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Bae et al.

(10) **Patent No.: US 12,392,081 B2**
(45) **Date of Patent: *Aug. 19, 2025**

(54) **LAUNDRY TREATING APPARATUS**

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

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 838 days.

This patent is subject to a terminal disclaimer.

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(22) Filed: **Feb. 8, 2022**

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(30) **Foreign Application Priority Data**

Feb. 8, 2021 (KR) 10-2021-0017560

(51) **Int. Cl.**
D06F 58/24 (2006.01)
D06F 58/04 (2006.01)
D06F 58/20 (2006.01)

(52) **U.S. Cl.**
CPC ***D06F 58/24*** (2013.01); ***D06F 58/04*** (2013.01); ***D06F 58/206*** (2013.01)

(58) **Field of Classification Search**
CPC D06F 58/24; D06F 58/04; D06F 58/206
USPC 34/73
See application file for complete search history.

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Primary Examiner — Stephen M Gravini
(74) *Attorney, Agent, or Firm* — Fish & Richardson P.C.

(57) **ABSTRACT**

A laundry treating apparatus includes a cabinet, a drum, the base, and a motor. The base is disposed under the drum to provide a space in which air inside the drum circulates. The motor is disposed in rear of the drum and disposed spaced apart from the base, and provides power to rotate the drum. The base includes an air circulating channel, a heat exchanger, a water collector body, a pump, a cleaning water channel, and a nozzle cover. The cleaning water channel is disposed on a top face of the air circulating channel, and receives water from the pump, and discharges the received water to the first heat exchanger. The nozzle cover is coupled to the top face of the circulating channel so as to shield the cleaning water channel.

20 Claims, 25 Drawing Sheets

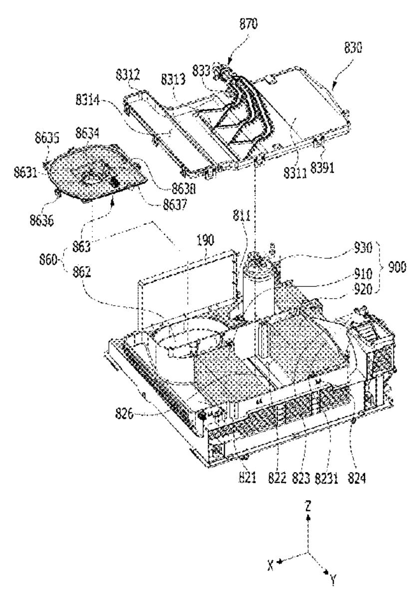

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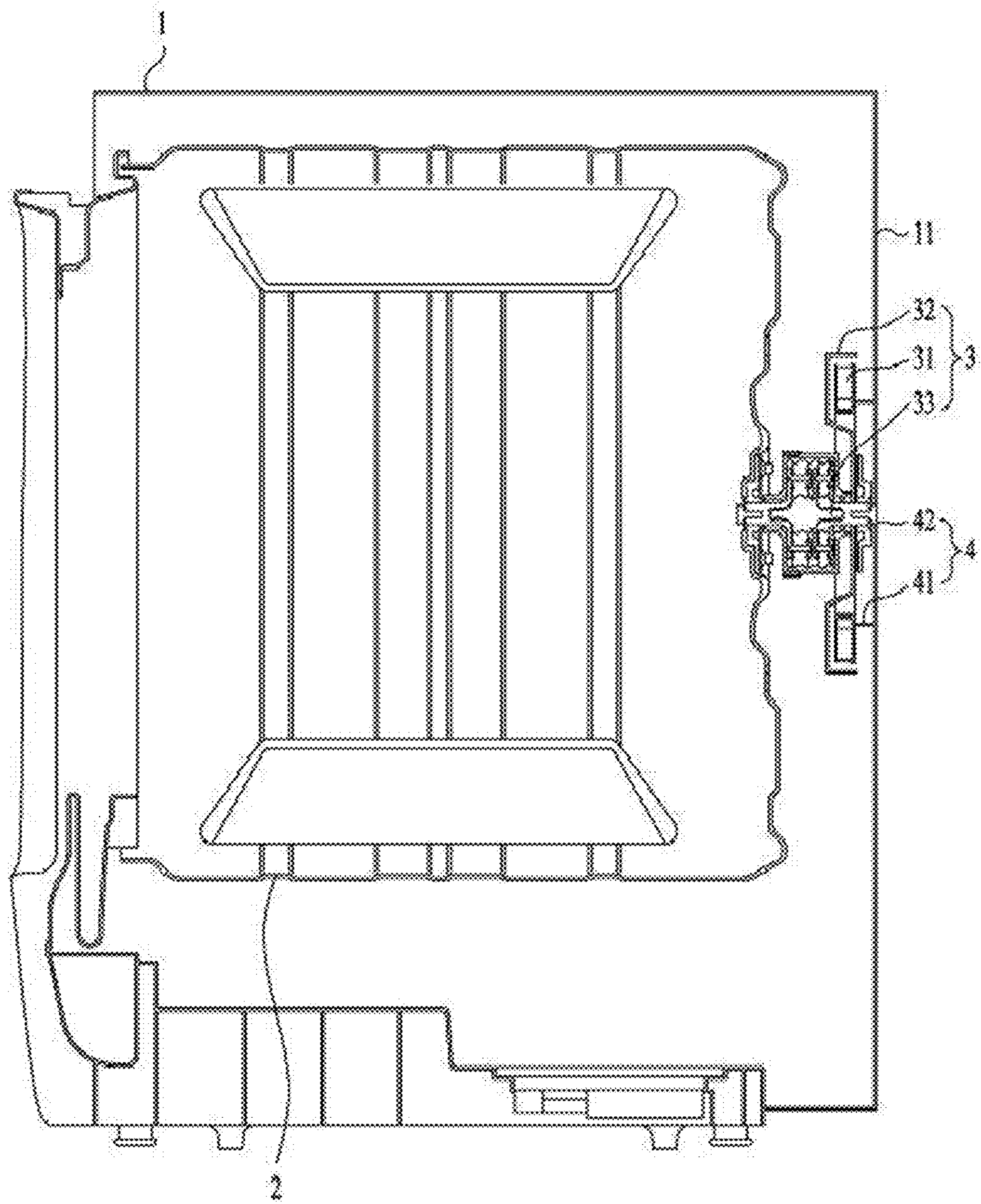
FIG. 1



Related art

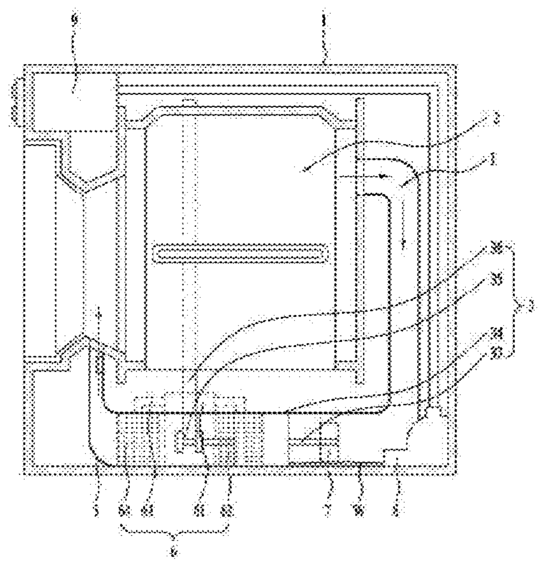


FIG. 2A

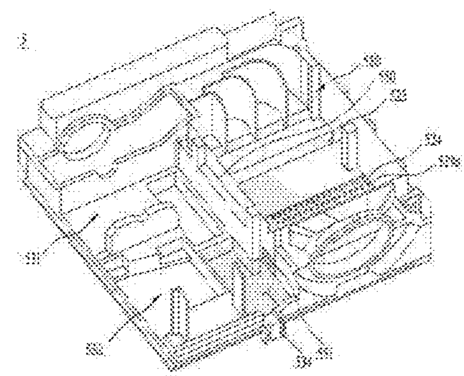


FIG. 2B

Related art

FIG. 3

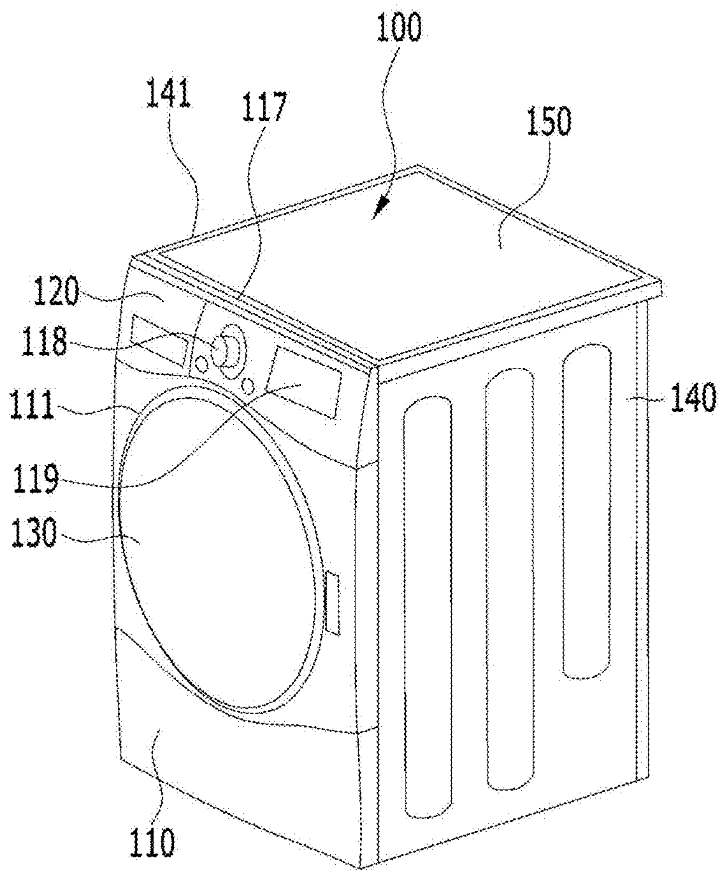
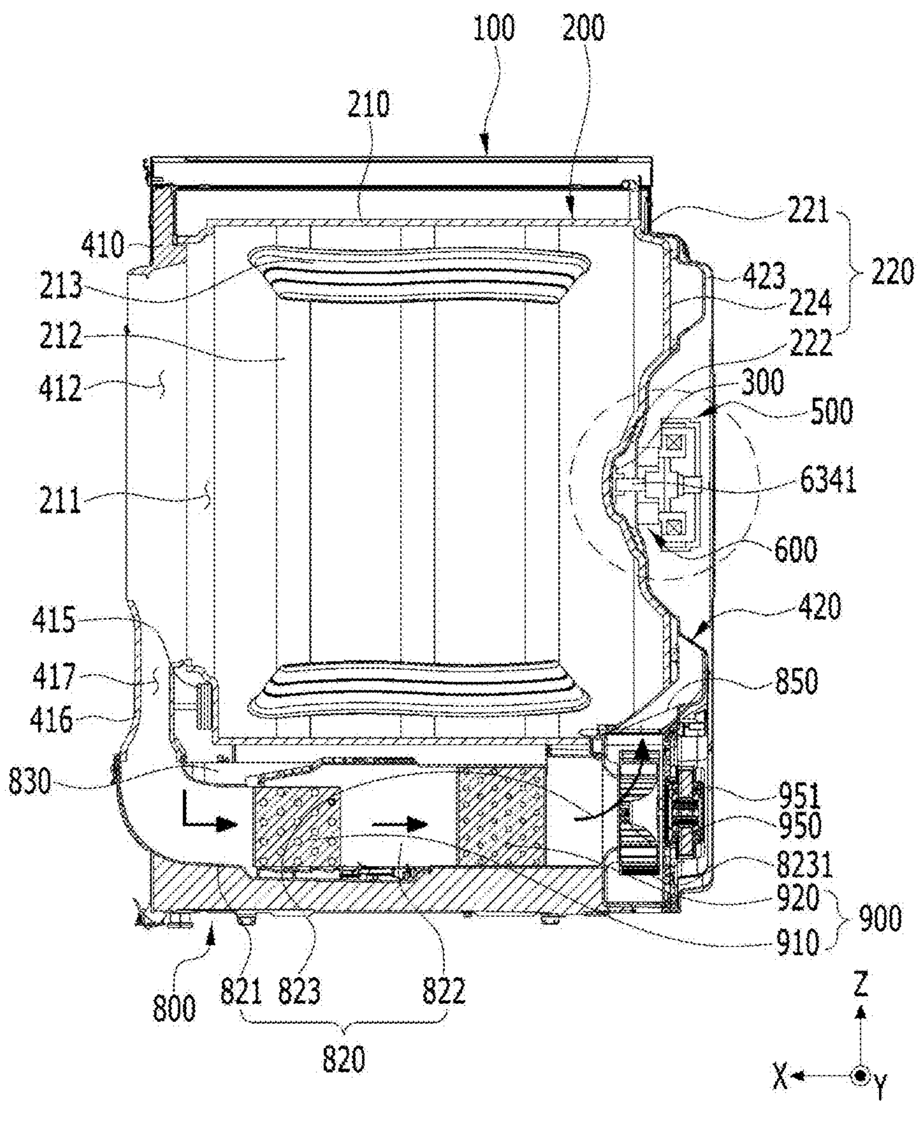


FIG. 4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224
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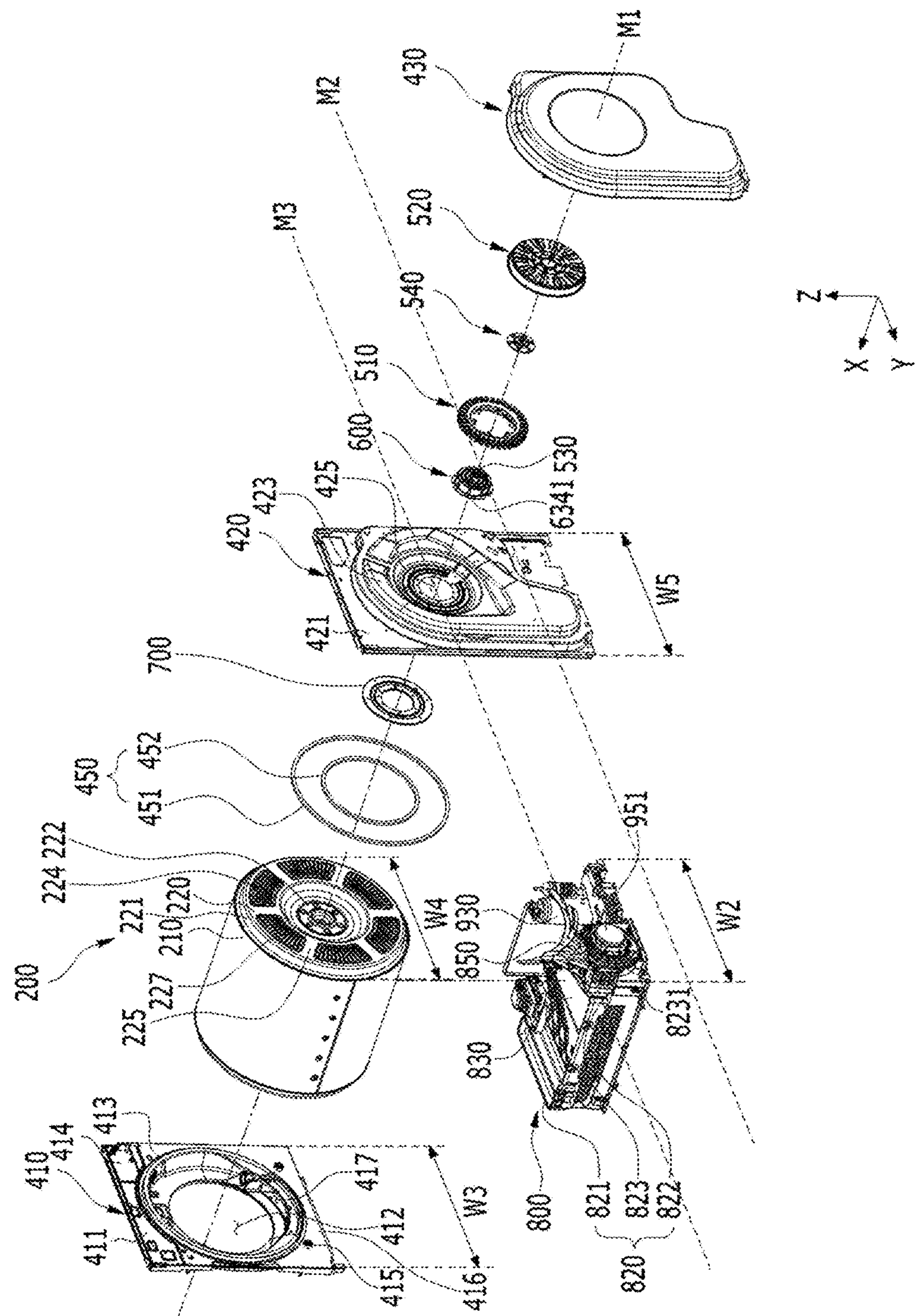
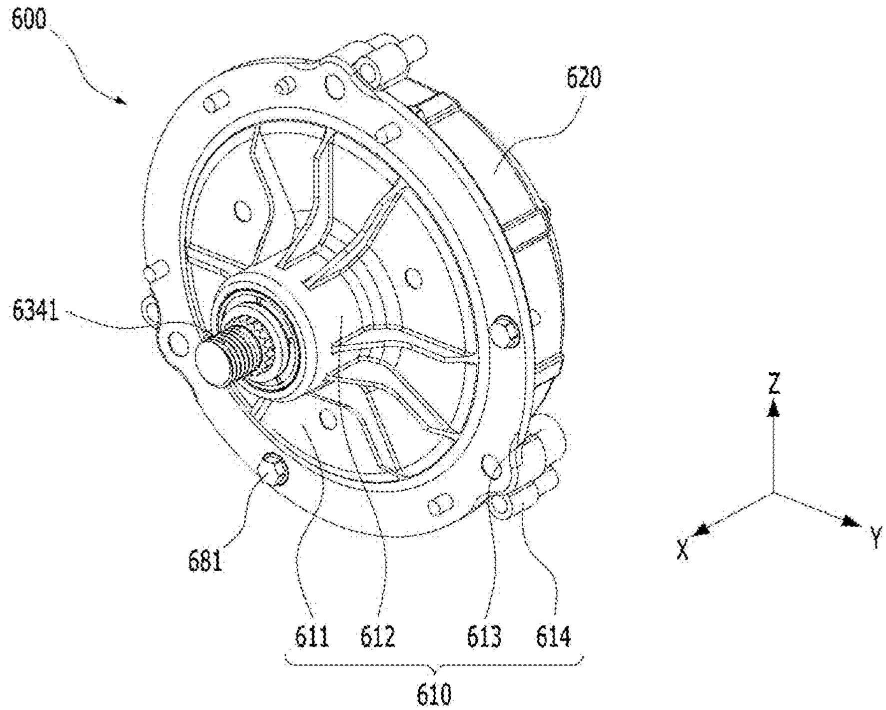
412
300
500
6341
211
600
415
420
417
850
416
830
951
950
8231
920
900
910
800
821
823
822
820
Z
X
Y

FIG. 5



M1
430
M2
520
540
M3
510
600
530
6341
425
423
420
421
W5
700
450
452
451
224 222
221 220
210
227
225
200
W4
850 930
951
W2
8231
830
800
821
823
822
820
413
414
410
411
417
412
415
416
W3
Z
X
Y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6341
681
611
612
613
614
610
Z
X
Y

FIG. 6A

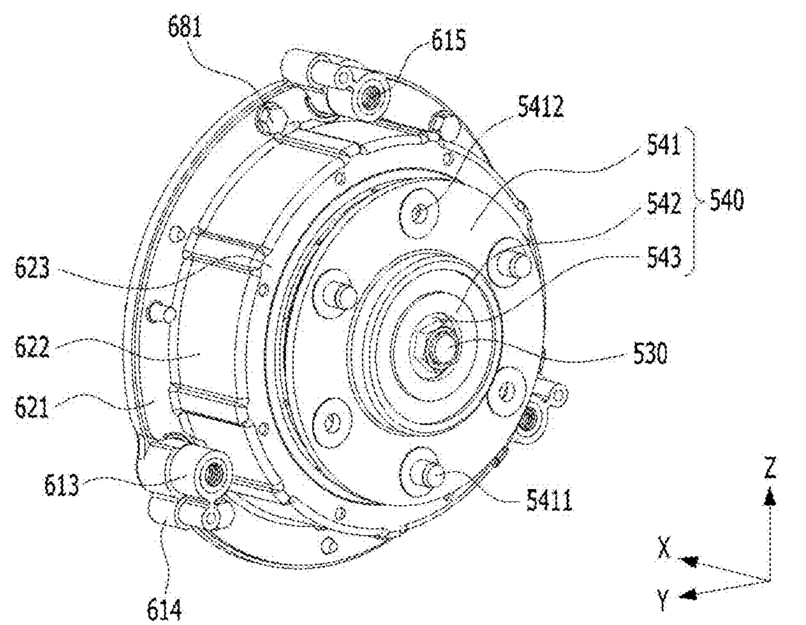
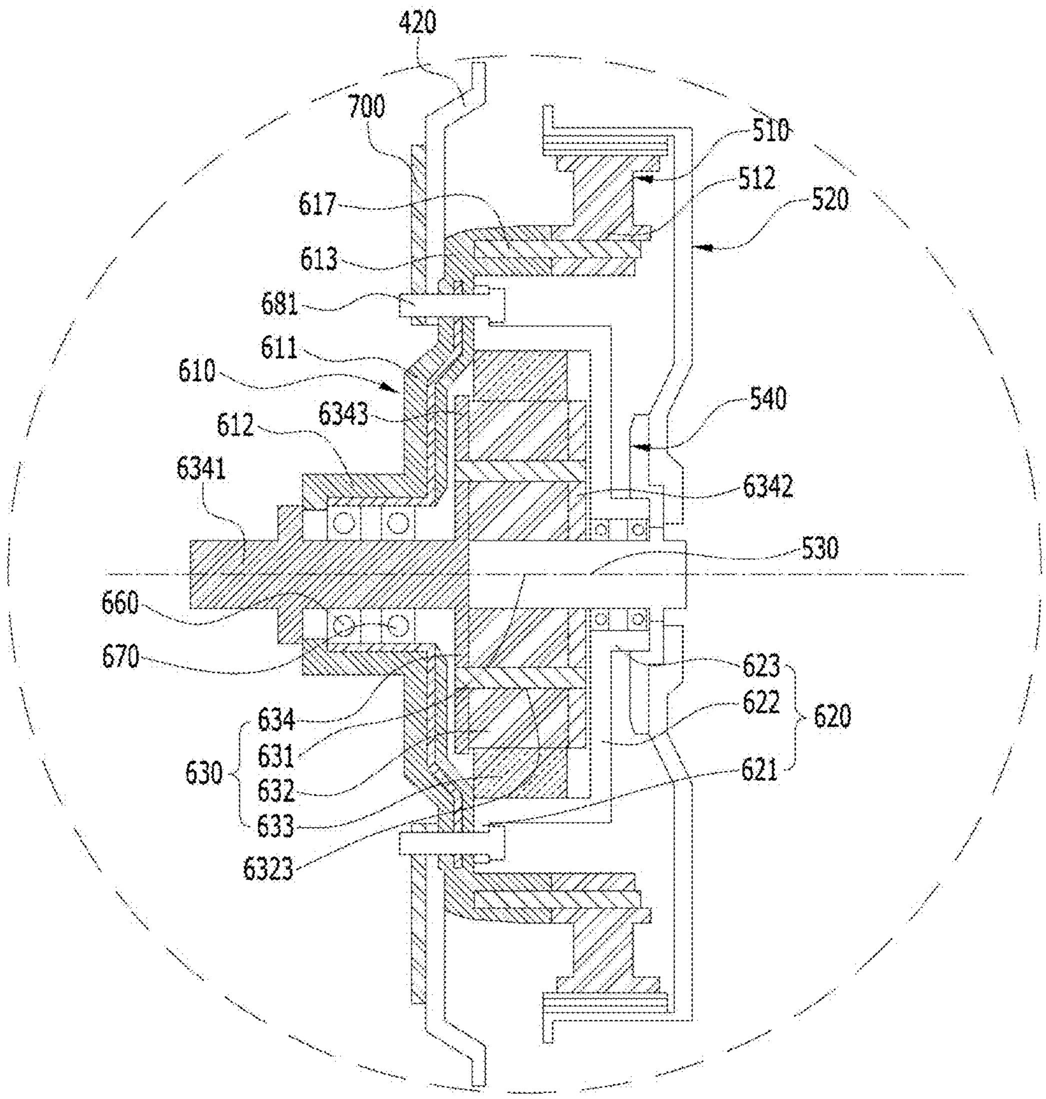

681
615
5412
541
542
543
540
623
622
621
530
613
5411
614
Z
X
Y

FIG. 6B

FIG. 7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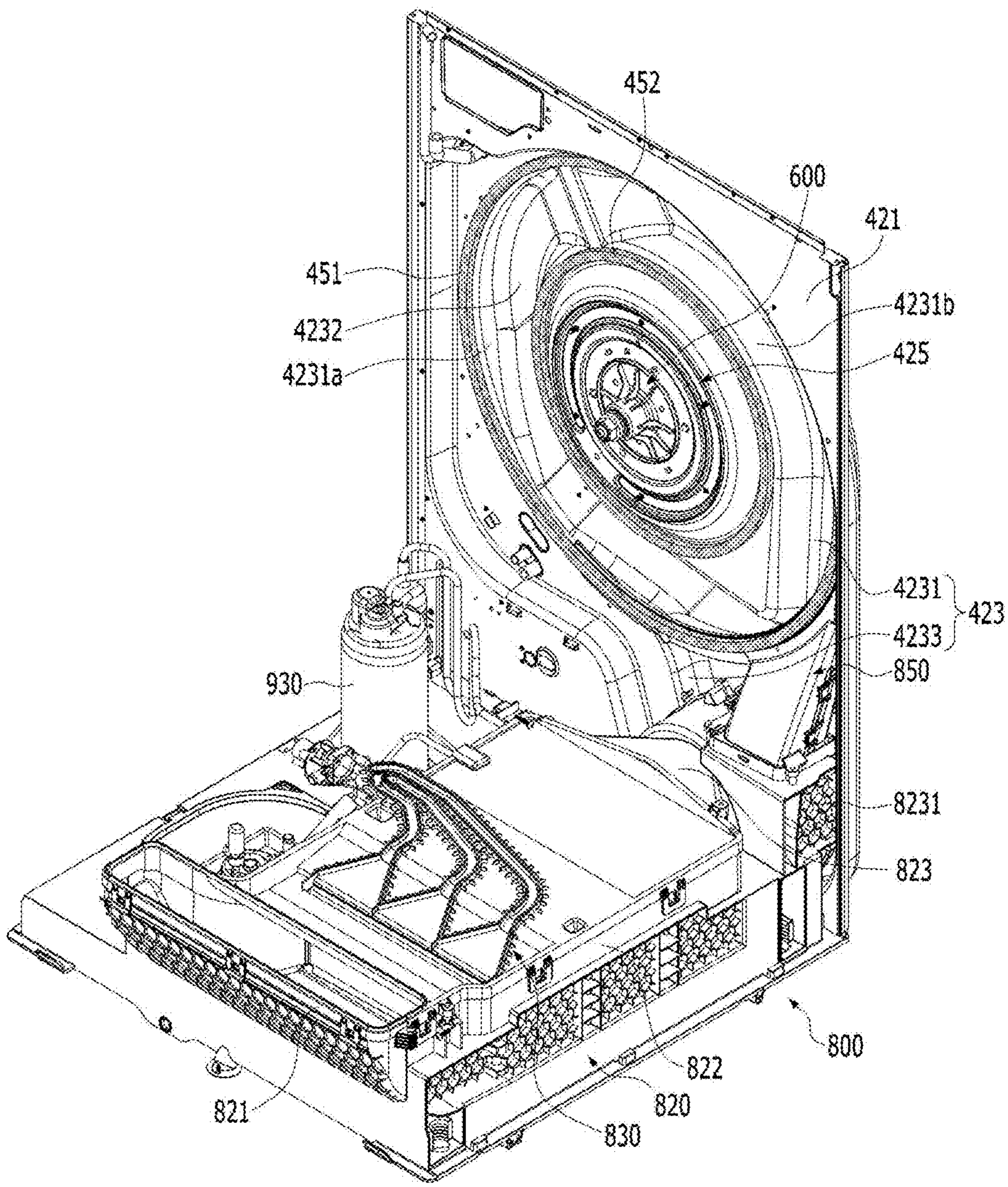
700
510
512
520
617
613
681
611
610
6343
540
612
6341
6342
530
660
670
623
622
620
634
631
630
632
621
633
6323

FIG. 8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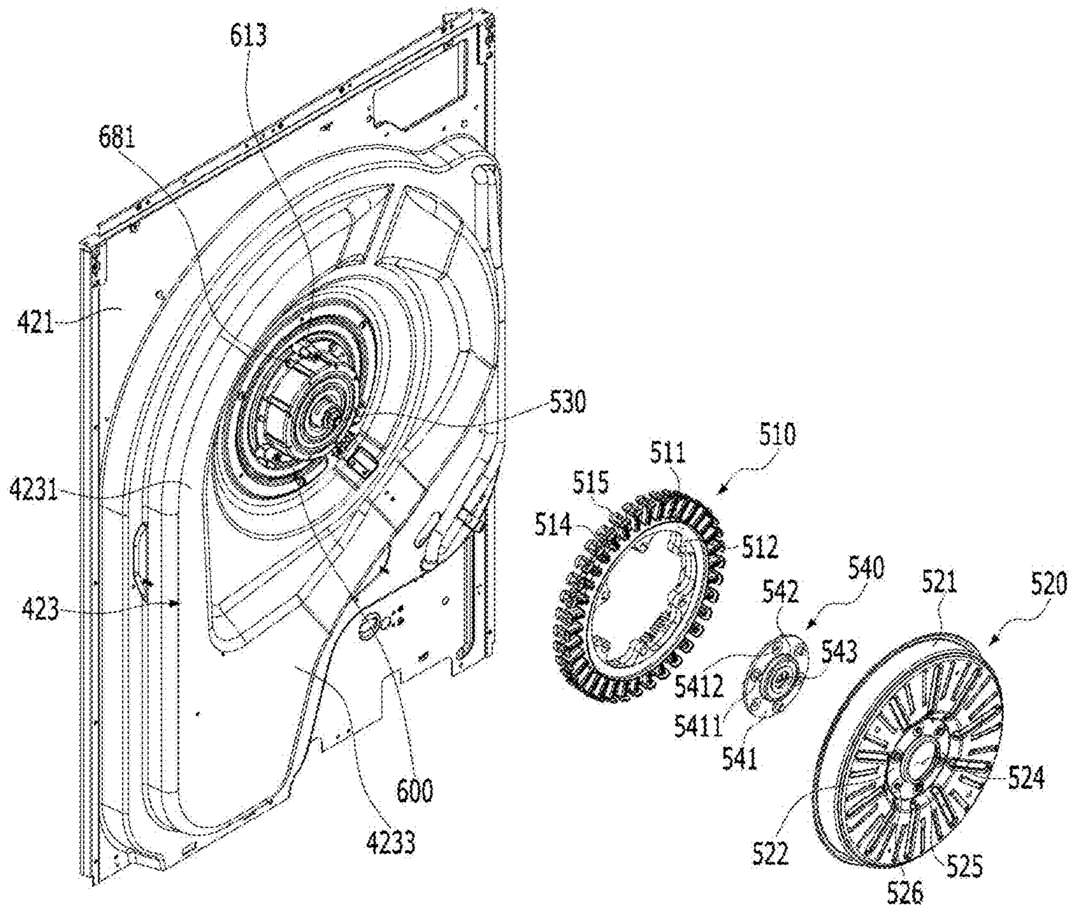
421
451
4232
4231b
425
4231a
4231
423
4233
850
930
8231
823
800
822
820
821
830

