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(54) **SEALING COVER OF WASHING MACHINE, WASHING MACHINE, AND WASHING AND DRYING INTEGRATED DEVICE**

(57) Disclosed are a sealing cover of a washing machine, the washing machine, and a washing and drying integrated device. The washing machine includes an outer tub (20) and a separation tub (21) which is fixedly connected to or integrally formed on a bottom wall of the outer tub (20), wherein an annular space between the separation tub (21) and the outer tub (20) forms a first washing area (81), and a second washing area (82) is formed in the separation tub; the sealing cover includes a first sealing cover (1) and a second sealing cover (2); the first sealing cover (1) is arranged at a top of the outer tub (20) in an openable and closable manner for covering the first washing area (81); the second sealing cover (2)

is arranged at an opening in an openable and closable manner for covering the separation tub (21); the first sealing cover (1) is provided with first ventilation structures that communicate an inside of the first washing area (81) and the outside of the first washing area (81); and/or the second sealing cover (2) is provided with second ventilation structures that communicate the inside of the second washing area (82) and an outside of the second washing area (82). The sealing cover can balance air pressure inside and outside a washing tub, the drainage is efficient, and meanwhile, the explosion risk caused by too high air pressure inside the washing tub is prevented.

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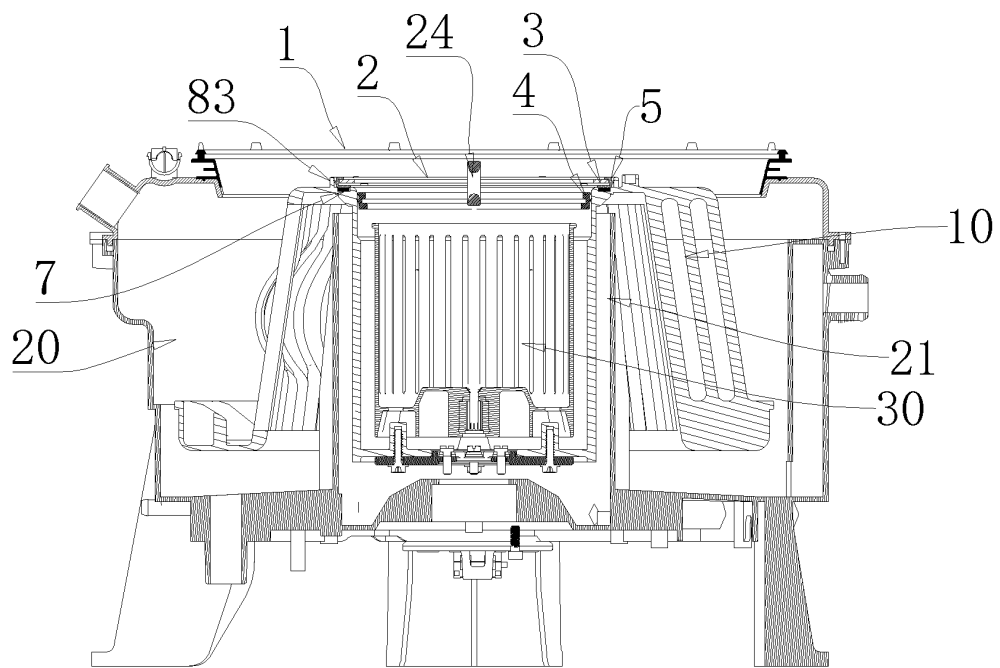


Fig. 2

Description

Cross-Reference to Related Application

[0001] The invention claims priority to Chinese patent application No. 202110881053.9, filed to the China National Intellectual Property Administration on August 2, 2021 and entitled "Sealing Cover of Washing Machine and Washing Machine", and Chinese patent application No. 202110882628.9, filed to the China National Intellectual Property Administration on August 2, 2021 and entitled "Washing and Drying Integrated Device", the inventions of which are hereby incorporated by reference in their entirety.

Technical Field

[0002] The invention belongs to the field of washing machines, and particularly relates to a sealing cover of a washing machine, the washing machine, and a washing and drying integrated device.

Background

[0003] Washing machines have become an essential electrical appliance in People's Daily life. With the strengthening of health consciousness of people, more and more users need to sort different types of clothes or wash a small amount of clothes in time. That is, family consumers are no longer satisfied with a conventional clothes washing manner of "washing in one tub", and have put forward healthier clothes washing requirements for, i.e., "washing multiple clothes in one machine" and "partitioned washing", requiring a washing machine to effectively distinguish cleaning of regular clothes, underwear, baby clothes, etc., to prevent cross-contamination.

[0004] During the washing process of the washing machine, an inside of a tub of the washing machine is sealed, so that when water enters the washing machine, the decreasing space continuously compresses the air, and an air pressure inside the tub increases. When the pressure inside the tub is greater than a water inlet pressure, water flow cannot enter the tub, thereby directly affecting the washing effect or even being unable to wash. In addition, if the pressure inside the tub cannot be released during the washing process of the washing machine, dangerous situations such as cracks and even explosions occur in a washing tub. In order to balance the air pressure inside and outside the washing machine, a ventilation channel needs to be arranged in the tub.

[0005] Furthermore, the partitioned washing of the washing machine meets washing needs of different clothes. When implementing separate partitioned washing, the problem of drying in different washing areas needs to be considered. After the washing machine completes clothes washing, a more complex drying structure is required for simultaneous drying of the clothes in different areas. In related technologies, portioned washing

and simultaneous drying are achieved, but an implementation manner is complex. Due to the limitations to a spatial structure between two partitions, a drying air duct connecting the two partitions becomes longer, and a cross-sectional shape of the air duct is limited, so that the efficiency of a drying system is not maximized.

[0006] In view of this, the invention is proposed.

Summary

[0007] The technical problem to be solved by the invention is to overcome the defects in related technologies, and provide a sealing cover capable of balancing air pressure inside and outside a washing tub and a washing machine.

[0008] In order to solve the above technical problem, a first objective of the invention is to provide a sealing cover of a washing machine. The washing machine includes an outer tub and a separation tub which is fixedly connected to or integrally formed on a bottom wall of the outer tub. An annular space between the separation tub and the outer tub forms a first washing area, and a second washing area is formed in the separation tub.

[0009] The sealing cover includes a first sealing cover and a second sealing cover. The first sealing cover is arranged at an opening of the outer tub in an openable and closable manner for covering the first washing area, or for covering the first washing area and the second washing area. The second sealing cover is arranged at an opening of the separation tub in an openable and closable manner for covering the separation tub.

[0010] The first sealing cover is provided with first ventilation structures that communicate the inside of the first washing area with the outside of the first washing area, and/or the second sealing cover is provided with second ventilation structures that communicate the inside of the second washing area with the outside of the second washing area.

[0011] In some implementations, the first sealing cover is provided with a first handle part, the first ventilation structures are a plurality of first air vents arranged in the first sealing cover, and the plurality of first air vents are hidden below the first handle part.

[0012] And/or, the second sealing cover is provided with a second handle part, the second ventilation structures are a plurality of second air vents arranged in the second sealing cover, and the plurality of second air vents are hidden below the second handle part.

[0013] In some implementations, the washing machine further includes a first clothes treatment piece, which includes: a treatment rack body and a mounting tub.

[0014] The treatment rack body is of a cylindrical structure, is rotationally arranged in the first washing area, and is arranged to carry clothes in the first washing area.

[0015] The mounting tub is rotationally arranged in the second washing area, and the mounting tub and the treatment rack body are synchronously and rotationally fixedly connected together or integrally formed.

[0016] The second sealing cover covers an opening of the mounting tub.

[0017] A first sealing structure is arranged between the second sealing cover and the mounting tub, and when the second sealing cover covers the mounting tub, a first seal is formed between the first sealing structure and the mounting tub.

[0018] A lower surface of the second sealing cover extends in a direction close to the mounting tub to form a protruding part, the end of the protruding part extends into the mounting tub, a side wall of the protruding part is provided with a second sealing structure, and when the second sealing cover covers the mounting tub, a second seal is formed between the second sealing structure and the mounting tub.

[0019] In some implementations, the first sealing structure includes a first attraction piece arranged on an edge of the second sealing cover and a second attraction piece arranged at the opening of the mounting tub. When the second sealing cover covers the mounting tub, the first attraction piece is attracted to the second attraction piece.

[0020] In some implementations, the lower surface of the edge of the second sealing cover is provided with a first mounting groove, and the first attraction piece is arranged in the first mounting groove.

[0021] In some implementations, the first sealing structure further includes a first sealing ring. The first sealing ring includes a cavity, and an upper wall face and a lower wall face which form the cavity. A lower end face of the first mounting groove is provided with a limiting groove, a convex rib matched with the limiting groove is formed on the lower wall face, and the convex rib protrudes towards the inside of the cavity.

[0022] The first sealing ring is arranged at an opening of the first mounting groove, the upper wall face extends into the mounting groove from the opening of the first mounting groove, the lower wall face covers the lower end face of the first mounting groove, the first attraction piece is limited between the first mounting groove and the cavity, and the convex rib is limited in the limiting groove.

[0023] In some implementations, an end face of the opening of the mounting tub is provided with a blocking rib, and the second attraction piece is located on the side, close to the opening of the mounting tub, of the blocking rib. When the second sealing cover covers the mounting tub, the second sealing cover is located in an area enclosed by the blocking rib, and the first sealing ring is in interference fit with the blocking rib.

[0024] In some implementations, a position corresponding to the first attraction piece at the opening of the mounting tub is provided with a second mounting groove, and the second attraction piece is arranged in the second mounting groove.

[0025] In some implementations, the second sealing structure is a second sealing ring arranged on the side wall of the protruding part, and when the second sealing

cover covers the mounting tub, the second sealing ring is in interference fit with an inner wall of the mounting tub.

[0026] In some implementations, the first sealing cover is plate-like and is arranged at the opening of the outer tub in an openable and closable manner for covering the first washing area and the second washing area.

[0027] When the first sealing cover covers the first washing area and the second washing area, and the sealing cover covers the separation tub, the second sealing cover is located below the first sealing cover.

[0028] In some implementations, the first sealing cover is annular and is arranged at the opening of the outer tub in an openable and closable manner for covering the first washing area.

[0029] When the first sealing cover covers the first washing area, and the second sealing cover covers the separation tub, the second sealing cover is located in a ring of the first sealing cover.

[0030] A second objective of the invention is to further provide a washing machine, which includes the above sealing cover.

[0031] A third objective of the invention is to further provide a washing and drying integrated device, which includes an outer tub and a separation tub.

[0032] The separation tub is fixedly connected to or integrally formed on a bottom wall of the outer tub. An annular space between the separation tub and the outer tub forms a first washing area, a second washing area is formed in the separation tub, and the top of the first washing area communicates with the top of the second washing area.

[0033] A side wall of the outer tub is provided with an air inlet and an outer tub air outlet, and the outer tub forms a first drying path for allowing dry hot air to flow through the first washing area between the air inlet and the outer tub air outlet.

[0034] The bottom of the separation tub is provided with a separation tub air outlet, and a second drying path for allowing the dry hot air to flow through the second washing area is formed between the air inlet and the separation tub air outlet.

[0035] The first drying path and the second drying path are controllable to perform drying treatment on the first washing area and the second washing area at the same time.

[0036] In some implementations, the air inlet is located at the top of the side wall of the outer tub, the outer tub air outlet is located at the bottom of the side wall of the outer tub, and the air inlet and the outer tub air outlet are respectively arranged on opposite sides of the side wall of the outer tub.

[0037] In some implementations, the outer tub is further provided with a first extended air duct and a second extended air duct.

[0038] An air inlet end of the first extended air duct communicates with the outer tub air outlet, so as to guide the dry hot air of the first drying path to the first extended air duct from bottom to top and discharge at a position

higher than the maximum preset height of the liquid level of washing water in the first washing area.

