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(54) **SPRINKLER APPARATUS, CONDENSER ASSEMBLY AND WASHING-DRYING MACHINE**

(57) A sprinkler device (100), condenser assembly (10) and washer-dryer (1), the sprinkler device (100) comprising a body (110), a water dividing member (120) and an anti-siphon diaphragm (130). A water input passage (101), a water output passage (102) and an anti-siphon chamber (103) are defined in the body (110), and the anti-siphon chamber (103) is connected to the water input passage (101) and the water output passage (102); the water dividing member (120) is provided in the anti-siphon chamber (103) and defines a plurality of flow passages (122); the anti-siphon diaphragm (130) is dis-

posed in the anti-siphon chamber (103) and is located at a side of the water dividing member (120) facing the water input passage (101). The flow passages (122) are communicated with the water input passage (101) when the anti-siphon diaphragm (130) is located at an open position and are disconnected from the water input passage (101) when the anti-siphon diaphragm (130) is located at a closed position.

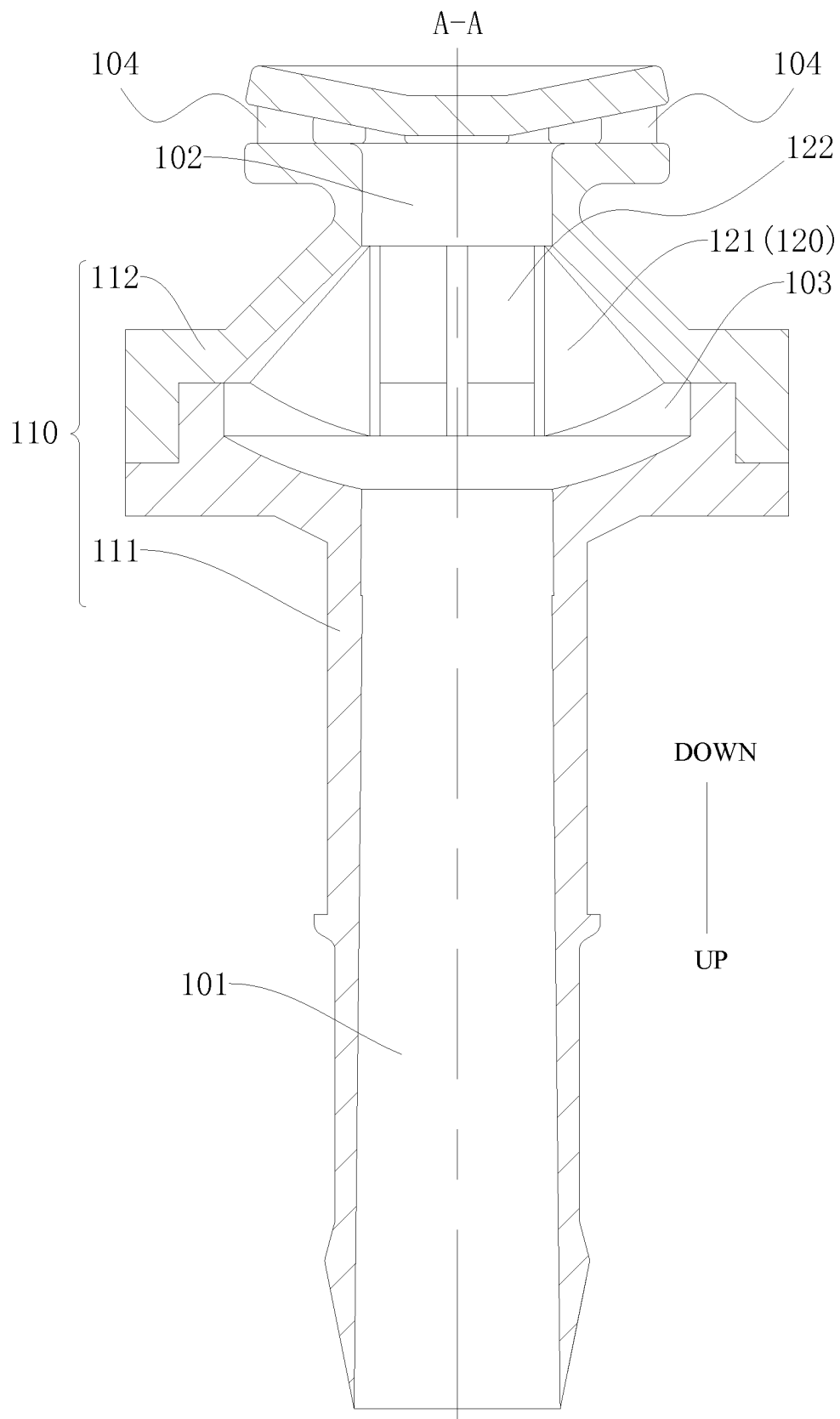


Fig. 3

Description

FIELD

[0001] The present disclosure relates to a technical field of washing equipment, and more particularly to a sprinkler device for a washer-dryer, a condenser assembly for a washer-dryer and having the sprinkler device, and a washer-dryer having the condenser assembly.

BACKGROUND

[0002] For a sprinkler device of a washer-dryer in the related art, a siphon risk may exist at a high water level. For this reason, a one-way valve is usually provided in a sprinkling waterway to achieve an anti-siphon effect, but the cost and the complexity of the manufacturing process are increased. Additionally, when the sprinkler device works in a low water pressure state, for example, on a high floor or in an area with a low water supply pressure, since the water pressure in the tap water pipe is about 0.03 MPa, and the water pressure allocated to the sprinkling waterway is lower, the sprinkler device cannot form a continuous jet water flow, and has a poor sprinkling effect.

SUMMARY

[0003] The present disclosure seeks to solve at least one of the problems existing in the related art to at least some extent. Therefore, the present disclosure provides a sprinkler device for a condenser of a washer-dryer, and the sprinkler device has advantages of anti-siphon effect, low cost, simple manufacturing process, and good sprinkling effect.

[0004] The present disclosure further provides a condenser assembly for a washer-dryer and having the sprinkler device.