FIG. 9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681
421
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510
511
515
514
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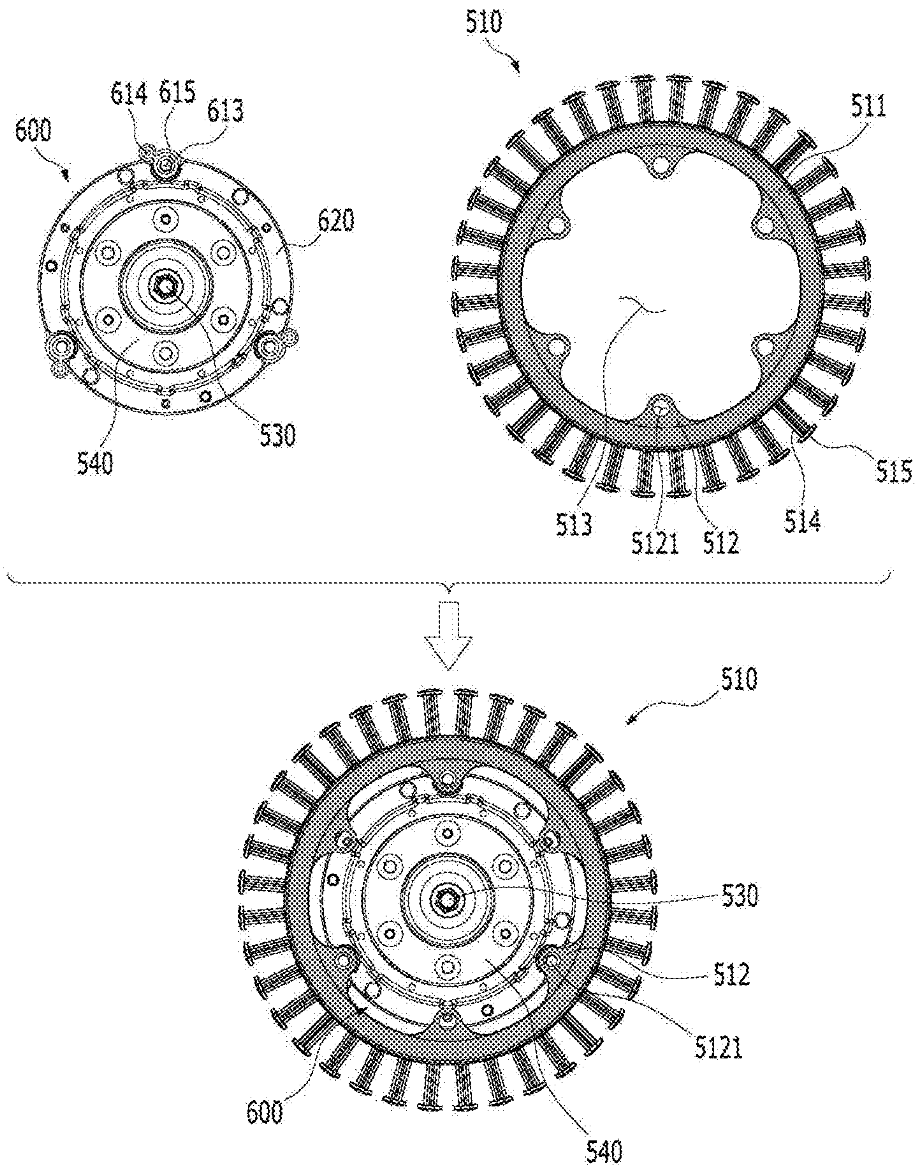
4231
540
542
521
520
423
543
5412
5411
541
524
600
4233
522
525
526

FIG. 10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514
510
530
512
5121
600
540

FIG. 11

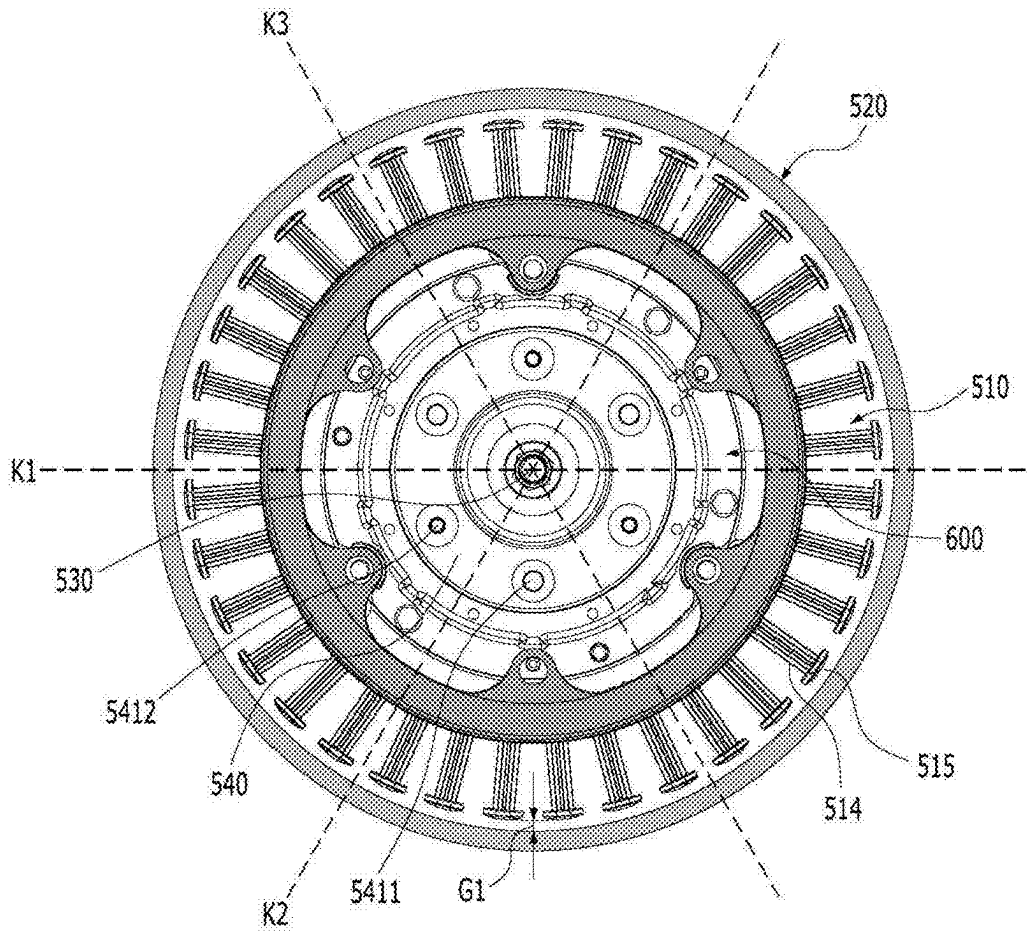


FIG. 12

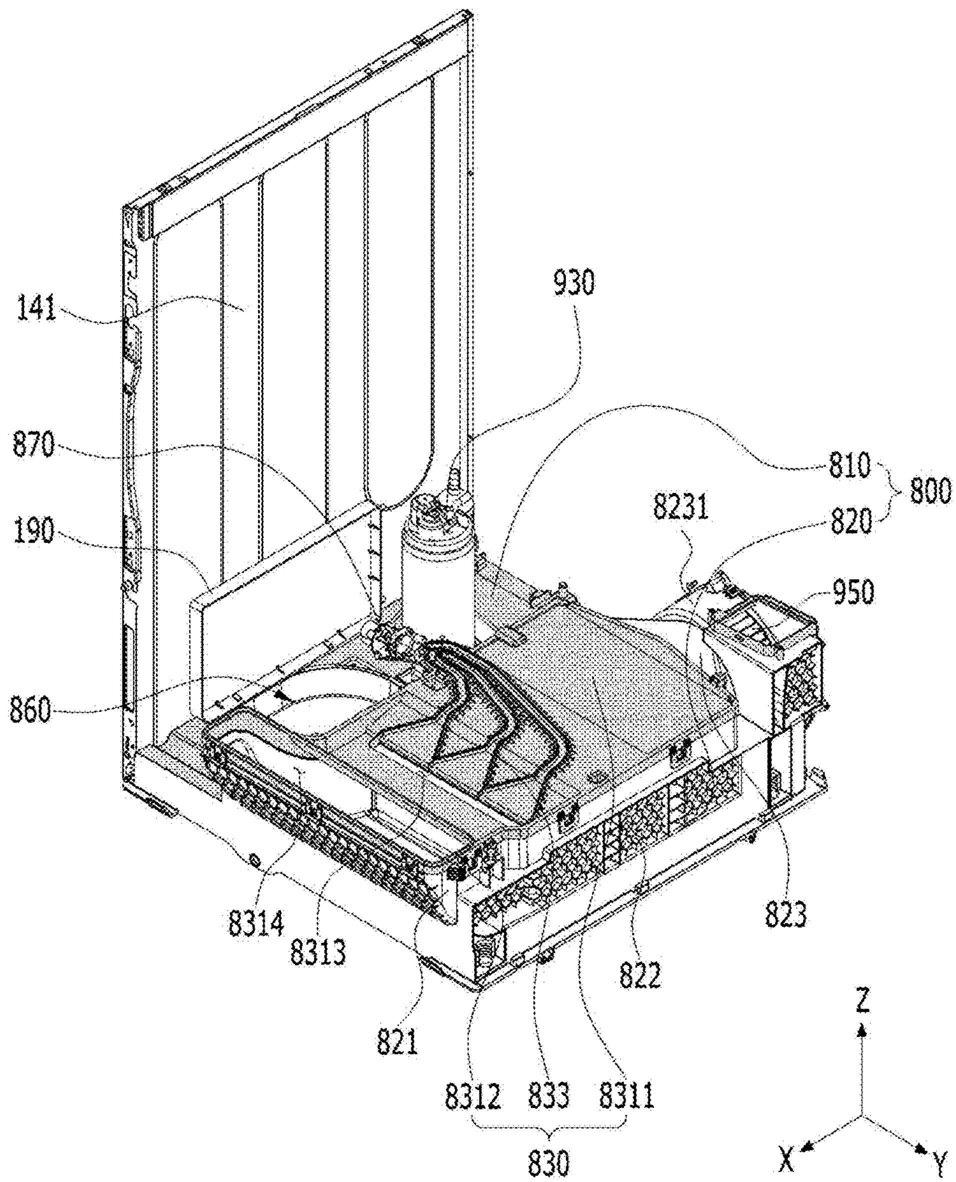
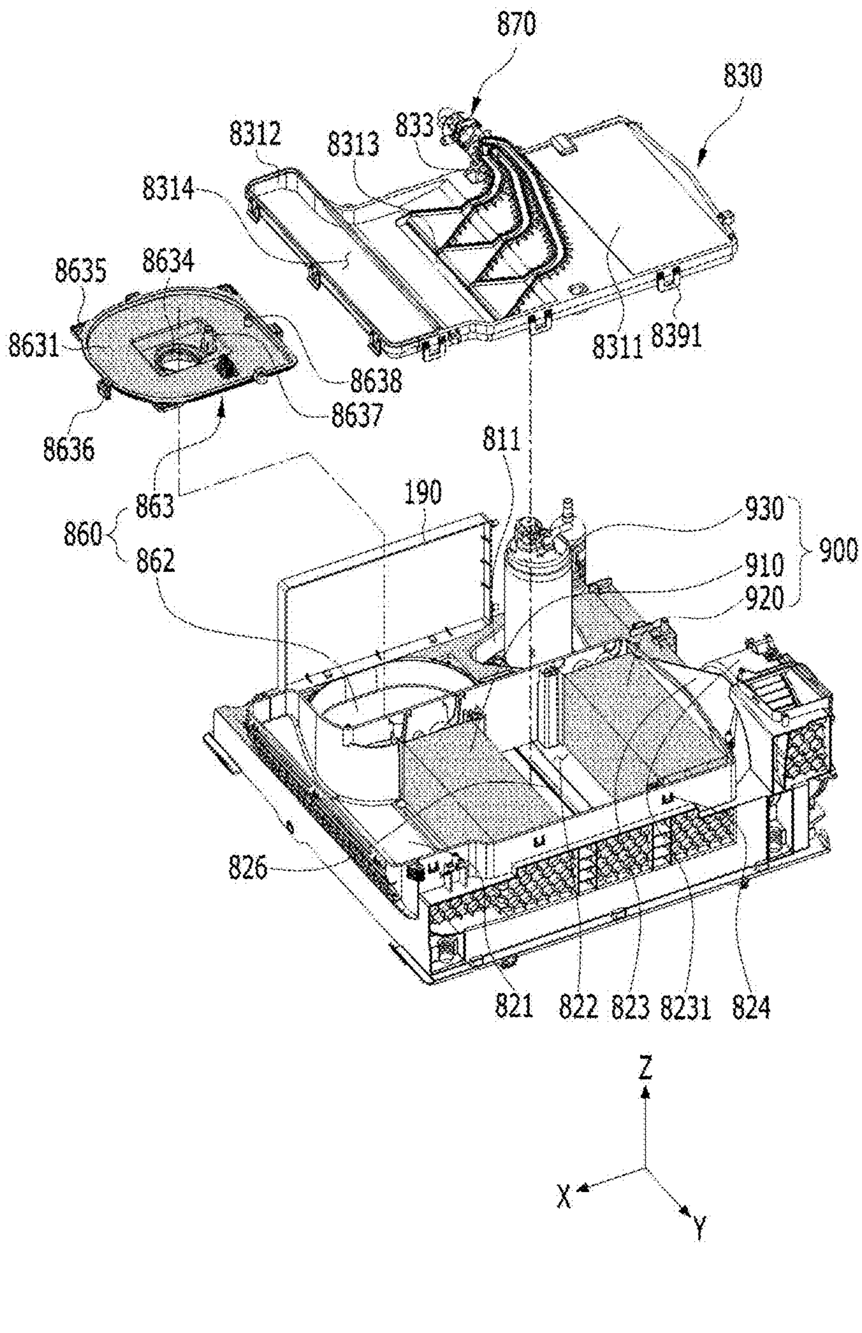
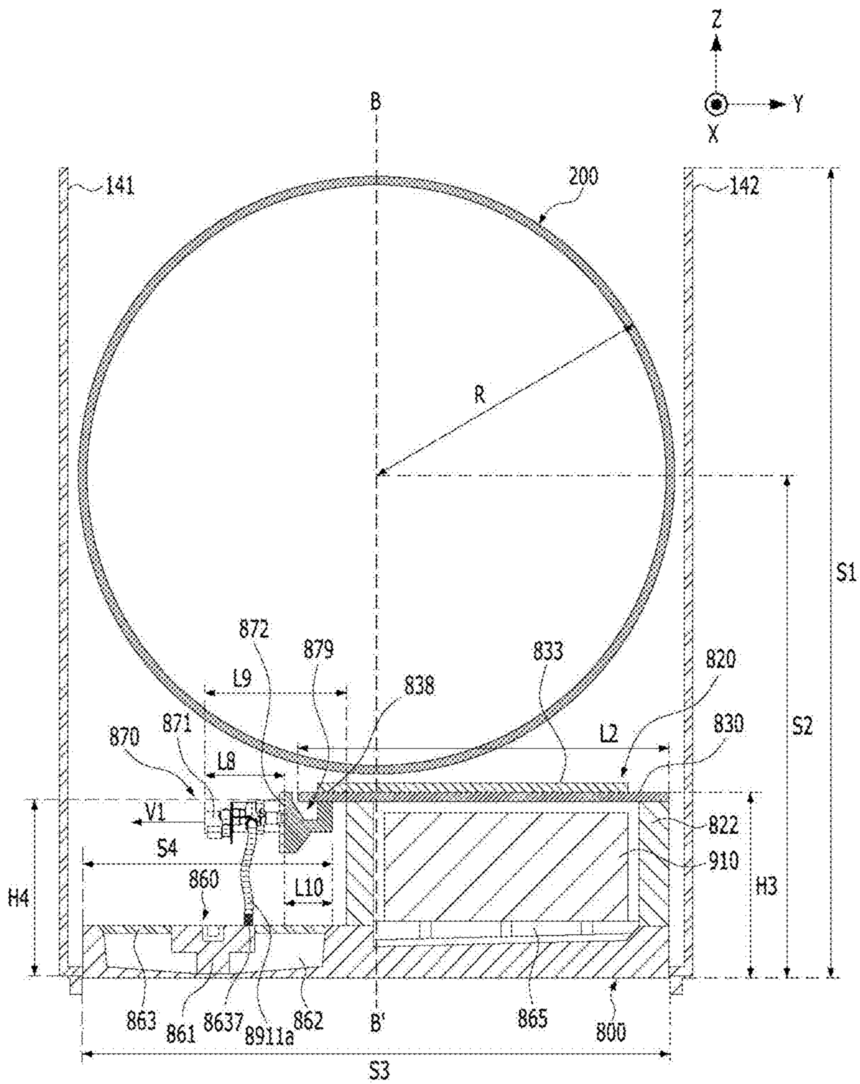

141
870
190
860
930
810
800
820
8231
950
823
822
8314
8313
821
8312
833
8311
830
Z
X
Y

FIG. 13



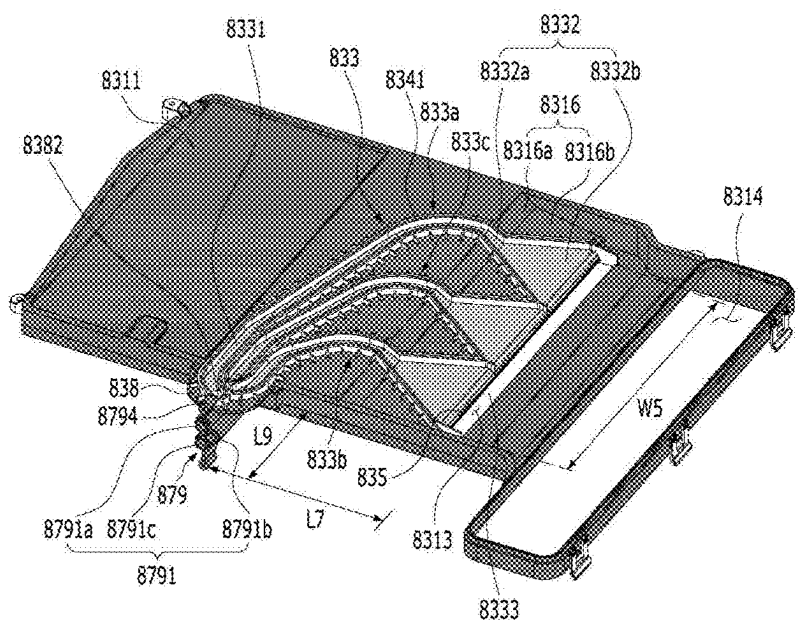
870
830
833
8312
8313
8314
8634
8635
8631
8638
8637
8636
8311
8391
811
190
863
860
862
930
910
920
900
826
821
822
823
8231
824
Z
X
Y

FIG. 14



Z
Y
X
B
141
142
200
R
S1
S2
872
879
833
820
L9
838
830
870
871
L2
L8
V1
822
910
S4
H4
860
L10
H3
863
861
8637
8911a
862
B'
865
800
S3

FIG. 15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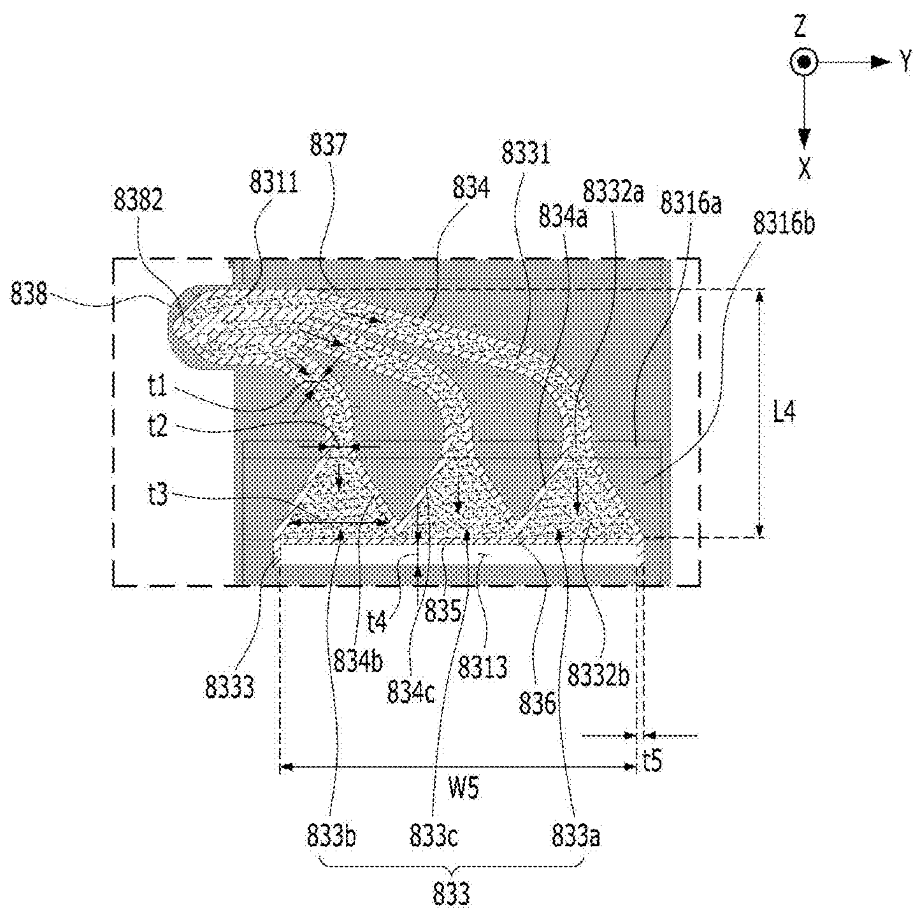
833
8341
8332
8332a
8332b
8316
8316a
8316b
833a
833c
8311
8382
8314
838
8794
W5
L9
833b
835
879
8313
8791a
8791c
8791b
L7
8791
8333

FIG. 16


Z
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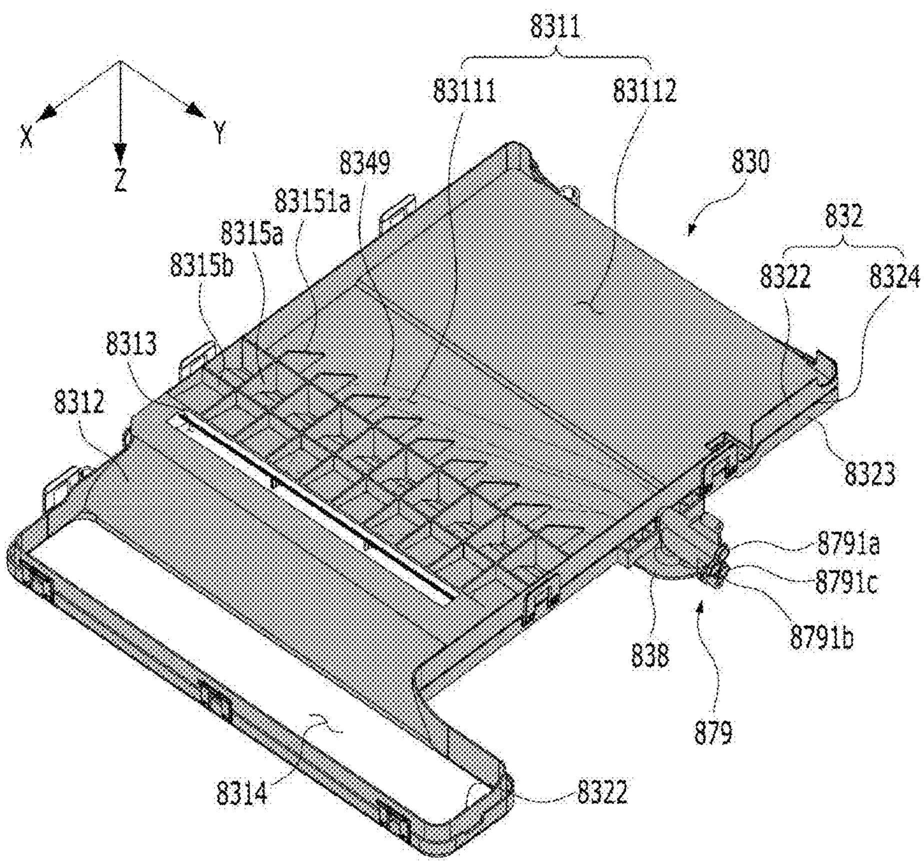
8382
834a
8316a
8316b
838
t1
t2
L4
t3
t4
835
834b
8313
8333
834c
836
8332b
t5
W5
833b
833c
833a
833

FIG. 17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8323
8791a
8791c
8791b
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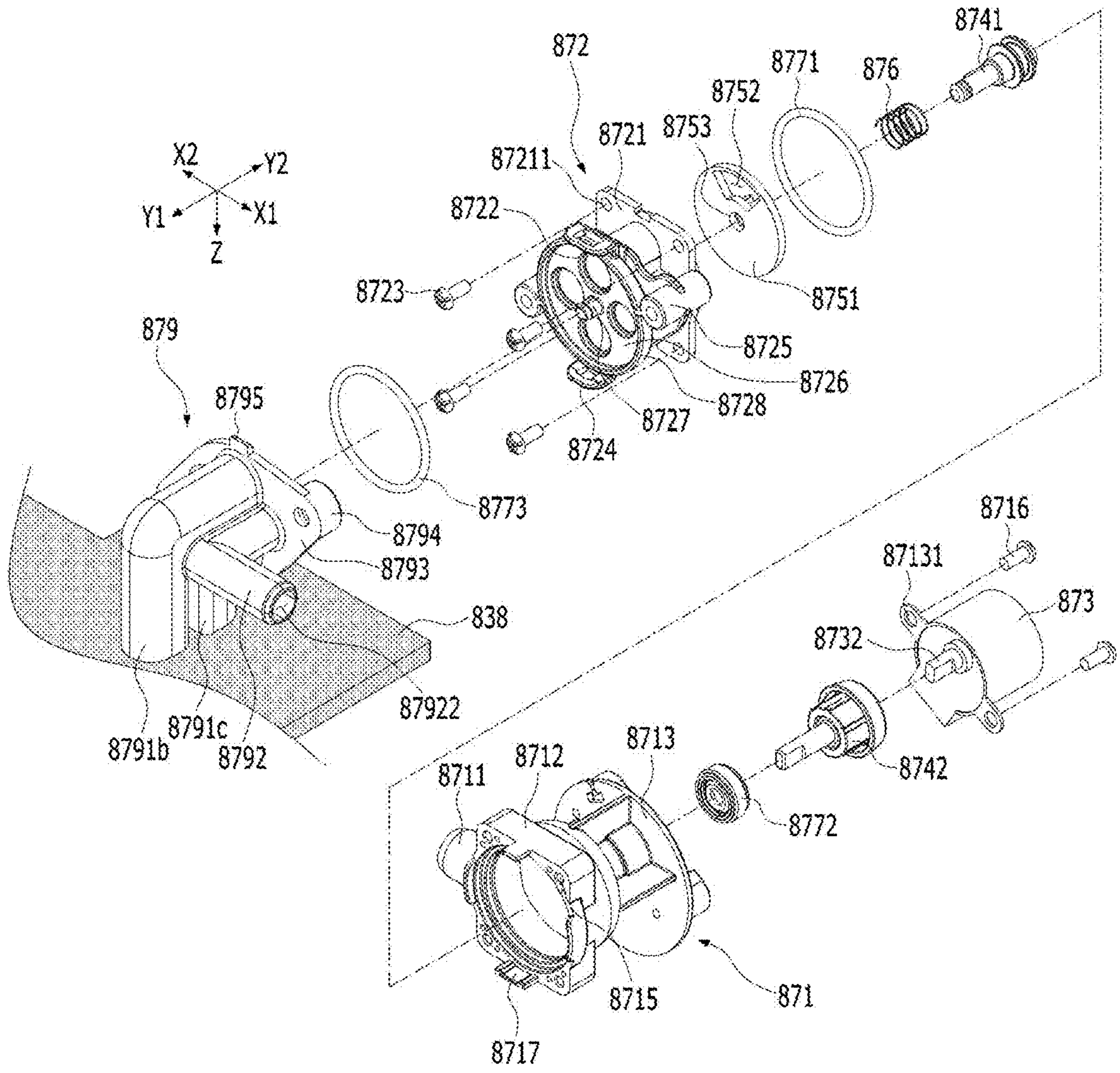
8314
8322

FIG. 18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8753
87211
X2
Y2
Y1
X1
Z
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8725
8726
8795
8728
8727
8724
8773
8794
8793
8716
87131
873
838
8732
87922
8791b
8791c
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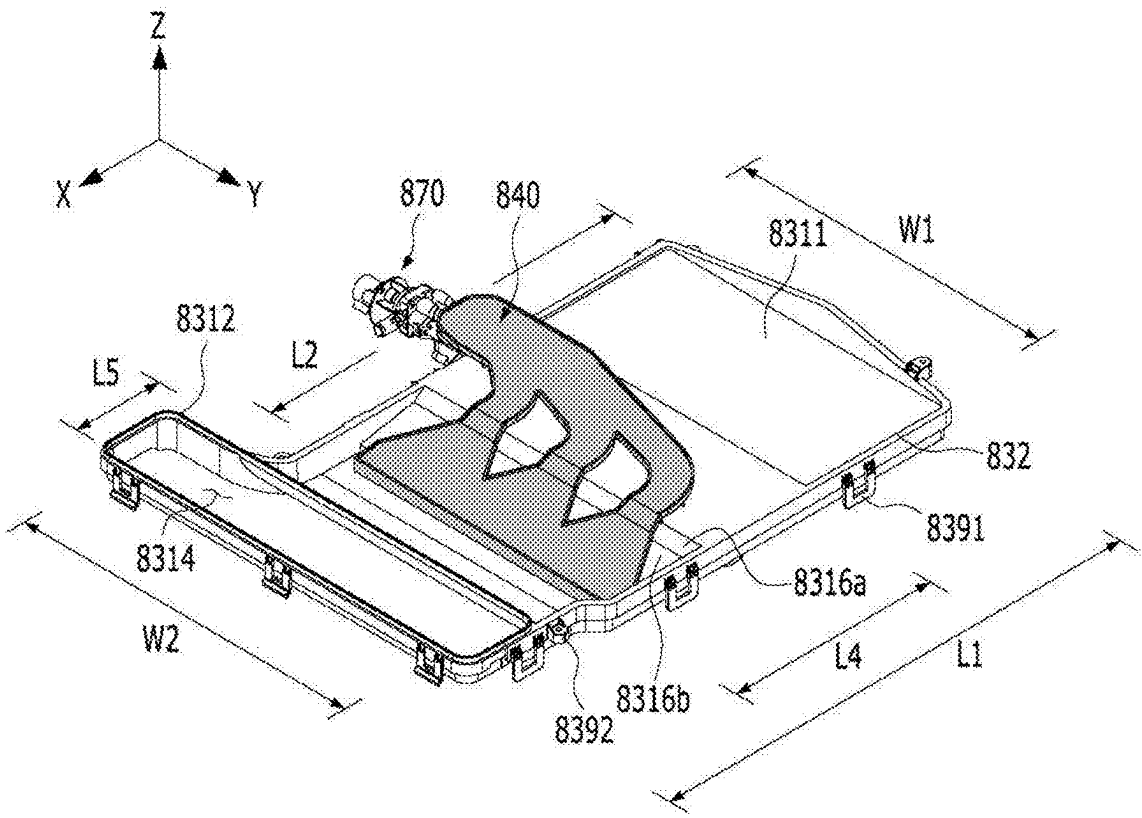
8712
8742
8711
8772
8715
871
8717

FIG. 19



Z
X
Y
870
840
8311
W1
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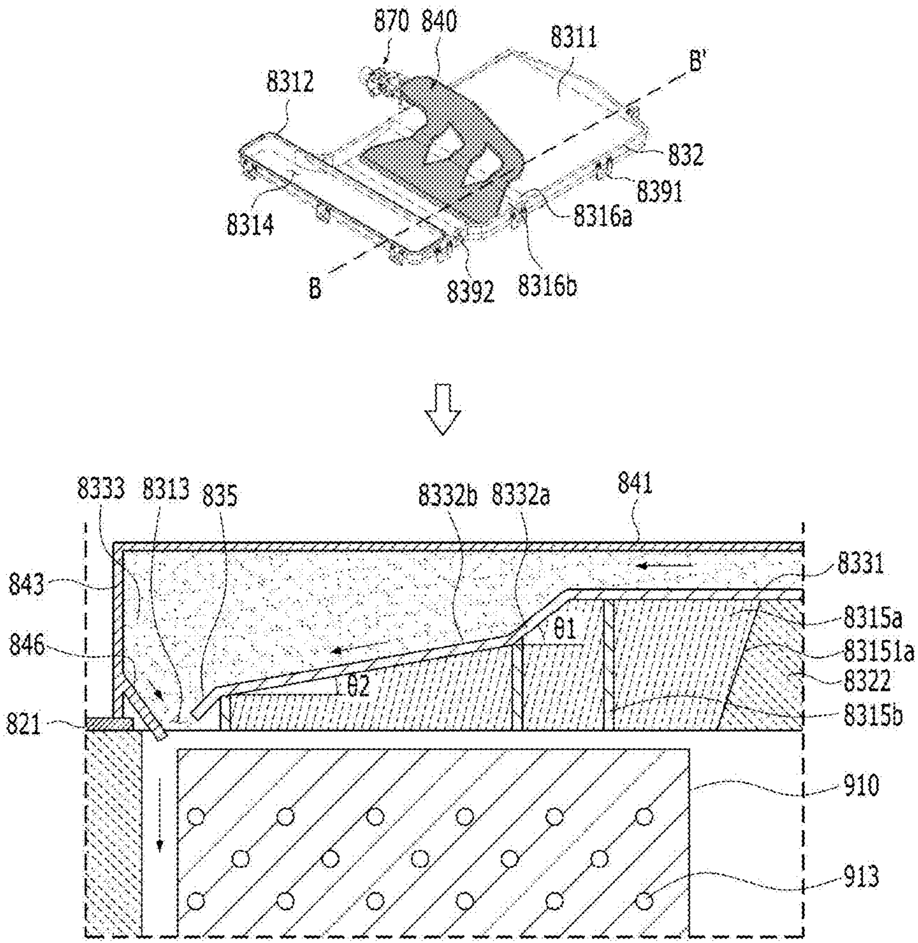
L2
L5
832
8391
8314
8316a
W2
L4
L1
8316b
8392