[0039] An air inlet end of the second extended air duct communicates with the separation tub air outlet, so as to guide the dry hot air of the second drying path to the second extended air duct from bottom to top and discharge at a position higher than the maximum preset height of the liquid level of the washing water in the second washing area.

[0040] In some implementations, at least part of the side wall of the outer tub forms a double-layer wall structure, a hollow structure is formed inside the double-layer wall structure, and the first extended air duct and the second extended air duct are formed in the hollow structure.

[0041] In some implementations, the first extended air duct is formed on the side wall of the outer tub and extends in a height direction of the outer tub.

[0042] One part of the second extended air duct is formed on the bottom wall of the outer tub and extends in a radial direction of the outer tub, and the other part is formed on the side wall of the outer tub and extends in the height direction of the outer tub.

[0043] In some implementations, the washing and drying integrated device further includes a first clothes treatment piece, which includes: a treatment rack body and a mounting tub.

[0044] The treatment rack body is of a cylindrical structure, is rotationally arranged in the first washing area, and is arranged to carry clothes in the first washing area.

[0045] The mounting tub is rotationally arranged in the second washing area, and the mounting tub and the treatment rack body are synchronously and rotationally fixedly connected together or integrally formed.

[0046] Ventilation holes for circulation of the dry hot air are formed on side walls of the treatment rack body and the mounting tub.

[0047] In some implementations, the air outlet faces the side wall of the treatment rack body.

[0048] In some implementations, the washing and drying integrated device further includes a second clothes treatment piece. The second clothes treatment piece is rotationally arranged in the second washing area and is located in the mounting tub.

[0049] In some implementations, the second clothes treatment piece is a drain basket.

[0050] A side wall of the drain basket is provided with a plurality of ventilation holes, and the plurality of ventilation holes are evenly distributed in a circumferential direction of the drain basket. And/or, A bottom wall of the drain basket is provided with a bottom hole.

[0051] The ventilation holes and the bottom hole are configured for circulation of the washing water and the dry hot air.

[0052] In some implementations, the second clothes treatment piece is an impeller.

[0053] In some implementations, the washing and dry-

ing integrated device further includes a driving mechanism.

[0054] The driving mechanism is in drive connection with the mounting tub and the second clothes treatment piece, and is arranged to drive the first clothes treatment piece and the second clothes treatment piece to rotate at the same time, or is arranged to drive the first clothes treatment piece or the second clothes treatment piece to rotate.

[0055] In some implementations, the washing and drying integrated device further includes a first sealing cover.

[0056] The first sealing cover is arranged to cover the outer tub, so that the closed first drying path is formed in the outer tub.

[0057] In some implementations, the washing and drying integrated device further includes a second sealing cover.

[0058] The second sealing cover is arranged on the first clothes treatment piece, a ventilation hole is formed in the second sealing cover, and the ventilation hole makes the first washing area communicate with the second washing area to form the second drying path.

[0059] In some implementations, the washing and drying integrated device further includes a drying system.

The drying system is connected to the air inlet on the outer tub and is arranged to provide the dry hot air.

[0060] After adopting the technical solution, the invention has the following beneficial effects compared with related technologies.

[0061] In the invention, by arranging ventilation structures on the sealing cover, the air pressure inside and outside of the drain basket may be effectively balanced, and a water inlet and drainage efficiency is improved. At the same time, the problem of a safety accident caused by the fact that the pressure inside the drain basket is too large during the washing process and the sealing cover is ejected out is prevented. At the same time, the ventilation structures are hidden to ensure that the aesthetics of a finished product is not affected. In the invention, by arranging the sealing cover, a problem of cross-contamination of the clothes caused by crossed flowing of washing water between the drain basket and the outer tub is prevented.

[0062] The invention adopts one drying system to simultaneously dry the first washing area and the second washing area, so as to ensure that the two washing areas share the drying system while washing independently, thereby simplifying the structure of the whole machine. Moreover, by arranging the air outlets at the bottom, a circulation path of the dry hot air is extended to improve the drying effect, and the washing water is avoided from flowing out through the air outlets by arranging extended air ducts, so as to ensure that drying and washing operations are performed normally.

[0063] The specific implementations of the invention are described in detail below with reference to the drawings.

Brief Description of the Drawings

[0064] The drawings, which constitute a part of the invention, are intended to provide a further understanding of the invention, and the exemplary embodiments of the invention and the description thereof are used to explain the invention, but do not constitute improper limitations to the invention. It is apparent that the drawings described below are only some embodiments. Other drawings may further be obtained by those of ordinary skill in the art according to these drawings without creative efforts. In the drawings:

Fig. 1 is an explosive view of a washing machine according to an embodiment.

Fig. 2 is a section view of a washing machine according to an embodiment.

Fig. 3 is a top view of a sealing cover provided with a handle part of a washing machine according to an embodiment of the invention.

Fig. 4 is a section view of a sealing cover provided with a handle part of a washing machine according to an embodiment of the invention.

Fig. 5 and Fig. 6 are top views of a sealing cover without a handle part of a washing machine according to an embodiment of the invention.

Fig. 7 is a section view of a sealing cover without a handle part of a washing machine according to an embodiment of the invention.

Fig. 8 is a structural diagram of a washing machine with a drying system according to an embodiment of the invention.

Fig. 9 is a sectional diagram of an outer tub (showing a first extended air duct) according to an embodiment of the invention.

Fig. 10 is a sectional diagram of an outer tub (showing a second extended air duct) according to an embodiment of the invention.

Fig. 11 is a schematic structural diagram of a first clothes treatment piece (excluding a clothes support structure) according to an embodiment of invention.

Fig. 12 is a top view of Fig. 11.

Fig. 13 is a schematic structural diagram of a first clothes treatment piece (including a clothes support structure) according to an embodiment of invention.

Fig. 14 is a schematic diagram of an assembly state

of a first clothes treatment piece and a drain basket (including an impeller) according to an embodiment of invention.

Fig. 15 is a sectional diagram of a drain basket according to an embodiment of invention.

Fig. 16 is a schematic structural diagram of a washing and drying integrated device (excluding a drying system) according to another embodiment of the invention.

Fig. 17 is a sectional diagram of a washing and drying integrated device according to another embodiment of the invention.

Fig. 18 is a schematic diagram of a decomposition state of a washing and drying integrated device according to another embodiment of the invention.

[0065] Herein: 1. First sealing cover; 2. Second sealing cover; 3. First attraction piece; 4. Second sealing ring; 5. First sealing ring; 7. Second attraction piece; 23. First mounting groove; 231. Limiting groove; 24. Second handle part; 25. Protruding part; 26. Second air vent; 27. Screw hole; 81. First washing area; 82. Second washing area; 83. Blocking rib; 821. Second mounting groove; 10. First clothes treatment piece; 11. Treatment rack body; 111. Clothes support structure; 112. Clothes fixing structure; 12. Supporting plate; 13. Water stirring rib; 14. Enclosure structure; 15. First water hole; 16. Second water hole; 17. Reinforcing rib; 18. Mounting tub; 20. Outer tub; 201. Air inlet; 202. First extended air duct; 203. Second extended air duct; 2021. Outer tube air outlet; 2022. First extension outlet; 2031. Separation tub air outlet; 2032. Second extension outlet; 21. Separation tub; 30. Drain basket; 301. Ventilation hole; 302. Bottom hole; 31. Impeller; 40. Direct Drive (DD) motor; 41. Clutch; 42. Flange fixing plate; 50. Fan; 60. Heating apparatus.

[0066] It is to be noted that these drawings and text descriptions are not intended to limit in any way the scope of the conception of the invention in any way, but rather to illustrate the concepts of the invention for those skilled in the art by reference to specific embodiments.

Detailed Description of the Embodiments

[0067] In the description of the invention, it is to be noted that the orientations or positional relationships indicated by the terms "inside", "outside", etc. are based on the orientations or positional relationships shown in the drawings, and are only for the convenience of describing the invention and simplifying the description. The description does not indicate or imply that the device or element referred to must have a specific orientation, be constructed and operated in a specific orientation, and therefore cannot be construed as limiting the invention.

[0068] In the description of the invention, it is to be

noted that, unless otherwise clearly specified and limited, the terms "installation", "mutual connection", "connection", "contact" and "communication" shall be understood in a broad sense. For example, the term may be a fixed connection or a detachable connection, or an integrated connection; the term may be a mechanical connection or an electric connection; and the term may be a direct connection or an indirect connection through an intermediary. The specific meaning of the above-mentioned terminology in the invention may be understood by those of ordinary skill in the art in specific circumstances.

Embodiment 1:

[0069] During a washing process of a washing machine, the inside of a tub of the washing machine is sealed, so that when water enters the washing machine, the decreasing space continuously compresses the air, and an air pressure inside the tub increases. When a pressure inside the tub is greater than a water inlet pressure, water flow cannot enter the tub, thereby directly affecting a washing effect or even being unable to wash. In addition, if the pressure inside the tub cannot be released during the washing process of the washing machine, dangerous situations such as cracks and even explosions may occur in a washing tub. In order to solve this problem, the embodiment provides a sealing cover of a washing machine. The washing machine includes an outer tub 20, as detailed in Fig. 1 and Fig. 2, and a separation tub 21 which is fixedly connected to or integrally formed on a bottom wall of the outer tub 20. An annular space between the separation tub 21 and the outer tub 20 forms a first washing area 81, and a second washing area 82 is formed in the separation tub 21. The first washing area and the second washing area wash clothes independently, that is, washing water of the first washing area 81 and the second washing zone 82 cannot circulate with each other, so as to avoid cross-contamination of the washing water.

[0070] The sealing cover includes a first sealing cover 1 and a second sealing cover 2. The first sealing cover is arranged at a top of the outer tub 20 in an openable and closable manner for covering the first washing area 81, or for covering the first washing area 81 and the second washing area 82 at the same time. The second sealing cover 2 is arranged at an opening of the separation tub 21 in an openable and closable manner for covering the separation tub 21. The first sealing cover 1 is provided with a first ventilation structure that communicate an inside of the first washing area 81 and an outside of the first washing area 81, and/or the second sealing cover 2 is provided with a second ventilation structure that communicate the inside of the second washing area 82 and the outside of the second washing area 82. In a specific implementation, the first sealing cover and the second sealing cover may be respectively arranged at an opening of the outer tub and the opening of the separation tub in a hinged or detachable manner. During the washing

process of the washing machine, the inside of the washing machine tub is sealed, so that the washing machine needs to be provided with the ventilation structure to balance the pressure inside and outside the tub, on the one hand, a water inlet efficiency is improved when the water enters the washing machine, a drainage efficiency is improved during drainage, and on the other hand, the risk of the tub rupture and even explosion caused by too large pressure inside and outside the tub is prevented.

[0071] In some implementations, the first sealing cover 1 is provided with a first handle part, the first ventilation structure includes a plurality of first air vents arranged in the first sealing cover 1, and the plurality of first air vents are hidden below the first handle part.

[0072] And/or, as detailed in Fig. 5 to Fig. 7, the second sealing cover 2 is provided with a second handle part 24, the second ventilation structure includes a plurality of second air vents 26 arranged in the second sealing cover 2, and the plurality of second air vents 26 are hidden below the second handle part 24. The first sealing cover 1 and/or the second sealing cover 2 are/is provided with ventilation holes, and the ventilation holes are arranged on a lower part of the handle part to communicate the inside and outside environment and balance the pressure inside and outside the tub. In some implementations, a concave structure is formed on the handle part. When a user removes the sealing cover by the handle part, a hand of the user extends into the concave structure to provide a point of force for the user. The air vents are located in a space formed by the concave structure and a top cover. The ventilation structure is simple and effectively balances the air pressure inside and outside the washing machine, and the structure is hidden to ensure that the aesthetics of a finished product is not affected. Taking the ventilation structure arranged on the second sealing cover 2 as an example, the second sealing cover 2 is provided with screw holes 27, the second air vents 26 are arranged near the screw holes 27, and the second handle part 24 is fixed to the second sealing cover 2 by screws and in other manners. The second air vents 26 are hidden below a handle. The structure of the first air vents arranged in the first sealing cover 1 is similar to this. In some embodiments, the air vents are arranged only in the first sealing cover 1, or only in the second sealing cover 2, and in other embodiments, the first sealing cover 1 and the second sealing cover 2 are respectively provided with the air vents.

