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(54) CONDENSATION CHANNEL FOR DRYING APPARATUS, AND DRYING APPARATUS

(57) A condensation channel for a drying apparatus, and a drying apparatus. The condensation channel comprises two double-spiral channels which are arranged in parallel and are independent of each other. A side wall of each double-spiral channel is provided with a water-blocking structure (10) to disperse a cooling water flow into water spray, such that not only can the side wall of the double-spiral channel be flushed by the water spray while a drying procedure is performed, but also lint in a circulating airflow can be dissolved in the water spray. A front side wall is provided with a first arc-shaped structure (11), a second arc-shaped structure (12) and a flow-splitting structure (13). A left side wall (14) and a right side wall (15) of the double-spiral channel are both arc-shaped. Air entering from an air inlet (19) is divided into two air streams by the flow-splitting structure (13). The two air streams can rotate and rise, and thus travel longer in the condensation channel, improving the cooling effect; and the two rotating and rising air streams carry the dispersed cooling water spray to form a cyclone-shaped water spray in the condensation channel, which can improve the filtering effect on lint.

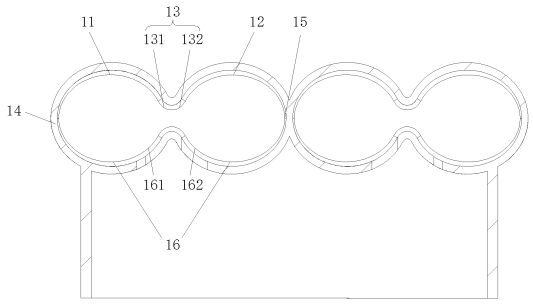

FIG.5

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Description

FIELD

[0001] The present disclosure relates to the technical field of household appliances, and specifically provides a condensation channel for a drying apparatus, and a drying apparatus.

BACKGROUND

[0002] A drying apparatus refers to a machine that can use hot air to dry clothing. The drying apparatus mainly includes a washing-drying integrated machine, a clothing dryer, or a drying machine, etc.

[0003] Taking the washing-drying integrated machine as an example, it is an intelligent apparatus in which rinsing, spinning, and drying functions are integrated together. Due to its special advantages such as high cost-effectiveness, strong spatial inclusiveness, and washing-drying integrated operations that are time-saving and laborsaving, the washing-drying integrated machine is currently widely welcomed by users in the household appliance market.

[0004] Currently, the self-cleaning problem of lint in the washing-drying integrated machine is still a major difficulty facing the industry. Due to the continuous mutual friction between clothing inside an inner cylinder, lint, fluffs and other impurities will be generated. These lint type impurities will continuously circulate in the system with airflow, and will adhere to various elements and components of the drying system and block them. If the lint is not cleaned in time, it may block an air duct and a fan, reduce the flow-through area, and cause a decrease in air volume, affecting a drying effect on the clothing.

[0005] In the prior art, a filter screen is mostly arranged in the midway of circulating air path to block the clothing lint generated by drying. However, due to the limited structural area at the location where the filter screen is arranged, the blocking effect of the filter screen on the lint is poor.

[0006] Accordingly, there is a need for a new technical solution in the art to solve the above problem.

SUMMARY

[0007] The present disclosure aims to solve the above technical problem, that is, to solve the problem that the air duct and fan of existing drying apparatuses can be easily blocked by lint.

[0008] In a first aspect, the present disclosure provides a condensation channel for a drying apparatus, in which the condensation channel includes two double spiral channels that are arranged side by side and are independent from each other; a water blocking structure is provided on a side wall of each of the double spiral channels to disperse a cooling water flow flowing into the double spiral channel; a front side wall of the double spiral channel is further provided with a first arc-shaped structure, a second arc-shaped structure, and a flow split structure located between the first arc-shaped structure and the second arc-shaped structure; the flow split structure is located below the water blocking structure; an air inlet is formed on a rear side wall of the double spiral channel; a left side wall of the double spiral channel is configured into an arc shape, and two ends of the left side wall are smoothly connected to the first arc-shaped structure and the rear side wall respectively; a right side wall of the double spiral channel is configured into an arc shape, and two ends of the right side wall are smoothly connected to the second arc-shaped structure and the rear side wall respectively; the flow split structure is opposite to the air inlet, and the flow split structure is arranged to be capable of dividing the gas entering from the air inlet into a first airflow and a second airflow and enabling the first airflow and the second airflow to enter the first arc-shaped structure and the second arc-shaped structure respectively in a tangential direction of the first arc-shaped structure and a tangential direction of the second arc-shaped structure respectively, so that the first airflow can rotate and rise along the first arc-shaped structure, the left side wall, and a left part of the rear side wall, and that the second airflow can rotate and rise along the second arc-shaped structure, the right side wall, and a right part of the rear side wall.

[0009] In a preferred technical solution of the condensation channel for the drying apparatus described above, a flushing nozzle is provided on the condensation channel, and a spray port of the flushing nozzle faces an inner side wall of the condensation channel.

[0010] In a preferred technical solution of the condensation channel for the drying apparatus described above, the number of the spray port is multiple, and the multiple spray ports spray in different directions.

[0011] In a preferred technical solution of the condensation channel for the drying apparatus described above, the water blocking structure is arranged on the front side wall and has a triangular shape, and a centerline of the water blocking structure coincides with a centerline of the flow split structure to evenly disperse the cooling water.

[0012] In a preferred technical solution of the condensation channel for the drying apparatus described above, the water blocking structure is a water blocking protrusion formed on the front side wall.

[0013] In a preferred technical solution of the condensation channel for the drying apparatus described above, a first arc-shaped guide structure and a second arc-shaped guide structure are also provided on the rear side wall, so that the first airflow and the second airflow can flow smoothly toward the first arc-shaped structure and the second arc-shaped structure respectively.

[0014] In a preferred technical solution of the condensation channel for the drying apparatus described above, the flow split structure is symmetrically arranged left and right, and a centerline of the flow split structure coincides

with a centerline of the air inlet so that the first airflow and the second airflow have substantially the same volume.

[0015] In a preferred technical solution of the condensation channel for the drying apparatus described above, the flow split structure includes a first arc-shaped flow split section and a second arc-shaped flow split section; one end of the first arc-shaped flow split section is smoothly connected to the first arc-shaped structure, the other end of the first arc-shaped flow split section is smoothly connected to one end of the second arc-shaped flow split section, and the other end of the second arc-shaped flow split section is smoothly connected to the second arc-shaped structure.

[0016] In a preferred technical solution of the condensation channel for the drying apparatus described above, a main water guide groove and branch water guide grooves are provided on the front side walls; the number of branch water guide grooves is two, top ends of the two branch water guide grooves are both communicated with a bottom end of the main water guide groove, and bottom ends of the two branch water guide grooves are respectively connected to two said water blocking structures located inside the double spiral channels.

[0017] In a second aspect, the present disclosure also provides a drying apparatus, which includes the condensation channel described above.