FIG. 20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8314
B
8392
8316b
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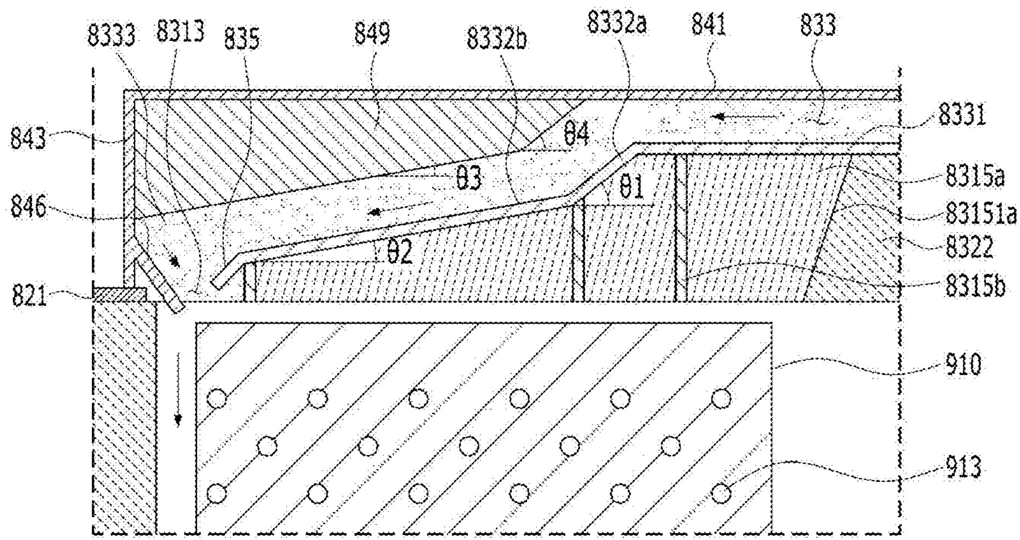
835
8332b
8332a
841
843
8331
8315a
θ1
83151a
846
θ2
8322
8315b
821
910
913

FIG. 21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8332b
8332a
841
833
8331
843
θ4
θ3
8315a
θ1
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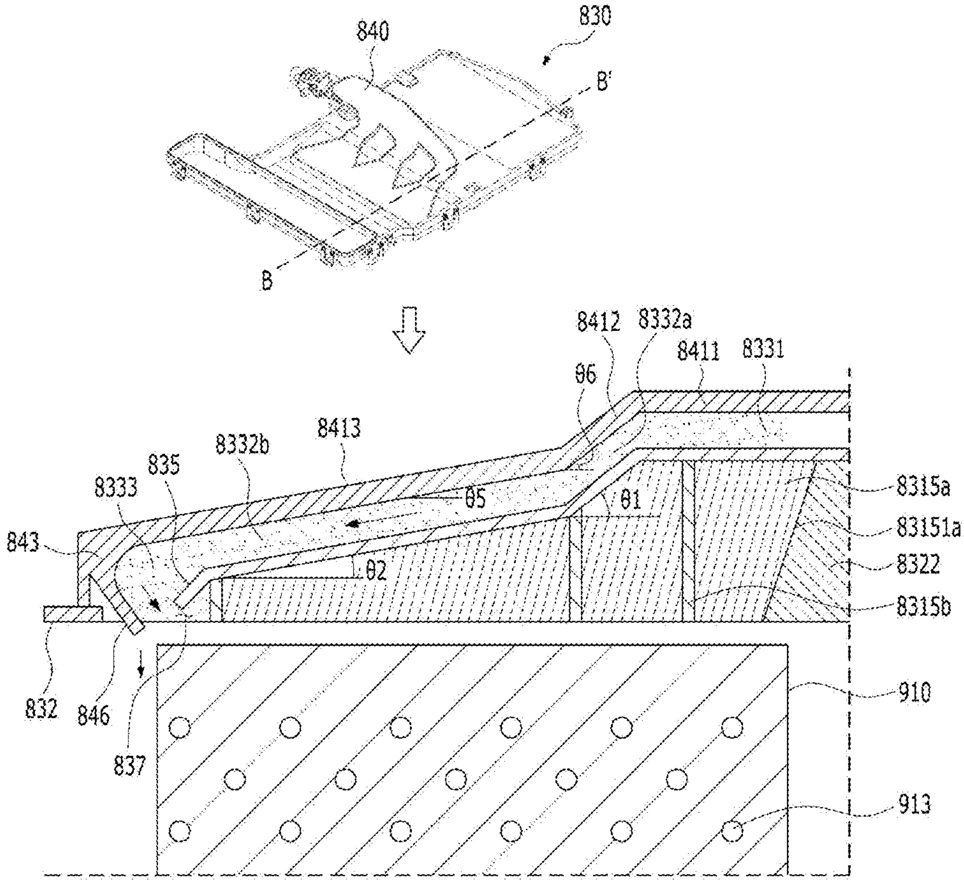
83151a
θ2
8322
821
8315b
910
913

FIG. 22


840
830
B'
B
8412
8332a
8411
8331
θ6
8413
8332b
835
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θ5
θ1
8315a
83151a
843
θ2
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8315b
832
846
837
910
913

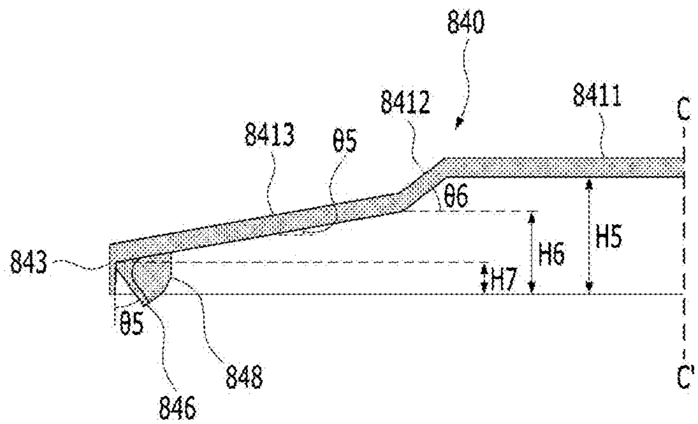


FIG. 23A

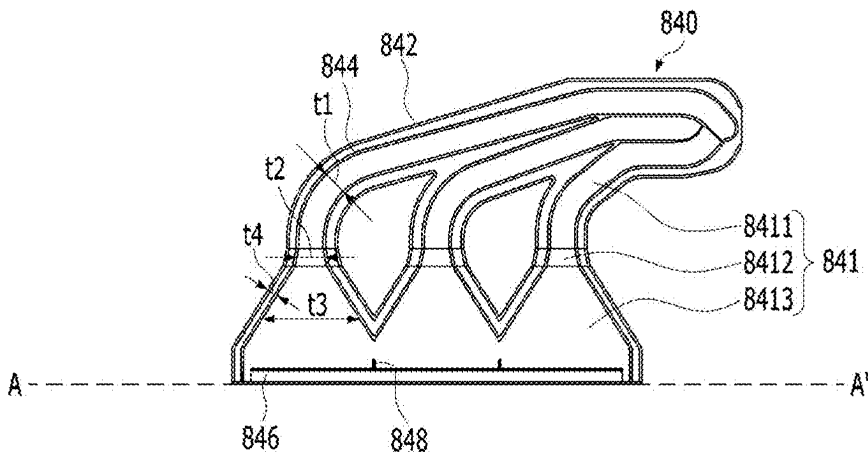


FIG. 23B

FIG. 24

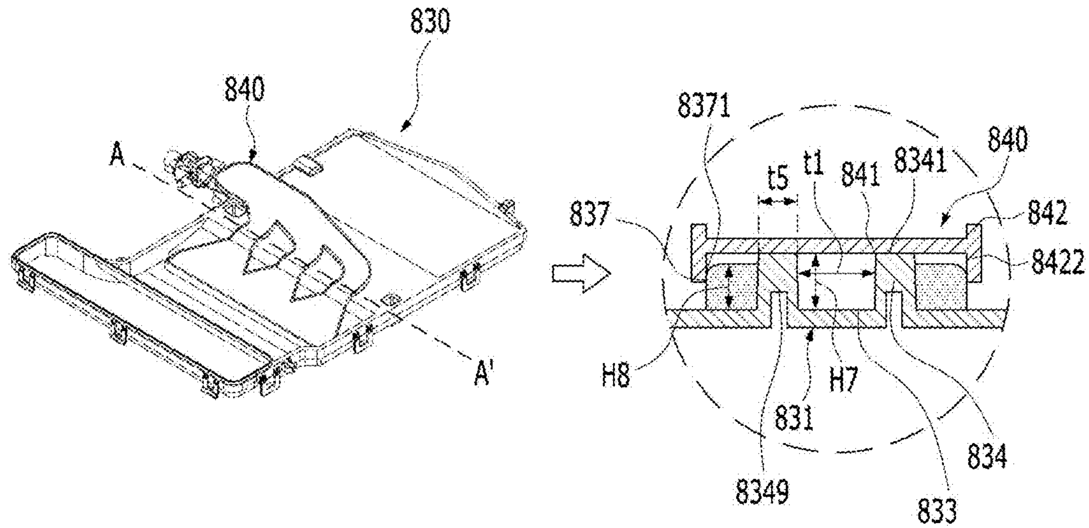
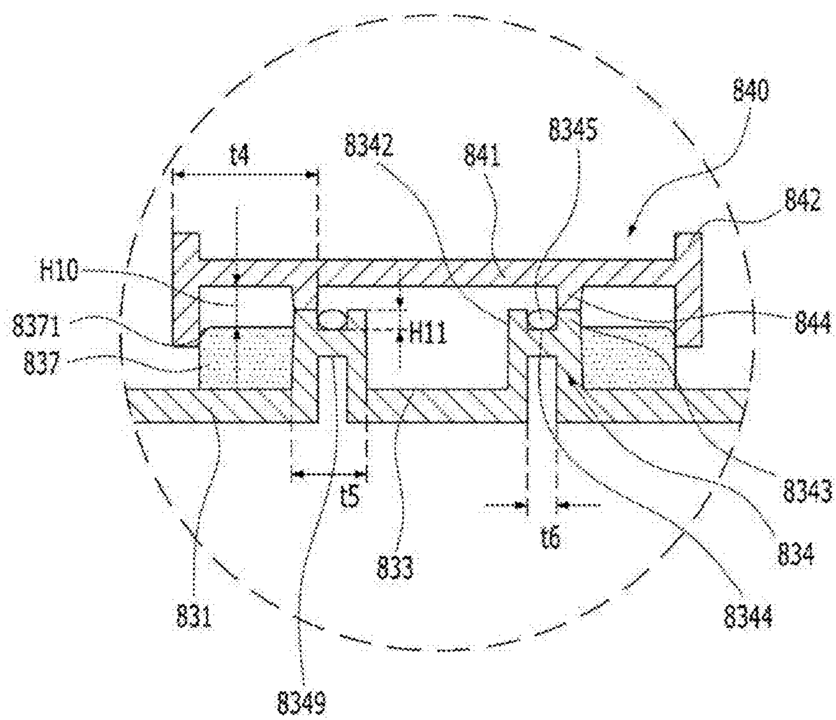

830
840
A
A'
8371
t5
t1
841
8341
840
842
837
8422
H8
H7
831
834
8349
833

FIG. 25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t4
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8343
t5
t6
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833
831
8344
8349

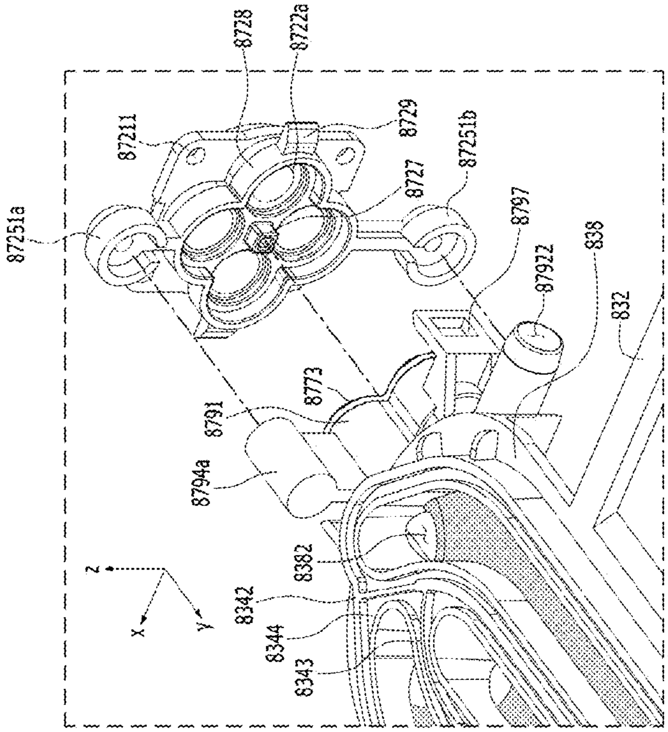


FIG. 26B

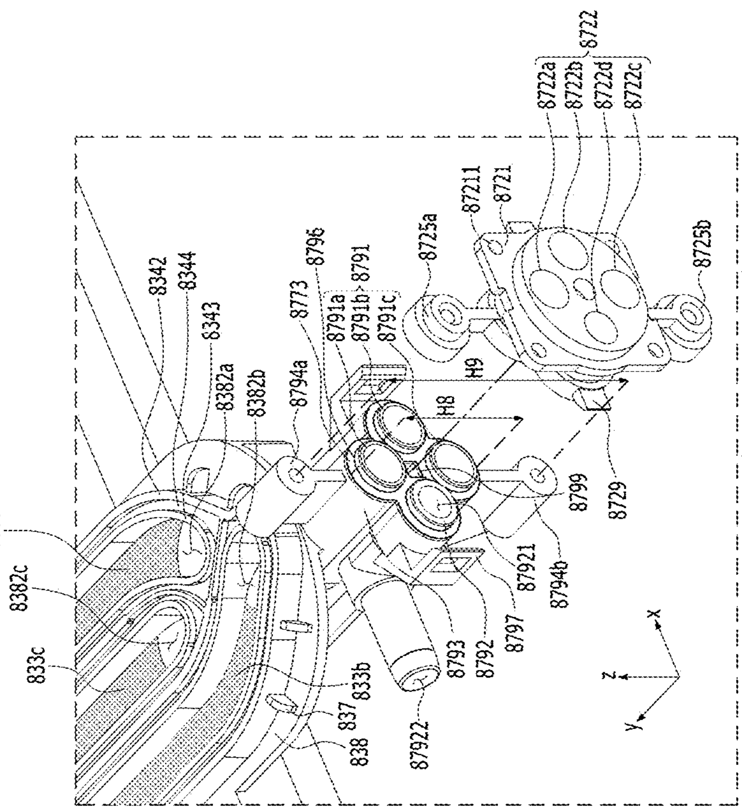
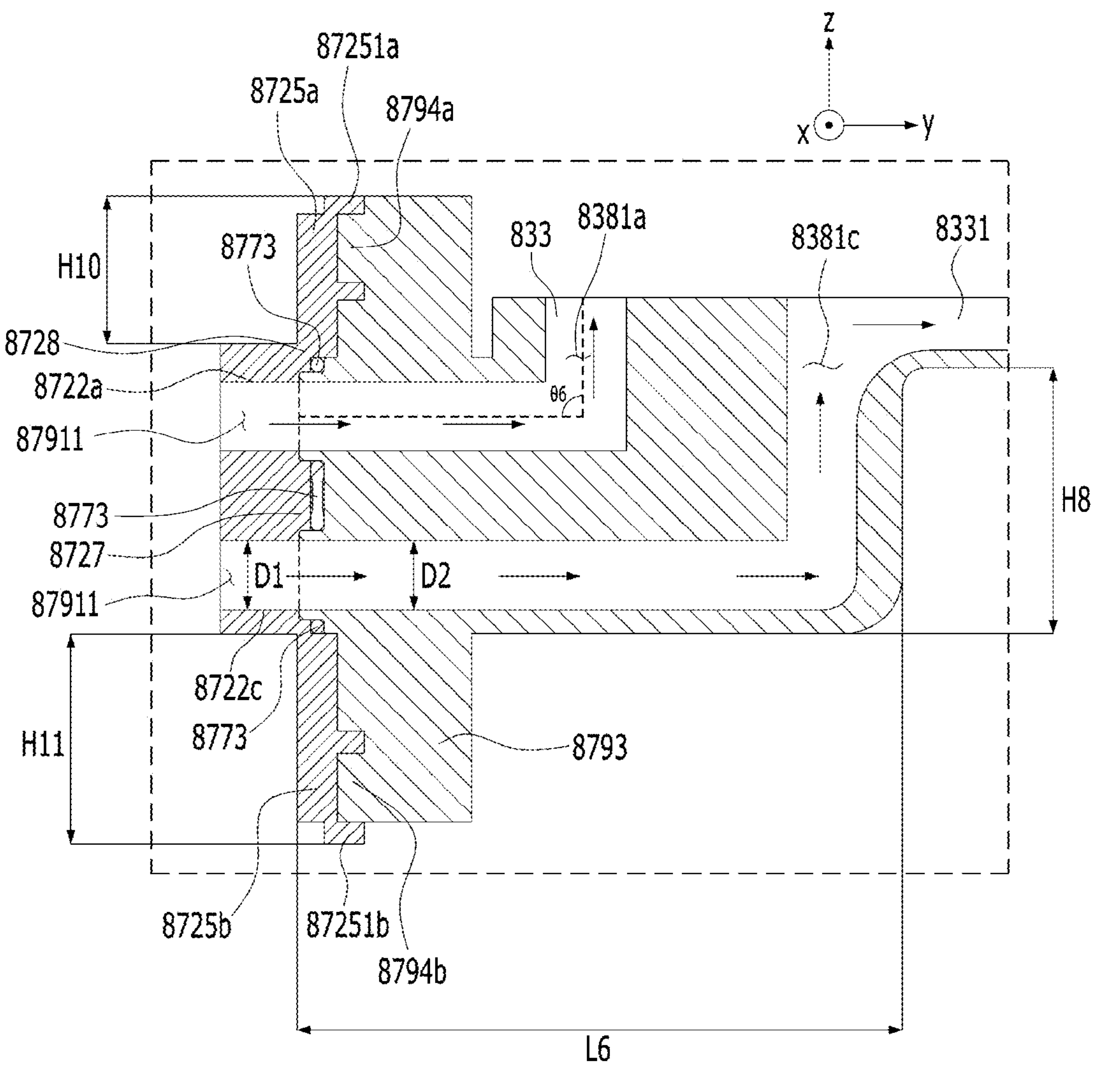


FIG. 26A

FIG. 27



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x
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8381a
8381c
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H10
8728
8722a
θ6
87911
8773
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H8
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D1
D2
8722c
8773
H11
8793
8725b
87251b
8794b
L6

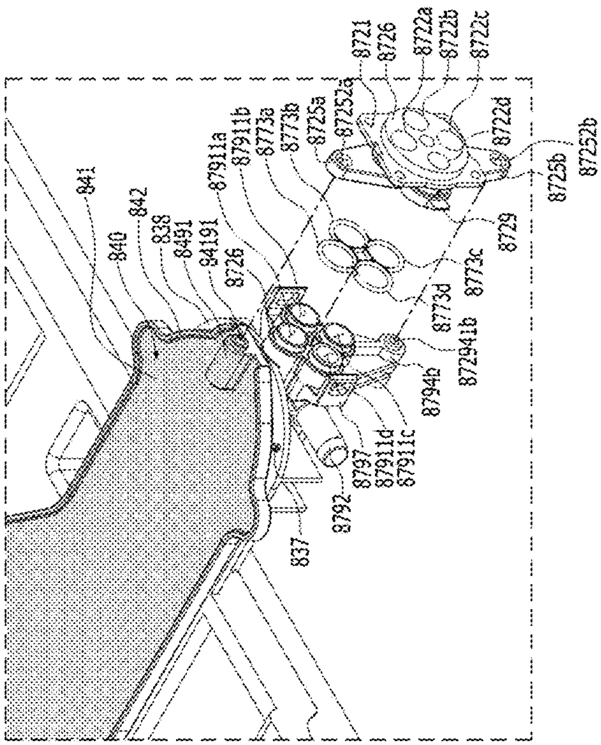

FIG. 28B

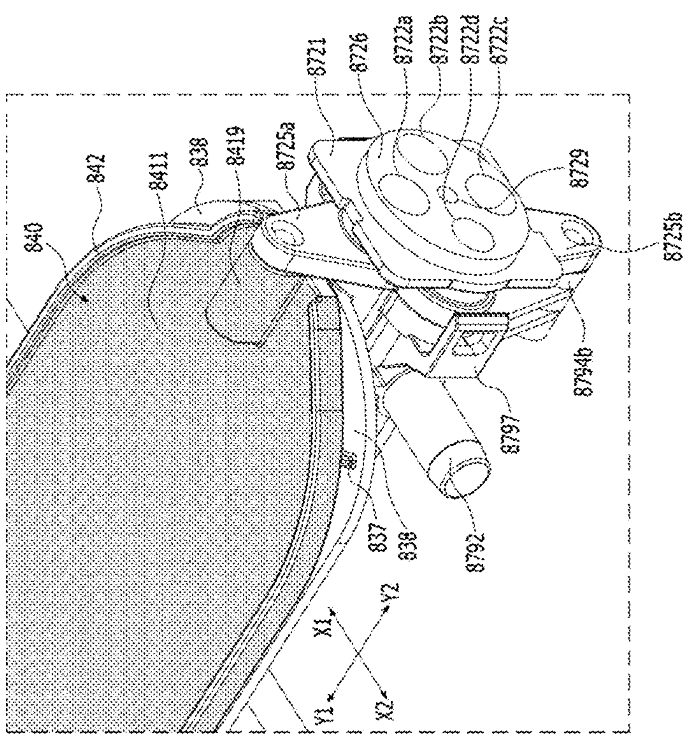

FIG. 28A

LAUNDRY TREATING APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of Korean Patent Application Nos. 10-2021-0017560, filed on Feb. 8, 2021, the disclosure of which is hereby incorporated by reference as if fully set forth herein.

TECHNICAL FIELD

The present disclosure relates to a laundry treating apparatus.

BACKGROUND

A laundry treating apparatus may remove dust or foreign substances from laundry by applying physical force to the laundry. For example, the laundry treating apparatus may include a washing machine, a dryer, and a refresher (styler).

The washing machine may perform a washing cycle for separating and removing foreign substances from the laundry by supplying water and detergent to the laundry.

The dryer may be classified into an exhaust type dryer or a circulation type dryer which is configured to produce high-temperature hot air through a heater and perform a drying cycle to remove moisture contained in the laundry by exposing the hot air to the laundry.

In some cases, the dryer may omit a component for supplying or draining water to or from an inside of the laundry and a tub for accommodating the water so that a drying cycle may be performed without those components. This may simplify an internal structure of the laundry dryer, and may directly supply the hot air to the drum accommodating the laundry to improve drying efficiency.

For example, the dryer may include a drum to accommodate the laundry, a hot air supply to supply hot air to the drum, and a driver to rotate the drum. Accordingly, the dryer supplies hot air to the inside of the drum to dry the laundry accommodated in the drum, and rotates the drum such that a surface of the laundry may be evenly exposed to the hot air. As a result, an entire surface of the laundry may evenly contact the hot air to complete drying.

In some cases, the driver may be fixed inside the cabinet in order to rotate the drum. The driver may be configured to rotate a rotation shaft coupled to the drum, and the driver may be coupled to the rotation shaft in a parallel manner. In some cases, the dryer may not have a fixed tub inside the cabinet, and thus the driver may not be fixed to the tub, which is typically included in a washing machine.

In some cases, a dryer may include a driver that is fixed to a rear face of the cabinet.

FIG. **1** shows a structure of a conventional dryer in which the driver is coupled to the rear face of the cabinet in related art.

The dryer may include a cabinet **1** constituting an outer shape, a drum **2** rotatably disposed inside the cabinet **1** to accommodate laundry, and a driver **3** configured to rotate the drum **2**.

The driver **3** may be disposed on a rear face of the drum **2** and configured to rotate the drum **2**, and coupled to and fixed to a rear panel **11** constituting the rear face of the cabinet **1**. In this way, the driver **3** is fixed to the cabinet **1** so that the drum **2** may be rotated.

The driver **3** of a conventional dryer as described above includes a stator **31** fixed to the rear panel **11**, a rotor **32** rotating by the stator **31**, and a rotation shaft **33** coupled to the rotor **32** to rotate the drum **2**. The dryer further includes a speed reducer **37** configured to rotate the drum **2** while increasing a torque by decreasing a RPM of the rotation shaft **33**.

Further, the conventional dryers may include fixing means **4** for fixing the driver **3** to the rear panel **11**. The fixing means **4** may include one or more of first fixing means **41** for fixing the stator **31** to the rear panel **11** and second fixing means **42** for fixing the rotation shaft **33** to the rear panel **11**. As a result, in the conventional dryers, the rotation shaft **33** and the driver **3** coupled to the drum **2** are arranged side by side to rotate the drum **2** stably.

In some cases, where the rear panel **11** of the cabinet is made of a thin steel plate, which may be easily deformed or vibrated even with a fairly small external force. Moreover, the rear panel **11** receives a load of the driver **3** as well as a load of the drum **2** via the rotation shaft **33** and thus may not maintain its shape.

Further, when the laundry is eccentric inside the drum **2** or repeatedly falls into the drum **2** during rotation, a repeated external force is transmitted to the rear panel **11** and the rear panel **11** may vibrate.

When vibration or external force is transmitted to the rear panel **11** and thus the rear panel **11** is bent or deformed even temporarily, the rotation shaft **33** connecting the driver **3** and the drum **2** may be distorted. Accordingly, vibration or noise may occur in the driver **3**, and in severe cases, the rotation shaft **33** may be damaged. Further, there is a problem that noise is generated while the rear panel **11** is bent or deformed.

Further, while the rear panel **11** vibrates, a distance between the rotor **32** and the stator **31** may temporarily change, causing the rotor **32** to collide with the stator **31** or generate vibration and noise.

In some cases, when the driver **3** further includes the speed reducer **37**, the rotation shaft **33** coupled to the speed reducer **37** and a speed reducing shaft **33*a*** extending from the speed reducer **37** to the drum **2** are separated from each other. In some examples, the speed reducer **37** is supported on the rear panel **11** via the stator **31** or the rotation shaft **33**. Thus, when the rear panel **11** is deformed even a little, the speed reducing shaft **33*a*** and the rotation shaft **33** may be distorted or misaligned with each other.

In other words, the speed reducing shaft **33*a*** connected to the drum **2** may have a smaller displacement amount due to the load of the drum **2** than that of the rotation shaft **33** connected to the driver **3**. Therefore, when the rear panel **11** is temporarily bent or deformed, inclinations of the rotation shaft **33** and the speed reducing shaft **33*a*** are different from each other, and thus, the rotation shaft **33** and the speed reducing shaft **33*a*** are misaligned with each other.

Therefore, in the conventional laundry treating apparatus, when the driver **3** operates, the rotation shaft **33** and the speed reducing shaft **33*a*** may be misaligned with each other. Thus, reliability of the speed reducer **37** may be not ensured, and the speed reducer **37** may be damaged.

Further, the conventional dryer may not include a channel through which the air of the drum flows in the base located below the drum or a structure to treat condensate condensed in the channel.

SUMMARY

Embodiments of the present disclosure are to provide a laundry treating apparatus in which an assembly process of a duct cover defining a passage through which air discharged to the drum flows.

Further, embodiments of the present disclosure are to provide a laundry treating apparatus having a nozzle cover coupled to a top of the duct cover so as to define a cleaning water channel between the duct cover and the nozzle cover.

Further, embodiments of the present disclosure are to provide a laundry treating apparatus in which a cleaning water channel is formed on top of the duct cover, thereby simplifying production and assembly processes of the apparatus.

Further, embodiments of the present disclosure are to provide a laundry treating apparatus having a cleaning water channel that may supply water evenly to a surface of an evaporator.

Further, embodiments of the present disclosure are to provide a laundry treating apparatus in which an inner face of a cleaning water channel capable of washing an evaporator is defined by a duct cover and a nozzle cover, thereby preventing water from leaking out of the cleaning water channel.

Further, embodiments of the present disclosure are to provide a laundry treating apparatus capable of discharging the water supplied to the cleaning water channel in a distributed manner over a larger area.

In order to achieve the above-described purpose, embodiments of the present disclosure provide a laundry treating apparatus including a cabinet, a drum, a base, and a motor.

Specifically, the apparatus includes a cabinet having an opening defined in a front face thereof; a drum disposed rotatably in the cabinet and having a laundry inlet defined in a front face thereof through which laundry is input into the drum; a base disposed below the drum and providing a space in which air inside the drum circulates; and a motor for providing power to rotate the drum.

The base includes an air circulating channel communicating with the drum, and intaking air from the drum and re-supply the air to the drum; and a heat exchanger including the first heat exchanger disposed inside the air circulating channel to cool the air, and the second heat exchanger spaced apart from the first heat exchanger to heat the air cooled by the first heat exchanger.

The base further includes a water collector body disposed out of the air circulating channel and communicating with the air circulating channel and constructed to collect water condensed in the first heat exchanger; a pump coupled to the water collector body to move the water collected in the water collector body; a cleaning water channel disposed on a top face of the air circulating channel, and receiving water from the pump, and discharging the received water to the first heat exchange; and a nozzle cover coupled to a top face of the air circulating channel to shield the cleaning water channel.

In the laundry treating apparatus according to one embodiment, the air circulating channel includes: an air flow duct extending upwards from the base and accommodating therein the first heat exchanger and the second heat exchanger.

The air circulating channel further includes a duct cover coupled to the air flow duct so as to shield the first heat exchanger and the second heat exchanger, wherein the nozzle cover is coupled to a top face of the duct cover so as to shield the cleaning water channel.

The duct cover includes: a cover through-hole extending through a top face of the duct cover and facing toward at least a portion of the first heat exchanger; and a valve communication hole spaced apart from the cover through-hole and connected to the pump, wherein the cleaning water channel extends from the valve communication hole to the cover through-hole.

The cleaning water channel includes a plurality of cleaning water channels arranged along a width direction of the first heat exchanger, wherein the cover through-hole has a width corresponding to a width of the first heat exchanger and is connected to the plurality of cleaning water channels.

The duct cover includes a channel wall protruding on a top face of the duct cover and constituting a side face of the cleaning water channel, wherein the channel wall surrounds the valve communication hole, and extends along an extension direction of the cleaning water channel, and is coupled to the nozzle cover.

The nozzle cover includes a channel wall protruding on a bottom face of the nozzle cover and constituting a side face of the cleaning water channel, wherein the channel wall surrounds the valve communication hole, and extends along an extension direction of the cleaning water channel, and is coupled to the duct cover.

The nozzle cover includes a nozzle cover body coupled to a top of the channel wall so as to shield the channel wall, wherein the nozzle cover body together with the channel wall defines the cleaning water channel; and a coupling portion extending from the nozzle cover body toward the channel wall and coupled to a top of the channel wall.

The channel wall and the coupling portion are thermally welded with each other.

The nozzle cover body is formed in a shape corresponding to a shape of the cleaning water channel and extends along an extension direction of the cleaning water channel.

The channel wall includes: a first coupling rib protruding from a top of the channel wall and coupled to the nozzle cover body, wherein the first coupling rib constitutes an inner side face of the cleaning water channel.

The channel wall further includes a second coupling rib protruding from the top of the channel wall and spaced apart from the first coupling rib, and coupled to the coupling portion, wherein the second coupling rib constitutes an outer side face of the cleaning water channel.

The second coupling rib is thermally welded with the coupling portion so that an outer circumferential face of the second coupling rib and an outer circumferential face of the coupling portion constitute a continuous single face.

The channel wall further includes: a sealing groove defined between the first coupling rib and the second coupling rib, and recessed downwardly, and extending along an extension direction of the cleaning water channel; and a sealing member seated in the sealing groove and constructed to be in contact with the nozzle cover body.

The sealing member shields between the nozzle cover body and the sealing groove so as to prevent water inside the cleaning water channel from leaking out through the nozzle cover body.

The cleaning water channel includes: a guide channel having the valve communication hole defined at one end thereof, wherein water from the pump is supplied through the valve communication hole thereto.

The cleaning water channel further includes: a discharge channel having one end connected to the guide channel and the other end connected to the cover through-hole, wherein the discharge channel receives the water from the guide channel and discharges the water to the cover through-hole.

The discharge channel extends in an inclined manner along a direction in which the water flows so that the water supplied from the guide channel flows to the cover through-hole.

The discharge channel includes: a first discharge channel extending in an inclined manner from the guide channel and receiving water from the guide channel; and a second discharge channel having one end connected to the first discharge channel, and the other end connected to the cover through-hole, wherein the second discharge channel receives water from the first discharge channel and guides the water to the cover through-hole.

The first discharge channel extends in a first inclination angle relative to the guide channel, and the second discharge channel extends in a second inclination angle relative to the guide channel, wherein the first inclination angle is larger than the second inclination angle.

A width of each of the first discharge channel and the second discharge channel increases as each of the first discharge channel and the second discharge channel extends along a flow direction of the water, wherein the width of the second discharge channel is larger than the width of the first discharge channel.

The duct cover further includes a discharge rib extending from one end of the cover through-hole connected to the cleaning water channel in a direction away from the cleaning water channel, wherein the discharge rib is accommodated in the cover through-hole.

The nozzle cover includes: a shielding rib extending from the nozzle cover body and coupled to a top face of the duct cover to shield the cover through-hole; and a switching rib extending from the shielding rib toward the cover through-hole and facing toward the discharge rib.

The switching rib extends from the shielding rib in an angle different from an angle at which the discharge rib extends from said one end of the cover through-hole. A vertical level of a distal end of the switching rib is lower than a vertical level of a distal end of the discharge rib.

