the tub 220. In addition, the first circulation path and the second circulation path may be simultaneously opened or closed.

The inside of the connection duct 450 may include the filter part 300 in front of the first heat exchanger 510. The fan 470 may be provided behind the second heat exchanger 520 to forcibly circulate air of the tub 220 and the first drum 130. The fan 470 is shown to be disposed at an end of the first exhaust duct 490 connected to the connection duct 450, but even if the fan 470 is installed elsewhere, the fan 470 may be disposed anywhere as long as air of air of the tub 220 and the second drum 230 is circulated.

The fan 470 may include the impeller 471 inside the circulation duct 400, and the blower motor 473 for rotating the impeller 471. The impeller 471 may be provided anywhere in the first exhaust duct 490, the connection duct 450, and the second exhaust duct 492, and FIG. 2 shows an example in which the impeller 471 is provided in the exhaust duct 490 (when the impeller 471 is disposed behind the second heat exchanger 520).

The first intake duct 410 may suck air through the first air inlet 198 formed in the connection body 177. The second intake duct 412 may suck air through the second air inlet 298. In a front surface of the connection duct 450, the duct through hole 315 may be connected to the filter insertion hole 313 to insert or separate the first purifier 350. The connection duct 450 may include the duct through hole 315 into which the spray nozzle 651 is inserted, and may spray water to wash the first purifier 350 or the first heat exchanger 510. Further, the connection duct 450 may include a first connection hole 456 connected to the first intake duct 410, a second connection hole 457 connected to the second intake duct 412, and a third connection hole 458 connected to the

first exhaust duct **490**. The first exhaust duct **490** may include a communication hole **493** connected to the second exhaust duct **492**, and may be connected to the second exhaust duct **492** through the communication hole **493**.

The circulation duct **400** may include the first opening/closing unit **710** for opening and closing the first intake duct **410** in the vicinity of the first connection hole **456**, the second opening/closing unit **720** for opening and closing the second intake duct **412** in the vicinity of the second connection hole **457**, and the third opening/closing unit **730** for opening and closing the communication hole **493**. A first circulation path circulating a first drum and/or a second circulation path circulating a tub may be formed through the first opening/closing unit **710**, the second opening/closing unit **720**, and the third opening/closing unit **730**. In addition, this may be controlled by the controller (not shown).

That is, when air of the first drum **130** is circulated, the first opening/closing unit **710** may be opened, the second opening/closing unit **720** may be closed to open the first intake duct **410**, the second intake duct **412** may be closed, and the first exhaust duct **490** may be opened with the third opening/closing unit **730** to close the second exhaust duct **492**. In contrast, when air of the tub **220** is circulated, the second opening/closing unit **720** may be opened, the first opening/closing unit **710** may be closed to open the second intake duct **412**, and the first intake duct **410** may be closed, and the second exhaust duct **492** may be opened and the first exhaust duct **490** may be closed with the third opening/closing unit **730**.

In order to circulate air at the both sides, the third opening/closing unit **730** may be opened by a predetermined angle, and then both the first opening/closing unit **710** and the second opening/closing unit **720** may be opened to form both the first circulation path and the second circulation path.

Unlike opening and closing of the first exhaust duct **490** and the second exhaust duct **492** using the third opening/closing unit **730**, the first intake duct **410** and the second intake duct **412** may have the first opening/closing unit **710** and the second opening/closing unit **720** that are respectively opened and closed. This is because the first purifier **350** needs to inserted or separated through the duct through hole **315** provided in a front surface of the connection duct and the filter insertion hole **313** provided in a front surface of the laundry treating apparatus **100**, and thus the first opening/closing unit **710** and the second opening/closing unit **720** for respectively opening and closing the first intake duct **410** and the second intake duct **412** may be separately provided to prevent interference with the first purifier **350**.

In contrast, since there is no such detachable component behind the connection duct **450**, the connection duct **450** may be connected to the first exhaust duct **490** through the third connection hole **458** provided at an end of the connection duct **450**, and may be connected to the second exhaust duct **492** through the communication hole **493** of the first exhaust duct, and accordingly, opening and closing of the first exhaust duct **490** and the second exhaust duct **492** may be controlled with only the third opening/closing unit **730**.