[0018] In a case where the above technical solutions are adopted, the condensation channel of the present disclosure includes two double spiral channels that are arranged side by side and are independent from each other; by arranging a water blocking structure on the side wall of the double spiral channel, the cooling water flow is dispersed into water splashes, which can not only flush the side wall of the double spiral channel at the same time the drying program is executed, but also can dissolve the lint in the circulating airflow. In addition, a first arc-shaped structure, a second arc-shaped structure, and a flow split structure are arranged on the front side wall; the left side wall and the right side wall of the double spiral channel are both arc-shaped, and the gas entering from the air inlet is divided by the flow split structure into a first airflow and a second airflow, which can rotate and rise. Through such an arrangement, the travel of the first airflow and the second airflow in the condensation channel is extended, thereby improving the cooling effect. Moreover, the dispersed cooling water splashes are carried by the two streams of rotating and rising airflows, forming "whirlwind" like water splashes in the condensation channel. By controlling the cooling water volume, vortex like water splashes with a certain liquid level height are formed in the condensation channel. When the airflows pass through this area, the lint dissolves in the water splashes. Meanwhile, at the air inlet where the lint is most likely to accumulate, the continuously fluctuating water splashes are used to flush the bottom of the condensation channel in real time, which can improve the filtering effect on the lint.

[0019] Further, a flushing nozzle is arranged on the condensation channel, and a spray port of the flushing nozzle faces an inner side wall of the condensation channel. Through such an arrangement, after drying is completed, the flushing nozzle sprays flushing water flow into the condensation channel to achieve the purpose of flushing and purifying.

[0020] Further, the number of the spray port is multiple, and the multiple spray ports spray in different directions. Through such an arrangement, the flushing effect on the inner wall of the condensation channel can be improved.

[0021] Further, the water blocking structure is also arranged on the front side wall of the double spiral channel and has a triangular shape, and a centerline of the water blocking structure coincides with a centerline of the flow split structure so that the cooling water is evenly dispersed. Through such an arrangement, the two streams of spiral airflows can carry substantially equal amounts of cooling water splashes for rising, making dehumidification and filtration more uniform, and further improving the filtration effect on the lint and the condensation effect on the airflows.

[0022] Further, the flow split structure is symmetrically arranged left and right, and the centerline of the flow split structure coincides with the centerline of the air inlet. Through such an arrangement, the first airflow and the second airflow can have substantially the same volume. In this way, after the first airflow and the second airflow meet at a position near the rear side wall, they will not disperse each other, but can flow in parallel toward the front side wall under the interaction, and then respectively enter the first arc-shaped structure and the second arc-shaped structure arranged on the front side wall.

[0023] Further, a first arc-shaped guide structure and a second arc-shaped guide structure are arranged on the rear side wall so that the first airflow and the second airflow can flow smoothly toward the first arc-shaped structure and the second arc-shaped structure respectively. Through such an arrangement, under the guidance of the first arc-shaped guide structure and the second arc-shaped guide structure, it is possible to avoid direct collision from opposite directions between the first airflow and the second airflow. When the first airflow and the second airflow meet, the movement trend of the first airflow and the movement trend of the second airflow are both facing the front side wall. Therefore, after the first airflow and the second airflow meet, they can interact with each other, so that the first airflow moves toward the first arc-shaped structure and the second airflow moves toward the second arc-shaped structure.

[0024] In addition, the drying apparatus further provided by the present disclosure on the basis of the above technical solutions, due to having the above condensation channel adopted, can have the technical effect of the above condensation channel. Compared with existing drying apparatuses, the drying apparatus of the present disclosure can better filter the lint and has higher drying efficiency.

BRIEF DESCRIPTION OF DRAWINGS

[0025] Preferred embodiments of the present disclosure will be described below in connection with the accompanying drawings, in which:

FIG. 1 is a first schematic view of the structure of the washing-drying integrated machine of the present disclosure;

FIG. 2 is a second schematic view of the structure of the washing-drying integrated machine of the present disclosure;

FIG. 3 is a first schematic view of the structure of the condenser of the present disclosure;

FIG. 4 is a second schematic view of the structure of the condenser of the present disclosure;

FIG. 5 is a sectional view taken along line A-A in FIG. 4;

FIG. 6 is a third schematic view of the structure of the condenser of the present disclosure;

FIG. 7 is a sectional view taken along line B-B in FIG. 6; and

FIG. 8 is a schematic view of the structure of the flushing nozzle of the present disclosure.

List of reference signs:

[0026] 1: body; 10: water blocking structure; 11: first arc-shaped structure; 12: second arc-shaped structure; 13: flow split structure; 14: left side wall; 15: right side wall; 16: rear side wall; 131: first arc-shaped flow split section; 132: second arc-shaped flow split section; 161: first arc-shaped guide structure; 162: second arc-shaped guide structure; 171: main water guide groove; 172: branch water guide groove; 18: air outlet; 19: air inlet; 2: cooling water pipe; 3: flushing nozzle; 31: spray port; 4: inner cylinder; 5: outer cylinder; 6: fan; 7: air pipe; 8: corrugated pipe.

DETAILED DESCRIPTION

[0027] Preferred embodiments of the present disclosure will be described below with reference to the accompanying drawings. It should be understood by those skilled in the art that these following embodiments are only used to explain the technical principle of the present disclosure, and are not intended to limit the scope of protection of the present disclosure.

[0028] For example, although the following embodiments are described below in connection with a washing-drying integrated machine, the present disclosure is still applicable to other drying apparatuses, such as a clothing dryer, a drying machine, etc. Such adjustments and changes to the application object do not deviate from the principle and scope of the present disclosure, and should all be defined within the scope of protection of the present disclosure.

[0029] It should be noted that in the description of the present disclosure, terms indicating directional or positional relationships, such as "upper", "lower", "left", "right", "front", "rear", "top", "bottom", "inner", "outer" and the like, are based on the directional or positional relationships shown in the accompanying drawings. They are only used for ease of description, and do not indicate or imply that the device or element must have a specific orientation, or must be constructed or operated in a specific orientation; therefore, they should not be considered as limitations to the present disclosure. In addition, terms "first" and "second" are only used for descriptive purpose, and should not be understood as indicating or implying relative importance.

[0030] In addition, it should also be noted that in the description of the present disclosure, unless otherwise clearly specified and defined, terms "arrange", "communicate" and "connect" should be understood in a broad sense; for example, the connection may be a fixed connection, or a detachable connection, or an integral connection; it may be a direct connection, or an indirect connection implemented through an intermediate medium, or internal communication between two elements. For those skilled in the art, the specific meaning of the above terms in the present disclosure can be interpreted according to specific situations.

[0031] Specifically, the washing-drying integrated machine of the present disclosure includes a cabinet, in which an inner cylinder, an outer cylinder, a condensation channel, a fan, a heater, and an air pipe are provided. The heater is installed in the air pipe, one end of the air pipe is communicated with the outer cylinder, the other end of the air pipe is communicated with an air outlet of the fan, and the fan is installed between the condensation channel and the air pipe.