Further, the laundry treating apparatus according to one embodiment of the present disclosure may further include a rear plate and a speed reducer. The rear plate is provided between the drum and the motor to guide the air discharged from the air circulating channel into the drum. The speed reducer is placed between the motor and the rear plate and is coupled to the drum and reduces a speed of the rotation power to rotate the drum.

A feature of each of the above-described embodiments may be implemented in combination with a feature of each of other embodiments as long as each of the above-described embodiments is not contradictory or exclusive to other embodiments.

Embodiments of the present disclosure may realize a laundry treating apparatus in which an assembly process of a duct cover defining a passage through which air discharged to the drum flows.

Further, embodiments of the present disclosure may realize a laundry treating apparatus having a nozzle cover coupled to a top of the duct cover so as to define a cleaning water channel between the duct cover and the nozzle cover.

Further, embodiments of the present disclosure may realize a laundry treating apparatus in which a cleaning water channel is formed on top of the duct cover, thereby simplifying production and assembly processes of the apparatus.

Further, embodiments of the present disclosure may realize a laundry treating apparatus having a cleaning water channel that may supply water evenly to a surface of an evaporator.

Further, embodiments of the present disclosure may realize a laundry treating apparatus in which an inner face of a cleaning water channel capable of washing an evaporator is defined by a duct cover and a nozzle cover, thereby preventing water from leaking out of the cleaning water channel.

Further, embodiments of the present disclosure may realize a laundry treating apparatus capable of discharging the water supplied to the cleaning water channel in a distributed manner over a larger area.

The effect of the present disclosure is not limited to the above effects, and other effects not mentioned will be clearly recognized by those skilled in the art from the description below.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a structure of a conventional dryer in related art.

FIGS. **2**A and **2**B show a dryer in related art.

FIG. **3** shows an outer shape of an example of a laundry treating apparatus according to the present disclosure.

FIG. **4** briefly shows an inside of the laundry treating apparatus.

FIG. **5** is an exploded perspective view showing example of internal components of the laundry treating apparatus.

FIGS. **6**A and **6**B show an outer shape of an example of a speed reducer.

FIG. **7** is an enlarged and detailed cross-sectional view of examples of the motor and the speed reducer.

FIG. **8** shows an example of a base and a rear plate.

FIG. **9** shows an example of the rear plate, the speed reducer, and the motor.

FIG. **10** shows an example of the speed reducer and the stator.

FIG. **11** shows an example of a speed reducer and a motor.

FIG. **12** is a perspective view showing an example of the base.

FIG. **13** is an exploded perspective view showing an example of a duct cover and a water collector cover coupled to an open top surface of a water collector body that are separated from the base of the FIG. **12**.

FIG. **14** is a cross-sectional view showing an example of an arrangement relationship of a drum and an air circulating channel.

FIG. **15** is a perspective view showing an example of a cleaning water channel disposed on a top surface of a duct cover.

FIG. **16** is a top view showing an example of a duct cover having a cleaning water channel.

FIG. **17** is a perspective view showing a bottom surface of an example of a duct cover.

FIG. **18** is an exploded perspective view showing an example of a channel switching valve.

FIG. **19** is a perspective view showing an example of a duct cover to which a nozzle cover is coupled.

FIG. **20** is a cross-sectional view showing an example of a nozzle cover.

FIG. **21** is a cross-sectional view showing an example of a nozzle cover.

FIG. **22** is a cross-sectional view showing an example of a nozzle cover.

FIGS. **23**A and **23**B are a side view and a bottom view of the nozzle cover shown in FIG. **22**.

FIG. **24** is a cross-sectional view showing one example in which a nozzle cover and a channel wall are coupled to each other.

FIG. **25** is a cross-sectional view showing another example in which a nozzle cover and a channel wall are coupled to each other.

FIGS. **26**A and **26**B are a perspective view showing an example of a connective portion and a water delivering portion are coupled to each other.

FIG. **27** shows an example of an internal cross-sectional view of the connective portion and the water delivering portion.

FIGS. **28**A and **28**B are perspective views of an example of a connective portion, a water delivering portion, and a nozzle cover are coupled to each other.

DETAILED DESCRIPTIONS

FIG. **3** shows an outer shape of an example of a laundry treating apparatus according to the present disclosure.

In some implementations, the laundry treating apparatus can include a cabinet **100** that defines an outer shape of the laundry treating apparatus.

For instance, the cabinet **100** can include a front panel **110** that defines a front surface of the laundry treating apparatus, a top panel **150** that defines a top surface thereof, and a side panel **140** that defines a side surface thereof. The side panel **140** can include a first side panel **141** defining a left side face. The front panel **110** can include an opening **111** communicating with an interior of the cabinet **100** and a door **130** pivotably coupled to the cabinet **100** to open and close the opening **111**.

In some implementations, the front panel **110** can be equipped with a manipulating panel **117**. The manipulating panel **117** can include an input unit **118** that receives a control command from a user, and a display **119** that outputs information such as a control command selectable by the user. The control commands can include a drying course or a drying option that can perform a series of drying cycles. Inside the cabinet **100**, a control box (see FIG. **12**) that controls internal components to execute the control commands input through the input unit **118** can be installed. The control box can be connected to components inside the laundry treating apparatus to control the components to perform an input command.

The input unit **118** includes a power supply request unit that requests a power supply of the laundry treating apparatus, a course input unit that enables a user to select a course among a plurality of courses, and an execution request unit that requests start of a course selected by the user.

The display **119** can be configured to include at least one of a display panel capable of outputting texts and figures, and a speaker capable of outputting a voice signal and sound.

In some implementations, the laundry treating apparatus can include a water storage tank **120** configured to separately store moisture generated in a process of drying the laundry. The water storage tank **120** can include a handle which the user can grip to withdraw the water storage tank **120** from one side of the front panel **110** to an outside. The water storage tank **120** can be configured to collect the condensate generated during a drying cycle. Thus, the user can withdraw the water storage tank **120** from the cabinet **100**, remove the condensate therefrom, and put the water storage tank **120** back into the cabinet **100**. Accordingly, the laundry treating apparatus can be disposed in a place where a sewer or the like is not installed.

In some examples, the water storage tank **120** can be disposed on top of the door **130**. Accordingly, when the user withdraws the water storage tank **120** from the front panel **110**, the user can bend a waist in a relatively smaller amount, thereby increasing the user's convenience.

FIG. **4** briefly shows an inside of the laundry treating apparatus.

The laundry treating apparatus includes a drum **200** accommodated inside the cabinet **100** to accommodate the laundry, a driver for rotating the drum **200**, and a heat exchanger **900** configured to supply hot air to the drum **200**, and a base **800** having an air circulating channel **820**. The air circulating channel **820** is communicating with the drum **200**. Air discharged from the drum **200** can be supplied to the air circulating channel **820**. Further, the air discharged from the air circulating channel **820** can be supplied to the drum **200** again.

The driver can include a motor **500** that provides power to rotate the drum **200**. The driver can be in direct connection with the drum **200** to rotate the drum **200**. For example, the driver can be implemented as a Direct Drive (DD) type driver. Accordingly, the driver can control a rotation direction of the drum **200** or a rotation speed of the drum **200** by directly rotating the drum **200** while the driver is free of a belt and a pulley.

The motor **500** can rotate at high revolutions per minute (RPM). For example, the laundry inside the drum **200** can rotate at a much higher RPM than RPM at which it can rotate while being coupled to an inner wall of the drum **200**.

However, when the laundry inside the drum **200** rotates while being continuously coupled to the inner wall of the drum **200**, there is a problem in that drying efficiency decreases because a portion of the laundry coupled to the inner wall of the drum is not exposed to hot air.

When the motor **500** is rotated at a low RPM in order that the laundry roll or are mixed with each other inside the drum **200** without being coupled to the inner wall of the drum **200**, there can be a problem that an output or torque that can be generated by the driver may not be properly utilized.

Therefore, the driver of the laundry treating apparatus can further include a speed reducer **600** that can reduce the RPM to increase the torque while taking advantage of a maximum output of the motor **500**.

Further, the driver can include a drum rotation shaft **6341** connected to the drum **200** to rotate the drum **200**.

The drum **200** can be formed in a cylindrical shape to accommodate the laundry therein. Further, unlike the drum used for washing, water may not be put inside the drum **200** used only for drying, and liquid water condensed inside the drum **200** may not be discharged out of the drum **200**. Therefore, through-holes defined in a circumferential face of the drum **200** can be omitted. That is, the drum **200** used only for drying can be different from the drum **200** used for washing.

The drum **200** can be formed in an integral cylindrical shape, or can be manufactured in a structure in which a drum body **210** including a circumferential face and a drum rear face **220** constituting a rear face are coupled to each other.

A laundry inlet **211** through which laundry enters and exits can be defined in a front face of the drum body **210**. The driver that rotates the drum can be connected to the drum rear face **220**. The drum body **210** and the drum rear face **220** can be coupled to each other via a fastener such as a bolt. The disclosure is not limited thereto. As long as the drum body **210** and the drum rear face **220** are coupled to each other while both rotate together, they can be coupled to each other using various methods.

The drum body **210** can have a lift **213** for lifting the laundry up so that the laundry accommodated therein can be mixed with each other under the rotation. When the drum **200** rotates, the laundry accommodated therein can repeatedly rise up and fall due to the lift **213**. The laundry accommodated inside the drum **200** can be in contact with hot air while the laundry repeatedly rise up and fall. Therefore, the drying efficiency increases, and the drying time is shortened.

A reinforcing bead **212** can be formed on a circumferential face of the drum body **210**. The reinforcing bead **212** can be configured to be recessed into or protrude from the circumferential face of the drum **200**. The reinforcing bead can include a plurality of beads which can be configured to be spaced apart from each other. The reinforcing beads can form a certain pattern and can be recessed into or protrude from the circumferential face.

Rigidity of the drum body **210** can increase due to the reinforcing bead **212**. Accordingly, even when a large amount of laundry is accommodated in the drum body **210** or a sudden rotation force is transmitted via the driver, the drum body **210** can be prevented from being distorted. Further, when the reinforcing bead **212** is provided, a spacing between the laundry and an inner circumferential face of the drum body can increase, compared to a case where the circumferential face of the drum body **210** is a flat face, so that the hot air supplied to the drum **200** is more effectively introduced between the laundry and the drum **200**. Durability of the drum increases due to the reinforcing bead, and the drying efficiency of the laundry treating apparatus increases due to the bead.

In general, in a DD-type washing machine, the driver can be fixed to a tub that accommodates the drum **200**, and the drum **200** can be coupled to the driver and supported on the tub. However, because a laundry treating apparatus can be configured to intensively perform a drying cycle, a tub fixed to the cabinet **100** to accommodate the drum **200** is omitted.

Accordingly, the laundry treating apparatus can further include a support **400** configured to fix or support the drum **200** or the driver inside the cabinet **100**.

The support **400** can include a front plate **410** disposed in front of the drum **200** and a rear plate **420** disposed in rear of the drum **200**. The front plate **410** and the rear plate **420** can have a plate shape and can be disposed to respectively face front and rear faces of the drum **200**. A distance between the front plate **410** and the rear plate **420** can be set to be equal to a length of the drum **200** or be larger than the length of the drum **200**. The front plate **410** and the rear plate **420** can be fixedly supported on the bottom face of the cabinet **100** or the base **800**.

The front plate **410** can be disposed between the front panel constituting the front face of the cabinet and the drum **200**. Further, the front plate **410** can have an inlet-communication hole **412** communicating with the laundry inlet **211**. Because the front plate **410** has the inlet-communication hole **412**, the front face of the drum **200** is supported thereon, laundry can be put into or taken out from the drum **200**.

The front plate **410** can include a duct connector **416** disposed below the inlet-communication hole **412**. The duct connector **416** can constitute a lower portion of the front plate **410**.

The front plate **410** can include a duct communication hole **417** extending through the duct connector **416**. The duct communication hole **417** can have a hollow shape to guide the air discharged through the laundry inlet **211** of the drum to a bottom of the drum **200**. Further, the air discharged through the laundry inlet **211** can be guided to the air circulating channel **820** positioned under the drum **200**.

In some implementations, a filter can be installed in the duct communication hole **417** to filter foreign substances such as large lint or large particles generated from the laundry. The filter filters the air discharged from the drum **200** to prevent foreign substances from accumulating inside the laundry treating apparatus, and to prevent foreign substances from accumulating and thus interfering with circulation of the air.

Because the laundry inlet **211** can be disposed in a front face, the driver can be installed on the rear plate **420** rather than the front plate **410**. The driver can be configured to be supported and mounted on the rear plate **420**. This allows the driver to rotate the drum **200** while the position of the driver is stably fixed due to the rear plate **420**.

At least one of the front plate **410** and the rear plate **420** can support the drum **200** such that the drum can rotate. At least one of the front plate **410** and the rear plate **420** can accommodate a front or rear end of the drum **200** such that the drum can rotate.

For example, a front portion of the drum **200** can be rotatably supported on the front plate **410**, and a rear portion of the drum **200** can be spaced apart from the rear plate **420** and can be connected to the motor **500** mounted on the rear plate **420** and thus can be indirectly supported on the rear plate **420**. In this way, an area where the drum **200** contacts or rubs against the support **400** can be minimized and noise or vibration can be prevented from occurring.

In another example, the drum **200** can be configured to be rotatably supported on both the front plate **410** and the rear plate **420**.

One or more support wheels **415** supporting the front portion of the drum **200** can be disposed at a lower portion of the front plate **410**. The support wheel **415** can be rotatably disposed on a rear face of the front plate **410**. The support wheel **415** can be rotated while in contact with a lower portion of the drum **200**.

When the drum **200** is rotated by the driver, the drum **200** can be supported on the drum rotation shaft **6341** connected to the rear portion of the drum. When the laundry is accommodated in the drum **200**, a load imposed to the drum rotation shaft **6341** due to the laundry can increase. Therefore, there is a risk of the drum rotation shaft **6341** being bent by the load.

When the support wheel **415** supports the front and lower portion of the drum **200**, the load on the drum rotation shaft **6341** can be reduced. This can prevent the drum rotation shaft **6341** from being bent and prevent noise from being generated due to the vibration.

The support wheels **415** can be disposed at positions symmetrical to each other around a center of rotation of the drum **200** so as to support the load of the drum **200**. The support wheels **415** can be disposed at left and right sides of the lower portion of the drum **200** to support the drum **200** thereon. However, the present disclosure is not limited thereto, and a larger number of support wheels **415** can be included according to an operating environment of the drum **200**.

The air circulating channel **820** disposed in the base **800** can circulate the air inside the drum **200** such that the air is input back into the drum **200**.

The air circulating channel **820** can include an inflow duct **821** into which the air discharged from the drum **200** flows, an air discharge duct **823** that supplies the air to the drum **200**, and an air flow duct **822** connecting the inflow duct **821** and the air discharge duct **823** to each other.

When air is discharged from the front face of the drum **200**, the air flow duct **822** can be located at a front side of the air circulating channel **820**. The air discharge duct **823** can be located at a rear side of the air circulating channel **820**.

The air discharge duct **823** can further include a blower **8231** that discharges air out of the air circulating channel

820. The blower 8231 can be disposed at the rear side of the air discharge duct 823. Air exhausted through the blower 8231 can flow to the drum 200.

A duct cover 830 can be coupled to a top of the air circulating channel 820, so that an open top face of the air circulating channel 820 can be partially shielded therewith. The duct cover 830 can prevent air from leaking out of the air circulating channel 820. In other words, the duct cover 830 can constitute one face of a channel through which air is circulated.

Further, a heat exchanger 900 disposed in the base 800 can include a first heat exchanger 910 disposed inside the air circulating channel 820 to cool the air, and a second heat exchanger 920 disposed inside the air circulating channel 820 to heat the air cooled in the first heat exchanger 910.

The first heat exchanger 910 dehumidifies the air discharged from the drum 200, and the second heat exchanger 920 can heat the dehumidified air. The heated air is supplied to the drum 200 again to dry the laundry accommodated in the drum 200.

Each of the first heat exchanger 910 and the second heat exchanger 920 can be implemented as a heat exchanger through which refrigerant flows. When being implemented as a heat exchanger through which the refrigerant flows, the first heat exchanger 910 can be implemented as an evaporator, and the second heat exchanger 920 can be implemented as a condenser. The refrigerant flowing along the first heat exchanger 910 and the second heat exchanger 920 can exchange heat with air discharged from the drum 200.

The heat exchanger 900 can include an air circulating channel fan 950 that is installed in the air circulating channel 820 to generate air flow inside the air circulating channel 820. Further, the heat exchanger 900 can further include an air circulating channel fan motor 951 that rotates the air circulating channel fan 950. The air circulating channel fan 950 can be rotated upon receiving rotation power from the air circulating channel fan motor 951. When the air circulating channel fan 950 operates, the air dehumidified by the first heat exchanger 910 and then heated by the second heat exchanger 920 can flow to the rear portion of the drum 200.

The air circulating channel fan 950 can be installed in one of the inflow duct 821, the air flow duct 822, and the air discharge duct 823. Because the air circulating channel fan 950 can be configured to rotate, noise can be generated when the air circulating channel fan 950 operates. Therefore, the air circulating channel fan 950 can be disposed in rear of the air circulating channel 820.

The air circulating channel fan 950 can be installed at the blower 8231. Further, the air circulating channel fan motor 951 can be located in rear of the blower 8231. When the air circulating channel fan 950 is rotated by the air circulating channel fan motor 951, air inside the air circulating channel 820 can be discharged out of the air circulating channel 820 via the blower 8231.

Because the laundry inlet 211 of the drum 200 can be disposed at a relatively higher position in order for the user to easily withdraw the laundry located inside the drum 200, the air circulating channel 820 and the heat exchanger 900 can be disposed below the drum 200.

The rear plate 420 can be disposed in rear of the drum 200 to guide the air discharged from the air circulating channel 820 to the drum 200. The rear plate 420 can be configured to be spaced apart from the drum rear face 220. The air circulating channel 820 can receive air inside the drum 200 through the front plate 410 and supply air to the drum 200 through the rear plate 420. Air discharged from the air circulating channel 820 can be guided to the drum 200 through the rear plate 420.

The base 800 can further include a connector 850 that guides the air discharged from the air circulating channel 820 to the rear plate 420. The connector 850 can guide the exhaust air to spread evenly throughout the rear plate 420.

The connector 850 can be installed at the blower 8231. That is, the connector 850 can guide the air discharged from the blower 8231 to the rear plate 420. The hot air supplied to the rear plate 420 can flow into the drum 200 through the drum rear face 220.

The drum 200 of the laundry treating apparatus can be rotated while being directly connected to the driver positioned in rear of the drum 200, rather than being indirectly rotated while being coupled to a belt. Therefore, unlike a drum of a conventional dryer that has a cylindrical shape in which front and rear faces are open, a rear face of the drum of the laundry treating apparatus can be shielded and can be directly coupled to the driver.

As described above, the drum 200 can include the drum body 210 having a cylindrical shape to accommodate laundry and the drum rear face 220 coupled to the rear portion of the drum body 210 to define a rear face of the drum.

The drum rear face 220 can be configured to shield the rear face of the drum body 210, and provide a coupling face for direct engagement with the driver. That is, the drum rear face 220 can be connected to the driver and receive the rotation power to rotate an entirety of the drum 200. As a result, the front face of the drum body 210 can have the laundry inlet 211 into which laundry is put, and the rear face thereof can be shielded with the drum rear face 220.

The drum rear face 220 can be equipped with a bushing 300 connecting the driver and the drum rear face 220 to each other. The bushing 300 can be disposed at the drum rear face 220 to define a center of rotation of the drum 200. The bushing 300 can be formed integrally with the drum rear face 220, or can be made of a material with greater rigidity and durability than that of the drum rear face 220 in order to be firmly coupled to the rotation shaft that transmits power. The bushing 300 can be seated on and coupled to the drum rear face 220 so as to be coaxial with the center of rotation of the drum rear face 220.

The drum rear face 220 can include a circumferential portion 221 coupled to an outer circumferential face of the drum body 210, and a mount plate 222 that can be disposed inwardly of the circumferential portion 221 and can be coupled to the driver. The bushing 300 can be seated on the mount plate 222 and can be coupled thereto. The rotation shaft that rotates the drum can be coupled to the mount plate 222 via the bushing 300, and thus can be more firmly coupled thereto. Further, this can prevent deformation of the drum rear face 220 from occurring.

The drum rear face 220 can include an intake hole 224 extending through a portion between the circumferential portion 221 and the mount plate 222, and air-communicating in a front and rear direction of the drum rear face 220. The hot air supplied through the air circulating channel 820 can be introduced into the drum body 210 through the intake hole 224. The intake hole 224 can include a plurality of holes extending through the drum rear face 220 or as a mesh.

The driver that rotates the drum 200 can be located in rear of the rear plate 420. The driver can include a motor 500 that generates rotation power and a speed reducer 600 that reduces the rotation force of the motor 500 and transmits the reduced force to the drum 200.

The motor **500** can be disposed in rear of the rear plate **420**. The motor **500** can be coupled to the rear face of the rear plate **420** via the speed reducer **600**.

The speed reducer **600** can be fixed to the rear face of the rear plate **420**, and the motor **500** can be coupled to the rear face of the speed reducer **600**. That is, the rear plate **420** can provide a support face on which the speed reducer **600** or the motor **500** is supported. However, the present disclosure is not limited thereto, and the motor **500** can be coupled to the rear plate **420**.

FIG. **5** is an exploded perspective view showing internal components constituting the laundry treating apparatus in a separated state from each other.

The laundry treating apparatus can include the drum **200** for accommodating the laundry, the front plate **410** for supporting the front face of the drum, the rear plate **420** located in rear of the drum, and the base **800** disposed below the drum to provide a space in which the air inside the drum is circulating or moisture contained in the air is condensed, and the motor **500**, which is located in rear of the drum and provides the rotation power to the drum, the speed reducer **600** to reduce the rotation speed of the motor and deliver the rotation power to the drum, and a rear cover **430** that can be coupled to the rear plate **420** to prevent the motor from being exposed to the outside.

The base **800** can include the air circulating channel **820** which communicates with the drum **200**, and receives the air from the drum or discharges the air to the drum.

The front plate **410** can include a front panel **411** constituting a front face thereof, and the inlet-communication hole **412** that is formed to extend through the front panel **411** and communicates with the drum **200**. The front plate **410** can have a front gasket **413** which can be disposed on the rear face of the front panel **411** and can be configured to surround a radially outer side of the inlet-communication hole **412** and can accommodate a portion of the drum body **210**.

The front gasket **413** can support the drum body **210** such that the drum body can rotate, and can be in contact with the outer circumferential face or an inner circumferential face of the laundry inlet **211**. The front gasket **413** can prevent the hot air inside the drum **200** from leaking into a space between the drum body **210** and the front plate **410**. The front gasket **413** can be made of a plastic resin or an elastic body. A separate sealing member can be additionally coupled to the front gasket **413** to prevent laundry or the hot air from escaping from the drum body **210** to the front plate **410**.

In some examples, the front plate **410** can include a duct communication hole **417** extending through an inner circumferential face of the inlet-communication hole **412**. Further, the front plate **410** can include a duct connector **416** extending downwardly of the duct communication hole **417** to define a channel communicating the drum body **210** and the air circulating channel **820** to each other.

The duct connector **416** can communicate with the drum body **210** through the duct communication hole **417**, and the air discharged from the drum body **210** can flow into the duct connector **416** through the duct communication hole **417** and can be guided to the air circulating channel **820**. Because the air discharged from the drum body **210** is guided to the air circulating channel **820** via the duct connector **416**, this can prevent the air inside the drum from leaking out.

A filter member that filters foreign substances or lint from the air discharged from the drum **200** and prevents foreign substances from entering the air circulating channel **820** can be installed in the duct connector **416**.

The support wheels **415** supporting the lower portion of the drum **200** and being rotatably installed on the rear face of the front panel **411** can be installed on the front plate **410**. The support wheel **415** supports the front face of the drum **200** and thus prevents the rotation shaft connected to the drum from being bent.

The front plate **410** can have a water storage tank support hole **414** which can be configured to extend through the front panel **411**, and which the water storage tank **120** (see FIG. **3**) in which the condensate generated in the drying process is stored can be withdrawn through or supported on. When the water storage tank support hole **414** can be disposed a top level, the user may not have to bend his back when withdrawing the water storage tank, so that the user's convenience increases.

The drum **200** for accommodating the laundry therein can include the drum body **210** having the laundry inlet **211** defined in a front portion thereof through which the laundry is input or output, and the drum rear face **220** constituting a rear face thereof.

The drum rear face **220** can include the circumferential portion **221** connected to the drum body **210**, the intake hole **224** defined inwardly of the circumferential portion **221** and extending through the drum rear face **220**, and the mount plate **222** disposed at the center of rotation of the drum rear face **220**, and coupled to the rotation shaft. Air can be introduced to the rear face of the drum through the intake hole **224**.

The drum rear face **220** can further include a reinforcing rib **225** extending from the circumferential portion **221** toward the center of rotation. The reinforcing rib **225** can extend while bypassing the intake hole **224**. The reinforcing rib **225** has the effect of preventing the rigidity of the drum rear face **220** from being reduced due to the intake hole **224**. The reinforcing rib **225** can be configured to extend radially from the outer circumferential face of the mount plate **222** toward an inner circumferential face of the circumferential portion **221**.

Further, the drum rear face **220** can further include a circumferential rib **227** extending in the circumferential direction of the drum rear face **220** to connect the reinforcing ribs **225** to each other. The intake holes **224** can be respectively disposed between adjacent ones of the reinforcing rib **225**, the circumferential rib **227**, and the circumferential portion **221**. The reinforcing rib **225** and the circumferential rib **227** have the effect of preventing the drum rear face **220** from being deformed upon receiving the rotation force from the motor **500**.

The inflow duct **821** can communicate with the duct communication hole **417** of the front plate **410** to communicate with a channel installed inside the front plate **410**. The air flow duct **822** can extend from a distal end of the inflow duct **821** toward the rear face of the drum **200**, and the air discharge duct **823** can be disposed at a distal end of the air flow duct **822** to direct the air to the drum **200**.

The blower **8231** can be located downstream of the air discharge duct **823**, and the blower **8231** can provide a space where the air circulating channel fan is installed. When the circulation fan channel fan operates, the air introduced into the inflow duct **821** can be discharged upwardly of the blower **8231**.

In some examples, the base **800** can be equipped with the heat exchanger **900** that can cool and heat the air circulating inside the drum **200**. The heat exchanger **900** can include a compressor **930** connected to the first heat exchanger and the second heat exchanger to supply compressed refrigerant. The compressor **930** can be configured so as not to directly exchange heat with the circulating air, and thus can be located out of the air circulating channel **820**.

Further, the heat exchanger can include the air circulating channel fan motor **951** supported on a rear face of the blower **8231** to rotate the air circulating channel fan. The air circulating channel fan motor **951** can be coupled to the rear face of the blower **8231**.

In some examples, the laundry treating apparatus can further include the connector **850** which can be coupled to the air circulating channel **820** for guiding the hot air discharged from the air circulating channel **820** to the rear portion of the drum **200** or the rear plate **420**.

The connector **850** can be disposed on top of the air discharge duct **823** and be configured to guide the hot air heated through the second heat exchanger **920** upwards beyond the air discharge duct **823**. Further, the connector **850** can be coupled to an opening disposed above the blower **8231**.

The connector **850** can be configured to have a channel defined therein. The connector **850** can be configured to evenly guide the flow of air generated by the air circulating channel fan to the rear plate **420**. That is, the connector **850** can be configured so that an area of the channel therein increases as a distance thereof from the blower **8231** increases.

The rear plate **420** can be coupled to the base **800** or supported on the base **800** and be positioned in rear of the drum **200**. The rear plate **420** can be configured to include the rear panel **421** positioned to face toward the front plate **410**, and a duct portion **423** recessed in the rear panel **421** to define a channel through which air flows and to guide the air discharged from the air circulating channel **820** to the drum.

The rear plate **420** can include a mount **425** to or on which the driver is coupled or supported. The mount **425** can be configured to extend through the rear panel **421** and disposed on an inner circumferential face of the duct portion **423**. The mount **425** can be configured to be spaced apart from an inner circumferential face of the duct portion **423** inwardly in a radial direction.

In some implementations, the driver can include a combination of the speed reducer **600** and the motor **500** as described above. In some examples, the driver can include only the motor **500**. That is, a component that generates power and transmits the rotation power to the drum can be referred to as a driver.

The driver can be mounted on the mount **425**. The mount **425** can support the driver's load. The driver can be connected to the drum **200** while supported on the mount **425**.

The duct portion **423** can be configured to receive a portion of the drum rear face **220**. The duct portion **423** can have the channel defined therein through which air flows together with the drum rear face **220**.

The driver can be installed on the mount **425** so as not to interfere with the duct portion **423**. In other words, the driver can be radially inwardly spaced away from an inner circumferential face of the duct portion **423**. The driver can be installed on the mount **425**, while a rear portion thereof can be exposed to the outside so that it can be cooled by external air.

The driver can include the motor **500** that provides power to rotate the drum **200**. The motor **500** can include a stator **510** that generates a rotating magnetic field, and a rotor **520** that can be configured to rotate by the stator **510**.

The rotor **520** accommodates the stator **510** and can be equipped with an outer rotor type configured to rotate along the circumference of the stator **510**. In some examples, the rotor **520** can be coupled to a drive shaft and can be directly connected to the drum **200** through the stator **510** and the mount **425**. In this case, the rotor **520** can directly transmit the power to rotate the drum **200**.

The rotor **520** can be coupled to the drive shaft via a washer **540**. The washer **540** can perform a function of connecting the drive shaft and the rotor **520** to each other. Because a contact area between the rotor **520** and the drive shaft can increase due to the washer **540**, the rotation of the rotor **520** can be transmitted more effectively.

The speed reducer **600** can be configured to connect the motor **500** and the drum **200** to each other. The speed reducer **600** can convert the power of the motor **500** to rotate the drum **200**. The speed reducer **600** can be disposed between the motor **500** and the drum **200** to receive the power of the motor **500**, convert the same, and transmit the same to the drum **200**. The speed reducer **600** can be configured to convert the RPM of the rotor to a small RPM but increase a torque value thereof and transfer the converted RPM to the drum **200**.

Specifically, the speed reducer **600** can be coupled to the rotor **520** and the drive shaft that rotates with the rotor **520**. The speed reducer **600** can include a gear assembly that can be engaged with the drive shaft and rotates therewith to reduce the RPM of the drive shaft but increase the torque thereof. The gear assembly can be coupled to the drum **200** and can be connected to the drum rotation shaft to rotate the drum. Thus, when the drive shaft **530** rotates, the drum rotation shaft rotates at a slower RPM than that of the drive shaft, but with the increased torque.

The performance of this speed reducer **600** depends on whether the drive shaft and the drum rotation shaft can be kept coaxial with each other. That is, when the drive shaft and the drum rotation shaft are misaligned with each other, there is a risk that coupling between the parts constituting the gear assembly inside the speed reducer **600** and at least one of the drive shaft and the drum rotation shaft can loosen or can be disengaged. Therefore, the power of the drive shaft may not be properly transmitted to the drum rotation shaft, or the drive shaft can rotate in vain.

Further, when the drive shaft and the drum rotation shaft are misaligned with each other even temporarily, the gears inside the speed reducer **600** can be misaligned with each other and collide with each other, resulting in vibration or noise.

Further, there is a risk that the speed reducer **600** can completely deviate from its correct position or be damaged when an angle by which the drive shaft and the drum rotation shaft are misaligned with each other increases even temporarily.

In some implementations, in the laundry treating apparatuses having the speed reducer, the speed reducer **600** and the motor **500** can be fixed to a support that maintains its original state without deformation even when an external force is applied thereto.

For example, in a washing machine, the tub accommodating the drum can be first fixed to the cabinet, and then the motor and the speed reducer can be second fixed to a bearing housing made of a rigid body built into the tub by injection molding. This allows the speed reducer and the driver to tilt or vibrate together with the bearing housing or the fixing steel plate, even when significant vibrations occur in the tub. As a result, the speed reducer and the driver themselves can maintain a combined state therewith, and the drive shaft and the rotation shaft can be kept coaxial.

In some implementations, the laundry treating apparatus is a dryer, the tub fixed inside the cabinet can be omitted.

Further, because the rear panel of the cabinet is made of a relatively thin plate, even when the stator **510** is fixed thereto, the rear panel can easily vibrate or be bent due to a repulsive force when the rotor **520** rotates. When the rear panel vibrates or bends even temporarily, the rotation centers of the speed reducer **600** and the motor **500** which are in combination with the drum **200** can be misaligned with each other.

Further, because the rear panel is made of a thin steel plate, the real panel may not support both the speed reducer **600** and the motor **500**. For example, when the speed reducer **600** and the motor **500** are coupled to the rear panel and are arranged side by side, a rotational moment can be generated due to a total length and weight of the speed reducer **600** and the motor **500**, such that the speed reducer **600** sags downwards. As a result, the drum rotation shaft itself coupled to the drum can be misaligned with the speed reducer **600**. Thus, the drum rotation shaft and the drive shaft may not be maintained at the coaxial state.

In some examples, a configuration can be considered that the stator **510** can be coupled to the rear plate **420** to support the motor **500**. When a large amount of laundry is accommodated inside the drum **200**, or when eccentricity occurs, the drum rotation shaft can be distorted according to the displacement of the laundry whenever the drum **200** rotates. In some examples, the stator **510** can be separated from the drum **200** and fixed to the rear plate **420**, so that the drum rotation shaft can vibrate at a different dimension or tilt at a different angle than the stator **510** can do. Therefore, the coaxiality of the drum rotation shaft and the drive shaft may not be maintained.