The first exhaust duct **490** and the second exhaust duct **492** may be connected through the first air inlet **198** and the second air inlet **298**, respectively.

FIG. **4**(*a*) shows an example in which a first exhaust duct and a second exhaust duct are connected. FIG. **4**(*b*) shows an example in which a first intake duct and a second intake duct are connected to a filter part provided in a connection duct. FIGS. **4**(*a*) and **4**(*b*) show an example in which the spray part **650** including the plurality of spray nozzles **651** is directly connected to an external water source.

The drawings show the case in which an external water source is directly connected to the spray pipe **653** and the spray nozzle **651** through a third switching valve **657**. Here, three spray pipes **6531**, **6533**, and **6535** may be connected to three spray nozzles **6511**, **6512**, and **6113**, respectively, and the third switching valve **657** may connect each spray pipe to the third water supply pipe **256** at a predetermined time interval and may spray water thereto.

This is because water pressure of water is different depending on an environment in which the laundry treating apparatus **100** is used, and thus a spray pressure is maintained constant in any environment to achieve the same effect. That is, the third switching valve **657** may be used to connect only one spray pipe at one time by selectively selecting each spray pipe rather than spraying water pressure by connecting three spray pipes at the same time.

The three spray pipes **6531**, **6533**, and **6535** may each be fixed to an upper plate **451** of the connection duct by a fixing part **654** to prevent each of spray pipes **6531**, **6533**, and **6535** from shaking under water pressure. A first fixing part **654** may be connected from the third switching valve **657** to fix the spray pipe **653** when passing over the upper plate, and a second fixing part **656** may fix a portion of the spray pipe **653** at which the spray nozzle **651** is disposed.

The upper plate **451** may be a part defining a body of the connection duct. The body of the connection duct may be divided into the upper plate **451** and a lower plate (not shown), and the lower plate may not be formed separately, but when a portion of the base **180**, in which the connection duct is positioned, is injected, a shape of the lower plate may be ejected together. Here, the upper plate **451** may be combined to form a flow path through which air passes.

The spray nozzle **651** may be inserted into the connection duct through the connection duct through hole **652** to spray water to the first heat exchanger and/or the first purifier **350**.

The plurality of the spray nozzle **651** may be provided to be arranged side by side in left and right directions of the connection duct **450** on the upper plate **451** as shown. The left-right direction of the connection duct **450** may be a direction perpendicular to a direction in which air flows inside the connection duct **450**. When water is sequentially sprayed through the plurality of the spray nozzles **651**, each of spray nozzle **6511**, **6512**, and **6513** may wash a part of the first heat exchanger **510** and/or the first purifier **350** in a sprayed area. When all of the plurality of spray nozzles **651** sequentially performs spaying, as a result, a front area of the first heat exchanger **510** and/or the first purifier may be washed.

In contrast, the spray nozzles **651** may simultaneously perform spraying and washing. In addition, washing may be repeatedly performed. That is, the third switching valve **657** may switch a direction of water to supply water to each spray pipe for a time preset by a controller. A 3 way solenoid valve or the like may be used as the third switching valve **657**. The third switching valve **657** or the second switching valve **655** may have different names depending on whether it is directly connected to an external water source but may have the same feature of sequentially or selectively passing the supplied water through the plurality of spray pipes **653** to the plurality of spray nozzles **651**.

FIG. **4**(*a*) shows a form in which the second purifier **370** is coupled to the first intake duct **410**. The second purifier **370** may be inserted and mounted in the first intake duct **410**, but according to an embodiment, in FIG. **4**(*a*), the first intake duct **410** includes a filter guide **419**, and the second purifier

370 may be inserted into the filter guide 419. A curved surface of an upper portion of the filter guide 419 may have the same radius of curvature to form a smooth circle along an inner circumferential surface when coupled to the circular connection body 177. An upper part of the second purifier 370 also forms the same curved surface.

The height of the first intake duct 410 is lower than that of the first exhaust duct 490 because the first intake duct 410 sucks air from a lower part of the connection body 177. The first exhaust duct 490 may be connected to the first drum 130 through the first air inlet 198 provided on the upper part of the second support 190.