[0032] In the process of executing a drying program by the washing-drying integrated machine, under the action of the fan, air can circulate between the outer cylinder, the condensation channel, and the heater. Under the action of the heater, dry air is heated to become dry hot air, which then enters the outer cylinder and the inner cylinder along the air pipe, exchanges heat with wet clothing in the inner cylinder, and takes away the moisture in the clothing to form relatively humid hot air, which then enters the condensation channel. Through the condensation effect of the condensation channel, the moisture in the relatively humid hot air is condensed into water, and the condensed air becomes relatively dry cold air, which then enters the air pipe and is heated by the heater to become dry hot air before entering the next cycle. This cycle repeats again and again until the drying program is completed.

[0033] It should be noted that in practical applications,

an independent condenser can be provided, and the condensation channel can be formed inside the condenser. The condenser can be installed on a rear wall of the outer cylinder, or a shell and the rear wall of the outer cylinder together can enclose the condensation channel, etc. The adjustment and change to the specific formation of the condensation channel do not deviate from the principle and scope of the present disclosure, and should all be defined within the scope of protection of the present disclosure.

[0034] In the following, the technical solutions of the present disclosure will be described using an example in which an independent condenser is provided and the condensation channel is formed inside the condenser.

[0035] Firstly, reference is made to FIGS. 1 and 2, in which FIG. 1 is a first schematic view of the structure of the washing-drying integrated machine of the present disclosure, and FIG. 2 is a second schematic view of the structure of the washing-drying integrated machine of the present disclosure.

[0036] As shown in FIGS. 1 and 2, the washing-drying integrated machine of the present disclosure includes a cabinet, in which an inner cylinder 4, an outer cylinder 5, a condenser, a fan 6, a heater (not shown in the figure) and an air pipe 7 are provided. The heater is installed in the air pipe 7, one end of the air pipe 7 is communicated with the outer cylinder 5, the other end of the air pipe 7 is communicated with an air outlet of the fan 6, and the fan 6 is installed between the condenser and the air pipe 7. A condensation channel is formed inside the condenser.

[0037] With continued reference to FIGS. 1 and 2 and next with reference to FIGS. 3 to 5, the condenser of the present disclosure includes a body 1 and a cooling water pipe 2. An upper part of the body 1 is provided with an air outlet 18, which is communicated with an air inlet of the fan 6. A lower part of the body 1 is provided with an air inlet 19, which is communicated with the outer cylinder 5 through a corrugated pipe 8. A condensation channel is formed inside the body 1. The top of the condensation channel is communicated with the air outlet 18, the bottom of the condensation channel is communicated with the air inlet 19, and the cooling water pipe 2 is communicated with the condensation channel.

[0038] In the process of executing the drying program by the washing-drying integrated machine, cooling water can be provided to the condensation channel by the cooling water pipe 2. The humid and hot air discharged from the inner cylinder 4 and the outer cylinder 5 enters the condensation channel through the air inlet 19 and exchanges heat with the cooling water in the condensation channel. The moisture in the humid and hot air is condensed into water, and the condensed air becomes relatively dry cold air, which is then discharged through the air outlet 18. The cooling water and condensate water are discharged from the lower air inlet 19.

[0039] With continued reference to FIGS. 3 to 5, the condensation channel includes two double spiral channels that are arranged side by side and are independent from each other.

[0040] Exemplarily, the two double spiral channels are arranged left and right side by side, and the two double spiral channels are independent from each other. The number of air inlet 19 is two, and the two air inlets 19 are communicated with the two double spiral channels respectively. After entering the two double spiral channels from the air inlets 19, gas rotates and rises along the double spiral channels without mutual interference, and is finally discharged from the air outlet 18. The body 1 of the condenser is provided with only one air outlet 18, and top ends of the two double spiral channels are both communicated with this air outlet 18.

[0041] It should be noted that in practical applications, an independent air outlet can also be set for each of the two double spiral channels. Such flexible adjustment and change do not deviate from the principle and scope of the present disclosure, and should all be defined within the scope of protection of the present disclosure.

[0042] In addition, it should also be noted that the structures of the two double spiral channels are the same. The following description is given by taking the double spiral channel located on the left side as an example.

[0043] As shown in FIGS. 4 and 5, a water blocking structure 10 is provided on the inner side wall of the double spiral channel. When the cooling water flowing into the double spiral channel reaches the water blocking structure 10, it is dispersed into water splashes. The water splashes can not only flush the inner side wall of the double spiral channel at the same time the drying program is executed, but also can dissolve the lint in the circulating airflow. Then, the lint flows out with the condensate water from the air inlet 19 and is finally discharged out of the machine through a drainage pipe.

[0044] Through such an arrangement, on the basis of achieving condensation, the condenser can also filter the lint, reduce the continuous circulation of lint in the drying system, "purify" the airflow that carries the lint, reduce the phenomenon of the lint adhering to various elements and components of the drying module, and alleviate the situation of blocking the drying air duct by the lint.

[0045] It should be noted that in practical applications, the water blocking structure 10 can be arranged as a water blocking rib, a water blocking block, a water blocking plate, etc. Such adjustment and change to the specific structural form of the water blocking structure 10 do not deviate from the principle and scope of the present disclosure, and should all be defined within the scope of protection of the present disclosure.

[0046] With continued reference to FIGS. 4 and 5, a front side wall of the double spiral channel is provided with a first arc-shaped structure 11, a second arc-shaped structure 12, and a flow split structure 13 located between the first arc-shaped structure 11 and the second arc-shaped structure 12; the flow split structure 13 is located below the water blocking structure 10; a left side wall 14 and a right side wall 15 of the double spiral channel are both configured into an arc shape, two ends of the left side

wall 14 are smoothly connected to the first arc-shaped structure 11 and a left end of a rear side wall 16 respectively, and two ends of the right side wall 15 are smoothly connected to the second arc-shaped structure 12 and a right end of the rear side wall 16 respectively.

[0047] With continued reference to FIGS. 4 and 5, the air inlet 19 is arranged on the rear side wall 16 of the double spiral channel, and the flow split structure 13 is opposite to the air inlet 19. Through such an arrangement, the gas entering from the air inlet 19 can right hit the flow split structure 13. The flow split structure 13 can divide the airflow into two streams of airflows (denoted as a first airflow and a second airflow) in such a way that the first airflow enters the first arc-shaped structure 11 substantially in a tangential direction of the first arc-shaped structure 11, and under the pushing effect of the subsequent airflow, the first airflow can rotate counterclockwise and rise along the first arc-shaped structure 11, the left side wall 14 and a left part of the rear side wall 16, as well as that the second airflow enters the second arc-shaped structure 12 substantially in a tangential direction of the second arc-shaped structure 12, and under the pushing effect of the subsequent airflow, the second airflow can rotate clockwise and rise along the second arc-shaped structure 12, the right side wall 15 and a right part of the rear side wall 16.