[0005] The present disclosure further provides a washer-dryer having the condenser assembly.

[0006] The sprinkler device according to embodiments of a first aspect of the present disclosure includes: a body defining a water input passage, a water output passage, and an anti-siphon chamber therein, the anti-siphon chamber being communicated between the water input passage and the water output passage, and the body being provided with a spout in communication with the water output passage; a water dividing member provided in the anti-siphon chamber, and defining a plurality of flow passages configured to be communicated with the water input passage and the water output passage; and an anti-siphon diaphragm provided in the anti-siphon chamber, located at a side of the water dividing member towards the water input passage, and configured to move to an open position under the impact of an influent water flow, wherein the flow passages are communicated with the water input passage when the anti-siphon diaphragm is in the open position, and the flow passages are dis-

connected from the water input passage when the anti-siphon diaphragm is in a closed position.

[0007] The sprinkler device according to embodiments of the present disclosure can prevent siphoning, lower the cost, simplify the manufacturing process, and achieve good sprinkling effect.

[0008] In addition, the sprinkler device according to embodiments of the present disclosure further has the following technical features.

[0009] According to some embodiments of the present disclosure, the water input passage is located above the anti-siphon chamber, and the anti-siphon diaphragm has a maximum diameter not greater than a distance between two flow passages that are farthest apart, and has a minimum diameter not less than a maximum diameter of the water input passage.

[0010] Preferably, the anti-siphon diaphragm has a circular cross section, and the circular shape has a diameter gradually increased in a direction from the water input passage to the water output passage.

[0011] According to some embodiments of the present disclosure, the water dividing member includes a plurality of water dividing sheets extending along a radial direction of the anti-siphon chamber and spaced apart in a circumferential direction of the anti-siphon chamber, and any two adjacent water dividing sheets define the flow passage therebetween.

[0012] Preferably, an inner side edge of an end, towards the water input passage, of each water dividing sheet protrudes towards the water input passage with respect to its outer side edge.

[0013] According to some embodiments of the present disclosure, a plurality of spouts are provided and spaced apart along a circumferential direction of the water output passage.

[0014] Optionally, each spout has an outlet orientation perpendicular to an axial direction of the water output passage.

[0015] Advantageously, each spout has a radial sectional area progressively increased in an effluent water flow direction.

[0016] According to some embodiments of the present disclosure, the water input passage, the water output passage, and the anti-siphon chamber are arranged coaxially.

[0017] According to some embodiments of the present disclosure, the body includes: a sprinkling water input section having the water input passage; and a sprinkling water output section having the water output passage, the sprinkling water output section together with the sprinkling water input section defining the anti-siphon chamber, and the spout being provided in the sprinkling water output section.

[0018] Advantageously, the sprinkling water input section and the sprinkling water output section are connected by welding.

[0019] The condenser assembly according to embodiments of a second aspect of the present disclosure in-

cludes: a condenser defining a heat exchange chamber therein, the heat exchange chamber having a cleaning inlet and a cleaning outlet; a sprinkler device serving to clean the heat exchange chamber, and configured as the sprinkler device according to the first aspect of the present disclosure, in which the water output passage is communicated with the cleaning inlet; and a sprinkling pipe having a first end communicated with a water inlet of the washer-dryer and a second end connected with the water input passage.

[0020] The condenser assembly according to embodiments of the present disclosure can prevent siphoning, lower the cost, simplify the manufacturing process, and achieve good sprinkling effect, by using the above sprinkler device.

[0021] According to some embodiments of the present disclosure, the cleaning inlet is provided in an upper portion of the heat exchange chamber, while the cleaning outlet is provided in a lower portion of the heat exchange chamber.

[0022] According to some embodiments of the present disclosure, the condenser assembly further includes a control valve configured to control connection and disconnection of the sprinkling pipe, and disposed to the sprinkling pipe; and a controller configured to communicate with the control valve.

[0023] The washer-dryer according to embodiments of a third aspect of the present disclosure includes: a drum provided with a circulating water inlet; the condenser assembly according to the embodiments of the second aspect of the present disclosure; and a circulating water pipe having a first end connected with the circulating water inlet and a second end connected with the cleaning outlet.

[0024] The washer-dryer according to embodiments of the present disclosure can prevent siphoning, lower the cost, simplify the manufacturing process, and achieve good sprinkling effect, by using the above condenser assembly.

[0025] According to some embodiments of the present disclosure, the washer-dryer further includes: a distributor cartridge communicated with the drum; and a main cleaning water input pipe connected with the water inlet and the distributor cartridge, in which the first end of the sprinkling pipe is disposed to the main cleaning water input pipe.

[0026] Additional aspects and advantages of embodiments of present disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027]

Fig. 1 illustrates a schematic view of a washer-dryer according to embodiments of the present disclosure.

Fig. 2 illustrates a schematic view of a sprinkler device for a condenser of a washer-dryer according to embodiments of the present disclosure.

Fig. 3 illustrates a sectional view taken along line A-A in Fig. 2.

Fig. 4 illustrates a sectional view taken along line B-B in Fig. 2.

Fig. 5 illustrates a sectional view taken along line C-C in Fig. 2.

Fig. 6 illustrates a schematic view of an anti-siphon diaphragm of a sprinkler device according to embodiments of the present disclosure.

Reference numerals:

[0028]

washer-dryer 1,
condenser assembly 10 for washer-dryer,
sprinkler device 100 for condenser of washer-dryer,
water input passage 101, water output passage 102,
anti-siphon chamber 103, spout 104, body 110,
sprinkling water input section 111, sprinkling water output section 112, water dividing member 120, water dividing sheet 121, flow passage 122, anti-siphon diaphragm 130,
condenser 200, cleaning inlet 201, sprinkling pipe 300, controller 400,
drum 20, distributor cartridge 30, main cleaning water input pipe 40, water inlet 41.

DETAILED DESCRIPTION

[0029] Embodiments of the present disclosure will be described in detail and examples of the embodiments will be illustrated in the drawings. The same or similar elements and the elements having same or similar functions are denoted by like reference numerals throughout the description. The embodiments described herein with reference to drawings are explanatory, which are merely used to illustrate the present disclosure, but shall not be construed to limit the present disclosure.