FIG. 4(*a*) shows an example in which the connection duct 450, the spray part 650, and the like are installed on a base 180. The connection duct 450 needs to have a duct shape to form a circulating air path, and thus a lower part of the duct may be formed by the base 180, and an upper part of the duct may be formed by the upper plate 451. That is, when the base is injected, the lower part of the duct may be already formed, and here, the upper plate 451 may be combined here to have the overall duct shape. Before the upper plate 451 is combined, the fan 470, the first heat exchanger 510, the second heat exchanger 520, the refrigerant pipe 580, and the like may be installed, and the spray nozzle 651 may be inserted into the upper plate 451 through the connection duct through hole 315 to fix the spray pipe 653. The third switching valve (not shown) may also be fixed.

Referring to FIG. 4(*a*), the second exhaust duct 492 may be connected to a lower portion of the first exhaust duct 490. To simplify a flow path as much as possible, the second exhaust duct 492 may be connected to the first exhaust duct as soon as the second exhaust duct 492 passes the heat exchanger 500 and the fan 470. The first exhaust duct may include the communication hole 493, and the communication hole 493 may have the third opening/closing unit 730 to open and close the communication hole 493. The third opening/closing unit 730 may be rotatably coupled into the first exhaust duct 490. That is, the third opening/closing unit 730 rotates only inside, and a position when the communication hole 493 is closed may be referred to as a first position, and in this case, an angle with the communication hole 493 may be determined as 0 degrees (°).

Referring to FIG. 4(*b*), the first intake duct 410 may be disposed above the filter insertion hole 313. The second intake duct 412 may be disposed below the filter insertion hole 313. The first opening/closing unit 710 may be disposed at an end of the first intake duct 410, at which the first intake duct 410 is connected to the connection duct 450. In addition, the second opening/closing unit 720 may be disposed at an end of the second intake duct 412, at which the second intake duct 412 is connected to the connection duct 450. Unlike the third opening/closing unit 730, a part for opening and closing the first intake duct 410 and the second intake duct 412 may be divided into the first opening/closing unit 710 and the second opening/closing unit 720 in order to ensure a space into which the first purifier 350 positioned in front is inserted.

Therefore, when the first opening/closing unit 710 is opened, the first intake duct 410 may move air sucked through an upper portion of the first purifier 350 to the connection duct 450. The second intake duct 412 may not be connected to a lower portion of the first purifier 350 or a lower portion of the filter insertion hole 313 to avoid interference with the filter part 300, specifically, the first purifier 350. As shown in FIG. 4(*b*), the second intake duct 412 may be connected to the outside of the filter insertion hole to move the sucked air to the connection duct 450 through a lateral surface of the first purifier 350.

In contrast, when the second opening/closing unit 720 is opened, the second intake duct 412 may move air to the connection duct 450 through a lower portion of the first purifier 350.

Accordingly, the width of the first intake duct 410 may be greater than the width of the second intake duct 412. The width of the first intake duct 410 may be similar to the sum of the second intake duct and the filter insertion hole 313.

The filter insertion hole 313 may be opened by the filter door 314, and the filter door 314 may include the handle 317 for rotating the filter door 314 and a filter fixing part 319 for inserting the first purifier 350 and closing and then fixing the filter door 314.

The first opening/closing unit 710 may include a first blocker 711 for opening and closing the first intake duct 410, and a first opening/closing driver 713 connected to the first blocker 711 to rotate the first blocker 711 and to open and close the first intake duct 410. Similarly, the second opening/closing unit 720 may include a second blocker 721 for opening and closing the first intake duct 410, and a second opening/closing driver 723 for rotating the first blocker 711 to open and close the second intake duct 412. The third opening/closing unit 730 may also include a third blocker 731 for opening and closing the first exhaust duct 490 and the second exhaust duct 492, and a third opening/closing driver 733 for rotating the third blocker 731.

The first opening/closing driver 713, the second opening/closing driver 723, and the third opening/closing driver 733 may include a motor for transferring torque. As an example of the motor, a geared motor using DC power may be used.

FIG. 5(*a*) shows the first blocker 711 and the first opening/closing driver 713, and the second blocker 721 and the second opening/closing driver 723 between the first intake duct 410 and the connection duct 450, and between the second intake duct 412 and the connection duct 450.