[0048] It can be understood that the double spiral channel includes two gas channels. The first arc-shaped structure 11, the left side wall 14, and the left part of the rear side wall 16 form a first gas channel; the second arc-shaped structure 12, the right side wall 15, and the right part of the rear side wall 16 form a second gas channel. After entering the double spiral channel from the air inlet 19, the gas is divided into the first airflow and the second airflow by the flow split structure 13. The first airflow can rotate and rise along the inner wall of the first gas channel, and the second airflow can rotate and rise along the inner wall of the second gas channel.

[0049] In the condenser of the present disclosure, the flow split structure 13 is creatively arranged on the front side wall of the double spiral channel. Through the flow split structure 13, the gas entering from the air inlet 19 is divided into the first airflow and the second airflow, so that the first airflow and the second airflow rotate and rise respectively. By causing the first airflow and the second airflow to rotate and rise, the travel of the first airflow and the second airflow in the condensation channel is extended, thereby improving the cooling effect.

[0050] Moreover, the dispersed cooling water splashes are carried by the two streams of rotating and rising airflows, forming "whirlwind" like water splashes in the condensation channel. By controlling the cooling water volume, vortex like water splashes with a certain liquid level height are formed in the condensation channel. When the airflows pass through this area, the lint dissolves in the water splashes. Meanwhile, at the air inlet 19 where the lint is most likely to accumulate, the continuously fluctuating water splashes are used to flush the bottom of the condensation channel in real time, which can improve the filtering effect on the lint. After the program runs stably, the volume of cooling water entering the condensation channel and the volume of cooling water exiting the condensation channel reach dynamic equilibrium.

[0051] Preferably, as shown in FIGS. 6 and 7, the water blocking structure 10 is arranged near the top end of the flow split structure 13. By arranging the water blocking structure 10 near the top end of the flow split structure 13, the cooling water can meet two streams of spiral airflows immediately after being dispersed, which can have better lint filtration effect and condensation effect.

[0052] In addition, through such an arrangement, the water blocking structure 10 can also be kept away from the air outlet 18, which can prevent water splashes from splashing from the air outlet 18 to the fan, and also prevent water splashes from being carried by the airflows into the inner cylinder 4 to reduce the drying efficiency.

[0053] Preferably, as shown in FIGS. 4 and 5, the flow split structure 13 includes a first arc-shaped flow split section 131 and a second arc-shaped flow split section 132; a left end of the first arc-shaped flow split section 131 is smoothly connected to the first arc-shaped structure 11, a right end of the first arc-shaped flow split section 131 is smoothly connected to a left end of the second arc-shaped flow split section 132, and a right end of the second arc-shaped flow split section 132 is smoothly connected to the second arc-shaped structure 12.

[0054] The gas entering from the air inlet 19 hits the flow split structure 13 and is divided into the first airflow and the second airflow. The first airflow flows along the first arc-shaped flow split section 131 toward the first arc-shaped structure 11, and the second airflow flows along the second arc-shaped flow split section 132 toward the second arc-shaped structure 12.

[0055] Preferably, as shown in FIGS. 4 and 5, the flow split structure 13 is symmetrically arranged left and right, and a centerline of the flow split structure 13 coincides with a centerline of the air inlet 19.

[0056] Through such an arrangement, the first airflow and the second airflow can have substantially the same volume. In this way, after the first airflow and the second airflow meet at a position near the rear side wall 16, they will not disperse each other, but can flow together in parallel toward the front side wall under the interaction, and then respectively enter the first arc-shaped structure 11 and the second arc-shaped structure 12 arranged on the front side wall.

[0057] Preferably, as shown in FIGS. 4 and 5, the first arc-shaped guide structure 161 and the second arc-shaped guide structure 162 are provided on the rear side wall 16 of the double spiral channel. Under the guidance of the first arc-shaped guide structure 161, the first airflow can smoothly flow toward the first arc-shaped structure 11. Similarly, under the guidance of the second arc-shaped guide structure 162, the second airflow can also smoothly flow toward the second arc-shaped structure

12.

[0058] Through such an arrangement, under the guidance of the first arc-shaped guide structure 161 and the second arc-shaped guide structure 162, it is possible to avoid direct collision from opposite directions between the first airflow and the second airflow. When the first airflow and the second airflow meet, the movement trend of the first airflow and the movement trend of the second airflow are both facing the front side wall. Therefore, after the first airflow and the second airflow meet, they can interact with each other, so that the first airflow can smoothly move toward the first arc-shaped structure 11 and the second airflow can smoothly move toward the second arc-shaped structure 12.

[0059] It should be noted that in order to ensure that the first airflow and the second airflow can each rotate and rise independently, a middle partition can be provided in the double spiral channel. A front side of the middle partition is smoothly connected to the first arc-shaped structure 11 and the second arc-shaped structure 12, respectively. A rear side of the middle partition is smoothly connected to the left part and right part of the rear side wall 16, respectively. By arranging the middle partition, the double spiral channel can be divided into two independent chambers. The first airflow can rotate and rise along an inner wall of a left chamber, and the second airflow can rotate and rise along an inner wall of a right chamber.

[0060] More preferably, the rear side wall 16 of the double spiral channel is also configured into an arc shape. Exemplarily, as shown in FIG. 5, the rear side wall 16 includes two arc-shaped parts. Two ends of the left arc-shaped part are smoothly connected to the left side wall 14 and the first arc-shaped guide structure 161 respectively, and two ends of the right arc-shaped part are smoothly connected to the right side wall 15 and the second arc-shaped guide structure 162 respectively.

[0061] Preferably, as shown in FIGS. 6 and 7, a main water guide groove 171 and branch water guide grooves 172 are provided on the front side walls of the double spiral channels. The number of branch water guide grooves 172 is two, top ends of the two branch water guide grooves 172 are both communicated with a bottom end of the main water guide groove 171, and bottom ends of the two branch water guide grooves 172 are respectively connected to two water blocking structures 10 located inside the double spiral channels.

[0062] In the process of executing the drying program by the washing-drying integrated machine, cooling water is supplied into the double spiral channels through the cooling water pipe 2. After entering the main water guide groove 171, the cooling water flows downward along the main water guide groove 171, and then flows into the two branch water guide grooves 172 respectively, thus flowing into the two double spiral channels. When the cooling water flows to the water blocking structures 10, it is dispersed into water splashes.

[0063] Preferably, as shown in FIGS. 6 and 7, the water blocking structure 10 is also provided on the front side wall of the double spiral channel, and the water blocking structure 10 has a triangular shape. A top end of the water blocking structure 10 is aligned with the bottom end of the branch water guide groove 172, and the centerline of the water blocking structure 10 coincides with the centerline of the flow split structure 13, so that the cooling water is evenly dispersed.

[0064] Through such an arrangement, the two streams of spiral airflows can carry substantially equal amounts of cooling water splashes for rising, making dehumidification and filtration more uniform, and further improving the filtration effect on the lint and the condensation effect on the airflows. The water blocking structure 10 is preferably a water blocking protrusion formed on the front side wall.