From another point of view, the drum **200** can be supported on the front plate **410** and the rear plate **420** so that an installed position thereof can be fixed to a certain degree. Therefore, the position of the drum rotation shaft coupled to the drum **200** can be fixed to a certain degree. Therefore, even when vibration occurs in the drum **200**, the vibration can be buffered by at least one of the front plate **410** or the rear plate **420**.

However, when the vibration generated in the drum **200** is transmitted to the motor **500**, and even when the speed reducer **600** and the motor **500** are fixed to the rear plate **420**, the vibration amplitude of the drum rotation shaft is larger than the vibration amplitude of the motor **500** and the rear plate **420**. Thus, there can be a problem that the drive shaft and the drum rotation shaft cannot be maintained in a coaxial relationship with each other.

In order to solve this problem, in the laundry treating apparatus, the motor **500** can be fixedly coupled to the speed reducer **600**. In other words, the speed reducer **600** itself can serve as a reference point of an entirety of the driver. In other words, the speed reducer **600** can serve as a reference of the overall vibration amplitude and tilting angle of the driver.

The motor **500** is not fixed to other components of the laundry treating apparatus, but is fixed only to the speed reducer **600**. Thus, when vibration is transmitted to the driver or external force is transmitted thereto, the motor **500** can tilt or vibrate simultaneously together with the speed reducer **600** when the speed reducer **600** tilts or vibrates.

As a result, the speed reducer **600** and the motor **500** can constitute one vibration system, and the speed reducer **600** and the motor **500** can be maintained in a fixed state with each other while not performing relative motion with respect to each other.

The stator **510** of the motor **500** can be directly coupled to the speed reducer **600** and fixed thereto. In this way, the installed position of the drive shaft **530** relative to the speed reducer **600** may not be changed. A center of the drive shaft **530** and a center of the speed reducer **600** can coincide with each other, and thus the drive shaft **530** can rotate in the coaxial state with the center of the speed reducer **600**.

A first axis M1 can refer to an imaginary line extending in a front-rear direction along the center of rotation of the drum **200**. That is, the first axis M1 can extend in parallel to an X axis.

Each of a second axis M2 and a third axis M3 can refer to an imaginary line extending in a left and right direction of the laundry treating apparatus. That is, each of the second axis M2 and the third axis M3 can be orthogonal to an XZ plane and parallel to a Y axis.

The first axis M1 and the second axis M2 can intersect each other at the speed reducer **600**. Further, the first axis M1 and the third axis M3 can intersect with each other at the mount **425**.

The speed reducer **600** and the motor **500** can be designed to be arranged along the first axis M1 parallel to a ground when there is no load on the drum **200** or when the motor **500** is not running.

However, when vibration occurs in the drum **200** or the motor **500**, the vibration is transmitted to the speed reducer **600** and thus the speed reducer **600** is tilted, thereby causing the speed reducer **600** to temporarily tilt along the second axis M2.

In some examples, the motor **500** can be coupled to the speed reducer **600**, and thus can vibrate or tilt together with the speed reducer **600**. Thus, the motor **500** and the speed reducer **600** can be arranged side by side along the second axis M2. Thus, the drive shaft and the drum rotation shaft can be arranged side by side along the second axis M2.

As a result, even when the speed reducer **600** is tilted, the motor **500** can move integrally with the speed reducer **600**, and thus the drive shaft and the drum rotation shaft can be maintained in a coaxial state with each other.

The speed reducer **600** can be fixedly coupled to the rear plate **420**. In this case, the speed reducer **600** will tilt or vibrate while being coupled to the rear plate **420**, so that the rear plate **420** plays the role of the center of the vibration system including the speed reducer **600**, the motor **500**, and the drum **200**. Even in this case, the motor **500** can be not directly coupled to the rear plate **420**, but can be only coupled to the speed reducer **600** and fixed thereto.

The speed reducer **600** and the motor **500** and the drum **200** can be arranged side by side along the first axis M1. However, the vibration of the drum **200** or the motor **500** causes the speed reducer **600** to be inclined in parallel to the third axis M3. The third axis M3 can extend through the speed reducer **600** coupled to the rear plate **420**. In some examples, the speed reducer **600** and the motor **500** are coupled to each other, so that the motor **500** can be tilted in parallel to the third axis M3, just like the speed reducer **600**.

Eventually, the motor **500** and the drum **200** can be coupled to the speed reducer **600**, so that the motor **500** and the drum **200** can be tilted in parallel manner with respect to the speed reducer **600** or vibrate at the same time with the vibration of the speed reducer.

The coaxiality and the coincidence as above-mentioned may not mean physically perfect coaxiality and coincidence, but can allow an error range acceptable in mechanical engineering or as recognized as coaxiality or coincidence by a person skilled in the art. For example, a state in which the drive shaft **530** and the drum rotation shaft **6341** are misaligned with each other by a range within 5 degrees can be defined as being coaxial or coincident. However, the angle value is only an example, and the allowable error in design can be changed.

Because the drive shaft **530** rotates relative to the speed reducer **600** but is fixed thereto to prevent tilting of the drive shaft **530**, and the stator **510** is fixed to the speed reducer **600**, a distance between the stator **510** and the rotor **520** can be maintained to be constant. As a result, the collision between the stator **510** and the rotor **520** can be prevented. The noise or vibration that can occur due to the change of the rotation center as the rotor **520** rotates the stator **510** can be fundamentally blocked.

The drum rotation shaft **6341** can be configured to extend from the inside of the speed reducer **600** toward the drum **200**, and can vibrate together with the speed reducer **600** and tilt tougher with the speed reducer **600**. That is, the drum rotation shaft **6341** can be only configured to be rotatably coupled to the speed reducer **600**, but the installed position thereof can be fixed. As a result, the drum rotation shaft **6341** and the drive shaft **530** can be arranged side by side and coaxial with each other. In other words, the center of the drum rotation shaft **6341** and the center of the drive shaft **530** can be maintained in a coinciding manner with each other.

In some examples, a sealing portion **450** can be disposed between the drum rear face **220** and the rear plate **420**. The sealing portion **450** can seal between the drum rear face **220** and the rear plate **420** so that the air introduced into the duct portion **423** of the rear plate **420** may not flow out thereof and flows into the intake hole **224**.

The sealing portion **450** can be disposed on each of an outer side face and an inner side face of the duct portion **423**. A first sealing **451** can be disposed at a radially outer side of the duct portion **423**, and a second sealing **452** can be disposed at a radially inner side. The first sealing **451** can prevent hot air between the drum rear face **220** and the duct portion **423** from leaking radially outwardly. The second sealing **452** can prevent hot air between the drum rear face **220** and the duct portion **423** from leaking radially inwardly.

In other words, the sealing portions **450** can be disposed at the radially outer and inner sides of the intake hole **224**, respectively. The first sealing **451** can be disposed at the radially outer side of the intake hole **224**, and the second sealing **452** can be disposed at the radially inner side of the intake hole **224**.

The sealing portion **450** can be configured to be in contact with both the drum rear face **220** and the rear plate **420** in order to prevent the hot air from leaking out. Because the drum **200** rotates during the operation of the laundry treating apparatus, continuous friction from the drum rear face **220** is applied to the sealing portion **450**. Therefore, the sealing portion **450** can be made of a material that can seal between the drum rear face **220** and the duct portion **423** without deterioration in performance even due to the frictional force and frictional heat generated according to rotation.

In some examples, the motor **500** or the speed reducer **600** can be coupled to the rear face of the rear plate **420**, and the rear plate **420** can be made of a thin sheet metal, so that the rear plate **420** can be bent or deformed due to the load transmitted to the speed reducer **600** via the speed reducer **600** and the drum **200**. That is, the rigidity of the rear plate **420** can be secured to install the speed reducer **600** and the motor **500** thereon.

In some implementations, the rear plate **420** can further include a bracket **700** to reinforce coupling rigidity. The rear plate **420** can additionally be coupled to the bracket **700** and the speed reducer **600** and the motor **500** can be coupled to the rear plate **420** via the bracket **700**.

The speed reducer **600** can be coupled simultaneously to the bracket **700** and the rear plate **420**. The fastener can simultaneously extend through and couple the speed reducer **600**, the rear plate **420**, and the bracket **700** to each other. The rear plate **420** can be coupled to the bracket **700** to ensure rigidity thereof. The speed reducer **600**, the motor **500**, etc. can be coupled to the rear plate **420** with the secured rigidity.

The fastening can be made in such a way that the speed reducer **600** is first coupled to the bracket **700** and the bracket **700** is then coupled to the rear plate **420**. That is, the speed reducer may not be directly coupled to the rear plate **420**, but can be fixed to the rear plate **420** via the bracket **700**.

In some examples, when the motor **500** or the speed reducer **600** can be coupled to the rear face of the rear plate **420**, the motor **500** and the speed reducer **600** can be exposed to the outside. In some examples, the motor **500** can be avoided from being exposed to the outside while being coupled to the rear face of the rear plate **420**. Further, the duct portion **423** can be heated by the hot air. Therefore, the rear face of the duct portion **423** can be thermally insulated.

The rear cover **430** can be coupled to the rear face of the rear plate **420** to prevent the duct portion **423** and the motor **500** or the speed reducer **600** from being exposed to the outside. The rear cover **430** can be spaced apart from the duct portion **423** and the driver.

The rear cover **430** has the effect of preventing the motor **500** from being damaged due to external interference, or preventing the drying efficiency from being lowered due to heat loss through the duct portion **423**.

FIGS. **6**A and **6**B show examples of an outer shape of the speed reducer.

The speed reducer **600** can include a speed reducer housing **610** and **620** constituting an outer shape thereof. The speed reducer housing can include a first housing **610** configured to face toward the drum and a second housing **620** to face toward the motor.

The speed reducer **600** can include a gearbox. The gearbox can be configured to receive power from the motor and convert the motor's RPM to a small RPM but increase the torque value and transmit the converted rotation force to the drum. A significant portion of the gearbox can be housed inside the second housing **620**, and the first housing **610** can be configured to shield the inside of the speed reducer **600**. In this way, an overall thickness of the speed reducer **600** can be reduced. The detailed configuration of the gearbox will be described later.

The first housing **610** can include a first housing shielding body **611** configured to shield the second housing **620** and a first housing shaft receiving portion **612** extending from the first housing shielding body **611** in a direction away from the second housing **620**. The first housing shaft receiving portion **612** can receive the drum rotation shaft **6341** and can support the drum rotation shaft **6341** such that the drum rotation shaft **6341** can rotate.

The first housing **610** can include a stator coupling portion **613** configured to support the motor. The stator coupling portion **613** can extend from a circumferential face of the first housing shielding body **611** in a direction away from the first housing shaft receiving portion **612**.

The stator coupling portion **613** can include a stator fastening hole **615** to which the motor can be fastened. The stator fastening hole **615** can be recessed in the stator coupling portion **613**. A separate fastener can be inserted into the stator fastening hole **615**. The stator coupling portion **613** and the motor can be coupled to each other using the fastener.

The first housing **610** can further include a coupling guide **614** to guide the coupling of the motor. The coupling guide **614** can extend from the circumferential face of the first housing shielding body **611** in a direction away from the first housing shaft receiving portion **612**. The coupling guide **614** can extend from the first housing shielding body **611** so as to be connected to the stator coupling portion **613**. The coupling guide **614** can guide a position of the stator **510** when the stator **510** can be coupled to the stator coupling portion **613**. Thus, the assembility can be improved.

Referring to FIGS. **6**A and **6**B, the second housing **620** can house the gear assembly therein. In general, the gearbox coupled to the speed reducer **600** can include a sun gear, a planetary gear orbiting the sun gear, and a ring gear that accommodates the planetary gear and allows the planetary gear to rotate. The second housing **620** can include a second housing coupling body **621** coupled to the first housing **610**, a second housing shielding body **622** extending from the second housing coupling body **621** in a direction away from the first housing **610** and defining a space in which the gearbox is accommodated, and a second housing shaft receiving portion extending from an inner circumferential face of the second housing shielding body **622** in a direction away from the first housing **610** to support the drive shaft **530**.

In some implementations, a center of the first housing **610** and a center of the second housing **620** can be designed to be coaxial with each other. When the drive shaft **530** and the drum rotation shaft **6341** are coaxial with each other, this is advantageous for power transmission. Accordingly, the first housing shaft receiving portion **612**, which rotatably supports the drum rotation shaft **6341**, and the second housing shaft receiving portion, which rotatably supports the drive shaft **530**, can be coupled to each other so as be coaxial with each other.

The drive shaft **530** can be inserted into the second housing **620** and rotatably supported within the second housing **620**. The drive shaft **530** can be coupled to the washer **540** that rotatably supports the rotor **520**. The washer **540** can include a receiving body **542** having a shaft support hole **543** defined in a center thereof for receiving the drive shaft **530**, and a washer coupling body **541** extending radially from an outer circumferential face of the receiving body **542** to define a face to which the rotor is coupled. The shaft support hole **543** can be formed in a groove shape corresponding to a protrusion formed on an outer circumferential face of the drive shaft **530** such that the protrusion can be received in the groove.

The washer **540** can include at least one washer coupling protrusion **5411** configured to protrude from the washer coupling body **541** in a direction away from the speed reducer. Further, the washer **540** can include one or more washer coupling holes **5412** extending through the washer coupling body **541**.

The washer coupling protrusion **5411** can be coupled to a receiving groove formed in the rotor. A fastener passing through the rotor can be inserted into the washer coupling hole **5412** to couple the rotor and the washer **540** to each other.

A plurality of washer coupling protrusions **5411** and a plurality of washer coupling holes **5412** can be alternately arranged along a circumferential direction and can be disposed on a surface of the washer coupling body **541**.

FIG. **7** is an enlarged cross-sectional view of the driver.

The driver can include the motor **500** that generates rotation power and the speed reducer that reduces the rotation speed of the motor **500** and delivers the rotation power having the reduced speed to the drum. The speed reducer **600** can include the drum rotation shaft **6341** that rotates the drum.

The motor **500** can include the stator **510** that generates a rotating magnetic field upon receiving external power and the rotor **520** that surrounds an outer circumferential face of the stator **510**. Permanent magnets can be disposed on an inner circumferential face of the rotor **520**.

The permanent magnets located on an inner circumferential face of the rotor **520** can move in a specific direction via rotating magnetism generated by the stator **510**, and the permanent magnet can be fixed to an inner circumferential face of the rotor **520**. Therefore, the rotor **520** can be rotated under the rotating magnetic field of the stator **510**.

The drive shaft **530** that rotates together with the rotor **520** and transmits the rotation power of the rotor **520** can be coupled to a center of rotation of the rotor **520**. The drive shaft **530** can be configured to rotate together with the rotor **520**. The drive shaft **530** can be coupled to the rotor **520** via the washer **540**.

The drive shaft **530** can be directly connected to the rotor **520**. Alternatively, when the drive shaft **530** is connected to the rotor via the washer **540**, the rotor **520** can be coupled thereto more firmly and thus can transmit the rotation force of the rotor **520** more effectively. Further, this can prevent the load from being concentrated on the drive shaft **530**, thereby increasing the durability of the drive shaft **530**.

The drive shaft **530** can be directly connected to the drum. In some cases, the drive shaft **530** can rotate at the same speed as that of the rotor **520**. In some cases, the speed of the drive shaft **530** can be decelerated to rotate the drum. For example, the drive shaft **530** can be connected to the speed reducer, and the speed reducer can be connected to the drum. That is, the speed reducer can decelerate the rotation of the drive shaft **530** to rotate the drum in the decelerated manner.

The speed reducer **600** can include a first housing **610** and a second housing **620** constituting an outer shape, and the gearbox **630** for reducing the power of the drive shaft **530**. The second housing **620** can provide a space to accommodate the gearbox **630** therein, and the first housing **610** can shield the accommodating space defined in the second housing **620**.

The second housing **620** can include a second housing coupling body **621** coupled to the first housing **610**, a second housing shielding body **622** extending rearwards from an inner circumferential face of the second housing coupling body **621** to define the receiving space for receiving the gearbox **630**, and a second housing shaft receiving portion **623** extending rearwardly from the second housing shielding body **622** and configured to receive the drive shaft **530**.

The gearbox **630** can include the ring gear **633** installed along an inner circumferential face of the second housing shielding body **622**. One or more planetary gear **632** meshed with the ring gear **633** can be disposed on an inner circumferential face of the ring gear **633**. The planetary gear **632** can be meshed with the ring gear **633**, and the sun gear **631** can rotate together with the drive shaft **530**.

The sun gear **631** can be configured to rotate while being coupled to the drive shaft **530**. The sun gear **631** can be implemented as a separate member from the drive shaft **530**. The disclosure is not limited thereto, and the sun gear **631** can be formed integrally with the drive shaft **530**.

Each of the sun gear **631**, the planetary gear **632** and the ring gear **633** can be implemented as a helical gear. When each gear is implemented as the helical gear, noise can be reduced and power transmission efficiency can increase. However, the present disclosure is not limited thereto, and each of the sun gear **631**, the planetary gear **632**, and the ring gear **633** can be implemented as a spur gear.

In an operation example of the gearbox **630**, as the rotor rotates, the drive shaft **530** and the sun gear **631** connected to the drive shaft **530** rotate. Thus, the planetary gear **632** meshed with an outer circumferential face of the sun gear **631** can rotate while being disposed between the ring gear **633** and the sun gear **631**.

The planetary gear **632** can include a planetary gear shaft **6323** that is inserted into the center of rotation. The planetary gear shaft **6323** can rotatably support the planetary gear **632**.

The speed reducer can further include a first carrier **6342** and a second carrier **6343** supporting the planetary gear shaft **6323**. A front face of the planetary gear shaft **6323** can be supported on the second carrier **6343**, while a rear face thereof can be supported on the first carrier **6342**.

The drum rotation shaft **6341** can extend from the rotation center of the second carrier **6343** in a direction away from the motor. The drum rotation shaft **6341** can be implemented as a separate component from the second carrier **6343** and can be coupled thereto such that both rotate together. To the contrary, the drum rotation shaft **6341** can extend from the second carrier **6343** and be integrally formed with the second carrier **6343**.

The drum rotation shaft **6341** can be coupled to the drum to rotate the drum. As described above, the drum rotation shaft **6341** can be coupled to the drum via a connecting body such as a bushing, or can be directly coupled to the drum without a separate connecting body.

The drum rotation shaft **6341** can be supported on the first housing **610**. The first housing **610** can include a first housing shielding body **611** shielding the receiving space of the second housing **620**, and a first housing shaft receiving portion **612** extending from the first housing shielding body **611** in a direction away from the second housing **620** to accommodate the drum rotation shaft **6341** therein. A first bearing **660** and a second bearing **670** can be press-fitted to an inner circumferential face of the first housing shaft receiving portion **612** to rotatably support the drum rotation shaft **6341**.

The first housing **610** and the second housing **620** can be coupled to each other via a speed reducer fastener **681**. Further, the speed reducer fastener **681** passes through the first housing **610** and the second housing **620** at the same time and can couple both to each other. Further, the speed reducer fastener **681** passes through the first housing **610**, the second housing **620** and the rear plate **420** simultaneously to couple the first housing **610** and the second housing **620** to each other and at the same time to fix the speed reducer **600** to the rear plate **420**.

The rear plate **420** can be made of a thin steel plate. Therefore, the rear plate **420** may not secure the rigidity thereof to support all of the speed reducer **600**, the motor **500** connected to the speed reducer **600**, and the drum **200** connected to the speed reducer **600**. Therefore, the bracket **700** can be used to secure the rigidity of the rear plate **420** when coupling the speed reducer **600** to the rear plate **420**. The bracket **700** can be made of a material with higher rigidity than that of the rear plate **420** and can be coupled to the front face or rear of the rear plate **420**.

The bracket **700** can be coupled to the front face of the rear plate **420** to secure the rigidity such that the speed reducer **600** can be coupled thereto, and the speed reducer **600** can be coupled to the rear plate **420** and the bracket **700** at the same time. A fastener such as a bolt can be used to couple the rear plate **420** to the bracket **700** and the speed reducer.

Further, in order to secure the speed reducer **600** to the rear plate **420**, the speed reducer fastener **681** that is used to couple the first housing **610** and the second housing **620** to each other can be used. That is, the speed reducer fastener **681** can extend through the second housing **620**, the first housing, the rear plate **420** and the bracket **700** at the same time to couple all thereof to each other. Thus, a front face of the rear plate **420** can be supported on the bracket **700** and a rear face thereof can be supported on the first housing **610**. Thus, when the speed reducer **600** can be coupled to the rear plate **420**, the rigidity thereof can be secured. However, the present disclosure is not limited thereto. First, only the first housing **610** and the second housing **620** can be coupled to each other using the speed reducer fastener **681**, and then the speed reducer **600** can be coupled to the rear plate **420** using a separate fastener.

Further, the stator coupling portion **613** to which the motor **500** can be coupled can be formed at a radially outer side of the first housing **610**. The stator coupling portion **613** can include a coupling groove formed by recessing which the stator coupling portion **613**.

The stator **510** can be directly coupled to the rear plate **420**, or can be coupled to the stator coupling portion **613**. The stator **510** can include a fixing rib **512** that can be disposed on an inner circumferential face thereof to support the stator. The fixing rib **512** can be coupled to the stator coupling portion **613**. The fixing rib **512** and the stator coupling portion **613** can be coupled to each other via a stator coupling pin **617**.

The motor **500** can be coupled to the speed reducer **600** while being spaced apart from the rear plate **420**, so that the motor **500** and the speed reducer **600** can constitute a single vibrating body. Therefore, even when external vibration is applied, the drive shaft **530** coupled to the rotor **520** and the drum rotation shaft **6341** connected to the speed reducer **600** can easily maintain the coaxial relationship with each other.

There is a risk that an axial direction of the drum rotation shaft **6341** can tilt due to the vibration of the drum **200**. However, the motor **500** can be coupled to the first housing **610** supporting the drum rotation shaft **6341**, such that even when the axial direction of the drum rotation shaft **6341** tilts, an axial direction of the drive shaft **530** can tilt by the same degree via the first housing **610**. That is, the motor **500** can move integrally with the speed reducer **600** so that the drum rotation shaft **6341** and the drive shaft **530** can be maintained in a coaxial relationship with each other even when the external force is applied thereto.

Under the above coupling structure, the efficiency and reliability at which the power generated from the motor **500** is transmitted to the drum **200** can increase, and wear, decrease in power transmission efficiency and durability and reliability of the gearbox **630** as caused by the axial misalignment between the drum rotation shaft **6341** and the drive shaft **530** can be prevented.

FIG. **8** shows the base and the rear plate.

Referring to FIG. **8**, the rear plate **420** can be located in rear of the drum. The rear plate **420** can guide the hot air discharged from the air circulating channel **820** to the drum. That is, the rear plate **420** can be located in rear of the drum to define a channel so that the hot air is uniformly supplied to an entirety of the drum.

The rear plate **420** can include the rear panel **421** facing toward the drum rear face, and the duct portion **423** that can be configured to be recessed rearwardly in the rear panel **421** to define a channel. The duct portion **423** can be formed by pressing backwards the rear panel **421**. The duct portion **423** can be configured to receive a portion of the drum rear face.

The duct portion **423** can include an air inlet **4233** positioned in rear of the air circulating channel and an air flow portion **4231** positioned in rear of the drum. The air flow portion **4231** can be configured to receive a portion of the drum. The air flow portion **4231** can accommodate a portion of the drum, and can define a channel located in rear of the drum.

The air flow portion **4231** can be formed in an annular shape so as to face toward the intake hole defined in the rear face of the drum. The air flow portion **4231** can be configured to be recessed in the rear panel **421**. That is, the air flow portion **4231** can be configured so that a front face thereof is open, and can define a channel together with the rear face of the drum.

When the front face of the air flow portion **4231** can be configured to be open, the hot air flowing to the air flow portion **4231** can directly flow to the drum without passing through a separate component. Accordingly, this can prevent heat loss from occurring while hot air passes through the separate component. That is, there is an effect that can increase the drying efficiency by reducing the heat loss of the hot air.

The rear plate **420** can include the mount **425** disposed at the radially inner side of the air flow portion **4231**. The mount **425** can provide a location to which the speed reducer **600** or the motor **500** is coupled. That is, the rear plate **420** can include the mount **425** disposed at an inner side thereof, and the air flow portion **4231** formed in an annular shape and disposed at a radially outer side of the mount **425**.

Specifically, the air flow portion **4231** can include an outer circumferential portion **4231***a* disposed outwardly of and surrounding an inner space in which hot air flows. Further, the air flow portion **4231** can include an inner circumferential portion **4231***b* disposed inward of and surrounding the inner space in which hot air flows. That is, the outer circumferential portion **4231***a* can constitute an outer circumference of the air flow portion **4231**, and the inner circumferential portion **4231***b* can constitute an inner circumference of the air flow portion **4231**.

Further, the air flow portion **4231** can include a recessed face **4232** that forms a rear face of the channel through which the hot air flows. The recessed face **4232** can be configured to connect the outer circumferential portion **4231***a* and the inner circumferential portion **4231***b* to each other. That is, a space in which the hot air discharged from the air circulating channel **820** flows can be defined by the inner circumferential portion **4231***b*, the outer circumferential portion **4231***a*, and the recessed face **4232**.

Further, the recessed face **4232** prevents the hot air from leaking rearwardly and guides the hot air toward the drum. That is, the recessed face **4232** can be recessed in the air flow portion **4231**.

The air inlet **4233** can be positioned to face toward the air circulating channel **820**. The inlet can be positioned to face toward the blower **8231**. The air inlet **4233** can be configured to be recessed backwards in the rear panel **421** to prevent interference with the blower **8231**. A top of the air inlet **4233** can be connected to the air flow portion **4231**.

The laundry treating apparatus can include the connector **850** connected to the blower **8231**. The connector **850** can guide the hot air discharged from the blower **8231** to the air flow portion **4231**. The connector **850** can have a channel defined therein to guide the hot air discharged from the blower **8231** to the air flow portion **4231**. That is, the connector **850** can define the channel for connecting the blower **8231** and the air flow portion **4231** to each other. A cross-sectional area of the channel defined inside the connector **850** can be configured to increase as the channel extends away from the blower **8231**.

The connector **850** can be positioned to face toward the air inlet **4233**. The air inlet **4233** can be formed to be recessed backwards to prevent interference with the connector **850**. Further, a top of the connector **850** can be configured to partition the air flow portion **4231** and the air inlet **4233** from each other. That is, the hot air discharged from the connector **850** can be introduced into the air flow portion **4231**, but can be prevented from flowing into the air inlet **4233**.

The connector **850** can be configured to evenly supply the hot air to the air flow portion **4231**. The connector **850** can be configured so that a width thereof increases as a distance thereof from the blower **8231** increases. The top of the connector **850** can be positioned along a circumferential extension line of the outer circumferential portion **4231***a*.

Accordingly, the hot air discharged from the connector **850** can be supplied to an entirety of the air flow portion **4231** without flowing to the air inlet **4233**. The connector **850** prevents the hot air from being concentrated on one side of the air flow portion **4231**, so that the hot air can be evenly supplied to the inside of the drum. Therefore, there is an effect of increasing the drying efficiency of laundry.

The connector **850** can be configured to increase in a width thereof as it extends toward an upstream side, so that a velocity of hot air flowing along the connector **850** can be reduced according to a flow direction. That is, the connector **850** can perform a function of a diffuser that adjusts a speed of the hot air. The connector **850** can reduce the speed of the hot air to prevent the hot air from being concentrated on a specific portion of the drum.

Due to the shape of the connector **850** as described above, the air inlet **4233** configured to face toward the connector **850**, and configured to prevent interference with the connector **850** can be configured to increase in a width thereof as a distance thereof from the blower **8231** increases. Due to the shape of the air inlet **4233**, an overall shape of the duct portion **423** can have a character '9' in a front view.

Because the drum can be configured to rotate during the drying cycle, the drum can be configured to be spaced apart from the air flow portion **4231** by a predetermined distance. Hot air can escape through a separation space.

Accordingly, the laundry treating apparatus can further include the sealing portion **450** that prevents the hot air from leaking into the separation space between the drum and the air flow portion **4231**. The sealing portion **450** can be positioned along a perimeter of the air flow portion **4231**.

The sealing portion **450** can include the first sealing **451** extending along the outer circumference of the air flow portion **4231**. The first sealing **451** can be disposed between the drum and the outer circumference of the air flow portion **4231**. Further, the first sealing **451** can be configured to contact both the drum rear face **220** and the rear plate **420** to prevent the leakage more effectively.

In some examples, the first sealing **451** can be configured to be in contact with the front face of the connector **850**. Further, the first sealing **451** can be configured to be in contact with the top of the connector **850**. The connector **850** can define a channel through which hot air flows together with the air flow portion **4231**. Therefore, the first sealing **451** can be configured to be in contact with connector **850** to prevent the hot air from leaking into a space between the drum and the connector **850**.

The sealing portion **450** can include the second sealing **452** extending along an inner circumference of the air flow portion **4231**. The second sealing **452** can be disposed between the drum and an inner circumference of the air flow portion **4231**. Further, the second sealing **452** can be configured to contact both the drum rear face **220** and the rear plate **420**. The second sealing **452** can prevent the hot air flowing along the air flow portion **4231** from leaking toward the mount **425**.

Because the drum **200** rotates during the operation of the laundry treating apparatus, continuous friction from the drum rear face **220** is applied to the sealing portion **450**. Therefore, the sealing portion **450** can be made of a material capable of sealing between the drum rear face **220** and the air flow portion **4231** without deterioration in performance even with frictional force and frictional heat generated according to the rotation.

FIG. **9** shows a combined structure of the rear plate and the speed reducer, and the motor.

Referring to FIG. **9**, the speed reducer **600** can be supported on the rear plate **420**, and the motor **500** can be coupled to the speed reducer **600**. That is, the rear plate **420** can be configured to support both the speed reducer **600** and the motor **500**.

The motor **500** that provides the rotation power and a speed reducer **600** that decelerates the power of the motor and transmits the same to the drum can be located in rear of the rear plate **420**.

The speed reducer **600** can be installed on the rear plate **420** so as to be located inside the duct portion **423**. The speed reducer **600** can be positioned radially inwardly of the air flow portion **4231** to prevent interference with the air flow portion **4231**.

A gear unit inside the speed reducer **600** can be damaged by the heat of the hot air flowing along the air flow portion **4231**. Accordingly, the air flow portion **4231** and the speed reducer **600** can be configured to be spaced apart from each other by a predetermined distance.

The speed reducer **600** can be coupled t and extend through the rear plate **420**. Therefore, the speed reducer **600** can be connected to the drum located in front of the rear plate **420**.

The stator **510** can be coupled to the speed reducer **600**. The stator **510** can be coupled to the speed reducer **600** and can be installed to be spaced apart from the rear plate **420**. In some examples, the speed reducer **600** can be located between the drum and the motor and can support the drum and the motor such that the drum and the motor are spaced apart from the rear plate **420**. That is, the speed reducer **600** can act as a center supporting the drum and the motor.

In some examples, the stator **510** can include the main body **511** formed in a ring shape, the fixing rib **512** that extends from an inner circumferential face of the main body **511** and can be coupled to the stator coupling portion **613** of the speed reducer, teeth **514** extending from and along an outer circumferential face of the main body **511** so that a coil is wound around the teeth, and a pole shoe **515** disposed at a free end of the teeth **514** to prevent the coil from being removed.

The rotor **520** can include the rotor body **521** that can be formed in a cylindrical hollow shape. Further, the rotor **520** can include an installation body **522** that is recessed frontwards in a rear face of the rotor body **521**. The rotor **520** can have permanent magnets disposed along an inner circumferential face of the rotor body **521**.

The rotor **520** can be coupled to the drive shaft **530** to transmit the rotation power of the rotor **520** to an external component via the drive shaft **530**. The drive shaft **530** can be connected to the rotor **520** via the washer **540**.

Further, the motor **500** can include the washer **540** that supports the drive shaft **530**. The washer **540** can include the washer coupling body **541** that is coupled to the rotor. The washer coupling body **541** can be formed in a disk shape.

The washer **540** can include the receiving body **542** that is housed in the rotor. The receiving body **542** can be configured to protrude rearward from the washer coupling body **541**. The washer **540** can include the shaft support hole **543** extending through the center of the receiving body **542**. The drive shaft **530** can be inserted into the shaft support hole **543** and supported on the washer **540**.

Further, the washer **540** can include the washer coupling hole **5412** extending through the washer coupling body **541**. Further, the installation body **522** can include a rotor coupling hole **526** disposed at a position corresponding to that of the washer coupling hole **5412**. That is, the washer **540** and the rotor **520** can be coupled to each other via a coupling member that passes through the washer coupling hole **5412** and the rotor coupling hole **526** at the same time. That is, the washer **540** and the rotor **520** can be coupled to each other so as to rotate together.

Further, the washer **540** can include the washer coupling protrusion **5411** that projects rearward from the washer coupling body **541**. Further, the installation body **522** can include a washer protrusion receiving hole **525** configured to correspond to the washer coupling protrusion **5411**. The washer coupling protrusion **5411** can be inserted into the washer protrusion receiving hole **525** to support the coupling between the washer **540** and the rotor **520**.