The first blocker 711 has a shape in which a circular cylinder is positioned sideways. Specifically, the first blocker 711 that opens and closes the first intake duct 410 may include a first main body 7111 formed in a left-to-right side longer than a front-to-rear side with respect to a front surface of the first cabinet and having a curved surface on the front-to-rear side, and a first sub-body 7112 with a circular shape coupled to each of both ends in left and right directions of the first main body. That is, both ends of the first main body 7111 may include the first sub-body 7112, which has a circular shape like both ends of a general cylinder, but the first main body 7111 connecting the first sub bodies 7112 at both ends does not have a cylindrical shape, but may have at least two curved surfaces with different radii of curvature, and here, a size of the first main body 7111 orthogonally projected onto a virtual plane is the same as a diameter of the first sub-body, and eventually is equal to the length of a front-to-rear section of the first intake duct 410.

Accordingly, when the first blocker 711 rotates, the first main body 7111 may close the inside of the first intake duct 410. In addition, the length of the first blocker 711 in a left and right direction is longer than that in a front and rear direction to correspond to a cross section of the inside of the first intake duct 410. As such, when the first blocker 711 rotates, the first main body 7111 may close the first intake duct 410, and when the first blocker 711 rotates, the first main body 7111 may open the first intake duct. Since the first blocker 711 has a shape similar to a circular cylinder, it is not necessarily required to rotate the first blocker 711 in different directions for opening and closing.

The first main body **7111** may have at least two curved surfaces. Accordingly, the first main body **7111** may have a concave surface and a convex surface on the other surface. In addition, a cross section of the first main body **7111** may be in the form of a crescent that becomes thicker toward the center. This reduces a polar moment of inertia and minimizes rotational force caused by the second opening/closing driver **723**.

The first main body **7111** has a shape with at least two curved surfaces in order to smoothly convert a flow direction. Thus, even if the first main body **7111** is not necessarily in such a shape, the first main body **7111** may have any shape as long as the flow is smoothly converted.

Since the first main body **7111** has a laterally long shape, the first main body **7111** may be bent by fatigue or torsion over time. To prevent this, the first main body **7111** may include a first reinforcing rib **7113** on a convex side. This is because, if the first reinforcing rib **7113** is placed on a concave surface, stress concentration may occur at a concave point.

The size of the first reinforcing rib **7113** protruding from the convex surface of the first main body **7111** is equal to or smaller than the size of the first sub-body **7112**, and thus when the first sub-body **7112** is orthogonally projected in a longitudinal direction of the body **7111**, the first reinforcing rib **7113** may be equal to or smaller than the orthogonal projected first sub-body **7112**.

In other words, the first reinforcing rib **7113** may be disposed in a virtual cylinder surface and space formed by the first sub-body **7112**.

The second blocker **721** has a shape in which a circular cylinder is positioned sideways. Specifically, the second blocker **721** that opens and closes the second intake duct **412** may include a second main body **7211** formed in a left-to-right side longer than a front-to-rear side with respect to a front surface of the first cabinet and having a curved surface on the front-to-rear side, and a second sub-body **7212** with a circular shape coupled to each of both ends in left and right directions of the second main body. That is, both ends of the second main body **7211** may include the second sub-body **7212**, which has a circular shape like both ends of a general cylinder, but the second main body **7211** connecting the second sub-body **7212** at both ends does not have a cylindrical shape, but may have at least two curved surfaces, and here, a size of the second main body **7211** orthogonally projected onto a virtual plane is the same as a diameter of the second sub-body, and eventually is equal to the length of a front-to-rear section of the second intake duct **412**.

Accordingly, when the second blocker **721** rotates, the second main body **7211** may close the inside of the second intake duct **412**. In addition, the length of the second blocker **721** in a left and right direction is longer than that in a front and rear direction to correspond to a cross section of the inside of the second intake duct **412**. As such, when the second blocker **721** rotates, the second main body **7211** may close the second intake duct **412**, and when the second blocker **721** rotates, the second blocker **721** may open the second intake duct. Since the second blocker **721** has a shape similar to a circular cylinder, it is not necessarily required to rotate the second blocker **721** in different directions for opening and closing.