[0065] Preferably, as shown in FIGS. 3 and 4, the condenser of the present disclosure further includes a flushing nozzle 3 which is arranged on the condensation channel, and a spray port 31 of the flushing nozzle 3 faces the inner side wall of the condensation channel. After drying is completed, the flushing nozzle 3 sprays flushing water flow into the condenser to achieve the purpose of flushing and purifying.

[0066] More preferably, as shown in FIG. 8, the number of the spray port 31 is multiple, and the multiple spray ports 31 spray in different directions. By providing the multiple spray ports 31 that spray in different directions, the flushing effect on the inner wall of the condenser can be improved.

[0067] Hitherto, the technical solutions of the present disclosure have been described in connection with the preferred embodiments shown in the accompanying drawings, but it is easily understood by those skilled in the art that the scope of protection of the present disclosure is obviously not limited to these specific embodiments. Without departing from the principles of the present disclosure, those skilled in the art can make equivalent changes or replacements to relevant technical features, and all the technical solutions after these changes or replacements will fall within the scope of protection of the present disclosure.

Claims

1. A condensation channel for a drying apparatus, wherein the condensation channel comprises two double spiral channels that are arranged side by side and are independent from each other;

   a water blocking structure is provided on a side wall of each of the double spiral channels to disperse a cooling water flow flowing into the double spiral channel;

   a front side wall of the double spiral channel is further provided with a first arc-shaped structure, a second arc-shaped structure, and a flow split structure located between the first arc-

shaped structure and the second arc-shaped structure, and the flow split structure is located below the water blocking structure;

an air inlet is formed on a rear side wall of the double spiral channel;

a left side wall of the double spiral channel is configured into an arc shape, and two ends of the left side wall are smoothly connected to the first arc-shaped structure and the rear side wall respectively;

a right side wall of the double spiral channel is configured into an arc shape, and two ends of the right side wall are smoothly connected to the second arc-shaped structure and the rear side wall respectively;

the flow split structure is opposite to the air inlet, and the flow split structure is arranged to be capable of dividing the gas entering from the air inlet into a first airflow and a second airflow and enabling the first airflow and the second airflow to enter the first arc-shaped structure and the second arc-shaped structure respectively in a tangential direction of the first arc-shaped structure and a tangential direction of the second arc-shaped structure respectively, so that the first airflow can rotate and rise along the first arc-shaped structure, the left side wall, and a left part of the rear side wall, and that the second airflow can rotate and rise along the second arc-shaped structure, the right side wall, and a right part of the rear side wall.

2. The condensation channel according to claim 1, wherein a flushing nozzle is provided on the condensation channel, and a spray port of the flushing nozzle faces an inner side wall of the condensation channel.

3. The condensation channel according to claim 2, wherein the number of the spray port is multiple, and the multiple spray ports spray in different directions.

4. The condensation channel according to claim 1, wherein the water blocking structure is arranged on the front side wall and has a triangular shape, and a centerline of the water blocking structure coincides with a centerline of the flow split structure to evenly disperse the cooling water.

5. The condensation channel according to claim 1, wherein the water blocking structure is a water blocking protrusion formed on the front side wall.

6. The condensation channel according to claim 1, wherein a first arc-shaped guide structure and a second arc-shaped guide structure are also provided on the rear side wall, so that the first airflow and the second airflow can flow smoothly toward the first arc-shaped structure and the second arc-shaped structure respectively.

7. The condensation channel according to claim 1, wherein the flow split structure is symmetrically arranged left and right, and a centerline of the flow split structure coincides with a centerline of the air inlet so that the first airflow and the second airflow have substantially the same volume.

8. The condensation channel according to claim 1, wherein the flow split structure comprises a first arc-shaped flow split section and a second arc-shaped flow split section; one end of the first arc-shaped flow split section is smoothly connected to the first arc-shaped structure, the other end of the first arc-shaped flow split section is smoothly connected to one end of the second arc-shaped flow split section, and the other end of the second arc-shaped flow split section is smoothly connected to the second arc-shaped structure.

9. The condensation channel according to any one of claims 1 to 8, wherein a main water guide groove and branch water guide grooves are provided on the front side walls; the number of branch water guide grooves is two, top ends of the two branch water guide grooves are both communicated with a bottom end of the main water guide groove, and bottom ends of the two branch water guide grooves are respectively connected to two said water blocking structures located inside the double spiral channels.