Further, the rotor **520** can include a rotor installation hole **524** that extends through a center of the installation body **522**. The rotor installation hole **524** can accommodate the receiving body **542** therein. Accordingly, the washer **540** can rotate together with the drive shaft **530** via the rotor **520** and can firmly support the coupling between the drive shaft **530** and the rotor **520**. Therefore, this can secure the durability and reliability of an entirety of the motor **500**.

FIG. **10** shows a coupling structure of the speed reducer and the stator from the rear.

The stator **510** can include the main body **511** formed in a ring shape and fixed to the speed reducer **600**, the fixing rib **512** extending from an inner circumferential face of the main body **511** and coupled to the stator fastening hole **615** of the speed reducer, the teeth **514** extending from and along the outer circumferential face of the main body **511** and configured so that the coil is wound around the teeth, the pole shoe **515** disposed at the free end of the teeth **514** to prevent the coil from being removed, and a terminal that controls supply of the current to the coil.

The stator **510** can include a receiving space **513** defined inside the main body **511** and extending through the main body **511**. A plurality of fixing ribs **512** can be arranged to be spaced apart by a certain angular spacing around the receiving space **513** and can be disposed inside the main body **511**. A fixed rib hole **5121** where a fixing member is installed can be defined inside the fixing rib **512** so that the fixed rib hole **5121** and the stator fastening hole **615** of the speed reducer can be coupled to each other using the fixing member such as a pin.

When the stator **510** is directly coupled to the speed reducer **600**, a portion of the speed reducer **600** can be configured to be accommodated in the stator **510**. In particular, when the speed reducer **600** is accommodated in the stator **510**, an overall thickness of the driver including both the speed reducer and the motor can be reduced, so that to volume of the drum can be further expanded.

In some examples, the speed reducer **600** can have a diameter smaller than a diameter of the main body **511**. That is, each of the first housing **610** and the second housing **620** can have a largest diameter smaller than the diameter of the main body **511**. Accordingly, the speed reducer **600** can be configured such that at least a portion thereof is accommodated in the main body **511**. However, the stator coupling portion **613** can extend from the housing of the speed reducer so as to overlap the fixing rib **512**. Accordingly, the stator coupling portion **613** can be coupled to the fixing rib **512** and portions of the first housing and the second housing **620** can be positioned inside the main body **511**.

FIG. **11** shows combination of the speed reducer and the motor.

The stator **510** can be coupled to the speed reducer **600**. The stator can be coupled to the stator coupling portion **613** protruding outwardly from the housing of the speed reducer **600** so that at least a portion of the speed reducer can be accommodated inside the main body **511**. Thus, the center of the main body **511** and the centers of the drive shaft **530** and the speed reducer **600** can be kept in a coaxial relationship with each other.

In some examples, the rotor **520** can be positioned to accommodate the stator **510** therein while being spaced apart from the pole shoe **515** by a certain distance. Because the drive shaft **530** is fixed to the speed reducer **600** housed in the main body **511**, a gap G1 between the rotor **520** and the stator **510** can be maintained.

Therefore, the rotor **520** and the stator **510** can be prevented from colliding with each other or the rotor can be prevented from rotating while the rotor is temporarily misaligned with the stator, so that noise or vibrations can be prevented.

In some examples, all of an imaginary first diameter line K1 passing through the center of the speed reducer **600** and the center of the drive shaft **530**, and an imaginary second diameter line K2 passing through the center of the main body **511**, and an imaginary third diameter line K3 passing through the center of the rotor **520** can meet each other at the rotation center of the speed reducer **600**.

In this way, the speed reducer **600** itself can act as the center of rotation of the drive shaft **530**, and the stator **510** can be fixed directly to the speed reducer **600**, so that the drive shaft **530** can be prevented from being misaligned with the speed reducer **600**. As a result, the reliability of the speed reducer **600** can be guaranteed.

FIG. **12** is a perspective view showing the base **800** of the laundry treating apparatus.

Referring to FIG. **12**, the base **800** can include the air circulating channel **820** which can be disposed at one side of the base **800**, and circulate the air in the drum. Further, at the other side of the base **800**, a component mount **810** that provides a space in which components for the operation of the dryer are installed can be provided. The component mount **810** can be disposed out of the air circulating channel **820**.

In the conventional dryer, the air circulating channel **820** may be disposed on the base **800**, and the driver for rotating the drum **200** may be installed on the base **800**. Because the driver occupies a large portion of an installation space of the base **800**, the component mount **810** formed in a space of the base **800** except for the air circulating channel **820** has a small space. Thus, it may not be easy to install other components of the laundry treating apparatus on the component mount.

In some implementations, in the laundry treating apparatus, the motor **500** rotating the drum **200** can be spaced apart from the base **800** and can be disposed in rear of the drum **200**. Thus, without the motor **500** in the base, a space of the base **800** can be utilized in various ways.

A compressor **930** for compressing refrigerant for heat exchange can be installed at the component mount **810**. Further, the base **800** can include a water collector **860** which can be configured to be spaced apart from the compressor **930**, and into which the condensate generated in the air circulating channel **820** is collected. A control box **190** for controlling the compressor **930** and the motor can be installed on the component mount **810**.

The control box **190** can be installed on the base and supported thereon firmly. Further, the control box **190** and a connection line for connecting components controlled by the control box to each other can be firmly supported on the base **800**.

In another example, the water collector **860** may not be disposed between the compressor **930** and the air circulating channel **820**, but can be disposed to overlap the compressor **930** in the front-rear direction. Because the water collector **860** may be located in a space where the motor is conventionally disposed, a volume of the water collector **860** can be expanded. When the volume of the water collector **860** increases, a frequency of emptying the collected condensate can be reduced, so that the user's convenience can be improved.

A side face of the base **800** can be coupled to the side panel constituting the side face of the cabinet. The side panel can include the first side panel **141** and the second side panel **142**. The control box **190** can be installed on the component mount **810** and can be installed closer to one of the side panels.

The control box **190** can control all operations of the laundry treating apparatus. Therefore, there can be many cases of checking or repairing the control box **190**.

When the control box **190** is adjacent to the first side panel **141**, the user can access the control box **190** by removing only the first side panel **141**. Accordingly, there is an effect that easiness of maintenance increases.

When the first side panel **141** is removed, various components such as the compressor **930** and the control box **190** can be easily accessed by the user, so that the first side panel **141** can be referred to as a service panel.

FIG. **12** shows a state in which the component mount **810** is located at a left side of the base **800** and the control box **190** can be accessed by the user when the first side panel **141** is removed. However, the present disclosure is not limited thereto. When the air circulating channel **820** is formed on at the left side and the component mount **810** is formed at the right side, the control box or the compressor can be repaired and checked by removing the right panel.

In some examples, the air circulating channel **820** can further include the duct cover **830** positioned at a top of the air circulating channel **820** to define a channel through which air discharged from the drum flows. The duct cover **830** can be coupled to an open top face of the air circulating channel **820**.

The top faces of the inflow duct **821** and the air flow duct **822** are open so that air can flow in and out through the open top faces. The duct cover **830** can shield an open top face of the air flow duct **822**. Therefore, the duct cover **830** allows the air of the drum to flow into the channel through the inflow duct **821**, and prevents the air flowing into the inflow duct **821** from flowing out of the channel through the open top face of the air flow duct **822**. That is, the duct cover **830** can constitute one face of the channel that guides the air introduced through the inflow duct **821** to the air discharge duct **823**.

The air discharge duct **823** can include the blower **8231** that discharges air out of the air discharge duct **823**. The blower **8231** can discharge the air that has passed through the inflow duct **821** and the air flow duct **822** out of the air discharge duct **823**.

The blower **8231** can provide a space where the air circulating channel fan **950** that circulates the air inside the drum is installed. The air circulating channel fan **950** can increase a circulating speed of air by forcibly flowing the air, and thus has the effect of shortening a drying time by increasing a drying speed of laundry.

When the air circulating channel fan **950** rotates, air can flow in such a way that the air is discharged through an opening formed above the blower **8231**. The air discharged from the blower **8231** can flow back into the drum and can be used to dry the laundry.

The air circulating channel fan **950** can employ various types of fans. For example, a sirocco fan can be applied so that air is introduced in a direction of the rotation shaft and is discharged in a radial direction. However, the present disclosure is not limited thereto, and various fans can be used to generate the air flow according to design purposes.

The duct cover **830** can include a communication cover body **8312** coupled to a top of the inflow duct **821** and a shielding cover body **8311** coupled to the top of the air flow duct **822**. The shielding cover body **8311** can extend from the communication cover body **8311**, and the shielding cover body **8311** can be formed integrally with the communication cover body **8312**.

The communication cover body **8312** can include an inflow communication hole **8314** that communicates the drum and the inflow duct **821** with each other. Even when the communication cover body **8312** can be coupled to the inflow duct **821**, the inflow communication hole **8314** can guide the air discharged from the drum to the inflow duct **821**.

Further, the shielding cover body **8311** can shield the top face of the air flow duct **82**. Thus, the air introduced into the inflow duct **821** can be guided to the air discharge duct **823** while not flowing out of the air circulating channel **820** via the air flow duct **822**.

The shielding cover body **8311** can include a cleaning water channel **833** through which water can flow and which can be disposed in a top face of the shielding cover body **8311**. The cleaning water channel **833** can receive water and spray the water toward the first heat exchanger located below the duct cover **830**.

A cover through-hole **8313** vertically extending through the shielding cover body **8311** can be disposed downstream of the cleaning water channel **833**. Water flowing along the cleaning water channel **833** can be sprayed downwardly of the shielding cover body **8311** through the cover through-hole **8313**.

The first heat exchanger to dehumidify the air discharged from the drum can be disposed below the cover through-hole **8313**. Therefore, the water passing through the cover through-hole **8313** can be sprayed towards the first heat exchanger to wash the first heat exchanger.

A nozzle cover can be coupled to a top of the cleaning water channel **833**. The nozzle cover can shield an open top face of the cleaning water channel **833**. The nozzle cover can prevent the air flowing along the air flow duct **822** from leaking through the cover through-hole **8313**. Further, the nozzle cover shields the top face of the cleaning water channel **833** to prevent the water flowing along the cleaning water channel **833** from scattering to the outside.

Alternatively, the air circulating channel **820** can further include a duct filter that can be disposed in front of the first heat exchanger to filter foreign substances of air that has passed through the inflow duct **821**. The duct filter can be disposed between the inflow duct **821** and the first heat exchanger to prevent foreign substances from being deposited on a front face of the first heat exchanger, thereby improving the drying efficiency and heat exchange efficiency of the first heat exchanger.

When the foreign substances are deposited on the duct filter, the circulation of air passing through the inflow duct **821** and the air flow duct **822** can be disturbed. In order to solve the above problem, the cleaning water channel **833** can remove the foreign substances deposited on the duct filter using water pressure via spraying water toward the duct filter.

However, for convenience of description, the following description will be based on the laundry treating apparatus in which the duct filter is omitted.

A channel switching valve **870** that can be coupled to the cleaning water channel **833** and supplies water for cleaning to the cleaning water channel **833** can be further included. The channel switching valve **870** can be connected to a water supply source to selectively supply water to the cleaning water channel **833**. The water supply source can include the water collector **860**.

The channel switching valve **870** can be connected to the water collector **860** via a hose to guide the water collected in the water collector **860** to the cleaning water channel **833**. The channel switching valve **870** can guide the water collected in the water collector **860** to the water storage tank **120** (refer to FIG. **1**).

FIG. **13** is an exploded perspective view showing the duct cover and the water collector cover in a separated state from the base in FIG. **12**.

Referring to FIG. **13**, below the duct cover **830**, the first heat exchanger **910** and the second heat exchanger **920** which sequentially exchange heat with the air inside the drum **200** can be installed so as to be spaced apart from each other in the front and rear direction. The air inside the drum **200** introduced into the inflow duct **821** can be heat-exchanged in the first heat exchanger **910** such that the moisture is removed therefrom, and the air from which the moisture has been removed can be heat-exchanged in the second heat exchanger **920** and thus can be heated. The heated air can be supplied back into the drum **200** through the air discharge duct **823**.

The air circulating channel **820** can further include a water cover **826** disposed between the first heat exchanger **910** and a bottom face of the air flow duct **822**. The water cover **826** can be configured to be supported on the air flow duct **822**.

The water cover **826** can be configured to be positioned under the first heat exchanger **910** to support the bottom face of the first heat exchanger **910**. The water cover **826** can support the first heat exchanger **910** so as to be spaced away from the bottom face of the air flow duct **822**.

In the first heat exchanger **910**, condensate can be generated by condensing the wet steam discharged from the drum **200**. When the condensate is not discharged from the inside of the laundry treating apparatus and remains, there is a problem that an odor is generated or the drying efficiency is reduced. Thus, the condensate can be collected while being spaced away from the first heat exchanger **910** or the second heat exchanger **920**, and then discharged.

The water cover **826** can support the first heat exchanger **910** so as to be spaced apart from the bottom face of the air flow duct **822** to define a space between the bottom face of the air flow duct **822** and the water cover **826**. The condensate can flow into the water collector **860** along the space defined by the water cover **826**.

The air dehumidified through the first heat exchanger **910** can be heated in the second heat exchanger **920**. The air passing through the second heat exchanger **920** has a low moisture content. As the air is heated, an amount of saturated steam increases, so that it is difficult to generate condensate. Accordingly, the water cover **826** can be positioned on a bottom face adjacent to the first heat exchanger **910**, and the water cover **826** can be configured to be spaced apart from the second heat exchanger **920**.

Because only a portion of a top face of the water cover **826** is shown in FIG. **13**, a shape of the channel formed by the water cover **826** and a detailed structure of the water cover **826** will be described later.

In some examples, the base **800** can include the water collector **860** that can be configured to be spaced apart from the air circulating channel **820** and configured to collect the condensate generated in the air circulating channel **820**. The water collector **860** can include the water collector body **862** that has a space defined therein where condensate is collected.

The water collector **860** can further include a water collector cover **863** shielding an open top face of the water collector body **862**. Moisture-sensitive components can be installed around the water collector **860**. In some examples, the condensate collected in the water collector body **862** can be blocked from scattering to the outside. For example, the water collector cover **863** can be coupled to the water collector body **862** to block the condensate from leaking to the top face of the water collector body **862**.

Further, the water collector **860** can include a pump that allows the condensate collected inside the water collector body **862** to flow to the outside. In order for the pump to function properly, the inside of the water collector body **862** can be sufficiently sealed. The water collector cover **863** seals the inside of the water collector body **862** to increase the reliability of the pump.

The water collector cover **863** can include a water collector cover body **8631** that constitutes a shielding face of the water collector body **862**. Further, the water collector cover **863** can include at least one of a support body **8635** configured to support the water collector cover body **8631** and a fastening hook **8636** configured to couple the water collector cover body **8631** to the water collector body **862**.

The support body **8635** can protrude from a circumference of the water collector cover body **8631** and be seated on the base. The fastening hook **8636** can be formed to protrude from the water collector cover body **8631**. The fastening hook **8636** can firmly fix the water collector cover body **8631** to the water collector body **862**. The fastening hook **8636** can be fixedly inserted into a hook hole to be described later.

The condensate generated in the air circulating channel **820** is collected inside the water collector body **862**. The top face of the water collector body **862** can be open, such that the condensate can be scattered to the outside. However, the water collector body **862** is located adjacent to the control box **190**, the compressor **930**, and the like. Thus, when the condensate scatters out of the water collector body **862**, a failure of the mechanical devices can occur.

The water collector cover **863** can shield the open top face of the water collector body **862** using the water collector cover body **8631** to prevent the condensate from scattering. The support body **8635** and the fastening hook **8636** can firmly fix the water collector cover body **9631** to the water collector body **862**. Therefore, this can prevent the condensate from scattering and thus a failure of the device from occurring.

Further, the water collector cover **863** can include a pump receiving portion **8634** configured to extend through the water collector cover body **8631** and to receive the pump. Further, the water collector cover **863** can include a drain channel **8637** that protrudes upwardly from the water collector cover body **8631** and is formed in a pipe shape communicating an inside and an outside of the water collector body **862** to each other.

The pump receiving portion **8634** can receive therein the pump configured to move the condensate collected inside the water collector body **862** out of the water collector body **862**. When the pump is activated, the condensate stored in the water collector body **862** can be discharged through the drain channel **8637**.

The hose can be connected to the drain channel **8637** to guide the discharged condensate out of the water collector body **862**. One end of the hose can be connected to the drain channel **8637**, and the other end thereof can be connected to the channel switching valve **870**. However, the disclosure is not limited thereto, and the other end of the hose can be located out of the cabinet to drain the condensate directly out of the cabinet. The other end of the hose can be connected to the water storage tank **120** (refer to FIG. **1**) located on a top of the cabinet, so that the condensate collected in the water collector body **862** can be guided to the water storage tank **120**.

The water collector cover **863** can further include a return channel **8638** which can be spaced apart from the drain channel **8637** and communicate an inside and an outside of the water collector body **862** with each other. The return channel **8638** can communicate the water collector body **862** and the water storage tank with each other. The return channel **8638** can guide water from the water storage tank back to the water collector body **862**.

The return channel **8638** can be connected via the hose to the water storage tank **120** disposed on the top of the cabinet (see FIG. **3**). To prevent water from overflowing the water storage tank, when the water storage tank is full of water, the water stored in the water storage tank can flow back to the water collector body **862** via the hose connecting the return channel **8638** and the water storage tank to each other. There is an effect that the user's convenience can be improved by reducing the frequency at which the user directly drains the water.

In some examples, the channel switching valve **870** for switching the channel along which the condensate collected in the water collector **860** flow can be further included. The pump can be connected to the channel switching valve **870** via the hose. The water stored in the water collector body **862** can flow, under the operation of the pump, to the channel switching valve **870**. The channel switching valve **870** can guide the flowing water to various paths.

The channel switching valve **870** can be connected to the cleaning water channel **833** to move the water to the cleaning water channel **833**. Water directed to the cleaning water channel **833** can be used to clean the first heat exchanger.

Further, the channel switching valve **870** can be connected to the water storage tank **120** via the hose to guide the condensate flowing from the water collector body **862** to the water storage tank **120**. The user can directly drain water from the water storage tank where the condensate is stored.

The channel switching valve **870** can be controlled by the control box **190**, and can operate in a different manner depending on an operation timing of the laundry treating apparatus. For example, when an operation of the first heat exchanger **910** has been completed in the drying cycle, the control box **190** can control the channel switching valve **870** to direct the condensate to the cleaning water channel **833**. Further, when washing of the first heat exchanger **910** has been completed, the control box **190** can control the channel switching valve **870** to guide the condensate to the water storage tank **120**.

In some examples, as described above, in order for the pump to operate normally, it is desirable to seal an inside of the space to which the pump drains water. Because the water collector cover **863** can be firmly coupled to the water collector body **862** using the support body **8635** and the fastening hook **8636**, this can easily seal the space where the condensate is stored. Thus, operational reliability of pump **861** can be improved. A sealing can be added to a portion where the water collector cover **863** and the water collector body **862** are joined to each other, thereby improving water-tightness of the space.

In some examples, the water collector cover **863** can be configured to seal the inside of the water collector body **862**, and can be detachably coupled to the water collector body **862**. Foreign substances such as lint included in the condensate generated by the first heat exchanger **910** can flow into the water collector body **862**. When the foreign substances with large particles are introduced thereto, there can be a problem that the substances can interfere with the operation of the pump.

In some examples, the water collector cover **863** can be removed to remove the foreign substances introduced into the water collector body **862**. Accordingly, the water collector cover **863** can be detachably coupled to the water collector body **862**. In some examples, there is an effect that the water collector cover **863** can be easily removed from the water collector body **862** using the fastening hook **8636**.

That is, in a general use environment, the support body **8635** and the fastening hook **8636** can securely shield the open top face of the water collector body **862** to prevent the condensate from scattering to the outside.

In some cases, when the water collector cover **863** is removed in order to remove foreign substances deposited on the water collector body **862**, the fastening hook **8636** can be used to easily remove the water collector cover.

In some examples, the duct cover **830** can include a cover mount hook **8391** formed along a perimeter thereof, and a duct protrusion **824** protruding from and along a periphery of the air circulating channel **820** and coupled to the cover mount hook **8391**.

The cover mount hook **8391** can be coupled to the duct protrusion **824** to couple the duct cover **830** to the air circulating channel **820**. That is, the duct cover **830** can be securely fastened to the duct protrusion **824** using the cover mount hook **8391** in a state seated around the inflow duct **821** and the air flow duct **822**.

A sealing can be added to a contact face of the duct cover **830** and the air circulating channel **820** to prevent air from leaking from the inside of the air circulating channel **820** to the outside.

FIG. **14** is a cross-sectional view showing an arrangement relationship of the drum and the air circulating channel in the laundry treating apparatus. Descriptions of those duplicate with the configurations as described in FIG. **13** are omitted.

The cabinet **100** can include the first side panel **141** positioned on one side of the drum **200** to constitute one side face thereof, and the second side panel **142** positioned on the other side of the drum **200** to constitute the other side face thereof.

In this case, the air circulating channel **820** can be disposed closer to one of the first side panel **141** and the second side panel **142** than to the other thereof. The water collector **860** can be disposed closer to the other of the first side panel **141** and the second side panel **142**.

In some examples, the air circulating channel **820** can be disposed closer to the second side panel **142** than to the first side panel **141**. The air flow duct **822** and the duct cover **830** can be disposed closer to the second side panel **142** than to the first side panel **141**. The first side panel **141** can define a left side face with respect to the drum **200**, and the second side panel **142** can define a right side face with respect to the drum **200**.

Accordingly, the water collector **860** can be spaced apart from the air circulating channel **820** and disposed out of the air circulating channel **820**. The water collector **860** can be installed between the second side panel **142** and the air circulating channel **820**.

In some examples, the channel switching valve **870** can be coupled to the air circulating channel **820** so as to communicate with the cleaning water channel **833** and can be configured to deliver the condensate to the cleaning water channel **833**. In some examples, the channel switching valve **870** can be coupled to the air circulating channel **820** and extend by a predetermined length L**9**. Thus, depending on an arrangement of the channel switching valve **870**, the channel switching valve **870** can interfere with the drum **200**.

To solve this situation, the channel switching valve **870** can be positioned at a lower level than that of the top face of the duct cover **830** and can be configured to face toward a side face of the air flow duct **822**. In some examples, the channel switching valve **870** can be disposed between the air circulating channel **820** and the first side panel **141** and can face toward the water collector **860**. A vertical level of a top of the channel switching valve **870** can be lower than that of the top face of the duct cover **830**.

Thus, the channel switching valve **870** may not interference with the drum **200**. Thus, the user can remove the first side panel **141** without removing the drum **200** to easily repair and maintain the channel switching valve **870**.

Further, the duct cover **830** can include a valve connector **838** extending toward the water collector **860** and facing toward the water collector **860**. The valve connector **838** can be configured to be disposed above the water collector **860**, and can be configured to be disposed side by side with the water collector **860**.

The channel switching valve **870** can be coupled to a bottom face of the valve connector **838** and can extend toward the water collector **860**. The cleaning water channel **833** can be configured such that one end thereof is formed on a top face of the valve connector **838** and communicates with the channel switching valve **870**.

Coupling the channel switching valve **870** to the bottom face of the valve connector **838** can allow the channel switching valve **870** to be further prevented from interfering with the drum **200**. Further, in the laundry treating apparatus, a radius R of the drum **200** can be further expanded within a range in which interference with the channel switching valve **870** is prevented. The channel switching valve **870** can be freely positioned according to the position of the valve connector **838**.

In some examples, regarding a detailed structure of the channel switching valve **870**, the channel switching valve **870** can include a water receiving portion **871** communicating with the pump **861** and receiving the water from the pump **861**, and a connective portion **879** communicating with the water receiving portion **871** and coupled to the duct cover **830** to deliver the water to the cleaning water channel **833**.

Further, the channel switching valve **870** can further include a water delivering portion **872** disposed between the water receiving portion **871** and the connective portion **879**. The water delivering portion **872** can be coupled to each of the water receiving portion **871** and the connective portion **879** and guide the water supplied from the water receiving portion **871** to the connective portion **879**. In other words, the water receiving portion **871**, the water delivering portion **872**, and the connective portion **879** can be arranged in this order along a direction in which the condensate flows.

In some examples, the connective portion **879** can be coupled to the valve connector **838** and extend toward the water collector **860**, and the connective portion **879** can be disposed to face toward the water collector body **862**. Further, the connective portion **879** can be coupled to the bottom face of the valve connector **838** and communicate with the cleaning water channel **833** to deliver the condensate to the cleaning water channel **833**. The connective portion **879** can be disposed at a side in a longitudinal direction of the air circulating channel **820**. At least a portion of the connective portion **879** is positioned at a lower level than that of the top face of the air circulating channel **820**.

In some examples, the water collector **860** can include the drain channel **8637** protruding upward from the water collector cover **863** and communicating the water collector body **862** with the outside of the water collector cover **863**, and a first water collector drain pipe **8911***a* for connecting the drain channel **8637** and the channel switching valve **870** to each other such that the condensate flows from the pump **861** to the channel switching valve **870**. The first water collector drain pipe **8911***a* can act as a passage through which the condensate flows from the pump **861** to the channel switching valve **870**.

In some examples, the water receiving portion **871** can be connected to the first water collector drain pipe **8911***a* and can receive condensate from the pump **861** through the first water collector drain pipe **8911***a*. The condensate supplied to the water receiving portion **871** can be delivered to the water delivering portion **872** and the connective portion **879**.

As the channel switching valve **870** extends from the valve connector **838** toward the water collector **860**, the water receiving portion **871** can be disposed on top of the water collector **860** and face toward the water collector **860**.

Thus, a distance between the water receiving portion **871** and the pump **861** can be reduced. Thus, an extension length of the first water collector drain pipe **8911***a* for connecting the pump **861** and the water receiving portion **871** to each other can be reduced to prevent the condensate from remaining in the first water collector drain pipe **8911***a*.

FIG. **15** is a perspective view showing the cleaning water channel disposed on the top face of the duct cover in the laundry treating apparatus.

The duct cover **830** can include a shielding cover body **8311** coupled to a top of the air flow duct **822** for shielding the first heat exchanger **910** and the second heat exchanger **920**, and a communication cover body **8312** extending forward from the shielding cover body **8311** and coupled to a top of the inflow duct **821**.

The shielding cover body **8311** can be configured to shield the open top face of the air flow duct **822**, and the communication cover body **8312** can be configured to be seated on a top face of the inflow duct **821**.

In this case, the shielding cover body **8311** and the communication cover body **8312** can be formed integrally with each other. Accordingly, an assembly process of the duct cover **830** can be simplified, and the air inside the air flow duct **822** and the inflow duct **821** can be prevented from leaking to a space between the shielding cover body **8311** and the communication cover body **8312**.

Further, the communication cover body **8312** can include an inflow communication hole **8314** that passes through one face thereof and communicates the drum **200** and the inflow duct **821** with each other. The inflow communication hole **8314** can communicate with the duct communication hole **417**. Thus, the air discharged from the drum **200** can be introduced through the inflow communication hole **8314**.

The inflow duct **821** can have a width larger than a width of the air flow duct **822**. Accordingly, the communication cover body **8312** seated on the top face of the inflow duct **821** can have a greater width than that of the shielding cover body **8311**.

Further, the inflow communication hole **8314** formed in the communication cover body **8312** has a larger width than that of the shielding cover body **8311**. Accordingly, the air inside the drum **200** can be smoothly introduced into the inflow communication hole **8314** that communicates with the drum **200**.

The inflow communication hole **8314** has a larger diameter than that of the shielding cover body **8311**, and one portion of the inflow communication hole **8314** extends in a parallel manner to the shielding cover body **8311** and the other portion of the inflow communication hole **8314** can be configured to protrude toward the connective portion **879**.

In some examples, the water supplied to the cleaning water channel **833** through the connective portion **879** flows along the top face of the shielding cover body **8311** and is discharged to the first heat exchanger **910**. In this way, the foreign substances attached to the front face of the first heat exchanger **910** can be removed.

In some implementations, the shielding cover body **8311** can include a cover through-hole **8313** extending through a top face thereof and facing toward at least a portion of the first heat exchanger **910**. The cover through-hole **8313** can be disposed at an end of the cleaning water channel **833** so as to communicate the cleaning water channel **833** and the first heat exchanger **910** with each other.

The cover through-hole **8313** can act as an outlet of the cleaning water channel **833**, and the water flowing along the cleaning water channel **833** can be sprayed to the first heat exchanger **910** via the cover through-hole **8313**.

Accordingly, the foreign substances attached to the first heat exchanger **910** can be removed by the water discharged from the cleaning water channel **833** through the cover through-hole **8313** without the user having to separate the first heat exchanger **910** to clean the same.

The cover through-hole **8313** can correspond to a width direction of the shielding cover body **8311**, and can extend parallel to the extension direction of the valve connector **838**. A width W5 of the cover through-hole **8313** can be smaller than a width of the shielding cover body **8311**, and can correspond to a width of the first heat exchanger **910** shown in FIG. **14**.

In some examples, the connective portion **879** can be connected to the water delivering portion **872** shown in FIG. **14** and configured to deliver water to the cleaning water channel **833**. For instance, the connective portion **879** can include receiving channels **8791***a*, **8791***b*, and **8791***c* that communicate with the water delivering portion **872** and receive water from the water delivering portion **872**. The receiving channels **8791***a*, **8791***b*, and **8791***c* can extend through the valve connector **838** and communicate with the cleaning water channel **833** and deliver the condensate supplied from the water delivering portion **872** to the cleaning water channel **833**.

Further, the cleaning water channel **833** can include a valve communication hole **8382** passing through the bottom face thereof and communicating with the receiving channels **8791***a*, **8791***b*, and **8791***c*. The condensate supplied from the receiving channels **8791***a*, **8791***b*, and **8791***c* can flow into the cleaning water channel **833** through the valve communication hole **8382**. The valve communication hole **8382** can be disposed on a top face of the valve connector **838**, and can be disposed on a top face of the shielding cover body **8311** and along an extension direction of the receiving channels **8791***a*, **8791***b*, and **8791***c*.

In some examples, the cleaning water channel **833** can be disposed on a top face of the shielding cover body **8311** to guide the water flowing therein from the valve communication hole **8382** to the cover through-hole **8313**. That is, the cleaning water channel **833** can extend from the valve communication hole **8382** to the cover through-hole. The valve communication hole **8382** can act as a starting point of the cleaning water channel **833**, and the cover through-hole **8313** can act as an ending point of the cleaning water channel **833**.

For example, one end of the cleaning water channel **833** can be disposed on a top face of the valve connector **838**, and the other end thereof can be connected to the cover through-hole **8313**. Further, one end of the cleaning water channel **833** can extend toward the valve connector **838**, and the other end thereof can extend toward the cover through-hole **8313**.

In some examples, the condensate supplied to the cleaning water channel **833** through the valve communication hole **8382** can friction with an inner face of the cleaning water channel **833** while flowing along the cleaning water channel **833**, and thus a flow speed can gradually decrease. Accordingly, the condensate inside the cleaning water channel **833** may not be discharged from the cleaning water channel **833** but can remain therein.

In some implementations, the shielding cover body **8311** can include an inclined face **8316** configured such that a portion of a top face extends in a downwardly inclined manner and frontwards. At least a portion of the cleaning water channel **833** can be disposed in the inclined face **8316**.

This can minimize an amount of residual water that is not discharged from the cleaning water channel **833**. Further, as the water flowing through the cleaning water channel **833** flows along the inclined face **8316**, the flow speed thereof naturally increases to remove the foreign substances remaining in the first heat exchanger **910**.

In some examples, the inclined face **8316** can include a first inclined face **8316***a* which extends from the top face of the shielding cover body **8311** in a downwardly inclined manner and in a frontward direction, and a second inclined face **8316***b* extending from the first inclined face **8316***a* toward the communication cover body **8312** in an inclined manner. An inclination of the first inclined face **8316***a* can be greater than that of the second inclined face **8316***b*.

The cleaning water channel **833** can include a guide channel **8331** that communicates with the valve communication hole **8382** and receives water from the valve communication hole **8382**, and a discharge channel **8332** that is connected to the guide channel **8331** and extends to the cover through-hole **8313**.

The guide channel **8331** can be disposed on the top face of the shielding cover body **8311** which is positioned at a higher level than that of the inclined face **8316**, and the discharge channel **8332** can be disposed on the inclined face **8316**.

Further, the discharge channel **8332** can include a first discharge channel **8332***a* connected to the guide channel **8331** and disposed on the first inclined face **8316***a*, and a second discharge channel **8332***b* connected to the first discharge channel **8332***a* and disposed on the second inclined face **8316***b*.

The guide channel **8331** can have one end disposed on the top face of the valve connector **838** and extending toward the first inclined face **8316***a*. One end of the first discharge channel **8332***a* can communicate with the guide channel **8331**, while the other end thereof can communicate with the second discharge channel **8332***b*, so that water flowing from the guide channel **8331** can be guided to the second discharge channel **8332***b*.

One end of the second discharge channel **8332***b* can communicate with the first discharge channel **8332***a* while the other end thereof can be connected to the cover through-hole **8313**, so that water flowing from the first discharge channel **8332***a* can be guided to the cover through-hole **8313**.

Accordingly, the flow speed of the water supplied to the guide channel **8331** from the valve communication hole **8382** can increase naturally as it passes through the first discharge channel **8332***a* and the second discharge channel **8332***b*. In other words, as the first discharge channel **8332***a* and the second discharge channel **8332***b* extend in a downwardly inclined manner, the flow speed of the water flowing from the guide channel **8331** to the cover through-hole **8313** can increase naturally.