[0030] In the specification, it is to be understood that terms such as "central," "longitudinal," "transverse," "upper," "lower," "inner," "outer," "axial," "radial," and "circumferential" should be construed to refer to the orientation or position relationship as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not indicate or imply that the present disclosure must have a particular orientation or be constructed and operated in a particular orientation. Thus, these relative terms should not be constructed to limit the present disclosure. In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or to imply the number of indicated technical features. Thus, the feature defined with "first" and "second" may include

one or more of this feature. In the description of the present disclosure, the term "a plurality of" means two or more than two, unless specified otherwise.

[0031] A sprinkler device 100 for a condenser of a washer-dryer according to embodiments of a first aspect of the present disclosure will be described below with reference to Figs. 1-6. The sprinkler device 100 has advantages of anti-siphon effect, low cost, simple manufacturing process, and good sprinkling effect.

[0032] As illustrated in Figs. 1-6, the sprinkler device 100 according to embodiments of the present disclosure includes a body 110, a water dividing member 120, and an anti-siphon diaphragm 130.

[0033] Specifically, the body 110 defines a water input passage 101, a water output passage 102, and an anti-siphon chamber 103 therein. The anti-siphon chamber 103 is communicated between the water input passage 101 and the water output passage 102. The body 110 is provided with a spout 104 in communication with the water output passage 102. The water dividing member 120 is arranged in the anti-siphon chamber 103, and defines a plurality of flow passages 122 configured to be communicated with the water input passage 101 and the water output passage 102. The anti-siphon diaphragm 130 is arranged in the anti-siphon chamber 103 and located at a side of the water dividing member 120 towards the water input passage 101 (e.g. located at an upper side of the water dividing member 120 in drawings). The anti-siphon diaphragm 130 is configured to move to an open position under the impact of an influent water flow. The flow passages 122 are communicated with the water input passage 101 when the anti-siphon diaphragm 130 is located in the open position, and the flow passages 122 are disconnected from the water input passage 101 when the anti-siphon diaphragm 130 is in a closed position.

[0034] The working process of the sprinkler device 100 according to embodiments of the present disclosure will be described in detail below with reference to the accompanying drawings.

[0035] Water enters the water input passage 101, and the water pressure thrusts the anti-siphon diaphragm 130 from the closed position to the open position, such that the anti-siphon diaphragm 130 abuts against the water dividing member 120 and the water enters the anti-siphon chamber 103. The water flow is divided into a plurality of strands along the flow passages 122 and branched from sides of the water dividing member 120, then converges, and is ejected from the spout 104 via the water output passage 102 in an accelerated way, so as to clean the condenser. When the water flows reversely, that is, the water flows in a direction from the water output passage 102 to the water input passage 101, the water pressure thrusts the anti-siphon diaphragm 130 from the open position to the closed position, such that the anti-siphon diaphragm 130 leaves the water dividing member 120 and abuts against the water input passage 101. In such a case, the flow passages 122 can be disconnected from the water input passage 101 to realize the purpose of

preventing siphoning.

[0036] The sprinkler device 100 according to embodiments of the present disclosure can achieve the anti-siphon effect, reduce the production cost, simplify the manufacturing process, and obtain good sprinkling effect, without using a one-way valve.

[0037] According to some embodiments of the present disclosure, as illustrated in Figs. 2 and 3, the water input passage 101 is located above the anti-siphon chamber 103, so that the water can smoothly enter the sprinkler device 100 under the action of gravity. The maximum diameter of the anti-siphon diaphragm 130 is not greater than a distance between the two flow passages 122 that are farthest apart, to ensure that the water input passage 101 is smoothly communicated with the flow passages 122 when the anti-siphon diaphragm 130 is in the open position. Meanwhile, the minimum diameter of the anti-siphon diaphragm 130 is not less than the maximum diameter of the water input passage 101, to ensure that the diameter of the anti-siphon diaphragm 130 is greater than the diameter of the water input passage 101, such that when the anti-siphon diaphragm 130 is in the closed position, the water input passage 101 and the flow passages 122 can be reliably disconnected to prevent the water from flowing out from the water input passage 101, so as to achieve the anti-siphon effect.

[0038] Preferably, as illustrated in Figs. 3 and 6, the anti-siphon diaphragm 130 has a circular cross section, and the diameter of the circular shape gradually increases in a direction from the water input passage 101 to the water output passage 102. Thus, when the anti-siphon diaphragm 130 is in the open position, the anti-siphon diaphragm 130 is deformed towards the water dividing member 120 under the action of water pressure, so as to communicate the water input passage 101 with the flow passages 122; when the anti-siphon diaphragm 130 is in the closed position, the anti-siphon diaphragm 130 completely abuts against a water outlet of the water input passage 101 under the action of water pressure, so as to completely disconnect the water input passage 101 from the flow passages 122.

[0039] According to some embodiments of the present disclosure, as illustrated in Figs. 3 and 4, the water dividing member 120 includes a plurality of water dividing sheets 121 spaced apart in a circumferential direction of the anti-siphon chamber 103. Each water dividing sheet 121 extends along a radial direction of the anti-siphon chamber 103, and any two adjacent water dividing sheets define a flow passage 122 therebetween, so as to achieve division of the water flow and enhance the sprinkling effect.

[0040] Preferably, as illustrated in Fig. 3, an inner side edge of an end, towards the water input passage 101, of each water dividing sheet 121 protrudes towards the water input passage 101, with respect to an outer side edge. Therefore, when the anti-siphon diaphragm 130 is in the open position, the anti-siphon diaphragm 130 can abut against a protruding portion of the water dividing sheet

121 to allow the water flow to enter the flow passage 122 smoothly. For example, an inner side edge of an upper end of each water dividing sheet 121 protrudes upwards with respect to its outer side edge. Herein, the inner side edge of the water dividing sheet 121 refers to a side edge adjacent to the center of the water dividing member 120, and the outer side edge of the water dividing sheet 121 refers to a side edge away from the center of the water dividing member 120.