10. A drying apparatus, comprising the condensation channel according to any one of claims 1 to 9.

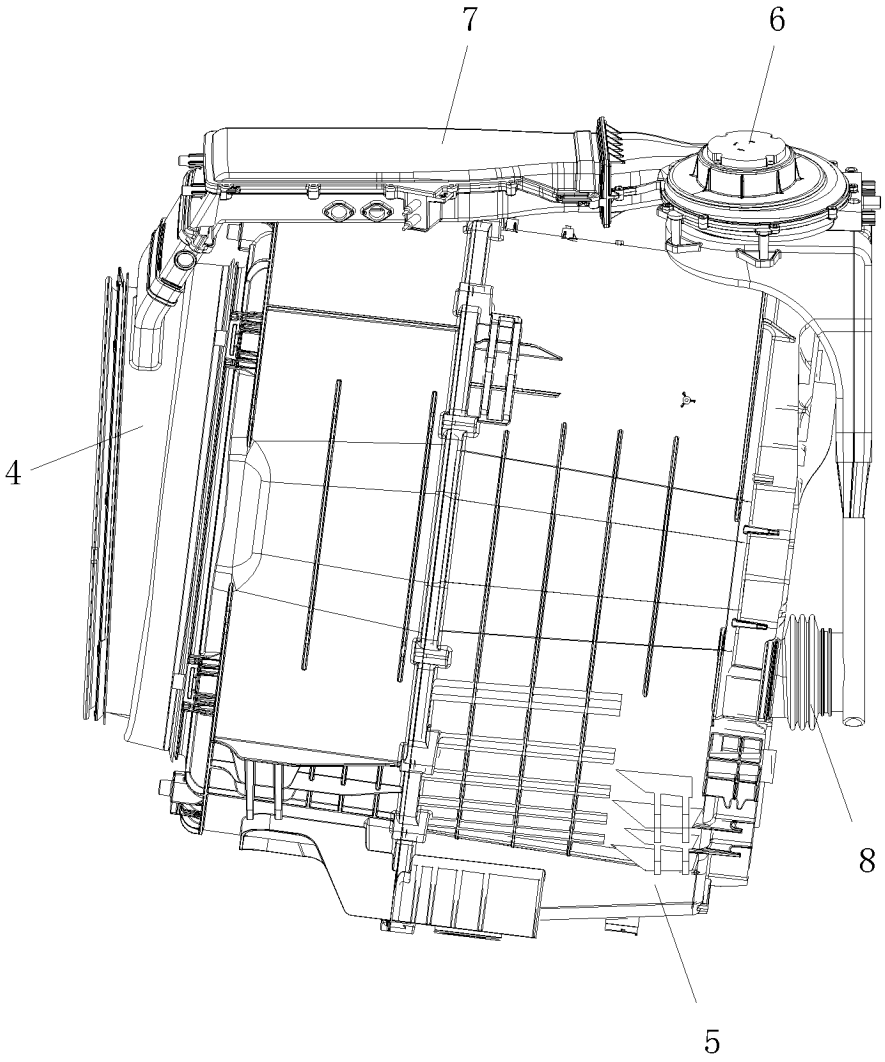

FIG.1

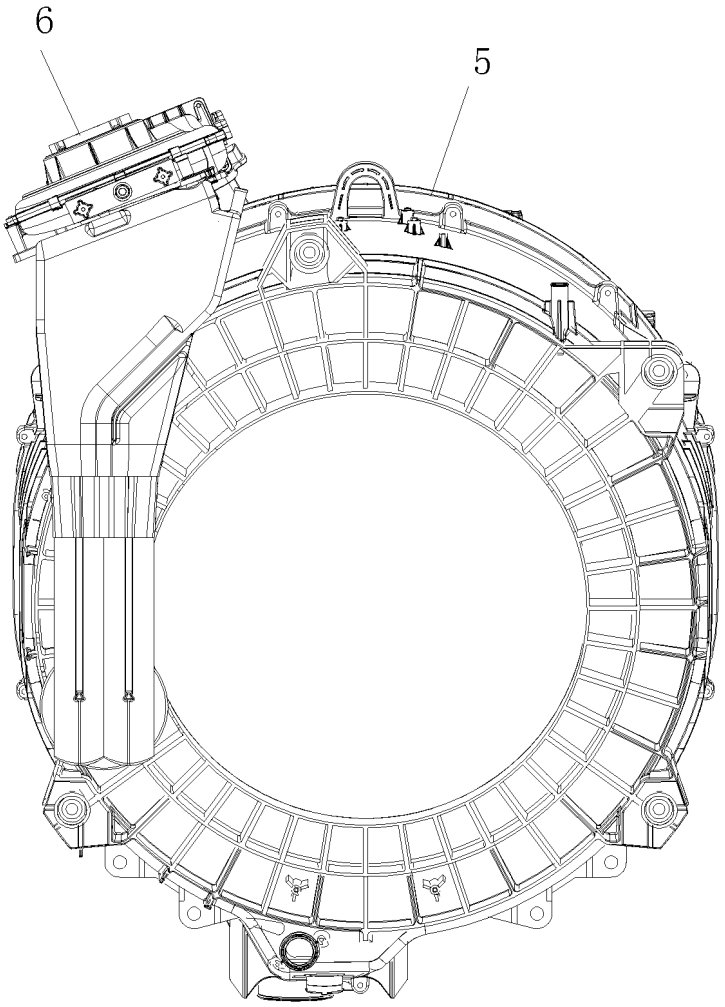

FIG.2

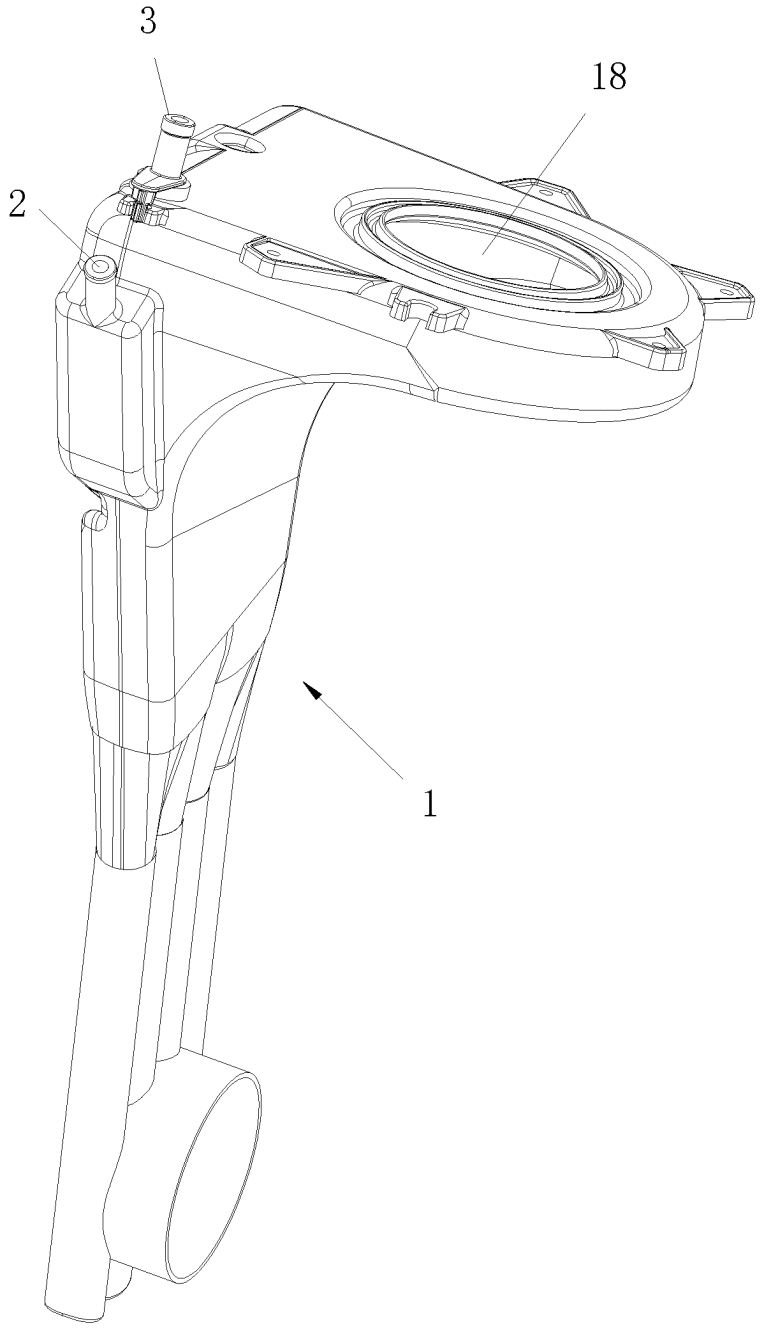

FIG.3

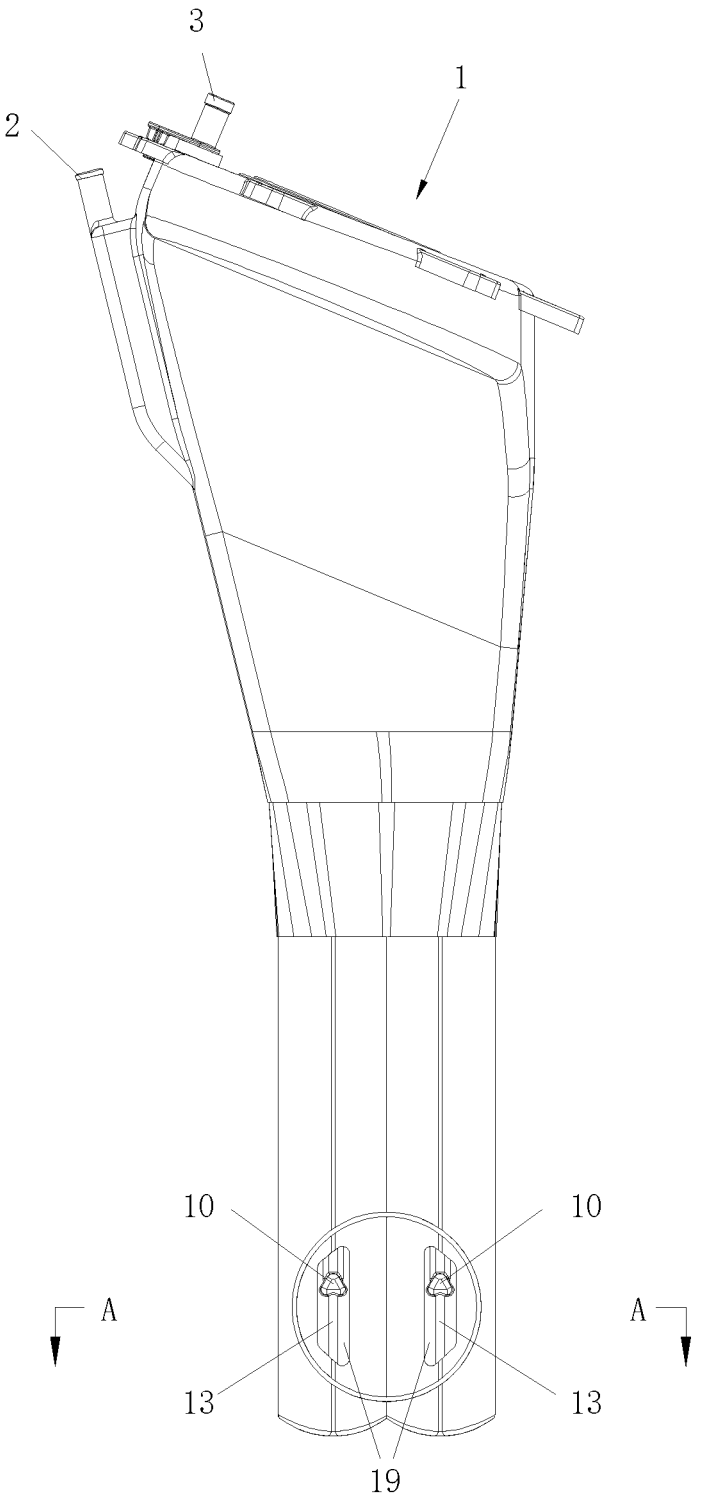

FIG.4

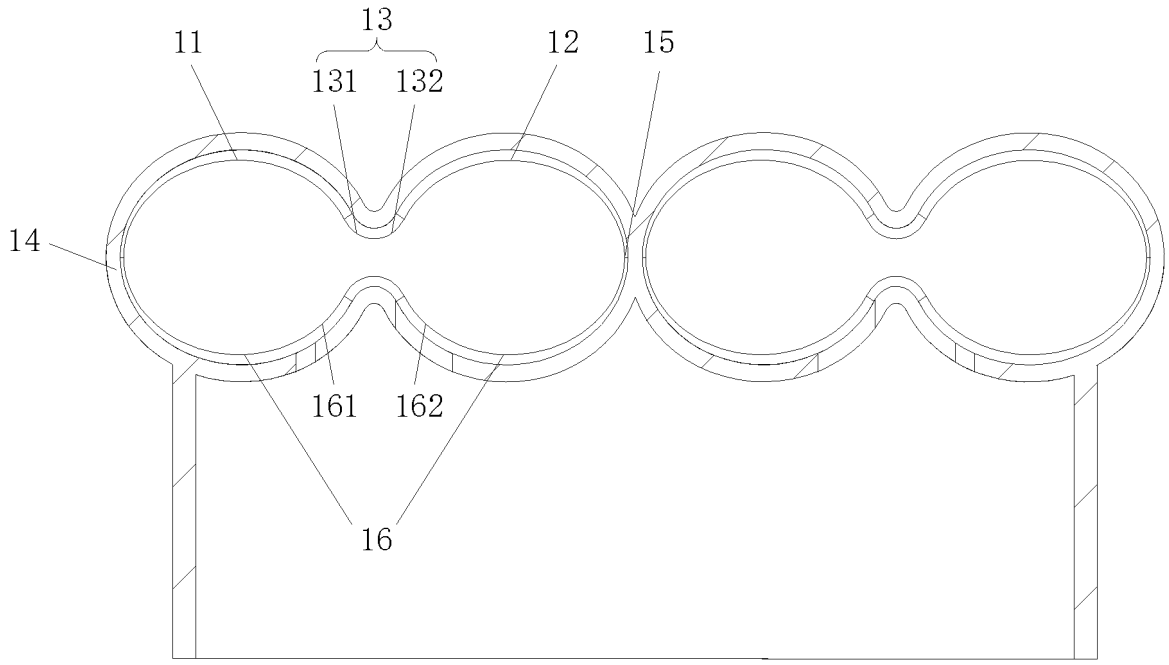

FIG.5

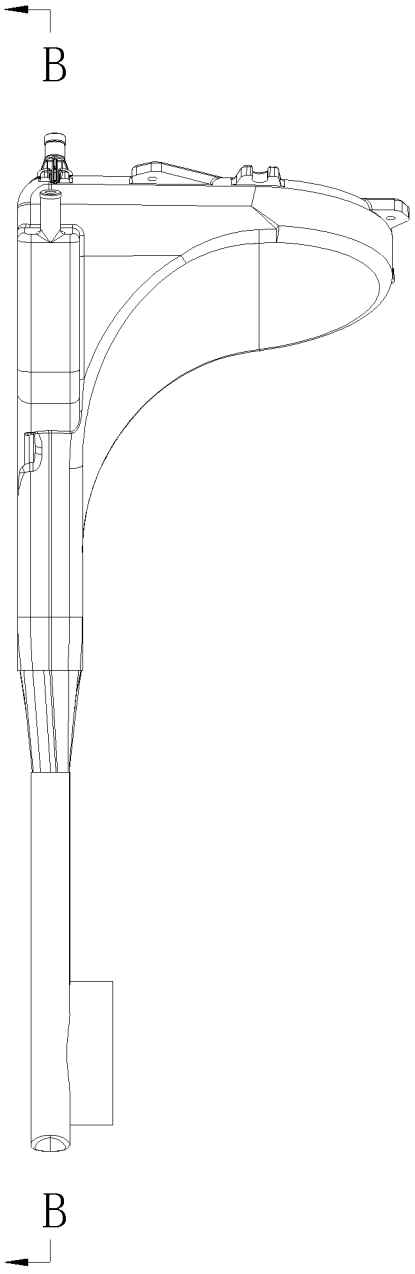

FIG.6

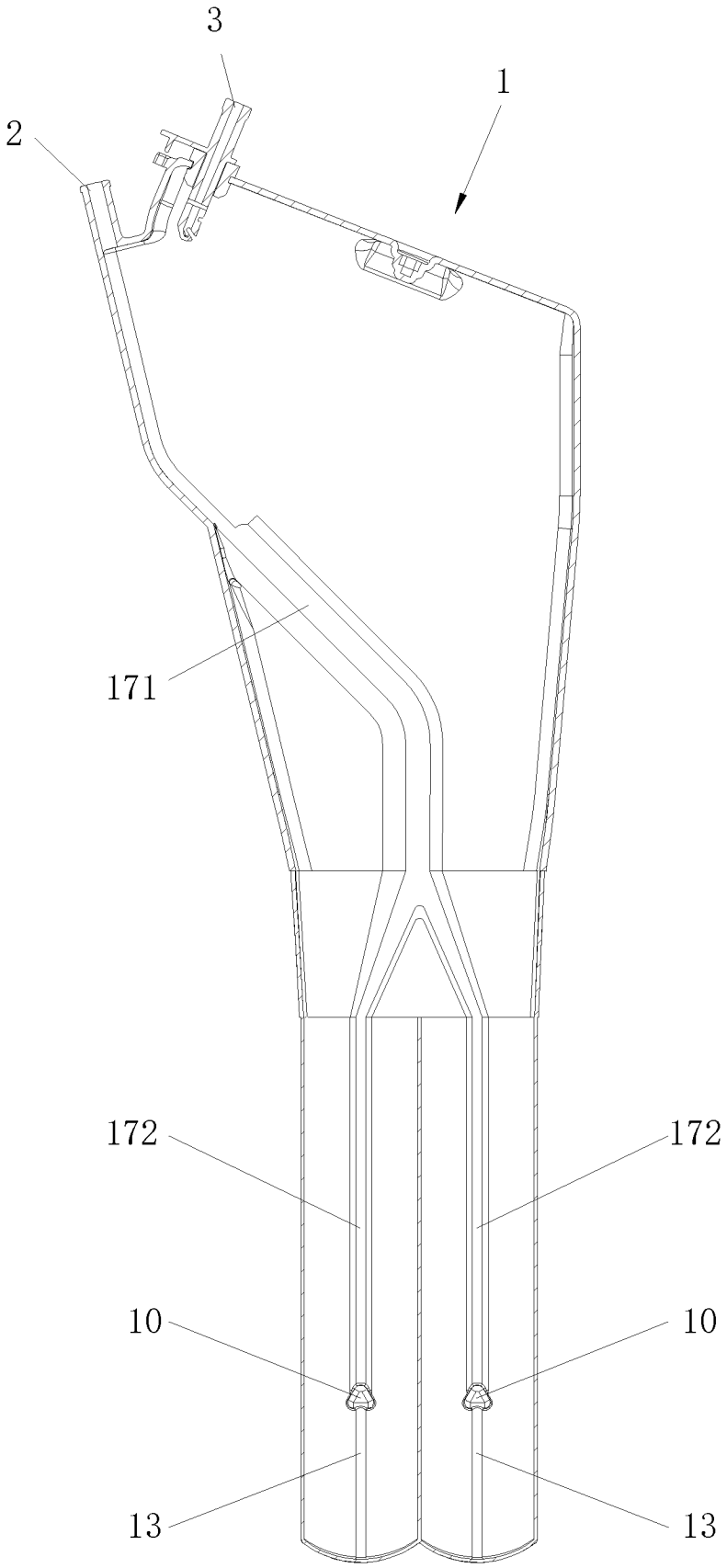

FIG.7

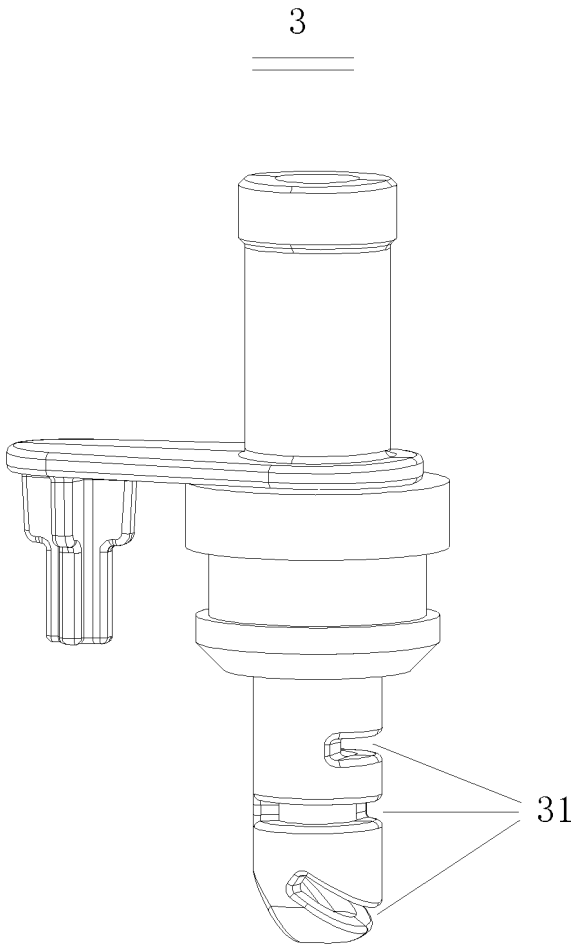

FIG.8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/143444

A. CLASSIFICATION OF SUBJECT MATTER

D06F58/24(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)