The second main body **7211** may have at least two curved surfaces. Accordingly, the first main body **7111** may have a concave surface and a convex surface on the other surface. In addition, a cross section of the second main body **7211** may be in the form of a crescent that becomes thicker toward the center. This reduces a polar moment of inertia and minimizes rotational force caused by the second opening/closing driver **723**.

The second main body **7211** has a shape with at least two curved surfaces in order to smoothly convert a flow direction. Thus, even if the second main body **7211** is not necessarily in such a shape, the second main body **7211** may have any shape as long as the flow is smoothly converted.

Since the second main body **7211** has a laterally long shape, the second main body **7211** may be bent by fatigue or torsion over time. To prevent this, the second main body **7211** may include a second reinforcing rib **7213** on a convex side. This is because, if the second reinforcing rib **7213** is placed on a concave surface, stress concentration may occur at a concave point.

The size of the second reinforcing rib **7213** protruding from the convex surface of the second main body **7211** is equal to or smaller than the size of the first sub-body **7112**, and thus when the second sub-body **7212** is orthogonally projected in a longitudinal direction of the second main body **7211**, the first reinforcing rib **7113** may be equal to or smaller than the orthogonal projected second sub-body **7212**.

In other words, the first reinforcing rib **7113** may be positioned in a virtual cylinder surface and space formed by the first sub-body **7112**.

FIG. **5**(*b*) shows an example of a connection part of the first exhaust duct **490** and the second exhaust duct **492** and the third opening/closing driver **733** for opening and closing the third blocker **731**.

The first exhaust duct **490** may include the fan **470** disposed through the third connection hole **458** connected to the connection duct **450**, and the communication hole **493** connected to the second exhaust duct **492** at a portion at which a direction of air flow through the fan is directed upward. The first exhaust duct **490** may include the third blocker **731** for opening and closing the communication hole **493**, and a third opening/closing driver for driving the same may be positioned on an outer side of the first exhaust duct **490**.

A coupler may be provided around the communication hole to connect the second exhaust duct **492** to the first exhaust duct **490**, and thus the second exhaust duct **492** may be fixed and connected to the first exhaust duct **490** through a coupling member.

FIGS. **6**(*a*) and **6**(*b*) show an example in which the first intake duct **410** is opened through the first blocker **711**, the second intake duct **412** is closed through the second blocker **721**, and the second exhaust duct is closed through the third blocker **731** when air of the first drum **130** is circulated. FIGS. **6**(*c*) and **6**(*d*) show an example in which the first intake duct **410** is closed through the first opening/closing unit **710**, the second intake duct **412** is opened through the second opening/closing unit **720**, and the first exhaust duct **490** is closed through the third blocker **731** when air of the tub **220** is circulated.

FIG. **6**(*a*) shows the case in which the first blocker **711** is opened, the second blocker **721** is closed, and the first intake duct **410** is opened. The first blocker **711** may be connected to a rotation shaft of the first opening/closing driver **713** in a longitudinal direction of the first main body **7111**, and along rotation of the first opening/closing driver **713**, the first main body **7111** may rotate. When the first blocker **711** rotates at a predetermined angle, the first intake duct **410** may be opened. Similarly, as shown in FIG. **6**(*c*), the second blocker **721** may be connected to a rotation shaft of the second opening/closing driver **723** in a longitudinal direc-

tion of the second main body **7211**, and along rotation of the second opening/closing driver **723**, the second main body **7211** may rotate. When the second blocker **721** rotates at a predetermined angle, the second intake duct **412** may be opened.

Since a controller (not shown) independently controls the first blocker **711** and the second blocker **721**, only the first blocker **711** may be opened, and the second blocker **721** may be closed, and in contrast, the blocking part **711** may be closed, and only the second blocker **721** may be opened. Drying functions of the first laundry treating apparatus **1000** and the second laundry treating apparatus **2000** may also be simultaneously used by simultaneously opening the first blocker **711** and the second blocker **721**.

FIG. **6**(*b*) shows an example in which the third blocker **731** closes the communication hole **493** to close the second exhaust duct **492**. In the present specification, when the third blocker **731** closes the second exhaust duct **492**, the third blocker **731** may be referred to as being in the first position. When the third blocker **731** is in the first position, a circulation path of the first laundry treating apparatus may be formed through the first exhaust duct **490**.