[0041] According to some embodiments of the present disclosure, as illustrated in Figs. 2 and 5, a plurality of spouts 104 are provided and spaced apart along a circumferential direction of the water output passage 102, so as to improve a cleaning effect on the condenser. Optionally, as illustrated in Figs. 2 and 3, each spout 104 has an outlet orientation perpendicular to an axial direction of the water output passage 102, such that the water flow converging in the water output passage 102 can be ejected from a radial direction of the water output passage 102, and the sprinkling effect is better.

[0042] Advantageously, as illustrated in Fig. 3, each spout 104 has a radial sectional area progressively increased in an effluent water flow direction, which facilitates the accelerated ejection of the water flow via the spout 104, so as to further enhance the sprinkling effect.

[0043] According to some embodiments of the present disclosure, as illustrated in Figs. 2 and 3, the water input passage 101, the water output passage 102, and the anti-siphon chamber 103 are arranged coaxially, that is, a longitudinal central axis of the water input passage 101, a longitudinal central axis of the water output passage 102, and a longitudinal central axis of the anti-siphon chamber 103 coincide, thereby further simplifying the manufacturing process and facilitating the smooth flow of water.

[0044] According to some embodiments of the present disclosure, as illustrated in Figs. 2 and 3, the body 110 includes a sprinkling water input section 111 and a sprinkling water output section 112. The sprinkling water input section 111 has the water input passage 101. The sprinkling water output section 112 has the water output passage 102. The sprinkling water input section 111 and the sprinkling water output section 112 together define the anti-siphon chamber 103. The spout 104 is provided in the sprinkling water output section 112. In such a way, the sprinkler device 100 can be manufactured conveniently. Advantageously, the sprinkling water input section 111 and the sprinkling water output section 112 are connected by ultrasonic welding, thereby further simplifying the machining process.

[0045] As illustrated in Figs. 1-6, a condenser assembly 10 for a washer-dryer according to embodiments of a second aspect of the present disclosure includes a condenser 200, a sprinkler device, and a sprinkling pipe 300.

[0046] Specifically, the condenser 200 defines a heat exchange chamber (not illustrated) therein, and the heat exchange chamber has a cleaning inlet 201 and a cleaning outlet (not illustrated). The sprinkler device is the

sprinkler device 100 according to the first aspect of the present disclosure, and the water output passage 102 is communicated with the cleaning inlet 201. The sprinkling pipe 300 has a first end communicated with a water inlet of the washer-dryer and a second end connected with the water input passage 101. Thus, water enters the sprinkling pipe 300 from the water inlet, then enters the sprinkler device 100 from the water input passage 101, and finally is ejected from the water output passage 102 and enters the condenser 200, so as to clean the heat exchange chamber of the condenser 200.

[0047] The condenser assembly 10 according to embodiments of the present disclosure can prevent siphoning, lower the cost, simplify the manufacturing process, and achieve good sprinkling effect, by using the above sprinkler device 100.

[0048] Preferably, as illustrated in Fig. 1, the cleaning inlet 201 is provided in an upper portion of the heat exchange chamber, while the cleaning outlet is provided in a lower portion of the heat exchange chamber, so as to guarantee the cleaning effect on the condenser 200 and facilitate the smooth flow of water into and out of the heat exchange chamber.

[0049] According to some embodiments of the present disclosure, as illustrated in Fig. 1, the condenser assembly 10 further includes a control valve (not illustrated) and a controller 400. The control valve is disposed to the sprinkling pipe 300, and the controller 400 communicates with the control valve and realizes the connection or disconnection of the sprinkling pipe 300 by controlling the control valve. Hence, the sprinkling pipe 300 can be communicated when the condenser 200 needs to be cleaned, and the sprinkling pipe 300 is disconnected when the condenser 200 does not need cleaning, thereby making it more flexible and convenient.

[0050] As illustrated in Figs. 1-6, the washer-dryer 1 according to embodiments of a third aspect of the present disclosure includes a drum 20, the condenser assembly 10 according to the embodiments of the second aspect of the present disclosure, and a circulating water pipe (not illustrated).

[0051] Specifically, the drum 20 is provided with a circulating water inlet. The circulating water pipe has a first end connected with the circulating water inlet and a second end connected with the cleaning outlet. Thus, the water that has been used to clean the condenser 200 enters the drum 20 from the cleaning outlet through the circulating water pipe to do the laundry, thereby improving the water utilization rate.

[0052] The washer-dryer 1 according to embodiments of the present disclosure can prevent siphoning, lower the cost, simplify the manufacturing process, and achieve good sprinkling effect, by using the above condenser assembly 10.

[0053] According to some embodiments of the present disclosure, as illustrated in Fig. 1, the washer-dryer 1 further includes a distributor cartridge 30 and a main cleaning water input pipe 40. The distributor cartridge 30

is in communication with the drum 20. The main cleaning water input pipe 40 is connected with the water inlet 41 and the distributor cartridge 30, and the first end of the sprinkling pipe 300 is disposed to the main cleaning water input pipe 40. Thus, water enters the main cleaning water input pipe 40 from the water inlet 41, and then enters the distributor cartridge 30 and the sprinkling pipe 300, respectively, such that the detergent in the distributor cartridge 30 is flushed into the drum 20 to do the laundry, and the water enters the sprinkler device 100 from the sprinkling pipe 300 to clean the condenser 200.

[0054] Other configurations and operations of the washer-dryer 1 according to embodiments of the present disclosure are known to those skilled in the art and will not be elaborated herein.

[0055] In the present disclosure, it should be noted that, unless specified or limited otherwise, the term "connected" and the like are used broadly, and may be direct connections or indirect connections via intervening structures; may also be inner communications of two elements, which can be understood by those skilled in the art according to specific situations.

[0056] Reference throughout this specification to "an embodiment," "some embodiments," "an example," or "some examples," means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present disclosure. Thus, the above terms throughout this specification are not necessarily referring to the same embodiment or example of the present disclosure. Furthermore, the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples.