[0073] The washing machine further includes a first clothes treatment piece 10, as detailed in Fig. 1, Fig. 2 and Fig. 11, the first clothes treatment piece 10 includes: a treatment rack body 11 and a mounting tub 18. The treatment rack body 11 is of a cylindrical structure, is rotationally arranged in the first washing area 81, sleeves the separation tub 21, and is arranged to carry clothes in the first washing area 81. In some implementations, the clothes can be fixed to the treatment rack body 11. The mounting tub 18 is rotationally arranged in the second washing area 82, and the mounting tub 18 and the

treatment rack body 11 are synchronously and rotationally fixedly connected together or integrally formed. The second sealing cover 2 covers an opening of the mounting tub 18. As detailed in Fig. 2, a first sealing structure is arranged between the second sealing cover 2 and the mounting tub 18, and when the second sealing cover 2 covers the mounting tub 18, a first seal is formed between the first sealing structure and the mounting tub 18. A lower surface of the second sealing cover 2 extends in a direction close to the mounting tub 18 to form a protruding part 25, an end of the protruding part 25 extends into the mounting tub 18, a side wall of the protruding part 25 is provided with a second sealing structure, and when the second sealing cover 2 covers the mounting tub 18, a second seal is formed between the second sealing structure and the mounting tub 18.

[0074] In the embodiment, the two seals are formed between the second sealing cover 2 and the mounting tub 18 to ensure a sealing property of the separation tub 21. At the same time, the first sealing structure prevents the water in the first washing area 81 from entering the second washing area 82, and the second sealing structure prevents water in the separation tub 21 from entering the first washing area 81, so that cross-contamination of water between the first washing area 81 and the second washing area 82 is avoided.

[0075] In some implementations, as detailed in Fig. 1, Fig. 2, Fig. 4 and Fig. 7, the first sealing structure includes a first attraction piece 3 arranged on an edge of the second sealing cover 2 and a second attraction piece 7 arranged at the opening of the mounting tub 18. When the second sealing cover 2 covers the mounting tub 18, the first attraction piece 3 is attracted to the second attraction piece 7. In some implementations, when the material of the first attraction piece 3 is iron, the material of the second attraction piece 7 is a magnet. When the material of the first attraction piece 3 is the magnet, the material of the second attraction piece 7 is the iron or a magnet magnetically opposite to the first attraction piece 3. When the second sealing cover 2 is detachably arranged, in some embodiments, the material of the first attraction piece 3 is the iron, and the material of the second attraction piece 7 is the magnet. This is because the second sealing cover 2 may be taken off by the user, which may magnetically attract nearby iron products to affect the experience, and even magnetically attract dangerous items such as needles and knives. Therefore, the first attraction piece is made into the iron product, which avoids a problem of attracting the iron products near a placement position of the first attraction piece, and reduces the cost.

[0076] The first attraction piece 3 is attracted to the second attraction piece 7 between the second sealing cover 2 and the mounting tub 18 to achieve attracted sealing, the first attraction piece is arranged on the edge of the first sealing cover 1 in the form of a ring, two half rings, a plurality of arc segments, or a plurality of blocks, and the second attraction piece 7 is arranged at the opening of the mounting tub 18 in the form of a ring, two half

rings, a plurality of arc segments, or a plurality of blocks. In some embodiments, in order to ensure a tight attraction effect between the first sealing cover 1 and the mounting tub 18, the first attraction piece 3 is arranged to be annular, so that when the user covers the second sealing cover 2 at the opening of the mounting tub 18, no matter how placed, the magnetic attraction is achieved, at this time, a plurality of blocky second attraction pieces 7 are arranged at the opening of the mounting tub 18, and a complete ring may be cut into two half rings for easy assembly in consideration of the assembly. In other embodiments, in order to ensure the tight attraction effect between the first sealing cover 1 and the mounting tub 18, the second attraction piece 7 is arranged to be annular, so that when the user covers the second sealing cover 2 at the opening of the mounting tub 18, no matter how placed, the magnetic attraction is achieved, at this time, a plurality of blocky first attraction pieces 3 are arranged at the edge of the second sealing cover 2, but the complete ring may be cut into two half rings for easy assembly in consideration of the assembly. In an embodiment, the semi-circular iron ring is integrally formed by injection molding and is arranged on the second sealing cover 2 or is arranged at the opening of the mounting tub 18.

[0077] In some implementations, as detailed in Fig. 1, Fig. 2, Fig. 4 and Fig. 7, the lower surface of the edge of the second sealing cover 2 is provided with a first mounting groove 23, and the first attraction piece 3 is arranged in the first mounting groove 23. A position corresponding to the first attraction piece 3 at the opening of the mounting tub 18 is provided with a second mounting groove 821, and the second attraction piece 7 is arranged in the second mounting groove 821. The length of the first mounting groove 23 is matched with a length of the first attraction piece 3, and the second mounting groove 821 is matched with the second attraction piece 7. For example, as shown in Fig. 1, when the first attraction piece is annular, the first mounting groove 23 is an annular groove, and the second attraction piece 7 is blocky, as shown in Fig. 1, four magnet blocks are respectively distributed at the top of the separation tub 21, and the second mounting groove is a groove matched with the size of the blocky second attraction piece 7.

[0078] In some implementations, as shown in Fig. 4, the first sealing structure further includes a first sealing ring 5. The first sealing ring 5 includes a concave cavity, and an upper wall face and a lower wall face which form the concave cavity. A lower end face of the first mounting groove 23 is provided with a limiting groove 231, a convex rib matched with the limiting groove 231 is formed on the lower wall face, and the convex rib protrudes towards an inside of the concave cavity. The first sealing ring 5 is arranged at an opening of the first mounting groove 23, the upper wall face extends into the mounting groove 23 from the opening of the first mounting groove 23, the lower wall face covers the lower end face of the first mounting groove 23, the first attraction piece 3 is limited

between the first mounting groove 23 and the concave cavity, and the convex rib is limited in the limiting groove 231, so that the first sealing ring 5 is fixed. At the same time, the first sealing ring 5 plays a role in further sealing the second washing area 82, so as to prevent cross-contamination of the clothes caused by crossed flowing of the water in the first washing area 81 and the water in the second washing area 82. In the process of closing the second sealing cover 2, the first sealing ring 5 also achieves a certain buffering role to improve the user experience. In addition, when the material of the first attraction piece 3 is the magnet, through the arrangement of the first sealing ring 5, a problem of the magnet rust caused by the outside water entering the first mounting groove 23 and reducing the service life of the magnet is prevented. In some implementations, a position corresponding to the first attraction piece 3 at the opening of the mounting tub 18 is provided with a second mounting groove, and the second attraction piece 7 is arranged in the second mounting groove 821.

[0079] In some implementations, as shown in Fig. 1 and Fig. 2, an end face of the opening of the mounting tub 18 is provided with a blocking rib 83, and the second attraction piece 7 is located on a side, close to the opening of the mounting tub 18, of the blocking rib 83. When the second sealing cover 2 covers the mounting tub 18, the second sealing cover 2 is located in an area enclosed by the blocking rib 83, and the first sealing ring 5 is in interference fit with the blocking rib 83. On the one hand, the first blocking rib 83 is in interference fit with the second sealing cover 2 to further improve the sealing property, and on the other hand, the water on the end face of the opening of the mounting tub 18 is prevented from entering the second washing area 82.

[0080] In some implementations, as detailed in Fig. 2 and Fig. 4, the second sealing structure is a second sealing ring 4 arranged on the side wall of the protruding part 25, and when the second sealing cover 2 covers the mounting tub 18, the second sealing ring 4 is in interference fit with an inner wall of the mounting tub 18. The second sealing ring 4 is installed on the side wall of the protruding part 25 of the second sealing cover 2, and the second sealing cover 2 is in interference fit with the inner wall of the mounting tub 18 to play a role in further sealing, that is, to provide a relatively closed space for the second washing area 82, a problem of cross-contamination caused by splattering (crossed flowing) of the washing water into the first washing area 81 during the washing process of the clothes in the second washing area is prevented.

[0081] In some implementations, as detailed in Fig. 1, in some embodiments, the first sealing cover 1 is plate-like, as shown in Fig. 1 and Fig. 2, the first sealing cover 1 is arranged at the opening of the outer tub 20 in an openable and closable manner for covering the first washing area 81 and the second washing area 82. When the first sealing cover 1 covers the first washing area 81 and the second washing area 82, and the second sealing

cover 2 covers the separation tub 21, the second sealing cover 2 is located below the first sealing cover 1. The edge of the first sealing cover 1 is further provided with a third sealing ring, and when the first sealing cover 1 covers the first washing area 81 and the second washing area 82, the third sealing ring and the outer tub 20 are sealed.

[0082] In other embodiments, the first sealing cover 1 is annular and is arranged at the opening of the outer tub 20 in an openable and closable manner for covering the first washing area 81. When the first sealing cover 1 covers the first washing area 81, and the second sealing cover 2 covers the separation tub 21, the second sealing cover 2 is located in a ring of the first sealing cover 1. An outer ring of the first sealing cover 1 is provided with the third sealing ring, and an inner ring of the first sealing cover 1 is provided with a fourth sealing ring. When the first sealing cover 1 covers the first washing area 81, the third sealing ring and the fourth sealing ring are respectively sealed to an outer ring wall and an inner ring wall of the first washing area.

[0083] The embodiment further provides a washing machine, which includes the above sealing cover.

[0084] In some implementations, as detailed in Fig. 8, the washing machine of the embodiment is provided with an air inlet 201 and a first extended outlet 2022 on a side wall of an outer tub 20, and the outer tub 20 forms a first drying path for allowing dry hot air to flow through a first washing area 81 between the air inlet 201 and the first extended outlet 2022. The bottom of a separation tub 21 is provided with a separation tub air outlet 2031, and a second drying path for allowing the dry hot air to flow through a second washing area 82 is formed between the air inlet 201 and the separation tub air outlet 2031.

[0085] The first drying path and the second drying path are controllable to perform drying treatment on the first washing area 81 and the second washing area 82 at the same time.

[0086] The outer tub 20 is provided with a drying air duct, which includes the air inlet 201 arranged on the side wall of the outer tub 20, an outer tub air outlet 2021 arranged at a bottom of the first washing area, and the separation tub air outlet 2031 arranged at a bottom of the second washing area. The dry hot air enters the first washing area and the second washing area from the air inlet 201, and is discharged through the outer tub air outlet 2021 and the separation tub air outlet 2031 respectively. In some implementations, the air inlet 201 is arranged at the top of the side wall of the outer tub 20, so that the air enters from the upper part and is discharged from the bottom, a circulation path of the dry hot air is extended, and the drying effect is improved. A first sealing cover 1 is able to close the outer tub 20, so that the dry hot air only circulates in the outer tub 20. Through second air vents 26 arranged in a second sealing cover 2, the hot air flows in and out of the second washing area 82 to maintain a pressure balance in the second washing area 82.