In contrast, FIG. **6**(*d*) shows an example in which the third blocker **731** opens the communication hole **493** to open the second exhaust duct **492**. When the third blocker **731** is rotated inside the first exhaust duct **490** and reaches a position (second position) for closing the first exhaust duct, a guide **495** for preventing the third blocker **731** from rotating any more may be provided. The guide **495** may prevent excessive rotation of the third blocker **731** to prevent the third blocker **731** from being deformed or damaged.

To reach the second position, the third blocker **731** needs to rotate at a predetermined angle through the third opening/closing driver. When a rotation angle at the first position is a first rotation angle, for example, 0 degrees (°), and an angle at the second position is a second rotation angle θ_2, the third blocker **731** may be rotated at a predetermined angle θ_3 between the first rotation angle and the second rotation angle and may be positioned at the third position.

When the third blocker **731** is positioned at the third position, both the first exhaust duct **490** and the second exhaust duct **492** may be opened. Accordingly, as necessary, the controller may use both a drying function of the first laundry treating apparatus and a drying function of the second laundry treating apparatus.

The present disclosure may be modified and implemented in various forms, but the scope of the present disclosure is not limited to the above-described embodiments. Accordingly, if the modified embodiment includes components of the claims according to the present disclosure, it should be regarded as belonging to the scope of the present disclosure.

The invention claimed is:

1. A laundry treating apparatus comprising:

a first cabinet that defines at least a portion of an outer appearance of the laundry treating apparatus;

a first drum rotatably disposed inside the first cabinet and configured to accommodate laundry;

a second cabinet disposed below the first cabinet;

a tub disposed inside the second cabinet;

a second drum rotatably disposed inside the tub and configured to accommodate laundry;

a first intake duct configured to receive air from the first drum;

a first opening/closing unit configured to open and close the first intake duct;

a second intake duct configured to receive air from the tub;

a second opening/closing unit configured to open and close the second intake duct;

a connection duct connected to the first intake duct and the second intake duct;

a heat exchanger disposed in the connection duct and configured to exchange heat with the air received in the connection duct;

a first exhaust duct configured to guide the air heat-exchanged through the heat exchanger to the first drum;

a second exhaust duct configured to guide the air heat-exchanged through the heat exchanger to the tub; and

a first purifier disposed in the connection duct and configured to filter a foreign substance from the air received from the first intake duct or the second intake duct before the heat exchanger exchanges heat with the air received from the first intake duct or the second intake duct,

wherein the first opening/closing unit comprises:

a first blocker configured to open and close the first intake duct, and

a first opening/closing driver connected to the first blocker and configured to rotate the first blocker to thereby open and close the first intake duct by the first blocker,

and

wherein the first blocker comprises:

a first main body that extends in a left-right direction and defines first curved surfaces that are curved in a front-rear direction, wherein a length of the first main body in the left-right direction is greater than a width of the first main body in the front-rear direction, and

first sub-bodies that have a circular shape and are coupled to left and right ends of the first main body, respectively.

2. The laundry treating apparatus of claim **1**, wherein the first cabinet and the second cabinet are parts of a single cabinet.

3. The laundry treating apparatus of claim **1**, further comprising:

a third opening/closing unit configured to branch the air heat-exchanged through the heat exchanger to the first exhaust duct or the second exhaust duct,

wherein the first opening/closing unit, the second opening/closing unit, and the third opening/closing unit are configured to independently operate to define (i) a first circulation path configured to guide the air from the first drum through the first intake duct, the connection duct,

and the first exhaust duct, or (ii) a second circulation path configured to guide the air from the tub through the second intake duct, the connection duct, and the second exhaust duct.

4. The laundry treating apparatus of claim **3**, wherein the first opening/closing unit is disposed between the first intake duct and the connection duct, and

wherein the second opening/closing unit is disposed between the second intake duct and the connection duct.

5. The laundry treating apparatus of claim **4**, wherein the first cabinet or the second cabinet defines a filter insertion hole that allows the first purifier to be detached from the connection duct, the filter insertion hole being defined at a bottom of the first cabinet or a top front surface of the second cabinet.