Further, the water inside the cleaning water channel **833** flows along the first discharge channel **8332***a* and the second discharge channel **8332***b* to the cover through-hole **8313**. Thus, the situation can be prevented in which the water inside the cleaning water channel **833** is not be discharged to the cover through-hole **8313** and remains inside the cleaning water channel **833**.

In some examples, as the flow speed of the water increases as the water flow along the channel, a diameter thereof becomes narrower. Thus, the water inside the cleaning water channel **833** may not be uniformly dispersed at a distal end of the cleaning water channel **833**. This can result in concentrated discharge to only a specific area of the cover through-hole **8313**, and thus can result in water not being evenly supplied to the surface of the first heat exchanger **910**.

Accordingly, the cleaning water channel **833** can include a plurality of channels and disposed on the top face of the shielding cover body **8311**. Each of the distal ends of the plurality of cleaning water channels **833** can be connected to the cover through-hole **8313**. Accordingly, a width of the distal end of one of the plurality of cleaning water channels **833** can be smaller than that of a single cleaning water channel **833** when the cleaning water channel **833** only includes the single cleaning water channel **833**.

The cleaning water channel **833** can include the first cleaning water channel **833***a* disposed closest to one end of the shielding cover body **8311** among the plurality of cleaning water channels **833**, the second cleaning water channel **833***b* disposed closest to the other end of the shielding cover body **8311** among the plurality of cleaning water channels **833**, and the third cleaning water channel **833***c* disposed between the first cleaning water channel **833***a* and the second cleaning water channel **833***b*.

The distal end of the first cleaning water channel **833***a* can be connected to one end of the cover through-hole **8313**, and the distal end of the second cleaning water channel **833***b* can be connected to the other end of the cover through-hole **8313**.

The cover through-hole **8313** can be configured to be in connection with distal ends of the first cleaning water channel **833***a*, the second cleaning water channel **833***b*, and the third cleaning water channel **833***c*.

Further, widths of the first cleaning water channel **833***a*, the second cleaning water channel **833***b*, and the third cleaning water channel **833***c* can be equal to each other. When the water may not be dispersed to a specific area due to a structure of the cleaning water channel **833**, the widths of the first cleaning water channel **833***a*, the second cleaning water channel **833***b*, and the third cleaning water channel **833***c* can be different from each other.

Further, one end of each of the first cleaning water channel **833***a*, the second cleaning water channel **833***b*, and the third cleaning water channel **833***c* can be referred to as a first end. In some examples, the first ends of the first cleaning water channel **833***a*, the second cleaning water channel **833***b*, and the third cleaning water channel **833***c* can be configured to be in contact with each other and to be disposed on a top face of the valve connector **838**. The first cleaning water channel **833***a*, the second cleaning water channel **833***b*, and the third cleaning water channel **833***c* can extend in a separate manner from each other and along a flowing direction of the condensate. The other end of each of the first cleaning water channel **833***a*, the second cleaning water channel **833***b* and the third cleaning water channel **833***c* can extend to the cover through-hole **8313**.

Further, the channel switching valve **870** shown in FIG. **14** can be configured to communicate with the first cleaning water channel **833***a*, the second cleaning water channel **833***b* and the third cleaning water channel **833***c* and to selectively supply water to the first cleaning water channel **833***a*, the second cleaning water channel **833***b* and the third cleaning water channel **833***c*.

Specifically, the valve communication hole **8382** can include the number of holes corresponding to the number of the plurality of cleaning water channels **833**. The number of the receiving channels **8791**, for example, **8791***a*, **8791***b*, and **8791***c* can correspond to the number of the cleaning water channels **833**.

The receiving channel **8791** can include the first receiving channel **8791***a* communicating with the first cleaning water channel **833***a*, the second receiving channel **8791***b* communicating with the second cleaning water channel **833***b*, and the third receiving channel **8791***c* communicating with the third cleaning water channel **833***c*.

The condensate can be selectively supplied to the first receiving channel **8791***a*, the second receiving channel **8791***b* and the third receiving channel **8791***c* through the water receiving portion **871** based on an operation of the channel switching valve **870** shown in FIG. **14**. Accordingly, the water can be selectively supplied to one of the first receiving channel **8791***a*, the second receiving channel **8791***b* and the third receiving channel **8791***c*. The water can be then supplied to one of the plurality of cleaning water channels **833** and discharged to the cover through-hole **8313**.

Accordingly, a water pressure of water discharged from one of the plurality of cleaning water channels **833** can be greater than that compared to a case in which the condensate from the channel switching valve **870** is supplied to all of the plurality of cleaning water channels **833**. As the pressure of water discharged from the cleaning water channel **833** increases, the foreign substances generated in the first heat exchanger **910** can be completely removed.

In some examples, the cleaning water channel **833** can include a channel wall **834** defining a channel through which water flowing into the valve communication hole **8382** can flow to the cover through-hole **8313**. The channel wall **834** can protrude from the top face of the shielding cover body **8311** and be formed integrally with the shielding cover body **8311**.

Accordingly, the cleaning water channel **833** may not be separately coupled to the shielding cover body **8311**, so that a manufacturing cost of the duct cover **830** can be reduced, and an assembly process thereof can be simplified.

The channel wall **834** can extend from the valve communication hole **8382** towards the cover through-hole **8313**.

That is, the channel wall **834** can constitute an inner circumferential face of the cleaning water channel **833**. Specifically, the channel wall **834** can be configured to constitute an inner circumferential face of the guide channel **8331** and an inner circumferential face of the discharge channel **8332**. Further, the channel wall **834** can be configured to constitute an inner circumferential face of each of the first discharge channel **8332***a* and the second discharge channel **8332***b*.

In some examples, the cleaning water channel **833** can include a discharge rib **835** configured to guide the water discharged from the cleaning water channel **833** to the first heat exchanger **910**.

The discharge rib **835** can extend frontwards from the distal end of the second discharge channel **8332***b*. The discharge rib **835** can extend downward so that the distal end of the discharge rib **835** can be positioned in the cover through-hole **8313** and can further extend toward the first heat exchanger **910**. Thus, the water discharged from the cleaning water channel **833** can flow uniformly along the discharge rib **835** towards the first heat exchanger **910**.

FIG. **16** is a top view of the duct cover having the cleaning water channel in a laundry treating apparatus.

The flow speed of the condensate flowing into the guide channel **8331** through the valve communication hole **8382** can increase naturally as it passes through the first discharge channel **8332***a* and the second discharge channel **8332***b*. As the flow speed of the water increases as the water flow along the channel, a diameter thereof becomes narrower. Thus, the cleaning water channel **833** can be configured so that a width thereof increases in the direction in which the condensate flows, so that the condensate can be spread widely at a distal end thereof.

Specifically, the guide channel **8331** can be configured such that a width t**1** thereof increases as it extends from the valve communication hole **8382** toward the first discharge channel **8332***a*.

Further, the first discharge channel **8332***a* has a larger width than that of the guide channel **8331**, so that water flowing from the guide channel **8331** to the first discharge channel **8332***a* can be uniformly discharged. A width t**2** of the first discharge channel **8332***a* can be greater than the width t**1** of the guide channel **8331**.

Further, the second discharge channel **8332***b* has a larger width than that of the first discharge channel **8332***a*, so that water flowing from the first discharge channel **8332***a* to the second discharge channel **8332***b* can be uniformly discharged. A width t**3** of the second discharge channel **8332***b* can be greater than the width t**2** of the first discharge channel **8332***a*.

Further, a width of each of the first discharge channel **8332***a* and the second discharge channel **8332***b* can increase as it extends along the flowing direction of the water.

Accordingly, the cleaning water channel **833** can evenly spray the water on the front face of the first heat exchanger **910**, and as a result, an entirety of water can be uniformly supplied to the first heat exchanger **910**

In some examples, the pressure of water as discharged from the valve communication hole **8382** can be lowered as the water flows toward the cover through-hole **8313**. A thickness of the channel wall **834** can decrease as it extends along the direction of movement of the water. That is, a thickness t**5** of the channel wall **834** can decrease as a distance thereof from the valve communication hole **8382** increases. Alternatively, the thickness t**5** of the channel wall **834** can be uniform in order to facilitate molding of an entirety of the duct cover **830**.

In one example, the channel wall **834** may include a first channel wall **834***a* constituting an inner circumferential face of the first cleaning water channel **833***a*, a second channel wall **834***b* constituting an inner circumferential face of the second cleaning water channel **833***b*, and a third channel wall **834***c* constituting an inner circumferential face of the third cleaning water channel **833***c*.

A distal end of the first channel wall **834***a* and a distal end of the third channel wall **834***c* may be constructed to be in contact with each other. A distal end of the first channel wall **834***a* and a distal end of the second channel wall **834***b* may be constructed to be in contact with each other.

The partitioning rib **836** may extend from the distal end of the first channel wall **834***a* and the distal end of the third channel wall **834***c* toward the cover through-hole **8313**. That is, the partitioning rib **836** may extend from a point at which the distal end of the first channel wall **834***a* and the distal end of the third channel wall **834***c* contact each other toward the cover through-hole **8313**.

In some examples, the channel wall **834** can include a first channel wall **834** constituting an inner circumferential face of the first cleaning water channel **833***a*, a second channel wall **834** constituting an inner circumferential face of the second cleaning water channel **833***b*, and a third channel wall **834** constituting an inner circumferential face of the third cleaning water channel **833***c*.

A distal end of the first channel wall **834** and a distal end of the third channel wall **834** can be configured to be in contact with each other. A distal end of the first channel wall **834** and a distal end of the second channel wall **834** can be configured to be in contact with each other.

Further, the cleaning water channel **833** can include a partitioning rib **836** configured to partition the first cleaning water channel **833***a*, the second cleaning water channel **833***b*, and the third cleaning water channel **833***c* from each other.

The partitioning rib **836** can extend from the distal end of the first channel wall **834** and the distal end of the third channel wall **834** toward the cover through-hole **8313**. That is, the partitioning rib **836** can extend from a point at which the distal end of the first channel wall **834** and the distal end of the third channel wall **834** contact each other toward the cover through-hole **8313**.

Accordingly, the water discharged from the second discharge channel **8332***b* can be uniformly discharged to the cover through-hole **8313** along the partitioning rib **836**. The partitioning rib **836** can extend from the channel wall **834** toward the discharge rib **835** and be disposed on a top face of the discharge rib **835**.

Further, the cleaning water channel **833** can include a communication channel **8333** that communicates the discharge channel **8332** and the cover through-hole **8313** with each other.

The communication channel **8333** can be disposed on a top of the cover through-hole **8313** and can be configured to face toward the cover through-hole **8313**. The communication channel **8333** can be configured so that water to be discharged from the discharge channel **8332** flows to the cover through-hole **8313**.

Further, the channel wall **834** can be configured to constitute an inner circumferential face of the communication channel **8333**, so that water discharged from the discharge channel **8332** can be prevented from flowing out of the cover through-hole **8313**.

In some examples, the cleaning water channel **833** can include a support **837** supporting the channel wall **834**.

The channel wall **834** can include the support **837** extending outwardly from an outer circumferential face thereof. The support **837** can be configured to protrude from a top face of the shielding cover body **8311**, and can be coupled to an outer circumferential face of the channel wall **834** to support the channel wall **834**. The support **837** can include a plurality of supports arranged along the outer circumferential face of the channel wall **834**.

Thus, the support **837** can support the channel wall **834** so that the channel wall **834** can withstand the water pressure of water therein. Thus, durability and reliability of the channel wall **834** can be improved.

FIG. **17** is a perspective view showing a bottom face of the duct cover in the laundry treating apparatus.

The duct cover **830** can include a first heat-blocking rib **8315***a* and a second heat-blocking rib **8315***b* that can prevent the heat from the first heat exchanger **910** from being transferred to the cleaning water channel **833**.

The first heat-blocking rib **8315***a* can protrude from a bottom face of the shielding cover body **8311** and extend in an away direction from the cover through-hole **8313**. The second heat-blocking rib **8315***b* can protrude from the bottom face of the shielding cover body **8311** and extend in parallel to the cover through-hole **8313**.

Each of the first heat-blocking rib **8315***a* and the second heat-blocking rib **8315***b* can include a plurality of heat-blocking ribs. The second heat-blocking rib **8315***b* can extend in a perpendicular manner to the first heat-blocking rib **8315***a* and be connected to the plurality of first heat-blocking ribs **8315***a*.

The first heat-blocking rib **8315***a* and the second heat-blocking rib **8315***b* can be configured to face toward the first heat exchanger **910**. Thus, an amount of the heat transfer from the first heat exchanger **910** to the cleaning water channel **833** via the first heat-blocking rib **8315***a* and the second heat-blocking rib **8315***b* can be reduced.

Further, the shielding cover body **8311** can include an evaporator cover body **83111** facing toward the first heat exchanger **910** and a condenser cover body **83112** extending rearwards from the evaporator cover body **83111** and facing toward the second heat exchanger **920**. The first heat-blocking rib **8315***a* and the second heat-blocking rib **8315***b* can be disposed on a bottom face of the evaporator cover body **83111**, and the cover through-hole **8313** can extend through the bottom face of the evaporator cover body **83111**.

In some examples, the duct cover **830** can include a channel inserted groove **8349** that is recessed in a bottom face of the duct cover and constitutes the channel wall **834**. The channel inserted groove **8349** can be recessed in the bottom face of the shielding cover body **8311** and extend to the channel wall **834**.

The channel inserted groove **8349** can extend along an extending direction of the channel wall **834**. The channel inserted groove **8349** can be formed in a process of injection molding the channel wall **834**, and a load applied to the channel wall **834** can be distributed, thereby reinforcing structural rigidity of the channel wall **834**.

In some examples, the duct cover **830** can include a duct cover extension **832** extending in a thickness direction from an outer face of each of the shielding cover body **8311** and the communication cover body **8312** and along a circumference of each of the shielding cover body **8311** and the communication cover body **8312**. The air flow duct **822** and the inflow duct **821** shown in FIG. **13** can be coupled to the duct cover extension **832**.

The duct cover extension **832** can protrude in the thickness direction from at least one of both side faces, a front face, and a rear face of each of the shielding cover body **8311** and the communication cover body **8312** to improve durability of each of the shielding cover body **8311** and the communication cover body **8312** and to provide a space in which a separate component can be seated on top of each of the shielding cover body **8311** and the communication cover body **8312**.

In some examples, the duct cover extension **832** can include an inserted portion **8322** extending in the thickness direction and inserted into an inner face of each of the inflow duct and the air flow duct **822**, and a step portion **8223** spaced outwardly from an outer circumferential face of the inserted portion **8322** and extending in the thickness direction Z2 and coupled to an outer face of each of the air flow duct **822** and the inflow duct **821**.

Between an inner circumferential face of the step portion **8223** and an outer circumferential face of the inserted portion **8322**, a sealing seat portion **8324** into which a top each of the air flow duct **822** and the inflow duct **821** is inserted can be disposed. The air flow duct **822** and the inflow duct **821** of the air circulating channel **820** can be inserted into the sealing seat portion **8324** and be coupled to a portion between the step portion **8223** and the inserted portion **8322**. Accordingly, the air flow duct **822** and the inflow duct **821** can be coupled to the shielding cover body **8311** and the communication cover body **8312**, respectively, so that open top faces thereof can be shielded.

FIG. **18** is an exploded perspective view of the channel switching valve in a laundry treating apparatus.

FIG. **18** illustrates a detailed structure of the channel switching valve **870** that selectively supplies the water to the plurality of cleaning water channels **833**. FIG. **18** is a view of the channel switching valve **870** viewed in a direction from a bottom to a top (Z direction).

The channel switching valve **870** can include the water receiving portion **871** communicating with the pump **861** and receiving the water from the pump **861**, and the connective portion **879** communicating with the water receiving portion **871** and connected to the valve connector **838** to deliver the water to the cleaning water channel **833**. The channel switching valve **870** can include the water delivering portion **872** disposed between the water receiving portion **871** and the connective portion **879** and coupled to the water receiving portion **871** and the connective portion **879**.

In some examples, the connective portion **879** can include a connective transfer channel **8792** that communicates with the water delivering portion **872** and receives water from the water delivering portion **872**. The connective transfer channel **8792** can act as a passage which can be in communication with the water storage tank **120** and along which the water supplied from the water delivering portion **872** can flow to the water storage tank **120**.

Accordingly, the water storage tank **120** can receive the water transferred to the channel switching valve **870** through the channel switching valve **870** from the pump **861** via the connective transfer channel **8792** and can temporarily store therein the water.

In this case, the connective transfer channel **8792** can be configured such that one end thereof faces toward the water delivering portion, and the other end thereof faces toward the water storage tank **120**.

Further, one end and the other end of the connective transfer channel **8792** can be spaced apart from each other so as to be prevented from facing toward each other. The connective transfer channel **8792** can be configured such that one end and the other end thereof can be prevented from facing toward each other in a straight line manner.

In some examples, the water receiving portion **871** can include a scroll receiving portion **8712** coupled to the water delivering portion **872**, and a water inlet portion **8711** extending from the scroll receiving portion **8712** toward the water collector **860** (see FIG. **14**) and connected to the first water collector drain pipe **8911***a*.

The water inlet portion **8711** can communicate with an inside of the scroll receiving portion **8712** and receive water from the first water collector drain pipe **8911***a* and can move the water into the inside of the scroll receiving portion **8712**.

Further, the water receiving portion **871** can include a driver receiving portion **8713** extending from the scroll receiving portion **8712** in a direction away from the water delivering portion **872**, a valve driver **873** installed in the driver receiving portion **8713** to provide rotation power, and a valve rotatable portion **874** disposed within the scroll receiving portion **8712** and coupled to the valve driver **873** and configured to rotate. The water receiving portion **871** can include a driver fixing member **8716** that secures the valve driver **873** to the driver receiving portion **8713**.

Further, the water receiving portion **871** can include a scroll **875** accommodated in the scroll receiving portion **8712** and coupled to the valve rotatable portion **874** and configured to rotate.

The valve rotatable portion **874** can include a second valve rotation shaft **8742** coupled to the valve driver **873** so as to rotate, and a first valve rotation shaft **8741** coupled to the second valve rotation shaft **8742** and the scroll **875** so as to rotate.

In some examples, the water delivering portion **872** can include a delivering body **8721** to which the scroll receiving portion **8712** is coupled, and a contact portion **8726** extending from the delivering body **8721** toward the connective portion **879** and coupled to the connective portion **879**.

Further, the water delivering portion **872** can include a supply channel **8722** that passes through the delivering body **8721** and the contact portion **8726** and communicates with the connective transfer channel **8792** and the receiving channels **8791***a*, **8791***b*, and **8791***c*.

The supply channel **8722** can include a plurality of supply channels arranged along a circumference of the contact portion **8726**. The plurality of supply channels can communicate with the plurality of receiving channels **8791***a*, **8791***b*, and **8791***c* and the connective transfer channel **8792**, respectively.

The scroll **875** can include a scroll plate **8751** that is accommodated in the scroll receiving portion **8712** and rotates, a scroll communication hole **8752** that passes through the scroll plate **8751** and selectively communicates with the plurality of supply channels **8722**, and a scroll coupling groove **8753** passing through the scroll plate **8751** and coupled to the first valve rotation shaft **8741**.

The scroll plate **8751** can rotate while being in contact with one end of the supply channel **8722**. The scroll communication hole **8752** can be configured to selectively communicate with one of the supply channels **8722** according to the rotation of the scroll plate **8751**.

Accordingly, water flowing into the water inlet portion **8711** according to the rotation of the scroll plate **8751** can be selectively guided to the connective transfer channel **8792** and the receiving channels **8791***a*, **8791***b*, and **8791***c*.

When water is supplied to the connective transfer channel **8792**, the water stored in the water collector **860** can flow to the water storage tank **120**. Further, when water is supplied to one of the receiving channels **8791***a*, **8791***b*, and **8791***c*, water can be supplied to one of the cleaning water channels **833**.

Accordingly, according to the operation of the channel switching valve **870**, water can be selectively supplied to one of the water storage tank **120** or the cleaning water channel **833**. Further, when water is supplied to one of the plurality of cleaning water channels **833**, the pressure of water discharged to the first heat exchanger **910** can be greater than that in a case when water is continuously supplied to all of the plurality of cleaning water channels **833**.

In some examples, when the water supplied to the channel switching valve **870** flows into a location between the connective portion **879** and the valve connector **838**, various devices for the operation of the laundry treating apparatus can come into contact with the water.

In some implementations, the receiving channels **8791***a*, **8791***b*, and **8791***c* can be formed integrally with the valve connector **838**. This prevents water from leaking to a location between the connective portion **879** and the valve connector **838**.

The receiving channels **8791***a*, **8791***b*, and **8791***c* can pass through the bottom face of the valve connector **838** and communicate with the cleaning water channel **833**. The receiving channels **8791***a*, **8791***b*, and **8791***c* can extend first downwards from the valve connector **838** and then extend in a direction away from the valve connector **838**.

Each of the receiving channels **8791***a*, **8791***b*, and **8791***c* can be formed to be positioned at a lower level than that of the top face of the valve connector **838**. Each of the receiving channels **8791***a*, **8791***b*, and **8791***c* can extend through the valve connector **838** so that one end thereof can be inserted into the cleaning water channel **833**.

In some examples, the connective portion **879** can include a connective extension **8793** extending from the outer circumferential face of the connective transfer channel **8792** and the outer circumferential face of each of the receiving channels **8791***a*, **8791***b*, and **8791***c*.

The connective extension **8973** can couple the connective transfer channel **8792** to the receiving channels **8791***a*, **8791***b*, and **8791***c*. The connective extension **8793** can be integrally formed with the connective transfer channel **8792** and the receiving channels **8791***a*, **8791***b*, and **8791***c*, and can serve to fix the connective transfer channel **8792** and the receiving channels **8791***a*, **8791***b*, and **8791***c*.

In some examples, the water delivering portion **872** can include a fastening portion **8725** that extends from an outer circumferential face of the contact portion **8726** and can be coupled to the connective extension **8793**. The connective portion **879** can include fixing protrusion **8794** extending from the connective extension **8793** to the fastening portion **8725** and coupled to the fastening portion **8725**.

The fixing protrusion **8794** and the fastening portion **8725** can be configured to face toward each other. One end of the fastening portion **8725** can be coupled to and accommodated in the fixing protrusion **8794**. As shown in the figure, the fixing protrusion **8794** can be disposed at each of one side and the other side of the connective extension **8793**. The fastening portion **8725** can be disposed at each of one side and the other side of the contact portion **8726** and can face toward the fixing protrusion **8794**.

Further, the connective portion **879** can include a connective protrusion **8795** protruding from the outer circumferential face of the connective extension **8793** and spaced apart from the fixing protrusion **8794**. Further, the water delivering portion **872** can include a mount hook **8724** which extends from the outer circumferential face of the contact portion **8726** and into which the connective protrusion **8795** is inserted.

The mount hook **8724** can be disposed at a position corresponding to that of the connective protrusion **8795** and can be coupled to the connective protrusion **8795**. In an example, as shown in the figure, the connective protrusion **8795** can be formed to protrude from each of one side and the other side in a vertical direction (the Z-direction) of the connective extension **8793**. The mount hook **8724** can be disposed at each of one side and the other side in a vertical direction (the Z-direction) of the contact portion **8726**.

Accordingly, the water delivering portion **872** can be coupled to the connective extension **8793** through the connective protrusion **8795** and the fixing protrusion **8794**, and can prevent the water delivering portion **872** from being spaced from the connective extension **8793**.

Further, the water delivering portion **872** can include a protrusion **8727** that protrudes from a center of the contact portion **8726** toward the connective extension **8793** and is inserted into the connective extension **8793**. The protrusion **8727** can be inserted into the connective extension **8793** to prevent the water delivering portion **872** from being removed from the connective portion **879**.

In some examples, the water delivering portion **872** can include a fixing member **8723** for fixing the scroll receiving portion **8712** to the delivering body **8721**. The scroll receiving portion **8712** can include a fixing groove **8715** into which the fixing member **8723** is inserted. Further, the water receiving portion **871** can have a protruding hook **8717** that extends from an outer circumferential face of the scroll receiving portion **8712** and is coupled to the delivering body **8721**.

In some examples, the channel switching valve **870** can include a sealing member **8773** disposed between the connective portion **879** and the water delivering portion **872**. The sealing member **8773** can be disposed between the connective extension **8793** and the contact portion **8726** to prevent water from leaking to a location between each of the receiving channels **8791***a*, **8791***b*, and **8791***c* and the supply channel **8722**.

The sealing member **8773** can be accommodated in one of the contact portion **8726** or the connective extension **8793**. The sealing member **8773** can be configured to surround the receiving channels **8791***a*, **8791***b*, and **8791***c*.

A sealing portion **877** can include a shaft sealing member **8772** disposed between the second valve rotation shaft **8742** and the first valve rotation shaft **8741** to prevent water from leaking to the valve driver **873**, and a scroll sealing member **8771** that surrounds an outer circumferential face of the scroll plate **8751** and prevents water from leaking to a location between the scroll receiving portion **8712** and the delivering body **8721**.

An elastic member **876** for pressing the scroll **875** in a direction away from the first valve rotation shaft **8741** can be disposed between the scroll **875** and the first valve rotation shaft **8741**.

FIG. **19** is a perspective view showing the duct cover to which the nozzle cover is coupled in the laundry treating apparatus.

The air circulating channel **820** can further include the nozzle cover **840** that shields the cleaning water channel **833** and prevents water flowing through the cleaning water channel **833** from scattering to the outside.

The nozzle cover **840** can be coupled to the top of the cleaning water channel **833** and can be disposed above the shielding cover body **8311**. When the shielding cover body **8311** is viewed from above the nozzle cover **840**, the nozzle cover **840** can accommodate the cleaning water channel **833** and can be coupled to the top of the cleaning water channel **833** so that the cleaning water channel **833** can be screened with the nozzle cover **840**.

The nozzle cover **840** can extend along an extension direction of the cleaning water channel **833**. That is, the nozzle cover **840** can extend from one side thereof at which the channel switching valve **870** can extend to the other side at which the inflow communication hole **8314** is disposed. For example, a direction toward one side can be a direction in which the channel switching valve **870** extends from the valve connector **838**, while a direction toward the other side can be a direction toward the inflow communication hole **8314**, that is, a frontward direction (X direction).

Further, a length L**4** by which the nozzle cover **840** extends frontwards and rearwards can be smaller than or equal to a length L**2** by which the shielding cover body **8311** extends. The length L**4** by which the nozzle cover **840** extends forwards and backwards can be larger than or equal to a length by which the cleaning water channel **833** extends, which can be appropriately designed according to an amount of water to wash the first heat exchanger **910**.

The nozzle cover **840** can be coupled to a top of the channel wall **834** shown in FIG. **15** and can be configured to shield the cleaning water channel **833**. As shown, the nozzle cover **840** can be coupled to a top of each of the first cleaning water channel **833***a*, the second cleaning water channel **833***b*, and the third cleaning water channel **833***c* and can be configured to shield the first cleaning water channel **833***a*, the second cleaning water channel **833***b* and the third cleaning water channel **833***c*.

Accordingly, the nozzle cover **840** can prevent the water flowing through the cleaning water channel **833** from scattering to the outside.

FIG. **20** is a cross-sectional view showing an example of the nozzle cover in the laundry treating apparatus. FIG. **20** is a cross-sectional view in a longitudinal direction B-B' showing an inside of the duct cover **830** and the nozzle cover **840** shown in FIG. **19**.

The nozzle cover **840** can include a nozzle cover body **841** shielding the cleaning water channel **833**.

The nozzle cover body **841** can be coupled to a top **8341** of the channel wall **834** shown in FIG. **15** and extend along the extension direction of the cleaning water channel **833**. The nozzle cover body **841** can extend in parallel with the guide channel **8331**, and a distance between the nozzle cover body **841** and the cleaning water channel **833** can gradually increase along a direction in which the water flows.

That is, a distance between a bottom face of each of the first discharge channel **8332***a* and the second discharge channel **8332***b* and the nozzle cover body **841** can gradually increase along the direction in which the water flows.

Further, the nozzle cover **840** can further include a shielding rib **843** that moves water flowing along the cleaning water channel **833** to the cover through-hole **8313**.

The shielding rib **843** can extend from a distal end of the nozzle cover body **841** to the shielding cover body **8311**. The shielding rib **843** together with the nozzle cover body **841** can serve to shield the cover through-hole **8313**, and can be disposed at the distal end of the cover through-hole **8313**.

That is, one end of the cover through-hole **8313** can be connected to the second discharge channel **8332***b* and the other end thereof can be connected to the shielding rib **843**. Alternatively, the shielding rib **843** can be spaced apart from the cover through-hole **8313** and positioned in front of the cover through-hole **8313**.

The shielding rib **843** can serve to temporarily store the water discharged from the cleaning water channel **833** inside the cleaning water channel **833**. Water flowing along the cleaning water channel **833** can collide with the shielding rib **843** such that the water can flow to the cover through-hole **8313**.

In some examples, the condensate discharged from the second discharge channel **8332** can be discharged through the cover through-hole **8313** and along the discharge rib **835**. In some examples, the condensate may not be discharged to the first heat exchanger **910**, but can be discharged to a location in front of the first heat exchanger **910** along the extension direction of the discharge rib **835**. In particular, as a speed of the condensate passing through the discharge rib **835** increases, the number of times the condensate comes into contact with an inlet face of the first heat exchanger **910** can be reduced.

In some implementations, the nozzle cover **840** can further include a switching rib **846** for guiding the water passing through the discharge rib **835** toward the first heat exchanger **910**.

The switching rib **846** can be configured to extend from the shielding rib **843** toward the cover through-hole **8313** and to face toward the discharge rib **835**. The switching rib **846** can extend toward the first heat exchanger **910** so that a distal end of the switching rib **846** can be configured to protrude downwardly beyond the cover through-hole **8313**. The switching rib **846** can extend in an inclined manner relative to the discharge rib **835**, and a distal end of the switching rib **846** and a distal end of the discharge rib **835** can be configured to be spaced apart from each other.

The distal end of the switching rib **846** can be disposed in front of a front face of the first heat exchanger **910**, and the distal end of the discharge rib **835** can be disposed in rear of the front face of the first heat exchanger **910**. Accordingly, the water passing through the discharge rib **835** can collide with the switching rib **846** and thus be discharged to a location between the distal end of the switching rib **846** and the distal end of the discharge rib **835**.

In some examples, an inclination angle θ**1** of the first discharge channel **8332***a*, that is, the inclination angle θ**1** of the first inclined face **8316***a* can be greater than or equal to an inclination angle θ**2** of the second discharge channel **8332***b*, that is, the inclination angle θ**2** of the second inclined face **8316***b*.

Accordingly, the water flowing into the cleaning water channel **833** can flow to the cover through-hole **8313** due to gravity while passing through the first discharge channel **8332***a* and the second discharge channel **8332***b*. Thus, the water can be completely discharged. Further, a thickness of each of the first inclined face **8316***a* and the second inclined face **8316***b* can be uniform.

FIG. **21** is a cross-sectional view showing another example of the nozzle cover in the laundry treating apparatus. Hereinafter, the description will be based on a different configuration from that of the nozzle cover **840** in FIG. **20**.

The nozzle cover **840** can further include an inserted portion **849** that reduces a distance between the cleaning water channel **833** and the nozzle cover body **841**.

The inserted portion **849** can be configured to protrude from the nozzle cover body **841** toward the inside of the cleaning water channel **833**. The inserted portion **849** can be configured to protrude from a top face of the nozzle cover body **841** toward the first discharge channel **8332***a* and the second discharge channel **8332***b*.

As the inserted portion **849** protrudes from the nozzle cover body **841** toward the cleaning water channel **833**, a thickness of the nozzle cover body **841** can increase. The inserted portion **849** can be configured such that a length by which the inserted portion **849** protrudes from the nozzle cover body **841** gradually increases along a flowing direction of the condensate.

The inserted portion **849** can be configured such that one face thereof facing toward the cleaning water channel **833** has an inclination angle corresponding to the inclined face **8316**.

In some examples, an inclination angle θ**4** of one face of the inserted portion **849** facing toward the first inclined face **8316** can correspond to the inclination angle θ**1** of the first inclined face. An inclination angle θ**3** of one face of the inserted portion **849** facing toward the second inclined face **8316***b* can correspond to the inclination angle θ**2** of the second inclined face.

A distance between one face of the inserted portion **849** facing toward the first discharge channel **8332***a* and the first inclined face **8316***a* can correspond to a vertical dimension between a bottom face and a top face of the guide channel **8331**.

Further, a distance between one face of the inserted portion **849** facing toward the second inclined face **8316***b* and the second inclined face **8316***b* can correspond to a vertical dimension between the bottom face and the top face of the guide channel **8331**.

The inserted portion **849** can serve to reduce an internal space of the cleaning water channel **833**. As a result, a vertical dimension of the cleaning water channel **833** can be reduced so that the speed of the water reaching the shielding rib **843** can increase and thus the water can flow quickly to the cover through-hole **8313**.

Further, as the inserted portion **849** is formed, a vertical dimension of the cleaning water channel **833** can be uniform. Accordingly, when the water flows in the cleaning water channel **833**, a volume occupied by air inside the cleaning water channel **833** can be reduced. Further, the noise and vibration generated when the water inside the cleaning water channel **833** collides with an inner circumferential face of the cleaning water channel **833** can be reduced.

Further, even when the water first reaches a specific area of the inserted portion **849**, the water can be uniformly discharged along an entire area of the inserted portion **849** and through the cover through-hole **8313**.