[0087] The separation tub 21 is arranged inside the outer tub 20, as detailed in Fig. 9, the separation tub 21 is connected to a bottom wall of the outer tub 20. An annular space between the separation tub 21 and the outer tub 20 forms the first washing area, and the second washing area is formed in the separation tub 21. The separation tub 21 divides the first washing area and the second washing area into two independent washing areas to avoid cross-contamination of washing water. However, the dry hot air enters the first washing area from the air inlet 201, and flows into the second washing area over the separation tub 21, so as to achieve the effect of drying the two washing areas with one drying system. The inside and the outside of the separation tub 21 are respectively provided with independent water inlet and drainage channels, so that the two washing areas wash independently, avoiding the problem of cross-contamination caused by intercommunication of the washing water. For example, the first washing area is configured to wash ordinary clothes, such as coats, shirts, etc., and the second washing area is configured to wash personal clothing, such as underwear, bras, etc. The first washing area and the second washing area are independent of each other, and may wash different clothes at the same time.

[0088] The outer tub 20 is further provided with a first extended air duct 202 that communicates with the first washing area and a second extended air duct 203 that communicates with the second washing area, which are described specifically as follows.

[0089] The first extended air duct 202 is arranged on a side wall of the outer tub 20, as detailed in Fig. 9, a first end thereof communicates with the first washing area through the outer tub air outlet 2021, that is, a first port of the first extended air duct 202 forms the outer tub air outlet 2021, which is located at the bottom of the first washing area, for example, arranged at the bottom of the side wall of the outer tub 20 or on the bottom wall of the outer tub 20. A second end of the first extended air duct 202 is located on a peripheral wall of the outer tub 20, and the second end of the first extended air duct 202 is higher than the maximum height of the liquid level of the washing water in the first washing area, so as to avoid the washing water in the first washing area from flowing out through the first extended air duct 202. In some implementations, the first extended air duct 202 extends vertically, i.e., in a height direction of the outer tub 20.

[0090] As detailed in Fig. 10, the first port of the second extended air duct 203 communicates with the second washing area through the separation tub air outlet 2031. Similarly, the first port of the second extended air duct 203 forms the separation tub air outlet 2031, which is located on the bottom wall of the outer tub 20 and in the second washing area. One part of the second extended air duct 203 is located on the bottom wall of the outer tub 20, and the other part is located on the side wall of the outer tub 20. A second end of the second extended air duct 203 is located on the peripheral wall of the outer tub

20, a second port of the second extended air duct 203 forms the second extended outlet 2032, and the height of the second end of the second extended air duct 203 is higher than the maximum height of the liquid level of the washing water in the second washing area, so as to avoid the washing water in the second washing area from flowing out through the second extended air duct 203.

[0091] The washing machine further includes a first clothes treatment piece, which is rotationally arranged in the first washing area and is configured to carry clothes washed in the first washing area; and a second clothes treatment piece, which is rotationally arranged in the second washing area and is configured to carry clothes in the second washing area.

[0092] As detailed in Fig. 1, Fig. 8 and Fig. 15, the second clothes treatment piece is a drain basket 30, which is rotationally arranged in the separation tub 21. As detailed in Fig. 15, at least one ventilation hole 301 is formed in a side wall of the drain basket 30. In some implementations, the ventilation hole 301 in the side wall of the drain basket 30 is a strip hole arranged parallel to an axis of the drain basket 30, and the plurality of ventilation holes 301 are evenly distributed in a circumferential direction of the drain basket 30 for circulation of the washing water and the dry hot air. In some implementations, the side wall of the drain basket 30 is constructed as a grid structure to improve the circulation amount of the washing water and the dry hot air. In some implementations, a bottom wall of the drain basket 30 is provided with a bottom hole 302, and the bottom hole 302 is configured for circulation of the washing water and the dry hot air.

[0093] In some implementations, and in other embodiments, as detailed in Fig. 16, the second clothes treatment piece may also be an impeller 31. The impeller 31 is connected with a driving mechanism. The clothes are washed by rotating and agitating the water flow through the impeller 31. Through the adoption of the impeller 31, the cleaning effect of the personal clothing is improved, and the problem that the personal clothing washed by a user is not clean is solved. In addition, this design reduces a material of the apparatus, reduces a production cost of a washing unit, and further saves a cost of a multi-tub washing machine.

[0094] The washing machine further includes a first clothes treatment piece 10, as detailed in Fig. 1, Fig. 2, Fig. 8 and Fig. 11 to Fig. 14, the first clothes treatment piece 10 includes: a treatment rack body 11 and a mounting tub 18. The treatment rack body 11 is of a cylindrical structure, is rotationally arranged in the first washing area 81, sleeves the separation tub 21, and is arranged to carry the clothes in the first washing area 81. In some implementations, the clothes are fixed to the treatment rack body 11. The mounting tub 18 is rotationally arranged in the second washing area 82, and the mounting tub 18 and the treatment rack body 11 are synchronously and rotationally fixedly connected together or integrally formed. The second sealing cover 2 covers an opening

of the mounting tub 18. The mounting tub 18 is of a cylindrical structure, and is arranged on an inner side of the treatment rack body 11. An open end of the mounting tub 18 is connected with the top of the treatment rack body 11, a bottom wall of the mounting tub 18 forms a mounting structure, the mounting tub 18 is placed in the separation tub 21, the drain basket 30 is placed in the mounting tub 18, the mounting structure is arranged to be connected with the driving mechanism, and the first clothes treatment piece 10 rotates as a whole.

[0095] Channels for the circulation of the dry hot air are formed on the side walls of the treatment rack body 11 and the mounting tub 18, so as to facilitate the flowing of the dry hot air from the first washing area into the second washing area.

[0096] In some implementations, the treatment rack body 11 is detachably connected with the mounting tub 18, so that the user can choose one of them for clothes washing as needed. At the same time, the detachable design also facilitates a better installation fit between the first clothes treatment piece 10 and the separation tub 21.

[0097] In some implementations, the treatment rack body 11 is arranged to hang or fix the clothes, the treatment rack body is constructed as a cage-type cylindrical structure, and the side wall thereof is of a grid structure. The grid structure is configured for circulation of the dry hot air and the water flow, and the grid structure includes a plurality of vertically arranged grid bars to facilitate passage of the water flow, so as to spray and wash the clothes with a spray structure. The grid bars may be of a rectangular strip structure, or in some implementations, the cross-section of the grid bars is constructed as a fusiform surface, the shape of the structure not only plays a role in draining, but also reduces the width of the grid bars, the material of the grid, and the production cost of the grid. The treatment rack body 11 of the grid structure is also conducive to circulation of the dry hot air when drying the clothes, and the dry hot air in the first washing area easily flows into the second washing area along the separation tub 21 after flowing through the treatment rack body 11.

[0098] As detailed in Fig. 11 and Fig. 12, the first clothes treatment piece 10 further includes: a supporting plate 12 and an enclosure structure 14. The supporting plate 12 is arranged at the bottom of the treatment rack body 11, and is arranged to be of a ring structure along a periphery of the bottom of the treatment rack body 11. The enclosure structure 14 is arranged to be of a cylindrical structure along an outer edge of the supporting plate 12, and is integrally connected with the supporting plate 12. The enclosure structure and the supporting plate 12 form an accommodating space on an outer side of the treatment rack body 11 for accommodating the clothes. The clothes rotate with the first clothes treatment piece 10 during washing. In some implementations, the supporting plate 12 is provided with a plurality of water stirring ribs 13, the plurality of water stirring ribs 13 are arranged in a circumferential direction of the supporting

plate 12, the water stirring ribs 13 are at an angle to a diameter direction of the supporting plate 12, that is, the water stirring ribs 13 extend in a direction at an angle to a radial direction of the supporting plate 12, and the plurality of water stirring ribs 13 are evenly distributed in the circumferential direction of the supporting plate 12. In some embodiments, each water stirring rib 13 is constructed as a trapezoidal plate-like structure, which is arranged vertically to the supporting plate 12, and the part, close to the treatment rack body 11, thereof forms a beveled edge. In a process of washing the clothes, the driving mechanism drives the first clothes treatment piece 10 to rotate, the water stirring ribs 13 equally distributed on the circumference of the first clothes treatment piece 10 rotate against the water flow to increase contact area between the water flow and the first clothes treatment piece 10, so that the water flow produces a large oscillation, and the oscillation of the water flow acts on the clothes to increase the mechanical force of the water flow on clothes washing, and then improve a washing ratio. An outer edge of the supporting plate 12 is provided with the enclosure structure 14, and the enclosure structure 14 forms an integrated structure with the supporting plate 12. The enclosure structure and the supporting plate 12 are arranged vertically, and the height of the enclosure structure is higher than that of the water stirring ribs 13. The structure effectively increases the clothes storage volume, and a contact friction between the clothes and the circumference also reduces the occurrence of clothes entanglement. In some implementations, one end of each water stirring rib 13 is connected with the enclosure structure 14, and a gap is provided between the other end and the treatment rack body 11 to facilitate the circulation of the washing water.

[0099] The supporting plate 12 is provided with first water holes 15, and each first water hole 15 is located between the two adjacent water stirring ribs 13; and/or, the enclosure structure 14 is provided with a plurality of second water holes 16, and the plurality of second water holes 16 are arranged in the circumferential direction of the enclosure structure 14. In the embodiment, the supporting plate 12 and the enclosure structure 14 are provided with the water holes at the same time, that is, the supporting plate 12 is provided with the first water holes 15, and the first water holes 15 are strip through holes extending in the radial direction of the supporting plate 12. The enclosure structure 14 is provided with the second water holes 16, and the second water holes 16 are rectangular holes formed in a vertical direction. The first water holes 15 and the second water holes 16 are evenly distributed in the circumferential direction, and at least one first water hole 15 is arranged between any two adjacent water stirring ribs 13. Through the arrangement of the water holes, when the first clothes treatment piece 10 rotates, the oscillation of the water flow may circulate from the water holes to form a circulation structure to accelerate the water circulation, thereby effectively reducing the clothes treatment time and improving the

clothes treatment efficiency.

[0100] In some implementations, the supporting plate 12 is further provided with reinforcing ribs 17. The reinforcing ribs 17 are arranged in the radial direction of the supporting plate 12, and are connected with the supporting plate 12, the enclosure structure 14 and the treatment rack body 11 at the same time, and the height of the reinforcing ribs 17 is lower than that of the water stirring ribs 13. In the embodiment, one reinforcing rib 17 is arranged between the two adjacent water stirring ribs 13, and one first water hole 15 is arranged between each reinforcing rib 17 and the water stirring rib 13 to make the overall structure more uniform.

[0101] In some implementations, the water stirring ribs 13, the reinforcing ribs 17, the supporting plate 12, the enclosure structure 14 and the treatment rack body 11 are fixed together and integrally formed, that is, the first clothes treatment piece 10 is of an integrally formed structure, which optimizes the structure of the first clothes treatment piece 10, reduces a series of intermediate processes, improves the production efficiency, reduces the production cost, has good process performance, and further optimizes the overall structure of the first clothes treatment piece 10.

[0102] The side wall of the mounting tub 18 and the side wall of the drain basket 30 are provided with ventilation holes, so that the washing water and the dry hot air circulate between the separation tub 21 and the drain basket 30. In some implementations, the drain basket 30 is detachably connected to the driving mechanism, and the side wall of the drain basket 30 forms a grid structure, so that the drain basket 30 forms the drain basket, and the drain basket 30 rotates to agitate the washing water to wash the clothes. After clothes washing is completed, the drain basket 30 is taken out, so that the clothes are taken out for easy access. Moreover, through a detachable arrangement manner, the drain basket 30 cleans separately, so as to further realize a partitioned washing mode of the clothes and the underwear, and a problem of cross infection of the stains of the underwear and the stains and bacteria of other clothes is provided.