[0057] Although embodiments have been shown and described, it would be appreciated by those skilled in the art that any changes, modifications, alternatives, and variants can be made in the embodiments without departing from principles and purposes of the present disclosure. The scope of the present disclosure is defined by claims or the like.

Claims

1. A sprinkler device for a condenser of a washer-dryer, comprising:

a body defining a water input passage, a water output passage, and an anti-siphon chamber therein, the anti-siphon chamber being communicated between the water input passage and the water output passage, and the body being provided with a spout in communication with the water output passage;

a water dividing member provided in the anti-siphon chamber, and defining a plurality of flow passages configured to be communicated with

the water input passage and the water output passage; and

an anti-siphon diaphragm provided in the anti-siphon chamber, located at a side of the water dividing member facing the water input passage, and configured to move to an open position under the impact of an influent water flow, wherein the flow passages are communicated with the water input passage when the anti-siphon diaphragm is in the open position, and the flow passages are disconnected from the water input passage when the anti-siphon diaphragm is in a closed position.

2. The sprinkler device for the condenser of the washer-dryer according to claim 1, wherein the water input passage is located above the anti-siphon chamber, and the anti-siphon diaphragm has a maximum diameter not greater than a distance between two flow passages that are farthest apart, and has a minimum diameter not less than a maximum diameter of the water input passage.
3. The sprinkler device for the condenser of the washer-dryer according to claim 2, wherein the anti-siphon diaphragm has a cross section in a circular shape, and the circular shape has a diameter gradually increased in a direction from the water input passage to the water output passage.
4. The sprinkler device for the condenser of the washer-dryer according to claim 1, wherein the water dividing member comprises a plurality of water dividing sheets extending along a radial direction of the anti-siphon chamber and spaced apart in a circumferential direction of the anti-siphon chamber, and any two adjacent water dividing sheets define the flow passage therebetween.
5. The sprinkler device for the condenser of the washer-dryer according to claim 4, wherein an inner side edge of an end of each water dividing sheet protrudes towards the water input passage with respect to an outer side edge of the water dividing sheet, wherein the end of the water dividing sheet faces the water input passage.
6. The sprinkler device for the condenser of the washer-dryer according to claim 1, wherein a plurality of spouts are provided and spaced apart along a circumferential direction of the water output passage.
7. The sprinkler device for the condenser of the washer-dryer according to claim 6, wherein each spout has an outlet orientation perpendicular to an axial direction of the water output passage.
8. The sprinkler device for the condenser of the washer-

dryer according to claim 6, wherein each spout has a radial sectional area progressively increased in an effluent water flow direction.

9. The sprinkler device for the condenser of the washer-dryer according to claim 1, wherein the water input passage, the water output passage, and the anti-siphon chamber are arranged coaxially. 5
10. The sprinkler device for the condenser of the washer-dryer according to any one of claims 1 to 9, wherein the body comprises:

a sprinkling water input section having the water input passage; and 15
a sprinkling water output section having the water output passage, the sprinkling water output section together with the sprinkling water input section defining the anti-siphon chamber, and the spout being provided in the sprinkling water output section. 20
11. The sprinkler device for the condenser of the washer-dryer according to claim 10, wherein the sprinkling water input section and the sprinkling water output section are connected by welding. 25
12. A condenser assembly for a washer-dryer, comprising:

a condenser defining a heat exchange chamber therein, the heat exchange chamber having a cleaning inlet and a cleaning outlet; 30
a sprinkler device configured to clean the heat exchange chamber, and configured as the sprinkler device according to any one of claims 1 to 11, the water output passage being communicated with the cleaning inlet; and 35
a sprinkling pipe having a first end communicated with a water inlet of the washer-dryer and a second end connected with the water input passage. 40
13. The condenser assembly for the washer-dryer according to claim 12, wherein the cleaning inlet is provided in an upper portion of the heat exchange chamber, while the cleaning outlet is provided in a lower portion of the heat exchange chamber. 45
14. The condenser assembly for the washer-dryer according to claim 12, further comprising:

a control valve disposed to the sprinkling pipe, and configured to control connection and disconnection of the sprinkling pipe; and 55
a controller configured to communicate with the control valve.

15. A washer-dryer, comprising:

a drum provided with a circulating water inlet; a condenser assembly according to any one of claims 12 to 14; and
a circulating water pipe having a first end connected with the circulating water inlet and a second end connected with the cleaning outlet.

16. The washer-dryer according to claim 15, further comprising:

a distributor cartridge communicated with the drum; and
a main cleaning water input pipe connected with the water inlet and the distributor cartridge, the first end of the sprinkling pipe being disposed to the main cleaning water input pipe.