FIG. **22** is a cross-sectional view showing another example of the nozzle cover in the laundry treating apparatus. FIG. **22** is a cross-sectional view of an inside of the duct cover **830** and the nozzle cover **840** (B-B').

The nozzle cover body **841** can include a welded plate **8411** coupled to the channel wall **834** and shielding the guide channel **8331**, a first inclined plate **8412** extending from the welded plate **8411** and coupled to the channel wall **834** and shielding the first discharge channel **8332***a*, and a second inclined plate **8413** extending from the first inclined plate **8412** and coupled to the channel wall **834** and shielding the second discharge channel.

The shielding rib **843** can extend downward from the distal end of the second inclined plate **8413** and can be coupled to the top face of the duct cover body **831**. The switching rib **846** can extend from the second inclined plate **8413** or the shielding rib **843** toward the cover through-hole **8313**.

The first inclined plate **8412** can extend from the welded plate **8411** in an inclined manner along the flowing direction of water, and the second inclined plate **8413** can extend from the first inclined plate **8412** in an inclined manner along the flowing direction of water.

An inclination angle θ**3** of the first inclined plate with respect to the welded plate can correspond to the inclination angle θ**1** of the first inclined face. An inclination angle θ**4** of the second inclined plate with respect to the welded plate **8411** can correspond to the inclination angle θ**2** of the second inclined face. Accordingly, an internal vertical dimension of the cleaning water channel **833** can be constant.

A thickness of each of the welded plate **8411**, the first inclined plate **8412** and the second inclined plate **8413** can be uniform, which has the effect of lowering a manufacturing cost of the nozzle cover **840**.

FIGS. **23**A and **23**B are a side view and a bottom view of the nozzle cover shown in FIG. **22**. FIG. **23**A is a side view of the nozzle cover **840**, and FIG. **23**B is a bottom view of the nozzle cover **840**.

The switching rib **846** can extend from the second inclined plate **8413** or the shielding rib **843** toward the cover through-hole **8313**. An angle θ**5** between the switching rib **846** and the shielding rib **843** can be in a range of 10 degrees to 80 degrees. The angle θ**5** between the switching rib **846** and the shielding rib **843** can be designed in various manners depending on an arrangement of the shielding rib **843** and the first heat exchanger **910** or an arrangement of the shielding rib **843** and the cover through-hole **8313**.

A vertical dimension H**7** of the shielding rib **843** can be smaller than a vertical dimension of the second inclined face **8316***b*. A vertical dimension of the second inclined plate **8413** can be smaller than a vertical dimension of the first inclined face **8316***a* of H**6** and be larger than a vertical dimension of the second inclined face **8316***b*.

Accordingly, the channel wall **834** can protrude by a certain vertical dimension and can be coupled to the nozzle cover **840**. The nozzle cover **840** can face toward the first inclined face **8316***a*, the second inclined face **8316***b*, and the cleaning water channel **833** and can have a certain vertical dimension.

In some examples, the nozzle cover **840** can include a partitioning rib **848**. The rib **848** together with the partitioning rib **836** can partitioning the water discharged from the plurality of cleaning water channels **833**.

The partitioning rib **848** can extend from the switching rib **846** towards the partitioning rib **836**. The partitioning rib **848** can overlap the partitioning rib **836**. For example, the partitioning rib **848** can be coupled to the partitioning rib **836**.

The partitioning rib **848** together with the partitioning rib **836** can partition the water discharged from the plurality of cleaning water channels **833**. Accordingly, the partitioning rib **848** prevents the water discharged from one cleaning water channel **833** from flowing to another cleaning water channel **833**, so that water is uniformly sprayed to the first heat exchanger **910**.

As shown in FIG. **23**B, the nozzle cover **840** can include a coupling portion **844** coupled to the channel wall **834**.

The coupling portion **844** can extend from the nozzle cover body **841** toward the channel wall **834**, and can be configured to be coupled to the top of the channel wall **834**.

The coupling portion **844** can be welded onto the top of the channel wall **834** so as to be integrally formed with the channel wall **834**. The welded plate **8411** can be configured to be in contact with the top of the channel wall **834**. The coupling portion **844** can face toward the channel wall **834** and extend along an extension direction of the channel wall **834**.

Further, the nozzle cover **840** can include an extension rib **842** that prevents the nozzle cover body **841** from being removed from the cleaning water channel **833**.

The extension rib **842** can be configured to extend from an outer circumferential face of the nozzle cover body **841** in the thickness direction and to accommodate therein the channel wall **834**. The extension rib **842** can be configured to have a larger width than a width of the channel wall **834** and to accommodate therein the outer circumferential face of the channel wall **834**.

Alternatively, when the support **837** can be disposed on the outer circumferential face of the channel wall **834**, the extension rib **842** can be configured to accommodate therein a top of the support **837**.

In some examples, a distance t**1** between both opposing inner faces of the coupling portion **844** extending from the welded plate **8411** can correspond to a width t**1** of the guide channel **8331**.

A distance t**2** between both opposing inner faces of the coupling portion **844** extending from the first inclined plate **8412** can correspond to a width t**2** of the first discharge channel **8332***a*. A distance t**3** between both opposing inner faces of the coupling portion **844** extending from the second inclined plate **8413** can correspond to a width t**3** of the second discharge channel **8332***b*.

Accordingly, the welded plate **8411** can shield the cleaning water channel **833**, such that the water inside the cleaning water channel **833** can be prevented from leaking to the outside.

FIG. **24** is a cross-sectional view showing an example in which the nozzle cover and the channel wall are coupled to each other in the laundry treating apparatus.

The support **837** can include a curved portion **8371** for easy coupling of the extension rib **842** thereto.

The support **837** can include the curved portion **8371** configured to be spaced apart from the at least a portion of the extension rib **842**. The curved portion **8371** can be formed at a distal end of the support coupled to the extension rib **842**.

The extension rib **842** can extend from the outer circumferential face of the nozzle cover body **841** in the thickness direction and can be coupled to the support **837** at the curved portion **8371** thereof. Thus, this can prevent burr from occurring in a process where a lower end **8422** of the extension rib **842** is coupled to the support **837**.

Further, a vertical dimension H**7** by which the channel wall **834** protrudes from the top face of the duct cover body **831** can be larger than or equal to a vertical dimension H**8** by which the support **837** protrudes. Accordingly, the nozzle cover body **841** can be configured to be spaced apart from the support **837**.

In some examples, a thickness t**5** of the channel wall **834** can be smaller than or equal to a width t**1** of the cleaning water channel **833**. A vertical dimension of the cleaning water channel **833** can correspond to a vertical dimension H**7** of the channel wall **834**.

Further, the nozzle cover body **841** can be coupled to a top **8341** of the channel wall **834**, and the channel wall **834** can be integrally coupled to the nozzle cover body **841** through a thermal welding process. For example, the channel wall **834** can be coupled to the nozzle cover body **841** by welding.

In some examples, the thermal welding process can refer to a process of bonding surfaces of two thermoplastic members to each other by applying heat and pressure thereto. In other words, heat can be applied to the coupling portion **844** and then the coupling portion **844** can be brought into contact with the channel wall **834** so that the coupling portion **844** is integrally formed with the channel wall **834**.

Alternatively, the channel wall **834** can be coupled to the nozzle cover body **841** through a vibrating welding process.

In some examples, the vibration welding process can refer to a process in which two thermoplastic members are melted with frictional heat generated at a contact area therebetween via vertical or left and right vibrations while pressing the two thermoplastic members against each other, and then the melted solidified members are joined to each other and are solidified.

In other words, the vibration welding process vibrates the nozzle cover body **841** or the channel wall **834** to generate the frictional heat between the coupling portion **844** and the channel wall **834** and the couples the coupling portion **844** and the channel wall **834** to each other using the frictional heat.

As a result, the nozzle cover body **841** can shield the cleaning water channel **833** more efficiently than in an approach in which the channel wall **834** and the body **841** are coupled to each other in a hook or bolt-nut coupling manner. Thus, a lifespan of a final product can extend as a modification and repair period can extend.

Further, the nozzle cover body **841** is integrally coupled to the channel wall **834**, thereby reducing a material cost and simplifying an assembly process thereof.

Further, even when a separate cleaning water pipe is not configured, the cleaning water channel **833** can be formed via the combination of the nozzle cover **840** and the duct cover **830**, so that a manufacturing process thereof can be easy.

FIG. **25** is a cross-sectional view showing another example in which the nozzle cover and the channel wall are coupled to each other in the laundry treating apparatus.

In FIG. **24**, the nozzle cover **840** is shown to be coupled to the channel wall **834**. FIG. **25** is a view showing a state in which the nozzle cover **840** is spaced apart from the channel wall **834** by a predetermined distance before being coupled to the channel wall **834**.

The channel wall **834** can further include a first coupling rib **8342** constituting an inner side face of the cleaning water channel **833** and a second coupling rib **8343** constituting an outer side face of the cleaning water channel **833**.

The first coupling rib **8342** can protrude from the channel wall **834** and be coupled to the nozzle cover body **841**. The second coupling rib **8343** can be coupled to the coupling portion **844** while protruding from the channel wall **834** so as to be spaced apart from the first coupling rib **8342**. A vertical dimension H**11** by which the second coupling rib **8343** can protrude from the channel wall **834** can correspond to the first coupling rib **8342**.

In some examples, a lower end of the coupling portion **844** can be configured to be in contact with the top of the second coupling rib **8343**, and the welded plate **8411** and the first coupling rib **8342** can be configured to be in contact with each other.

The second coupling rib **8343** can be coupled to the coupling portion **844** via a thermal welding process, or via a vibration welding process. In this process, the coupling portion **844** can be melted and coupled to the second coupling rib **8343**. In some examples, the channel wall **834** can further include a sealing groove **8344** disposed between the first coupling rib **8342** and the second coupling rib **8343** and extending in the extension direction of the cleaning water channel **833**, and a sealing member **8345** seated in the sealing groove **8344** for shielding a space between the nozzle cover body **841** and the cleaning water channel **833**.

A vertical dimension H**11** by which the second coupling rib **8343** and the first coupling rib **8342** protrude can correspond to a diameter of the sealing member **8345**.

The sealing member **8345** can be configured to be in contact with the nozzle cover body **841** and to shield a space between the nozzle cover body **841** and the sealing groove **8344**, and to prevent the water inside the cleaning water channel **833** from leaking out through the nozzle cover body **841**. That is, the sealing member **8345** can prevent water leakage from the inside of the cleaning water channel **833** to the outside.

Further, a plurality of sealing grooves **8344** and a plurality of sealing members **8345** can be defined in the channel wall **834** and can overlap each other along the width direction.

When the plurality of sealing grooves **8344** and the plurality of sealing members are provided, a shielding force of the nozzle cover body **841** can further increase compared to a case when a single sealing groove **8344** and a single sealing member **8345** are provided.

In some examples, a distance t**6** between both opposing inner faces of the channel inserted groove **8349** can be smaller than a thickness t**5** of the channel wall **834**, so that the channel inserted groove **8349** can be accommodated in the channel wall **834**.

FIGS. **26**A and **26**B are perspective views showing a state in which the connective portion and the water delivering portion are coupled to each other in the laundry treating apparatus. Hereinafter, descriptions of those with the above-described structures will be omitted.

FIG. **26**A is a perspective view showing a state in which the water receiving portion **871** is omitted from the channel switching valve **870** and the connective portion **879** and the water delivering portion **872** are present. FIG. **26**B is a perspective view of a state in which the connective portion **879** and the water delivering portion **872** in FIG. **26**A are coupled to each other when viewed in a different direction.

The connective portion **879** can be coupled to the valve connector **838** and extend toward the water delivering portion **872**. The water delivering portion **872** can be connected to the connective portion **879** and guide the condensate supplied from the water receiving portion **871** to the connective portion **879**. Further, the water receiving portion **871** can be connected to the water delivering portion **872** to supply the condensate to the water delivering portion **872**.

The water receiving portion **871** can be located on top of the water collector **860** and can be connected to the water delivering portion **872**. Accordingly, the water delivering portion **872** can receive a load due to a weight of the water receiving portion **871**.

Further, the water delivering portion **872** can be located on top of the water collector **860** and can be connected to the connective portion **879**. Accordingly, the connective portion **879** can receive a load due to the weight of the water receiving portion **871** and the weight of the water delivering portion **872**.

Accordingly, the connective portion **879** can include the fixing protrusion **8794** to which the fastening portions **8725***a* and **8725***b* of the water delivering portion **872** are coupled, in order to support the water delivering portion **872** and the water receiving portion **871**. The fixing protrusion **8794** can be configured to protrude from an outer circumferential face of the connective extension **8793**.

The connective extension **8793** can have a distal end facing toward the water delivering portion **872** and protruding beyond the valve connector **838** in order to prevent the fixing protrusion **8794** from coming into contact with the valve connector **838**. A top of the fixing protrusion **8794** can be positioned above the valve connector **838** and the first coupling rib **8342**.

Further, the fixing protrusion **8794** can include first fixing protrusion **8794***a* extending from the connective extension **8793** to one side and second fixing protrusion **8794***b* extending from the connective extension **8793** to the other side.

For example, one side to which the first fixing protrusion **8794***a* can extend can refer to a side above the connective extension **8793**, and the other side to which the second fixing protrusion **8794***b* can extend can refer to a side below the connective extension **8793**.

In some examples, the water delivering portion **872** can include a receiving portion **8728** extending toward the connective portion **879** and an outer circumferential face of the plurality of supply channels **8722**.

The receiving portion **8728** can be integrally formed with the plurality of supply channels **8722**, and can be disposed closer to the valve connector **838** than the distal end of the supply channel **8722** can be.

Further, the receiving portion **8728** can be connected to the connective extension **8793** and accommodate the plurality of receiving channels **8791** therein. The sealing member **8773** can be seated on an inner circumferential face of the receiving portion **8728** and can shield a space between the supply channel **8722** and the receiving channel **8791** and the connective transfer channel **8792**.

Further, the water delivering portion **872** can include a fastening portion **8725** that extends from the outer circumferential face of the receiving portion **8728** and is coupled to the connective extension **8793**.

In some examples, the fastening portion **8725** can include a first fastening portion **8725***a* coupled to the first fixing protrusion **8794***a* and a second fastening portion **8725***b* coupled to the second fixing protrusion **8794***b*.

The first fastening portion **8725***a* can extend to one side from the outer circumferential face of the receiving portion **8728** and be positioned in a corresponding manner to that of the first fixing protrusion **8794***a*. The second fastening portion **8725***b* can extend from the outer circumferential face of the receiving portion **8728** to the other side and be disposed at a position corresponding to that of the second fixing protrusion **8794***b*.

In some examples, one side to which the first fastening portion **8725***a* extends from the outer circumferential face of the receiving portion **8728** can refer to a side above the receiving portion **8728**. The other side to which the second fastening portion **8725***b* extends from the outer circumferential face of the receiving portion **8728** can refer to a side below the receiving portion **8728**.

In some examples, the fastening portion **8725** can include a fastening rib **87251** that accommodates the fixing protrusion **8794** therein. The fastening rib **87251** has a diameter larger than a diameter of the fixing protrusion **8794** and can be configured to accommodate the fixing protrusion **8794** therein.

The fastening rib **87251** can include a first fastening rib **87251***a* protruding from the first fastening portion **8725***a* and accommodating the first fixing protrusion **8794***a* therein, and a second fastening rib **87251***b* protruding from the second fastening portion **8725***b* and accommodating the second fixing protrusion **8794***b* therein.

Accordingly, the fastening portions **8725***a* and **8725***b* can be prevented from moving in the vertical direction from the fixing protrusion **8794**, so that the coupling force between the fastening portions **8725***a* and **8725***b* and the fixing protrusion **8794** can increase.

In some examples, the water delivering portion **872** can include a protrusion **8729** extending from an outer circumferential face of the receiving portion **8728**. The connective portion **879** can include the mount hook **8797** that is coupled to the protrusion **8729**.

The mount hook **8797** can be configured to protrude from an outer circumferential face of the connective extension **8793** and extend toward the protrusion **8729**.

In some examples, the supply channel **8722** can communicate with one of the receiving channel **8791** or the connective transfer channel **8792**. A plurality of supply channels **8722** can be provided and can be arranged along a circumference of the receiving portion **8728**.

In some examples, the plurality of supply channels **8722** can include the first supply channel **8722***a* in communication with the first receiving channel **8791***a*, the second supply channel **8722***b* in communication with the second receiving channel **8791***b*, the third supply channel **8722***c* that communicates with the third receiving channel **8791***c*, and the fourth supply channel **8722***d* that communicates with the connective transfer channel **8792**.

Further, the water delivering portion **872** can include a protrusion **8727** that can be disposed between the first supply channel **8722***a*, the second supply channel **8722***b*, the third supply channel **8722***c*, and the fourth supply channel **8722***d*.

The connective portion **879** can include the inserted portion **8799** which is disposed at a position corresponding to that of the protrusion **8727** and into which the protrusion **8727** is inserted.

The inserted portion **8799** can be disposed between the first receiving channel **8791***a*, the second receiving channel **8791***b*, the third receiving channel **8791***c*, and the connective transfer channel **8792** and face toward the protrusion **8727**.

The protrusion **8727** has a diameter corresponding to that of the inserted portion **8799** and can be inserted into the inserted portion **8799**. Thus, the protrusion **8727** can prevent the water delivering portion **872** from being spaced apart from the connective portion **879**.

In some examples, the channel switching valve **870** can include the sealing member **8773** that prevents leakage of water supplied from the water delivering portion **872** to the connective portion **879**. The connective portion **879** can include the receiving portion **8796** in which the sealing member **8773** is seated.

One end of each of the connective transfer channel **8792** and the receiving channel **8791** can protrude toward the water delivering portion **872** beyond the connective extension **8793**. The receiving portion **8796** can be disposed on an outer circumferential face of each of the connective transfer channel **8792** and the receiving channel **8791** and face toward the connective extension **8793**. The sealing member **8773** can be disposed between the connective portion **879** and the water delivering portion **872** and be seated in the receiving portion **8796**.

In some examples, the sealing member **8773** can be configured to accommodate an outer circumferential face of each of the connective transfer channel **8792** and the receiving channel **8791**. The sealing member **8773** can serve to seal a space between the connective transfer channel **8792** and the receiving channel **8791**, and the supply channel **8722**.

The first fastening rib **87251***a* can extend from an outer circumferential face of the first fastening portion **8725***a* toward the first fixing protrusion **8794***a* and can accommodate the first fixing protrusion **8794***a* therein. The second fastening rib **87251***b* can extend from an outer circumferential face of the second fastening portion **8725***b* toward the second fixing protrusion **8794***b* and accommodate the second fixing protrusion **8794***b* therein.

FIG. **27** is an internal cross-sectional view of the connective portion and the water delivering portion in the laundry treating apparatus. Hereinafter, a description of the configuration duplicate with the above configuration is omitted.

A length by which the second fixing protrusion **8794***b* extends vertically from the connective extension **8793** can be larger than a length by which the first fixing protrusion **8794***a* extends vertically from the connective extension **8793**.

Because the load delivered from the water delivering portion **872** to the connective portion **879** is delivered to the second fixing protrusion **8794***b* in a larger amount than an amount in which the load is delivered to the first fixing protrusion **8794***a*, a length H**11** by which the second fixing protrusion **8794***b* extends vertically from the connective extension **8793** can be larger than a length H**10** by which the first fixing protrusion **8794***a* extends vertically from the connective extension **8793**.

Accordingly, even when the water delivering portion **872** is coupled to the connective portion **879**, the connective portion **879** can stably support the weights of the water delivering portion **872** and the water receiving portion **871**.

Further, a diameter D**1** of the supply channel **8722** can be equal to a diameter D**2** of each of the connective transfer channel **8792** and the receiving channel **8791**.

Thus, the water discharged from the supply channel **8722** can stably flow to the connective transfer channel **8792** and the receiving channel **8791**. Further, the sealing member **8773** can shield a small gap between the supply channel **8722** and the receiving channel **8791** and the connective transfer channel **8792**. The connective transfer channel **8792** can include a water receiving hole **87921** defined at one end of the connective transfer channel **8792** and a water discharging hole **87922** defined at another end of the connective transfer channel **8792** and configured to discharge the water received through the water receiving hole **87921** toward the water storage tank **120**.

In some examples, the protrusion **8727** can pass through the sealing member **8773** and be inserted into the connective extension **8793**. Thus, this can prevent the sealing member **8773** from being removed from between the water delivering portion **872** and the connective portion **879**.

The receiving channel **8791** can extend in an inclined manner and toward the cleaning water channel **833**, and the receiving channel **8791** can have an inclination angle θ**6** in a range of 10 to 90 degrees.

For example, when the inclination angle θ**6** of the receiving channel **8791** is smaller than 10 degrees, the pressure of the water flowing into the connective portion **879** becomes too low. This can be disadvantageous in terms of the energy efficiency of the pump **861**.

When the inclination angle θ**6** of the receiving channel **8791** exceeds 90 degrees, a length L**6** by which the connective portion **879** extends from the valve connector **838** is too small. Thus, the connective portion **879** may not be able to support the loads of the water delivering portion **872** and the water receiving portion **871**.

However, a distance H**8** between the valve communication hole **8382** and a supply hole **87911** can be appropriately designed based on an extension length of the channel switching valve **870**.

The sealing member **8773** can be accommodated in one end of the receiving channel **8791**, and can be constructed to surround one end of each of the receiving channels **8791**. The supply hole **87911** can be surrounded with the sealing member **8773**, and the supply hole **87911** can protrude toward the water delivering portion **872** relative to the sealing member **8773**.

The connective extension **8793** can be configured to have a larger diameter than a diameter of all of the plurality of receiving channels **8791** and extend from an outer circumferential face of the receiving channel **8791**.

The sealing member **8773** can be seated on the distal end of the connective extension **8793** and surround the plurality of receiving channels **8791**.

FIG. **28**A is a perspective view showing a state in which the connective portion, the water delivering portion and the nozzle cover are coupled to each other in the laundry treating apparatus. FIG. **28**B is a perspective view viewed in a different direction of a state in which the connective portion, the water delivering portion and the nozzle cover in FIG. **28**A are coupled to each other in the laundry treating apparatus.

Hereinafter, a description will be focused on a structure different from that of the water delivering portion **872** and the connective portion **879** shown in FIGS. **26**A and **26**B.

When a distance by which the connective portion **879** protrudes from the valve connector **838** is too larger, a rotational moment applied to a contact point between the connective portion **879** and the valve connector **838** can increase. That is, the structural rigidity of the connective portion **879** can be lowered.

For this reason, the distal end of the valve connector **838** can be configured to protrude beyond the distal end of the connective portion **879**. In other words, the distal end of the connective portion **879** can be positioned below the valve connector **838**.

Thus, the protruding length of the connective portion **879** from the valve connector **838** can be reduced, such that an amount of moment loaded onto the connective portion **879** can be reduced.

Further, as a distal end of the valve connector **838** can be configured to protrude beyond a distal end of the connective portion **879**, the fixing protrusion **8794** can extend from the connective extension **8793** to one side so that the first fixing protrusion **8794***a* to which the first fastening portion **8725** is coupled can be omitted.

In this case, the nozzle cover **840** can include a fastening part **8419** coupled to the first fastening portion **8725** or the second fastening portion **8725***b* so as to reinforce structural rigidity of the connective portion **879**.

The fastening part **8419** can be disposed at a position corresponding to that of one of the first fastening portion **8725** or the second fastening portion **8725***b* and can protrude from a top face of the nozzle cover **840** in a vertical direction (Z direction). The fastening part **8419** can protrude upwards from the nozzle cover body **841** and extend toward the first fastening portion **8725***a*.

Coupling the first fastening portion **8725** to the fastening part **8419** can allow a load applied to the connective portion **879** supporting a weight of the first water collector drain pipe **8911***a* and the water delivering portion **872** and the water receiving portion **871** to be reduced. In other words, because the nozzle cover **840** can be coupled to the channel wall **834** in a relatively large area, the load applied to the connective portion **879** can be transmitted to the nozzle cover **840** and thus can be distributed. For example, the fastening part **8419** can include a protrusion that protrudes from a top surface of the nozzle cover **840** and a hole defined inside the protrusion.

Further, a length by which the connective portion **879** extends from the valve connector **838** can be reduced. The water delivering portion **872** can be closer to the duct cover **830**, so that an overall extension length of the channel switching valve **870** can be reduced.

Thus, a possibility that the channel switching valve **870** interferes with the drum **200** can be significantly reduced. Furthermore, a length of each of the receiving channel **8791** and the connective transfer channel **8792** can be reduced, so that an amount of residual water inside each of the receiving channel **8791** and the connective transfer channel **8792** can be reduced.

In some examples, a length of the first fastening portion **8725***a* can be equal to a length of the second fastening portion **8725***b*. In some examples, unlike a configuration shown in FIGS. **26**A and **26**B, the first fixing protrusion **8794***a* can be omitted from the connective portion **879**, such that the length of the first fastening portion **8725***a* and that of the second fastening portion **8725***b* may not be different from each other.

In some examples, the first fastening portion **8725***a* extending upwardly from an outer circumferential face of the receiving portion **8728** can have a length corresponding to that of the second fastening portion **8725***b* extending downwardly from an outer circumferential face of the receiving portion **8728**.

Accordingly, manufacturing and repair of the first fastening portion **8725***a* and the second fastening portion **8725***b* can be facilitated. Further, when assembling the water delivering portion **872**, positions of the first fastening portion **8725***a* and the second fastening portion **8725***b* can be exchanged with each other such that the second fastening portion **8725***b* can be coupled to the fastening portion **8719**. Accordingly, the water delivering portion **872** can be easily assembled to the connective portion **879** and the nozzle cover **840**.

In some examples, the sealing member **8773** can include a first sealing member **8773***a* which accommodates an outer circumferential face of the first receiving channel **8791***a*, a second sealing member **8773***b* which accommodates an outer circumferential face of the second receiving channel **8791***b*, a third sealing member **8773***c* which accommodates an outer circumferential face of the third receiving channel **8791***c*, and a fourth sealing member **8773***d* which accommodates the protrusion **8727**.

The first sealing member **8773***a*, the second sealing member **8773***b*, and the third sealing member **8773***c* can have diameters and thicknesses corresponding to each other, and can be configured to be in contact with each other.

The fourth sealing member **8773***d* can be formed in a shape corresponding to that of the protrusion **8727**. The first sealing member **8773***a*, the second sealing member **8773***b*, and the third sealing member **8773***c* can be arranged along a perimeter.

Various implementations of the present disclosure have been described above in detail. However, those of ordinary skill in the art to which the present disclosure belongs can make various modifications to the above-described implementations without deviating from the scope of the present disclosure. Therefore, the scope of the present disclosure should not be limited to the described implementations, and should be defined by the claims as described below as well as the equivalents thereto.

What is claimed is:

1. A laundry treating apparatus comprising:

a cabinet having an opening defined at a front surface thereof;

a drum disposed rotatably in the cabinet, the drum having a laundry inlet defined at a front surface thereof and configured to introduce laundry to the drum;

a base disposed below the drum, the base defining a space configured to receive air discharged from the drum and to guide the air to the drum; and

a motor disposed rearward relative to the drum and spaced from the base, the motor being configured to rotate the drum,

wherein the base comprises:

an air circulating channel configured to fluidly communicate with the drum, the air circulating channel being configured to receive air discharged from the drum and to guide the air to the drum,

a heat exchanger comprising (i) a first heat exchanger disposed inside the air circulating channel and configured to cool the air discharged from the drum and (ii) a second heat exchanger spaced apart from the first heat exchanger and configured to heat air that has been cooled by the first heat exchanger,

a water collector body that is disposed outside the air circulating channel and in fluid communication with the air circulating channel, the water collector body being configured to collect water condensed from the air in the first heat exchanger,

a pump configured to move water that has been collected in the water collector body,

a cleaning water channel disposed on a top surface of the air circulating channel, the cleaning water channel being configured to, based on operation of the pump, carry and discharge the water toward the first heat exchanger, and

a nozzle cover that is coupled to the top surface of the air circulating channel and covers the cleaning water channel.

2. The laundry treating apparatus of claim **1**, wherein the air circulating channel comprises:

an air flow duct that extends upward from the base and accommodates the first heat exchanger and the second heat exchanger; and

a duct cover that is coupled to the air flow duct and covers the first heat exchanger and the second heat exchanger, and

wherein the nozzle cover is coupled to a top surface of the duct cover and covers the cleaning water channel.

3. The laundry treating apparatus of claim **2**, wherein the duct cover defines:

a cover through-hole that passes through the top surface of the duct cover and faces at least a portion of the first heat exchanger; and

a valve communication hole spaced apart from the cover through-hole and connected to the pump, and

wherein the cleaning water channel extends from the valve communication hole to the cover through-hole.

4. The laundry treating apparatus of claim **3**, wherein the cleaning water channel comprises a plurality of cleaning water channels arranged along a width direction of the first heat exchanger and connected to the cover through-hole, and

wherein a width of the cover through-hole corresponds to a width of the first heat exchanger.

5. The laundry treating apparatus of claim **3**, wherein the duct cover comprises a channel wall that protrudes from the top surface of the duct cover and defines the cleaning water channel, the channel wall being coupled to the nozzle cover and extending from the valve communication hole to the cover through-hole.

6. The laundry treating apparatus of claim **5**, wherein the nozzle cover comprises:

a nozzle cover body that is coupled to a top of the channel wall and covers the channel wall to thereby define the cleaning water channel together with the channel wall; and

a coupling portion that extends from the nozzle cover body to the channel wall and is coupled to the top of the channel wall.

7. The laundry treating apparatus of claim **6**, wherein the channel wall and the coupling portion are welded with each other.

8. The laundry treating apparatus of claim **6**, wherein the nozzle cover body extends along an extension direction of the cleaning water channel, and a shape of the nozzle cover body corresponds to a shape of the cleaning water channel.

9. The laundry treating apparatus of claim **6**, wherein the channel wall comprises:

a first coupling rib that protrudes from an upper portion of the channel wall toward the nozzle cover body, the first coupling rib defining an inner surface of the cleaning water channel; and

a second coupling rib that protrudes from the upper portion of the channel wall and is coupled to the coupling portion, the second coupling rib being spaced apart from the first coupling rib and defining an outer surface of the cleaning water channel.

10. The laundry treating apparatus of claim **9**, wherein the second coupling rib is welded with the coupling portion, and

wherein an outer circumferential surface of the second coupling rib is flush with an outer circumferential surface of the coupling portion.

11. The laundry treating apparatus of claim **9**, wherein the channel wall defines a sealing groove between the first coupling rib and the second coupling rib, the sealing groove being recessed downward away from the nozzle cover body and extending along an extension direction of the cleaning water channel,

wherein the laundry treating apparatus further comprises a sealing member that is disposed in the sealing groove and in contact with the first coupling rib and the second coupling rib, and

wherein the sealing member is disposed between the nozzle cover body and the sealing groove and configured to block the water inside the cleaning water channel from leaking out of the cleaning water channel.

12. The laundry treating apparatus of claim **5**, wherein the cleaning water channel comprises:

a guide channel having the valve communication hole defined at one end thereof, the guide channel being configured to, based on operation of the pump, receive the water supplied through the valve communication hole; and

a discharge channel having a first end connected to the guide channel and a second end connected to the cover through-hole, the discharge channel being configured to receive the water from the guide channel and discharge the water to the cover through-hole, and

wherein the discharge channel extends along an inclined direction relative to the guide channel and is configured to guide the water from the guide channel to the cover through-hole along the inclined direction.

13. The laundry treating apparatus of claim **12**, wherein the discharge channel comprises:

a first discharge channel that extends from the guide channel and is configured to receive the water from the guide channel, the first discharge channel being inclined by a first inclination angle relative to the guide channel; and

a second discharge channel that connects the first discharge channel to the cover through-hole and is configured to receive the water from the first discharge channel and guide the water to the cover through-hole, and

wherein the second discharge channel is inclined by a second inclination angle relative to the guide channel, the first inclination angle being greater than the second inclination angle.

14. The laundry treating apparatus of claim **13**, wherein a first width of the first discharge channel increases along a flow direction of the water in the first discharge channel, and

wherein a second width of the second discharge channel increases along a flow direction of the water in the second discharge channel, the second width being greater than the first width.

15. The laundry treating apparatus of claim **6**, wherein the duct cover further comprises a discharge rib that extends from an end of the cover through-hole and is accommodated in the cover through-hole, the discharge rib defining an extension of the cleaning water channel toward an inside of the cover through-hole.

16. The laundry treating apparatus of claim **15**, wherein the nozzle cover comprises:

a shielding rib that extends from the nozzle cover body and is coupled to the top surface of the duct cover, the shielding rib covering the cover through-hole; and

a switching rib that extends from the shielding rib along a first angle toward the cover through-hole, the switching rib facing the discharge rib, and

wherein the discharge rib extends from the end of the cover through-hole along a second angle different from the first angle.

17. The laundry treating apparatus of claim **16**, wherein a vertical level of a distal end of the switching rib with respect to the base is lower than a vertical level of a distal end of the discharge rib with respect to the base.

18. The laundry treating apparatus of claim **17**, wherein the distal end of the switching rib is disposed below the top surface of the duct cover, and

wherein the distal end of the discharge rib is disposed above the top surface of the duct cover.

19. The laundry treating apparatus of claim **16**, wherein a front end of the first heat exchanger is disposed at a position corresponding to a gap defined between the switching rib and the discharge rib.

20. The laundry treating apparatus of claim **12**, wherein the duct cover is inclined with respect to the guide channel and extends along the discharge channel.

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