[0103] In some implementations, the air inlet 201 is perpendicular to a side wall face of the treatment rack body 11, that is, the air inlet 201 blows air towards the treatment rack body 11 at a specific angle, so that the air is blown directly towards the clothes to improve the drying efficiency. For example, when the taper of the side wall of the treatment rack body 11 is 5° to 10° , the air inlet 201 is tilted downwards from the top wall of the side wall of the outer tub 20, and a tilt angle is 80° to 85° . The outer side of the outer tub 20 is provided with a drying system, which includes a fan 50 and a heating apparatus 60, wherein the drying system is connected with the air inlet 201 and is configured to provide the dry hot air.

[0104] In some implementations, the treatment rack body 11 is constructed as a cylindrical structure, which increases an outside washing space, or in some embodiments, the treatment rack body 11 is a round table-

shaped cylinder, whose taper of the side wall is between 5° to 10° , so that the design is conducive to the placement during bra washing, that is, to play a role in guiding during bra mounting.

[0105] In some implementations, the air inlet 201 is perpendicular to the side wall face of the treatment rack body 11, that is, the air inlet 201 blows air towards the treatment rack body 11 at a specific angle, so that the air is blown directly towards the clothes to improve the drying efficiency. For example, when the taper of the side wall of the treatment rack body 11 is 5° to 10° , the air inlet 201 is tilted downwards from the top wall of the side wall of the outer tub 20, and the tilt angle is 80° to 85° . The outer side of the outer tub 20 is provided with the drying system, which includes the fan 50 and the heating apparatus 60, is connected with the air inlet 201 and is configured to provide the dry hot air.

[0106] The side wall of the treatment rack body 11 is provided with a clothes support structure 111, as detailed in Fig. 13, which is arranged to support the clothes. The clothes support structure 111 is of a convex structure protruding outward on the side wall of the treatment rack body 11. The clothes support structure 111 is integrally formed with the treatment rack body 11, and is constructed as a grid structure to facilitate passage of the water flow.

[0107] In the embodiment, the clothes support structure 111 includes two hemispherical convex structures, which are arranged side by side in the circumferential direction of the treatment rack body 11, are arranged in a substantially intermediate position in a longitudinal position of the treatment rack body 11, and are arranged to support a bra. During washing, the bra is mounted on the treatment rack body 11 in a surrounding manner and a cup part is placed on the clothes support structure 111 to be supported and lifted to ensure that the bra does not slip, and shoulder straps on both sides of the bra surround the treatment rack body 11 and are fastened by buckles on the shoulder straps to fix the bra to the treatment rack body 11. In some implementations, the side wall of the treatment rack body 11 is further provided with a clothes fixing structure 112. In some embodiments, the clothes fixing structure 112 includes a clamping structure which is arranged on the side wall of the first clothes treatment piece 10 and is a clamping strip arranged in the length direction of the side wall of the treatment rack body 11, and a gap is formed between the clamping strip and the side wall of the treatment rack body 11. The shoulder straps surround the treatment rack body 11 and are inserted into the gap for clamping, which further facilitates fixation and improves the reliability of bra fixation.

[0108] The washing machine in the embodiment includes the driving mechanism, as detailed in Fig. 8. The driving mechanism is connected with the mounting structure of the mounting tub 18 and the drain basket 30, and is arranged to drive the first clothes treatment piece 10 and the drain basket 30 to rotate. In some implementations, the driving mechanism includes a DD motor 40 and

a clutch 41, is output by a hollow shaft of the clutch 41 and is fixed by connecting a flange through screws, and then drives the first clothes treatment piece 10 connected to a flange fixing plate 42 through the screws, and the first clothes treatment piece 10 with the water stirring ribs 13 performs a clothes treatment operation in a clothes treatment space formed by an assembly of the outer tub 20 and the drain basket 30. The motor, the clutch and the two washing units are connected by a spindle. When the clutch is opened, the drain basket 30 and the first clothes treatment piece 10 rotate at the same time to realize washing and dehydration at the same time. When the clutch is not opened, only the drain basket 30 rotates for washing. In some implementations, and in other embodiments, the driving mechanism further includes two drive motors which are respectively arranged to drive the first clothes treatment piece 10 and the drain basket 30 to rotate. In some embodiments, the driving solution is in motor and clutch drive, which has a better washing effect.

[0109] In the drying process of the washing machine in the embodiment, a separate washing area is dried through the control of the motor, including separate drying of the first washing area and the second washing area. When the bra is washed and dried accordingly for the first washing area, the underwear is fixed to a middle tub in such a way that the underwear cup is tightly attached to the clothes support structure 111 on the first clothes treatment piece 10, and flanks of the underwear are fixed to the first clothes treatment piece 10 in a circumferential spreading manner. There are three drying forms for the underwear (bra) in the first washing area, including aligned drying, rotary drying and hovering drying. During aligned drying, the underwear is fixed to the first clothes treatment piece 10, the motor does not drive the first clothes treatment piece 10 to rotate, and the fan 50 generates the dry hot air to dry the underwear to improve the drying efficiency of the local position. During rotary drying, the motor drives the first clothes treatment piece 10 to rotate at a constant speed, and the fan 50 generates the dry hot air to achieve the drying effect on the whole underwear. During hovering drying, the motor drives the first clothes treatment piece 10 to rotate back and forth at a constant speed within a certain angle range for drying, so as to increase the local drying range and improve the drying efficiency.

Embodiment 2:

[0110] The invention adopts one drying system to simultaneously dry the first washing area and the second washing area, so as to ensure that the two washing areas share the drying system while washing independently, thereby simplifying the structure of the whole machine. Moreover, by arranging air outlets at the bottom, a circulation path of dry hot air is extended to improve the drying effect, and the washing water is avoided from flowing out through the air outlet by arranging extended air ducts, so

as to ensure that drying and washing operations are performed normally. The invention is introduced in conjunction with specific embodiments.

[0111] As shown in Fig. 16, Fig. 17 and Fig. 18, the disclosure provides a washing and drying integrated device, which includes an outer tub 20.

[0112] A separation tub 21 is arranged inside the outer tub 20. The separation tub 21 is fixedly connected with a bottom wall of the outer tub 20. The separation tub 21 divides the inside of the outer tub 20 into a first washing area and a second washing area which may wash independently, that is, washing water in the first washing area and the second washing area may not circulate to each other to avoid cross-contamination of the washing water. A side wall of the outer tub 20 is provided with an air inlet 201 and an outer tub air outlet 2021, and the outer tub 20 forms a first drying path for allowing dry hot air to flow through the first washing area between the air inlet 201 and the outer tub air outlet 2021. In some implementations, the air inlet 201 is located at the top of the side wall of the outer tub 20, the outer tub air outlet 2021 is located at the bottom of the side wall of the outer tub 20, and the air inlet 201 and the outer tub air outlet 2021 are respectively arranged on opposite sides of the side wall of the outer tub 20, as shown in Fig. 1 and Fig. 2.

[0113] The bottom of the separation tub 21 is provided with a separation tub air outlet, and a second drying path for allowing the dry hot air to flow through the second washing area is formed between the air inlet 201 and the separation tub air outlet 2031.

[0114] The first drying path and the second drying path are controllable to perform drying treatment on the first washing area and the second washing area at the same time.

[0115] The outer tub 20 is provided with a drying air duct, which includes the air inlet 201 arranged on the side wall of the outer tub 20, the outer tub air outlet 2021 arranged at the bottom of the first washing area, and the separation tub air outlet 2031 arranged at the bottom of the second washing area. The dry hot air enters the first washing area and the second washing area from the air inlet 201, and is discharged through the outer tub air outlet 2021 and the separation tub air outlet 2031 respectively. In some implementations, the air inlet 201 is arranged at the top of the side wall of the outer tub 20, so that the air enters from the upper part and is discharged from the bottom, the circulation path of the dry hot air is extended, and the drying effect is improved.

[0116] As shown in Fig. 9 and Fig. 10, the separation tub 21 is arranged inside the outer tub 20, the separation tub 21 is connected to a bottom wall of the outer tub 20, an annular space between the separation tub 21 and the outer tub 20 forms the first washing area, and the second washing area is formed in the separation tub 21. The separation tub 21 divides the first washing area and the second washing area into two independent washing areas to avoid cross-contamination of washing water. However, the dry hot air enters the first washing area from

the air inlet 201, and flows into the second washing area over the separation tub 21, so as to achieve the effect of drying the two washing areas with one drying system. The inside and the outside of the separation tub 21 are respectively provided with independent water inlet and drainage channels, so that the two washing areas wash independently to avoid cross-contamination caused by intercommunication of the washing water. For example, the first washing area is configured to wash ordinary clothes, such as coats, shirts, etc., and the second washing area is configured to wash personal clothing, such as underwear, bras, etc. The first washing area and the second washing area are independent of each other, and may wash different clothes at the same time.

[0117] The outer tub 20 is further provided with a first extended air duct 202 that communicates with the first washing area and a second extended air duct 203 that communicates with the second washing area, which are described specifically as follows.

[0118] As shown in Fig. 9, the first extended air duct 202 is arranged on a side wall of the outer tub 20, a first end thereof communicates with the first washing area through the outer tub air outlet 2021, that is, a first port of the first extended air duct 202 forms the outer tub air outlet 2021, which is located at the bottom of the first washing area, for example, arranged at the bottom of the side wall of the outer tub or a bottom wall of the outer tub 20. A second end of the first extended air duct 202 is located on a peripheral wall of the outer tub 20 to form a first extended outlet 2022, and the height of the first extended outlet 2022 is higher than the maximum height of the liquid level of the washing water in the first washing area, so as to avoid the washing water in the first washing area from flowing out through the first extended air duct 202. In some implementations, the first extended air duct 202 extends vertically, i.e., in a height direction of the outer tub 20.

[0119] As shown in Fig. 10, a first end of the second extended air duct 203 communicates with the second washing area through the separation tub air outlet 2031. Similarly, a first port of the second extended air duct 203 forms the separation tub air outlet 2031, which is located on the bottom wall of the outer tub 20 and is located in the second washing area. One part of the second extended air duct 203 is located on the bottom wall of the outer tub 20, and the other part is located on the side wall of the outer tub 20. A second end of the second extended air duct 203 is located on the peripheral wall of the outer tub 20 to form a second extended outlet 2032, and the height of the second extended outlet 2032 is higher than the maximum height of the liquid level of the washing water in the second washing area, so as to avoid the washing water in the second washing area from flowing out through the second extended air duct 203.

[0120] The washing and drying integrated device further includes a first clothes treatment piece, which is rotationally arranged in the first washing area and is arranged to carry clothes washed in the first washing area;

and a second clothes treatment piece, which is rotationally arranged in the second washing area and is arranged to carry clothes washed in the second washing area.

[0121] As shown in Fig. 16, Fig. 17 and Fig. 18, the second clothes treatment piece is a drain basket 30, which is rotationally arranged in the separation tub 21. As shown in Fig. 15, ventilation holes 301 are formed in a side wall of the drain basket 30. In some implementations, the ventilation holes 301 in the side wall of the drain basket 30 are strip holes arranged parallel to an axis of the drain basket 30, and the plurality of ventilation holes 301 are evenly distributed in a circumferential direction of the drain basket 30 for circulation of the washing water and the dry hot air. In some implementations, the side wall of the drain basket 30 is constructed as a grid structure to improve the circulation amount of the washing water and the dry hot air. In some implementations, a bottom wall of the drain basket 30 is provided with a bottom hole 302, and the bottom hole 302 is configured for circulation of the washing water and the dry hot air.

[0122] In some implementations, and in other embodiments, as shown in Fig. 14, the second clothes treatment piece may also be an impeller 31. The impeller 31 is connected with a driving mechanism. The clothes are washed by rotating and agitating the water flow through the impeller 31. In some implementations, the appearance of the impeller 31 is designed to imitate the shape of a human hand, which does not damage the clothes and reduces the entanglement and friction of the clothes in the cleaning process. Through the adoption of the impeller 31, the cleaning effect of the personal clothing may be improved, and the problem that the personal clothing washed by a user is not clean is solved. In addition, this design reduces the material of the apparatus, reduces the production cost of a washing unit, and further saves the cost of a multi-tub washing and drying integrated device.