6. The laundry treating apparatus of claim 5, wherein the first opening/closing unit is disposed between the first intake duct and an upper part of the first purifier, and

wherein the second opening/closing unit is disposed between the second intake duct and the first purifier.

7. The laundry treating apparatus of claim 3,

wherein the second opening/closing unit comprises:

a second blocker configured to open and close the second intake duct; and

a second opening/closing driver configured to rotate the second blocker to thereby open and close the second intake duct by the second blocker.

8. The laundry treating apparatus of claim 7, wherein the second blocker comprises:

a second main body that extends in the left-right direction and defines second curved surfaces that are curved in the front-rear direction, wherein a length of the second main body in the left-right direction is greater than a width of the second main body in the front-rear direction; and

second sub-bodies that have a circular shape and are coupled to left and right ends of the second main body, and

wherein a thickness of a cross-section of the second main body increases toward a center of the second main body.

9. The laundry treating apparatus of claim 8, wherein the second opening/closing driver comprises a rotation shaft that extends in the left-right direction and is connected to one of the second sub-bodies.

10. The laundry treating apparatus of claim 8, wherein the second blocker further comprises a plurality of second reinforcing ribs that protrude from a convex surface among the second curved surfaces of the second main body,

wherein a portion of the second sub-bodies is disposed at the convex surface of the second main body and faces the plurality of second reinforcing ribs, and

wherein a size of each of the plurality of second reinforcing ribs is less than or equal to a size of the portion of the second sub-bodies disposed at the convex surface of the second main body.

11. The laundry treating apparatus of claim 7, wherein a length of the first blocker in the left-right direction is greater than a length of the second blocker in the left-right direction.

12. The laundry treating apparatus of claim 3, wherein the third opening/closing unit comprises:

a third blocker configured to open and close the first exhaust duct and the second exhaust duct; and

a third opening/closing driver configured to rotate the third blocker to open and close the first exhaust duct and the second exhaust duct.

13. The laundry treating apparatus of claim 12, wherein the first exhaust duct comprises a guide disposed inside the first exhaust duct and configured to limit rotation of the third blocker, the guide being configured to contact the third blocker based on the third blocker rotating into the first exhaust duct to close the first exhaust duct.

14. The laundry treating apparatus of claim 3, wherein the third opening/closing unit comprises:

a third blocker configured to open and close the first exhaust duct and the second exhaust duct; and

a third opening/closing driver configured to rotate the third blocker to (i) a first position at which the third blocker opens the first exhaust duct and closes the second exhaust duct to thereby define the first circulation path, (ii) a second position at which the third blocker opens the second exhaust duct and closes the first exhaust duct to thereby define the second circulation path, and (iii) a third position at which the third blocker opens a portion of each of the first exhaust duct and the second exhaust duct by a predetermined angle to thereby define both of the first circulation path and the second circulation path.

15. The laundry treating apparatus of claim 1, wherein the first opening/closing driver comprises a rotation shaft that extends in the left-right direction and is connected to one of the first sub-bodies.

16. The laundry treating apparatus of claim 1, wherein a thickness of a cross-section of the first main body increases toward a center of the first main body.

17. The laundry treating apparatus of claim 1, wherein the first blocker further comprises a plurality of first reinforcing ribs that protrude from a convex surface among the first curved surfaces of the first main body,

wherein a portion of the first sub-bodies is disposed at the convex surface of the first main body and faces the plurality of first reinforcing ribs, and

wherein a size of each of the plurality of first reinforcing ribs is less than or equal to a size of the portion of the first sub-bodies disposed at the convex surface of the first main body.

18. The laundry treating apparatus of claim 1, wherein the first exhaust duct defines a communication hole that is in fluid communication with the second exhaust duct,

wherein the connection duct is connected to the first exhaust duct, and

wherein the first exhaust duct is connected to the second exhaust duct through the communication hole.

19. The laundry treating apparatus of claim 18, further comprising a fan disposed in the first exhaust duct and configured to cause the air heat-exchanged through the heat exchanger to be discharged to the first exhaust duct or the second exhaust duct, and

wherein the communication hole is defined at a position above the fan.

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