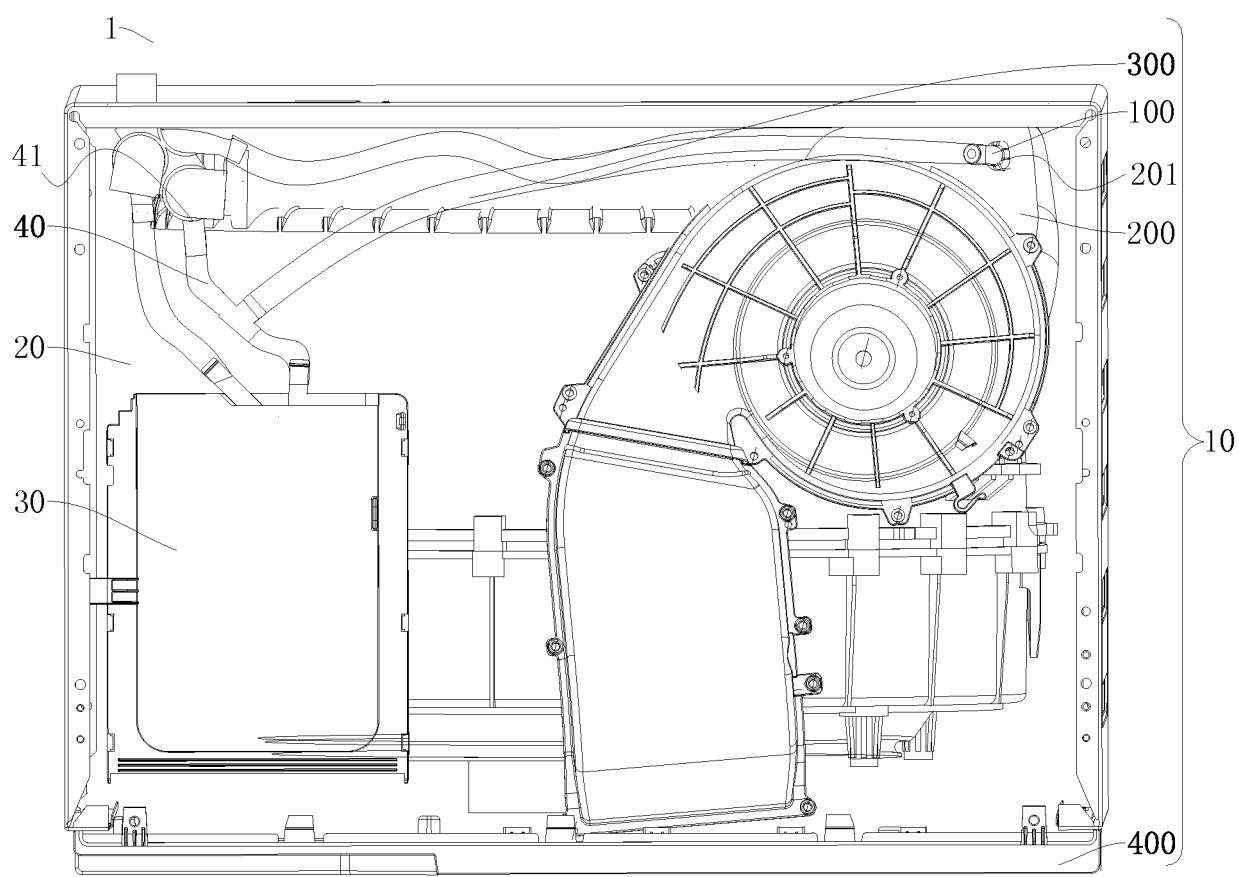


Fig. 1

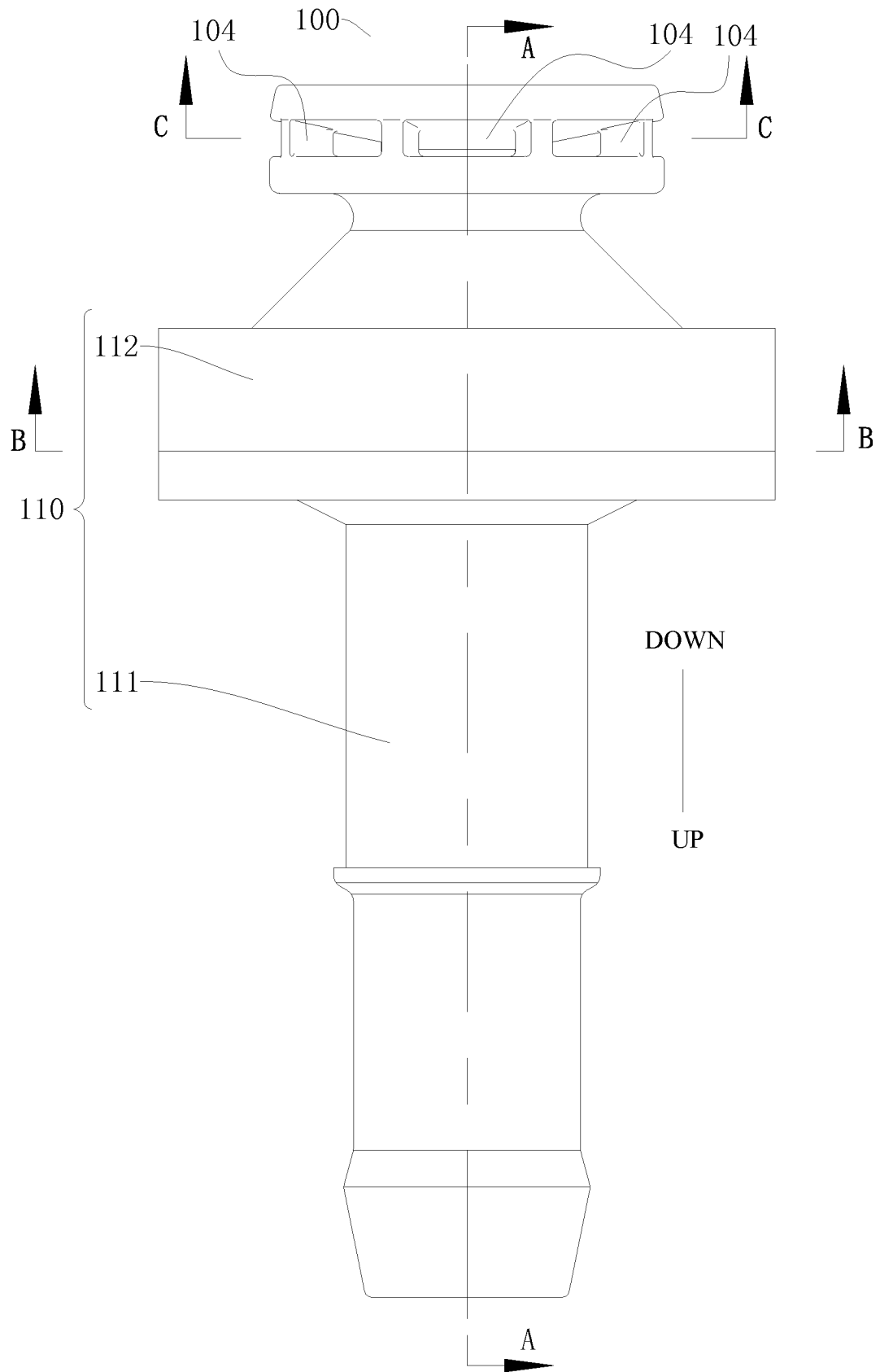


Fig. 2

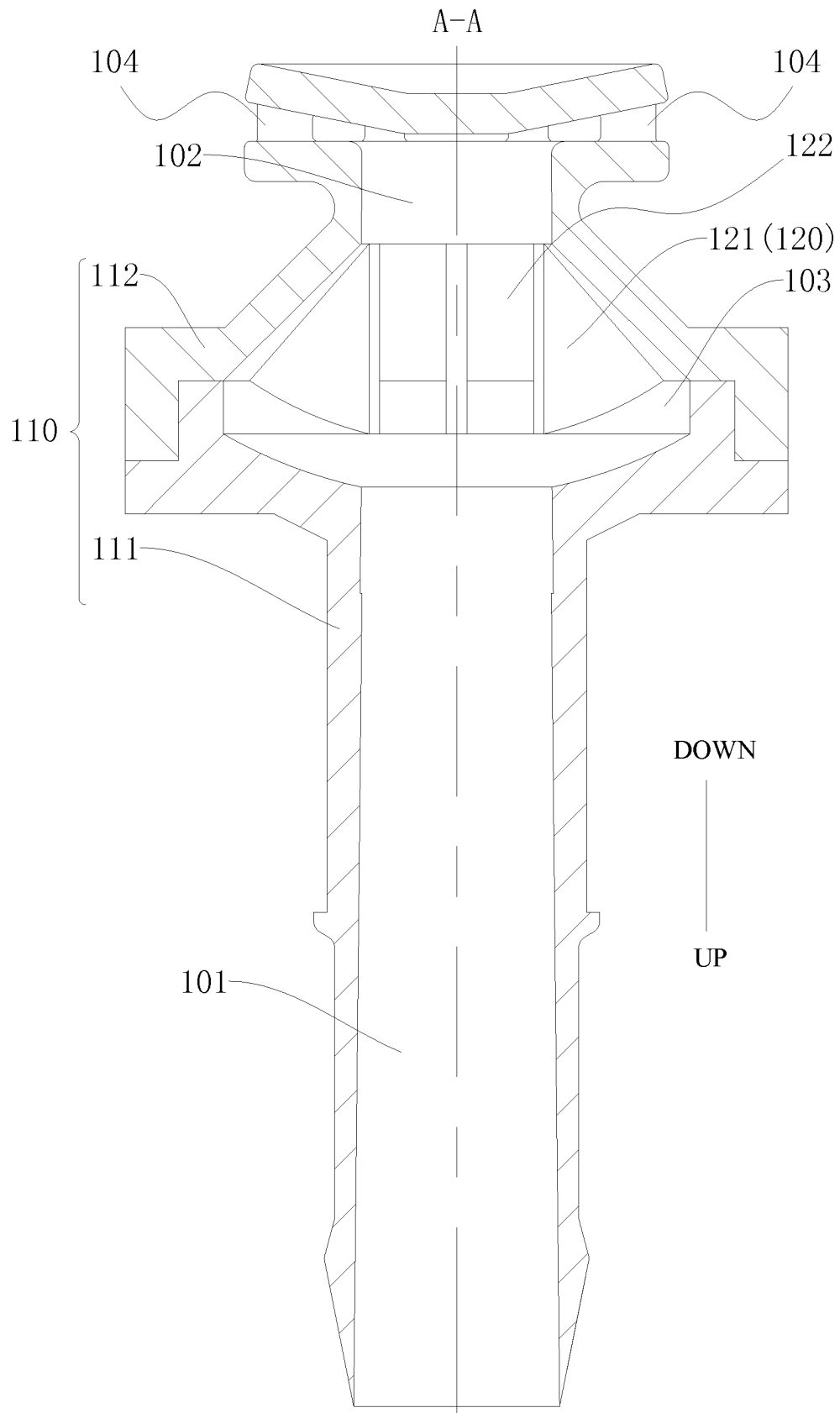


Fig. 3

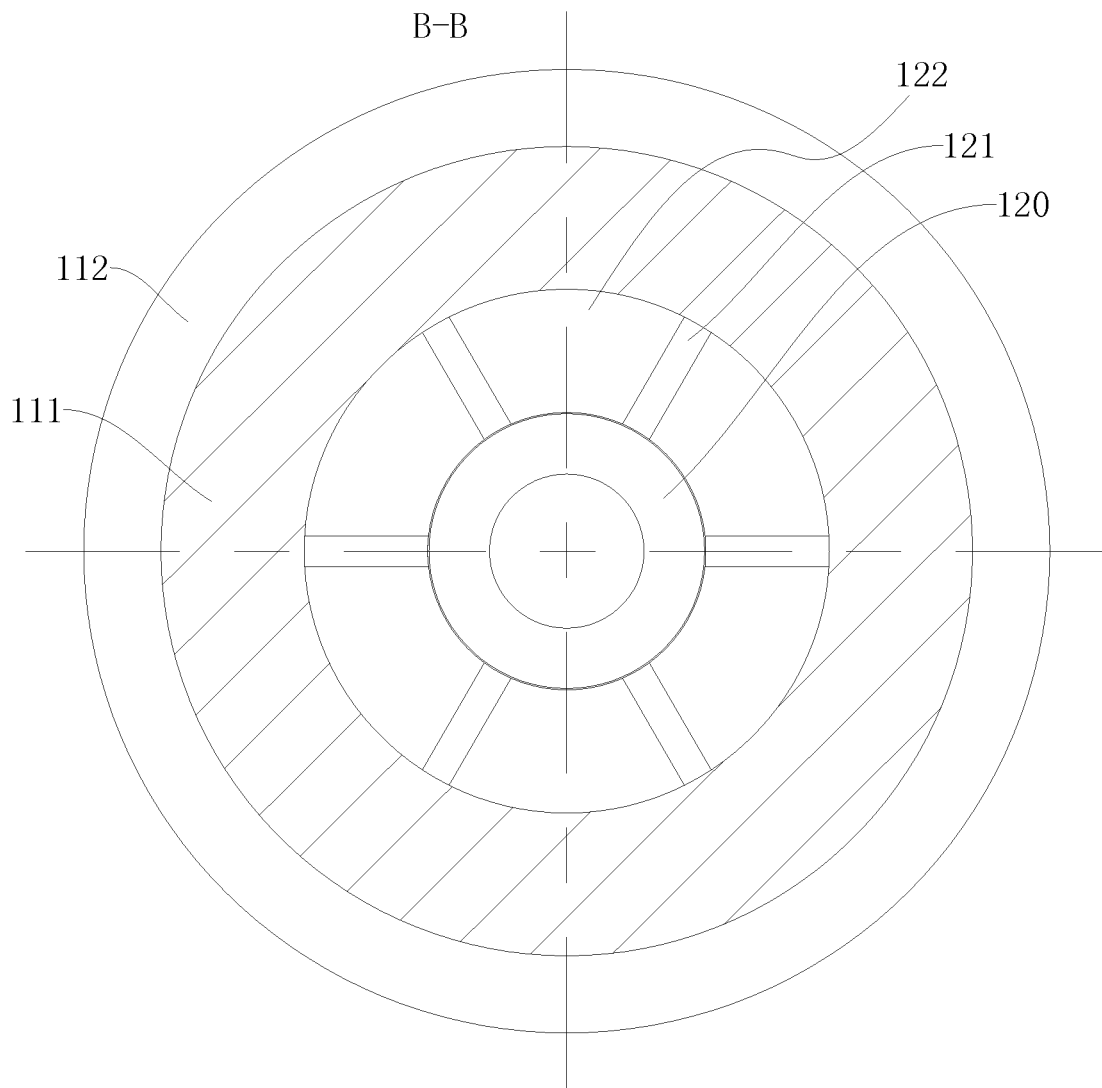


Fig. 4

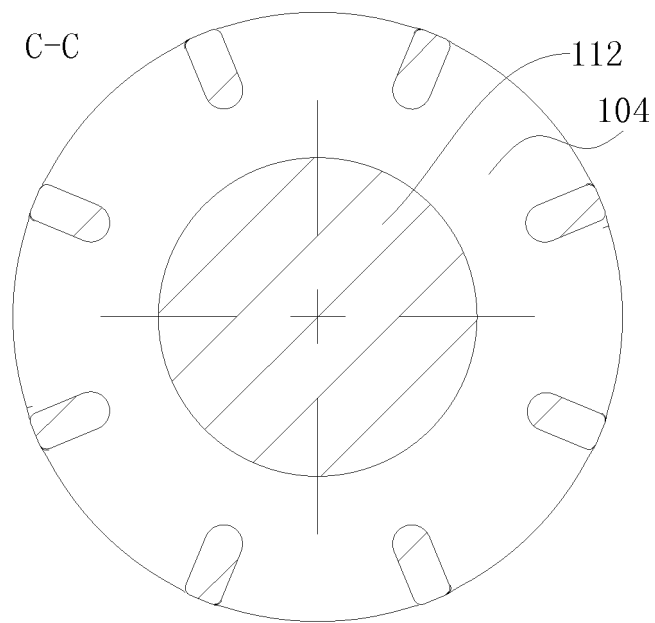


Fig. 5

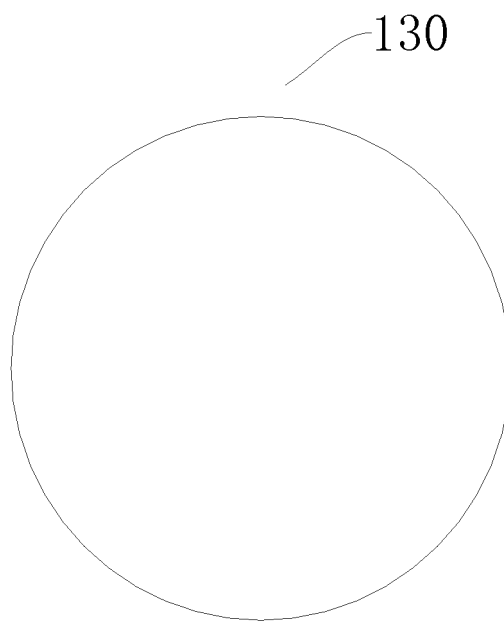


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2016/102204

A. CLASSIFICATION OF SUBJECT MATTER

D06F 58/24 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, CNPAT, CNKI: 喷, 进水, 膜, 片, 冷凝, 分水, 通道, 洗干, 烘干, 虹吸, spray+, nozzle, drain, condenser, film, dry, siphon

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 101684610 A (BSH ELECTRICAL APPLIANCES (JIANGSU) CO., LTD.), 