[0123] As shown in Fig. 16, Fig. 17 and Fig. 18, the washing and drying integrated device further includes a first clothes treatment piece 10. As shown in Fig. 11, Fig. 12 and Fig. 13, the first clothes treatment piece 10 includes: a treatment rack body 11 and a mounting tub 18.

[0124] The treatment rack body 11 is of a cylindrical structure, sleeves the separation tub 21, and is arranged to carry the clothes in the first washing area 81. In some implementations, the clothes are fixed to the treatment rack body 11.

[0125] The mounting tub 18 is of a cylindrical structure, and is arranged on an inner side of the treatment rack body 11. An open end of the mounting tub 18 is connected to the top of the treatment rack body 11, a bottom wall of the mounting tub 18 forms a mounting structure, the mounting tub 18 is placed in the separation tub 21, the drain basket 30 is placed in the mounting tub 18, the mounting structure is arranged to be connected to the driving mechanism, and the first clothes treatment piece 10 rotates as a whole.

[0126] Channels for the circulation of the dry hot air

are formed on the side walls of the treatment rack body 11 and the mounting tub 18, so as to facilitate the flowing of the dry hot air from the first washing area into the second washing area.

[0127] In some implementations, the treatment rack body 11 is constructed as a cage-type cylindrical structure, and the side wall thereof is of a grid structure. The grid structure is configured for circulation of the dry hot air, and includes a plurality of vertically arranged grid bars to facilitate passage of the water flow, so as to be matched with a spraying structure to spray and wash the clothes. The grid bars may be of a rectangular strip structure, or in some implementations, the cross-section of the grid bars is constructed as a fusiform surface, the shape of the structure not only plays a role in draining, but also reduces the width of the grid bars, the material of the grid, and the production cost of the grid. The treatment rack body 11 of the grid structure is also conducive to circulation of the dry hot air, and the dry hot air in the first washing area easily flows into the second washing area along the separation tub 21 after flowing through the treatment rack body 11.

[0128] The first clothes treatment piece 10 further includes: a supporting plate 12 and an enclosure structure 14. The supporting plate 12 is arranged at the bottom of the treatment rack body 11, and is arranged to be of a ring structure along the periphery of the bottom of the treatment rack body 11. The enclosure structure 14 is arranged to be of a cylindrical structure along an outer edge of the supporting plate 12, and is integrally connected to the supporting plate 12. The enclosure structure and the supporting plate 12 form an accommodating space on an outer side of the treatment rack body 11 for accommodating the clothes. The clothes rotate with the first clothes treatment piece 10 during washing.

[0129] In some implementations, the supporting plate 12 is provided with a plurality of water stirring ribs 13, the plurality of water stirring ribs 13 are arranged in a circumferential direction of the supporting plate 12, the water stirring ribs 13 are at an angle to a diameter direction of the supporting plate 12, that is, the water stirring ribs 13 extend in a direction at an angle to a radial direction of the supporting plate 12, and the plurality of water stirring ribs 13 are evenly distributed in the circumferential direction of the supporting plate 12. In some embodiments, each water stirring rib 13 is constructed as a trapezoidal plate-like structure, which is arranged vertically to the supporting plate 12, and the part, close to the treatment rack body 11, thereof forms a beveled edge.

[0130] In the process of washing the clothes, the driving mechanism drives the first clothes treatment piece 10 to rotate, the water stirring ribs 13 equally distributed on the circumference of the first clothes treatment piece 10 rotate against the water flow to increase contact area between the water flow and the first clothes treatment piece 10, so that the water flow produces a large oscillation, and the oscillation of the water flow acts on the clothes to increase the mechanical force of the water flow

on clothes washing, and then improve a washing ratio.

[0131] The outer edge of the supporting plate 12 is provided with the enclosure structure 14, and the enclosure structure 14 forms an integrated structure with the supporting plate 12. The enclosure structure and the supporting plate 12 are arranged vertically, and the height of the enclosure structure is higher than that of the water stirring ribs 13. The structure effectively increases the clothes storage volume, and the contact friction between the clothes and the circumference also reduces the occurrence of clothes entanglement. In some implementations, the end of each water stirring rib 13 is connected with the enclosure structure 14, and a gap is provided between the other end and the treatment rack body 11 to facilitate passage of the washing water.

[0132] The supporting plate 12 is provided with first water holes 15, and each first water hole 15 is located between the two adjacent water stirring ribs 13; and/or, the enclosure structure 14 is provided with a plurality of second water holes 16, and the plurality of second water holes 16 are arranged in the circumferential direction of the enclosure structure 14. In the embodiment, the supporting plate 12 and the enclosure structure 14 are provided with water holes at the same time, that is, the supporting plate 12 is provided with the first water holes 15, and the first water holes 15 are strip through holes extending in the radial direction of the supporting plate 12. The enclosure structure 14 is provided with the second water holes 16, and the second water holes 16 are rectangular holes formed in a vertical direction. The first water holes 15 and the second water holes 16 are evenly distributed in the circumferential direction, and at least one first water hole 15 is arranged between any two adjacent water stirring ribs 13. Through the arrangement of the water holes, when the first clothes treatment piece 10 rotates, the oscillation of the water flow may circulate from the water holes to form a circulation structure to accelerate the water circulation, thereby effectively reducing the clothes treatment time and improving the clothes treatment efficiency.

[0133] In some implementations, the supporting plate 12 is further provided with reinforcing ribs 17. The reinforcing ribs 17 are arranged in the radial direction of the supporting plate 12, and are connected to the supporting plate 12, the enclosure structure 14 and the treatment rack body 11 at the same time, and the height of the reinforcing ribs 17 is lower than that of the water stirring ribs 13. In the embodiment, one reinforcing rib 17 is arranged between the two adjacent water stirring ribs 13, and one first water hole 15 is arranged between each reinforcing rib 17 and the water stirring rib 13 to make the overall structure more uniform.

[0134] In some implementations, the water stirring ribs 13, the reinforcing ribs 17, the supporting plate 12, the enclosure structure 14 and the treatment rack body 11 are integrally formed, that is, the first clothes treatment piece 10 is of an integrally formed structure, which optimizes the structure of the first clothes treatment piece

10, reduces a series of intermediate processes, improves the production efficiency, reduces the production cost, has good process performance, and further optimizes the overall structure of the first clothes treatment piece 10.

[0135] The washing and drying integrated device includes the driving mechanism. The driving mechanism is connected to the mounting structure of the mounting tub 18 and the drain basket 30, and is arranged to drive the first clothes treatment piece 10 and the drain basket 30 to rotate. In some implementations, the driving mechanism includes a DD motor 40 and a clutch 41, is output by a hollow shaft of the clutch 41 and is fixed by connecting a flange through screws, and then drives the first clothes treatment piece 10 connected to a flange fixing plate 42 through the screws, and the first clothes treatment piece 10 with the water stirring ribs 13 performs a clothes treatment operation in a clothes treatment space formed by an assembly of the outer tub 20 and the drain basket 30. The motor, the clutch and the two washing units are connected by a spindle. When the clutch is opened, the drain basket 30 and the first clothes treatment piece 10 rotate at the same time to realize washing and dehydration at the same time. When the clutch is not opened, only the drain basket 30 rotates for washing. In some implementations, and in other embodiments, the driving mechanism may further include two drive motors which are respectively arranged to drive the first clothes treatment piece 10 and the drain basket 30 to rotate. In an embodiment, the driving solution is in motor and clutch drive, which has a better washing effect.

[0136] The side wall of the mounting tub 18 and the side wall of the drain basket 30 are provided with ventilation holes, so that the washing water and the dry hot air circulate between the separation tub 21 and the drain basket 30. In some implementations, the drain basket 30 is detachably connected with the driving mechanism, and the side wall of the drain basket 30 forms a grid structure, so that the drain basket 30 forms the drain basket, and the drain basket 30 rotates to agitate the washing water to wash the clothes. After clothes washing is completed, the drain basket 30 is taken out, so that the clothes are taken out for easy access. Moreover, through a detachable arrangement manner, the drain basket 30 cleans separately, so as to further realize a partitioned washing mode of the clothes and the underwear, and a problem of cross infection of the stains of the underwear and the stains and bacteria of other clothes is avoided.

[0137] In some implementations, the treatment rack body 11 is constructed as a cylindrical structure, which increases the outside washing space, or the treatment rack body 11 is a round table-shaped cylinder, whose taper of the side wall is between 5° to 10°, so that the design is conducive to the placement during bra washing, that is, to play a role in guiding during bra mounting.

[0138] In some implementations, the air inlet 201 is perpendicular to the side wall face of the treatment rack body 11, that is, the air inlet 201 blows air towards the

treatment rack body 11 at a specific angle, so that the air is blown directly towards the clothes to improve the drying efficiency. For example, when the taper of the side wall of the treatment rack body 11 is 5° to 10°, the air inlet 201 is tilted downwards from the top wall of the side wall of the outer tub 20, and the tilt angle is 80° to 85°. In some implementations, the taper of the side wall of the treatment rack body 11 is α , and the tilt angle of the air inlet 201 is β , where $\alpha + \beta = 90^\circ$. The outer side of the outer tub 20 is provided with the drying system, which includes an assembly of the fan 50 and the heating apparatus 60, is connected to the air inlet 201 and is configured to provide the dry hot air.

[0139] In some implementations, the side wall of the treatment rack body 11 is provided with a clothes support structure 111, which is arranged to support the clothes. In some embodiments, the clothes support structure 111 is of a convex structure protruding outward on the side wall of the treatment rack body 11, which is a protrusion for placing a bra cup (e.g., a hemispherical structure). The clothes support structure 111 is integrally formed with the treatment rack body 11, and is constructed as a grid structure to facilitate passage of the water flow.

[0140] In the embodiment, the clothes support structure 111 includes two hemispherical convex structures, which are arranged side by side in the circumferential direction of the treatment rack body 11, are arranged in a substantially intermediate position in a longitudinal position of the treatment rack body 11, and are arranged to support a bra. During washing, the bra is mounted on the treatment rack body 11 in a surrounding manner and a cup part is placed on the clothes support structure 111 to be supported and lifted to ensure that the bra does not slip, and shoulder straps on both sides of the bra surround the treatment rack body 11 and are fastened by buckles on the shoulder straps to fix the bra to the treatment rack body 11. In some implementations, the side wall of the treatment rack body 11 is further provided with a clothes fixing structure 112. The clothes fixing structure 112 includes a clamping structure which is arranged on the side wall of the first clothes treatment piece 10, in some embodiments, the clamping structure is a clamping strip arranged in the length direction of the side wall of the treatment rack body 11, and a gap is formed between the clamping strip and the side wall of the treatment rack body 11. The shoulder straps surround the treatment rack body 11 and are inserted into the gap for clamping, which further facilitates fixation and improves the reliability of bra fixation.

[0141] The washing and drying integrated device further includes a first sealing cover 1, which is arranged on the outer tub 20 in a turnover manner, and may close the outer tub 20, so that the first drying path is formed inside the outer tub 20, and the dry hot air only circulates in the outer tub 20. In some embodiments, the washing and drying integrated device further includes a second sealing cover 2, which covers the first clothes treatment piece 10, and specifically covers the treatment rack body

11. The washing water in the first washing area is prevented from splashing into the second washing area in the washing process, the second sealing cover 2 is provided with ventilation holes, which are arranged to communicate the first washing area with the second washing area to form a second drying path flowing through the second washing area.