CNABS, CNTXT, DWPI, SIPOABS, CNKI: 螺旋, 双, 两个, 2个, 多个, 挡水, 管, 通道, 气路, 通路, double, dual, helix, spiral, tube, pipe

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 113756071 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD. et al.) 07 December 2021 (2021-12-07) description, paragraphs [0046]-[0052], and figures 1-2	1-10
PX	CN 217266526 U (QINGDAO HAIER WASHING MACHINE CO., LTD. et al.) 23 August 2022 (2022-08-23) claims 1-10	1-10
A	CN 107541893 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.) 05 January 2018 (2018-01-05) entire document	1-10
A	CN 107558127 A (HISENSE (SHANDONG) REFRIGERATOR CO., LTD.) 09 January 2018 (2018-01-09) entire document	1-10
A	EP 1612318 A2 (SAMSUNG ELECTRONICS CO., LTD.) 04 January 2006 (2006-01-04) entire document	1-10

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 February 2023	**24 February 2023**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088**	Authorized officer
Facsimile No. **(86-10)62019451**	Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/143444

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 113756071 A	07 December 2021	None	
CN 217266526 U	23 August 2022	None	
CN 107541893 A	05 January 2018	None	
CN 107558127 A	09 January 2018	None	
EP 1612318 A2	04 January 2006	None	

Form PCT/ISA/210 (patent family annex) (July 2022)