31 March 2010 (31.03.2010), description, page 4, line 12 to page 5, line 27, and figures 1-4	1-16
A	CN 103603974 A (SHIXIA HOLDING CO., LTD.), 26 February 2014 (26.02.2014), entire document	1-16
A	CN 203866575 U (HAIER ELECTRONICS GROUP CO., LTD. et al.), 08 October 2014 (08.10.2014), entire document	1-16
A	US 6338472 B1 (TOYODA CHUO KENKYUSHO K. K.), 15 January 2002 (15.01.2002), entire document	1-16
A	CN 1782211 A (LG ELECTRONICS (TIANJIN) APPLIANCES CO., LTD.), 07 June 2006 (07.06.2006), entire document	1-16
A	KR 100792522 B1 (SAMSUNG ELECTRONICS CO., LTD.), 10 January 2008 (10.01.2008), entire document	1-16

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

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Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer CHEN, Zhengjun Telephone No. (86-10) 62413230

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 101684610 A	31 March 2010	EP 2169107 B1	05 March 2014
		CN 101684610 B	09 November 2011
		EP 2169107 A1	31 March 2010
CN 103603974 A	26 February 2014	CN 103603974 B	26 August 2015
CN 203866575 U	08 October 2014	None	
US 6338472 B1	15 January 2002	JP 4325016 B2	02 September 2009
		JP 2000317358 A	21 November 2000
CN 1782211 A	07 June 2006	CN 100519912 C	29 July 2009
KR 100792522 B1	10 January 2008	None	

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