[0142] In the drying process of the washing and drying integrated device in the invention, a separate washing area is dried through the control of the motor, including separate drying of the first washing area and the second washing area. When the bra is washed and dried accordingly for the first washing area, the underwear is fixed to the middle tub in such a way that the underwear cup is tightly attached to the clothes support structure 111 on the first clothes treatment piece 10, and flanks of the underwear are fixed to the first clothes treatment piece 10 in a circumferential spreading manner. There are three drying forms when drying the underwear (bra) in the first washing area, including a fixed drying mode, a constant-speed rotary drying mode and a reciprocating rotary drying mode. In the fixed drying mode, the underwear is fixed to the first clothes treatment piece 10, the motor does not drive the first clothes treatment piece 10 to rotate, and the fan 50 generates the dry hot air to dry the underwear to improve the drying efficiency of the local position. In the constant-speed rotary drying mode, the motor drives the first clothes treatment piece 10 to rotate at a constant speed, and the fan 50 generates the dry hot air to achieve the drying effect on the whole underwear. In the reciprocating rotary drying mode, the motor drives the first clothes treatment piece 10 to rotate back and forth at a constant speed within a certain angle range for drying, so as to increase the local drying range and improve the drying efficiency.

[0143] The above is only embodiments of the invention, and is not intended to limit the invention in any way. Although the invention has been disclosed above as the preferred embodiment, it is not intended to limit the invention. Those skilled in the art may make some changes or modifications to the above-mentioned variations or replacements apparent to equivalent embodiments with equivalent changes by using the technical content of the described technical scope without departing from the scope of the technical solution of the invention, and any simple modification, equivalent change and modification may be made to the above-mentioned embodiments according to the technical substance of the invention without departing from the content of the technical solution of the invention, and still fall within the scope of the solution of the invention.

Claims

1. A sealing cover of a washing machine, the washing machine comprising an outer tub and a separation tub which is fixedly connected to or integrally formed

on a bottom wall of the outer tub, wherein an annular space between the separation tub and the outer tub forms a first washing area, and a second washing area is formed in the separation tub;

the sealing cover comprises a first sealing cover and a second sealing cover, wherein the first sealing cover is arranged at an opening of the outer tub in an openable and closable manner for covering the first washing area, or for covering the first washing area and the second washing area, and the second sealing cover is arranged at an opening of the separation tub in an openable and closable manner for covering the separation tub;

the first sealing cover is provided with a first ventilation structure that communicate an inside of the first washing area with an outside of the first washing area; or the second sealing cover is provided with a second ventilation structure that communicate an inside of the second washing area with an outside of the second washing area.

2. The sealing cover according to claim 1, wherein the first sealing cover is provided with a first handle part, the first ventilation structure comprises a plurality of first air vents arranged in the first sealing cover, and the plurality of first air vents are hidden below the first handle part; or the second sealing cover is provided with a second handle part, the second ventilation structure comprises a plurality of second air vents arranged in the second sealing cover, and the plurality of second air vents are hidden below the second handle part.
3. The sealing cover according to claim 1 or 2, wherein the washing machine further comprises a first clothes treatment piece, the first clothes treatment piece comprising:

a treatment rack body, wherein the treatment rack body is of a cylindrical structure, is rotationally arranged in the first washing area, and is arranged to carry clothes in the first washing area; and

a mounting tub, which is rotationally arranged in the second washing area, wherein the mounting tub and the treatment rack body are synchronously and rotationally fixedly connected together or integrally formed;

the second sealing cover covers an opening of the mounting tub;

a first sealing structure is arranged between the second sealing cover and the mounting tub, and when the second sealing cover covers the mounting tub, a first seal is formed between the first sealing structure and the mounting tub;

a lower surface of the second sealing cover ex-

- tends in a direction close to the mounting tub to form a protruding part, an end of the protruding part extends into the mounting tub, a side wall of the protruding part is provided with a second sealing structure, and when the second sealing cover covers the mounting tub, a second seal is formed between the second sealing structure and the mounting tub.
4. The sealing cover according to claim 3, wherein the first sealing structure comprises a first attraction piece arranged on an edge of the second sealing cover and a second attraction piece arranged at the opening of the mounting tub, wherein the first attraction piece is attracted to the second attraction piece when the second sealing cover covers the mounting tub.
 5. The sealing cover according to claim 4, wherein a lower surface of the edge of the second sealing cover is provided with a first mounting groove, and the first attraction piece is arranged in the first mounting groove.
 6. The sealing cover according to claim 5, wherein the first sealing structure further comprises a first sealing ring, wherein the first sealing ring comprises a cavity, and an upper wall face and a lower wall face which form the cavity; a lower end face of the first mounting groove is provided with a limiting groove, a convex rib matched with the limiting groove is formed on the lower wall face, and the convex rib protrudes towards an inside of the cavity; the first sealing ring is arranged at an opening of the first mounting groove, the upper wall face extends into the mounting groove from the opening of the first mounting groove, the lower wall face covers the lower end face of the first mounting groove, the first attraction piece is limited between the first mounting groove and the cavity, and the convex rib is limited in the limiting groove.
 7. The sealing cover according to claim 6, wherein an end face of the opening of the mounting tub is provided with a blocking rib, and the second attraction piece is located on a side, close to the opening of the mounting tub, of the blocking rib; and when the second sealing cover covers the mounting tub, the second sealing cover is located in an area enclosed by the blocking rib, and the first sealing ring is in interference fit with the blocking rib.
 8. The sealing cover according to claim 7, wherein a position corresponding to the first attraction piece at the opening of the mounting tub is provided with a second mounting groove, and the second attraction piece is arranged in the second mounting groove.
 9. The sealing cover according to any one of claims 4 to 8, wherein the second sealing structure comprises a second sealing ring arranged on a side wall of the protruding part, and when the second sealing cover covers the mounting tub, the second sealing ring is in interference fit with an inner wall of the mounting tub.
 10. The washing machine according to claim 1, wherein the first sealing cover is plate-like, and is arranged at the opening of the outer tub in an openable and closable manner for covering the first washing area and the second washing area; when the first sealing cover covers the first washing area and the second washing area, and the sealing cover covers the separation tub, the second sealing cover is located below the first sealing cover.
 11. The washing machine according to claim 1, wherein the first sealing cover is annular and is arranged at the opening of the outer tub in an openable and closable manner for covering the first washing area; when the first sealing cover covers the first washing area, and the second washing area covers the separation tub, the second sealing cover is located in a ring of the first sealing cover.
 12. A washing machine, comprising the sealing cover according to any one of claims 1 to 11.
 13. A washing and drying integrated device, comprising:

an outer tub and a separation tub which is fixedly connected to or integrally formed on a bottom wall of the outer tub, wherein an annular space between the separation tub and the outer tub forms a first washing area, a second washing area is formed in the separation tub, and a top of the first washing area communicates with a top of the second washing area;

a side wall of the outer tub is provided with an air inlet and an outer tub air outlet, and the outer tub forms a first drying path for allowing dry hot air to flow through the first washing area between the air inlet and the outer tub air outlet;

a bottom of the separation tub is provided with a separation tub air outlet, and a second drying path for allowing the dry hot air to flow through the second washing area is formed between the air inlet and the separation tub air outlet;

the first drying path and the second drying path are controllable to perform drying treatment on the first washing area and the second washing area at the same time.
 14. The washing and drying integrated device according to claim 13, wherein the air inlet is located at a top of the side wall of the outer tub, the outer tub air outlet

is located at a bottom of the side wall of the outer tub, and the air inlet and the outer tub air outlet are respectively arranged on opposite sides of the side wall of the outer tub.

15. The washing and drying integrated device according to claim 14, wherein the outer tub is further provided with:

a first extended air duct, wherein an air inlet end of the first extended air duct communicates with the outer tub air outlet, so as to guide the dry hot air of the first drying path to the first extended air duct from bottom to top and discharge at a position higher than a maximum preset height of the liquid level of washing water in the first washing area; and

a second extended air duct, wherein an air inlet end of the second extended air duct communicates with the separation tub air outlet, so as to guide the dry hot air of the second drying path to the second extended air duct from bottom to top and discharge at a position higher than a maximum preset height of the liquid level of the washing water in the second washing area.

16. The washing and drying integrated device according to claim 15, wherein at least part of the side wall of the outer tub forms a double-layer wall structure, a hollow structure is formed inside the double-layer wall structure, and the first extended air duct and the second extended air duct are formed in the hollow structure.

17. The washing and drying integrated device according to claim 16, wherein the first extended air duct is formed on the side wall of the outer tub and extends in a height direction of the outer tub; one part of the second extended air duct is formed on the bottom wall of the outer tub and extends in a radial direction of the outer tub, and the other part is formed on the side wall of the outer tub and extends in the height direction of the outer tub.

18. The washing and drying integrated device according to claim 13, wherein the washing and drying integrated device further comprises a first clothes treatment piece, the first clothes treatment piece comprising:

a treatment rack body, wherein the treatment rack body is of a cylindrical structure, is rotationally arranged in the first washing area, and is arranged to carry clothes in the first washing area; and

a mounting tub, which is rotationally arranged in the second washing area, wherein the mounting tub and the treatment rack body are synchronously and rotationally fixedly connected together

or integrally formed;

ventilation holes for circulation of the dry hot air are formed on side walls of the treatment rack body and the mounting tub.

19. The washing and drying integrated device according to claim 18, wherein the air outlet faces a side wall of the treatment rack body.

20. The washing and drying integrated device according to claim 18, further comprising a second clothes treatment piece, wherein the second clothes treatment piece is rotationally arranged in the second washing area and is located in the mounting tub.

21. The washing and drying integrated device according to claim 20, wherein the second clothes treatment piece is a drain basket;

a side wall of the drain basket is provided with a plurality of ventilation holes, and the plurality of ventilation holes are evenly distributed in a circumferential direction of the drain basket; or, a bottom wall of the drain basket is provided with a bottom hole.

22. The washing and drying integrated device according to claim 20, wherein the second clothes treatment piece is an impeller.

23. The washing and drying integrated device according to claim 20, further comprising a driving mechanism, wherein the driving mechanism is in drive connection with the mounting tub and the second clothes treatment piece, and is arranged to drive the first clothes treatment piece and the second clothes treatment piece to rotate at the same time, or is arranged to drive the first clothes treatment piece or the second clothes treatment piece to rotate.

24. The washing and drying integrated device according to any one of claims 13 to 23, further comprising: a first sealing cover, which is arranged to cover the outer tub, so that a closed first drying path is formed in the outer tub.

25. The washing and drying integrated device according to any one of claims 18 to 23, further comprising: a second sealing cover, which is arranged on the first clothes treatment piece, wherein a ventilation hole is formed in the second sealing cover, and the ventilation hole makes the first washing area communicate with the second washing area to form the second drying path.

26. The washing and drying integrated device according to any one of claims 13 to 23, further comprising a drying system, wherein the drying system is connect-

ed with the air inlet on the outer tub and is arranged to provide the dry hot air.

27. The washing and drying integrated device according to claim 20, wherein the second clothes treatment piece is a drain basket; 5

a side wall of the drain basket is provided with a plurality of ventilation holes, and the plurality of ventilation holes are evenly distributed in a circumferential direction of the drain basket; 10
a bottom wall of the drain basket is provided with a bottom hole;
the ventilation holes and the bottom hole are configured for circulation of the washing water 15
and the dry hot air.

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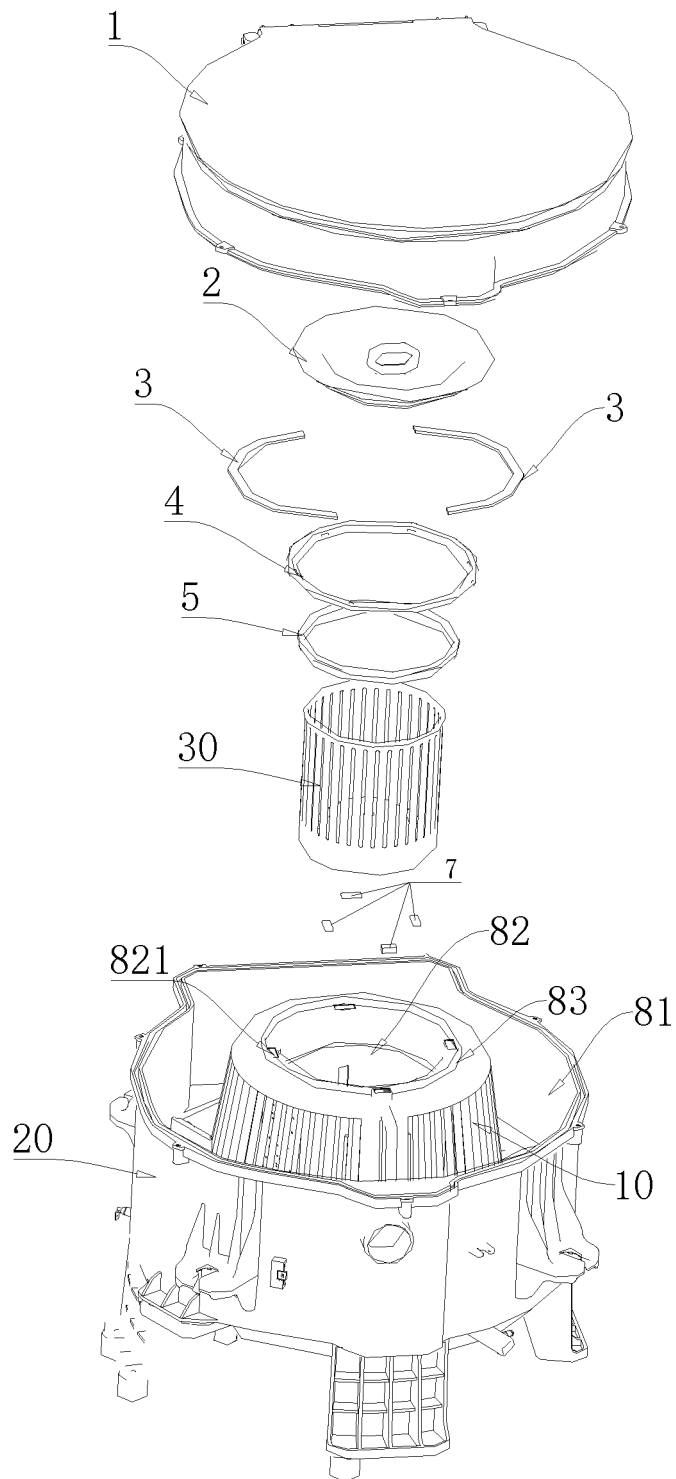


Fig. 1

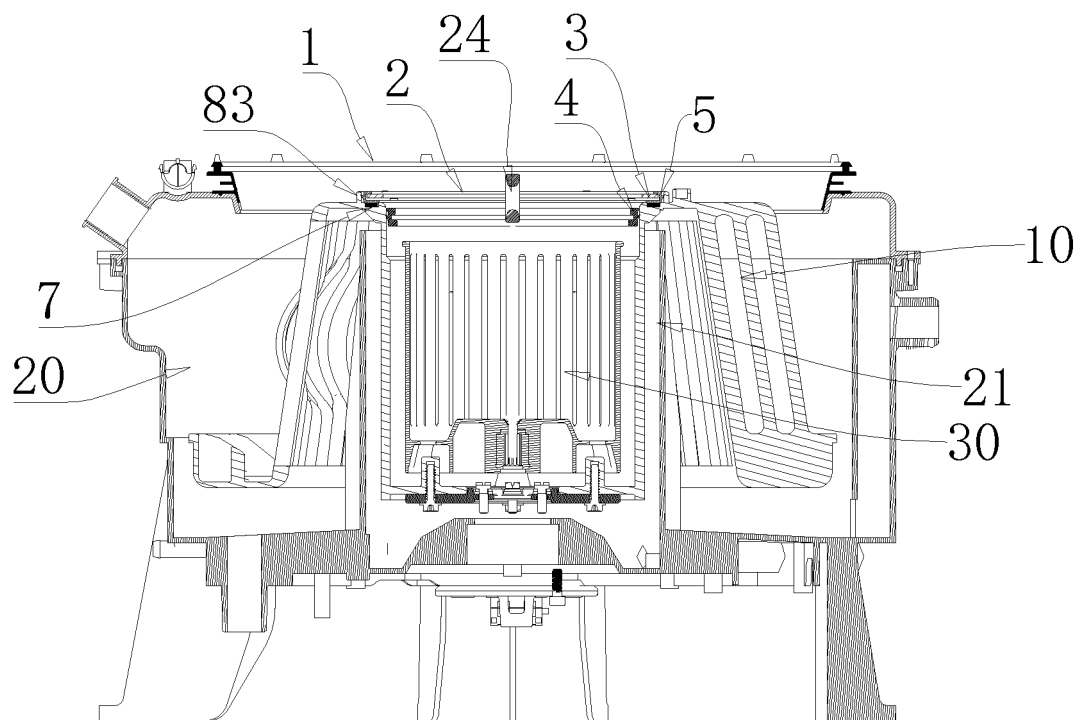


Fig. 2

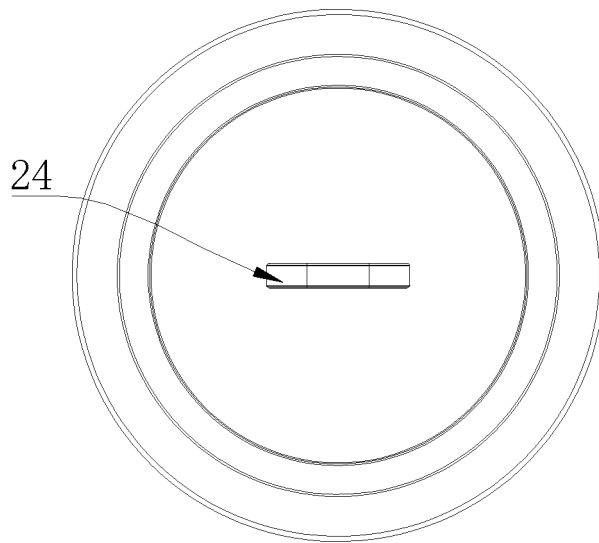


Fig. 3

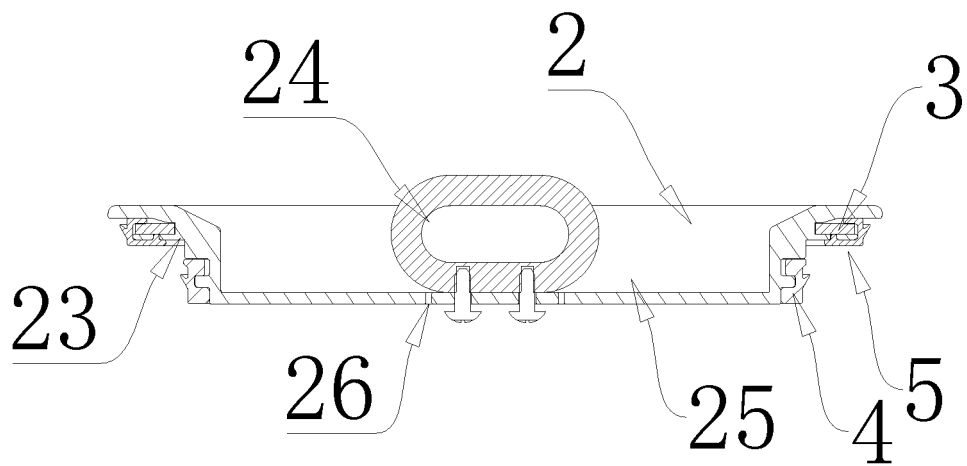


Fig. 4

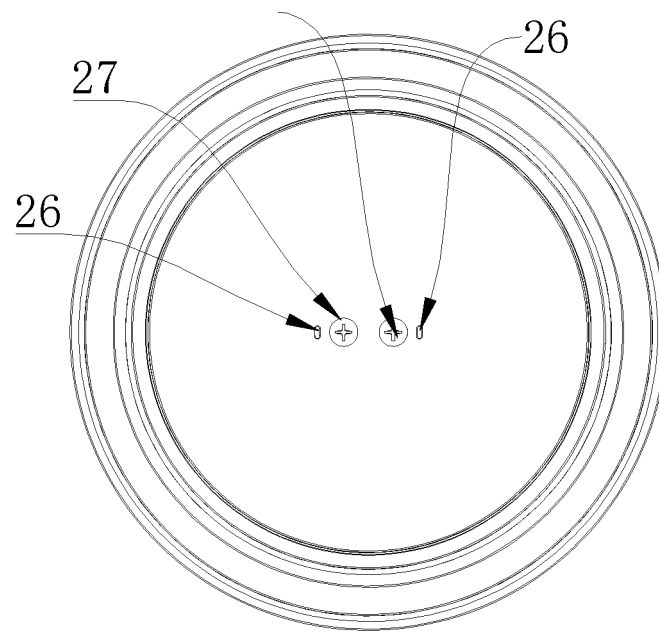


Fig. 5

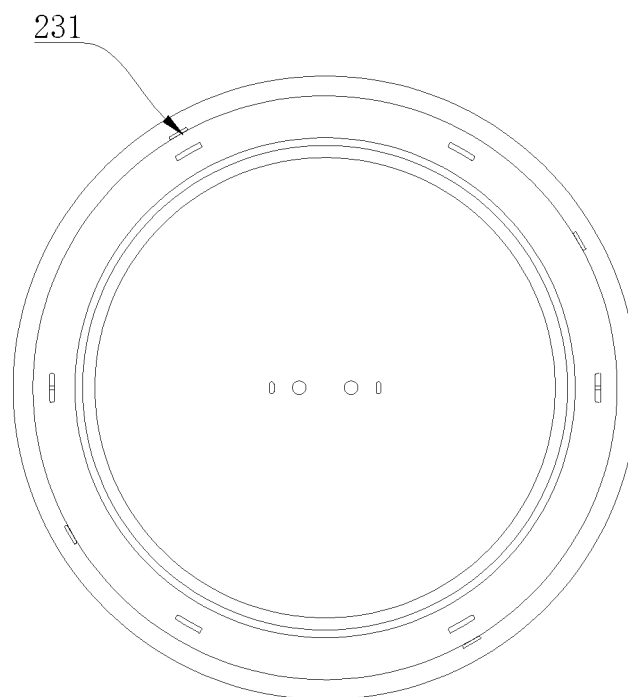


Fig. 6

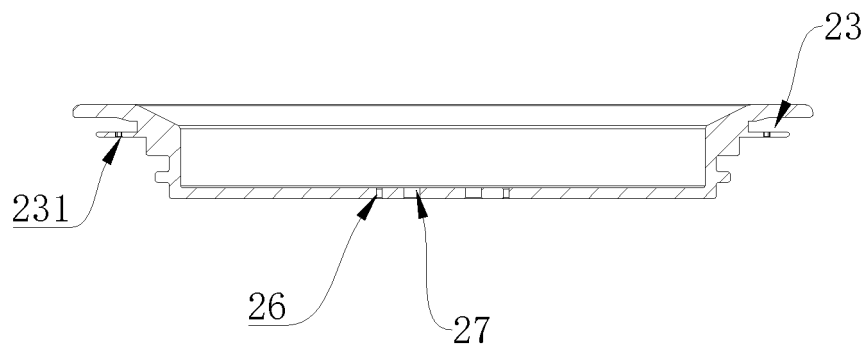


Fig. 7

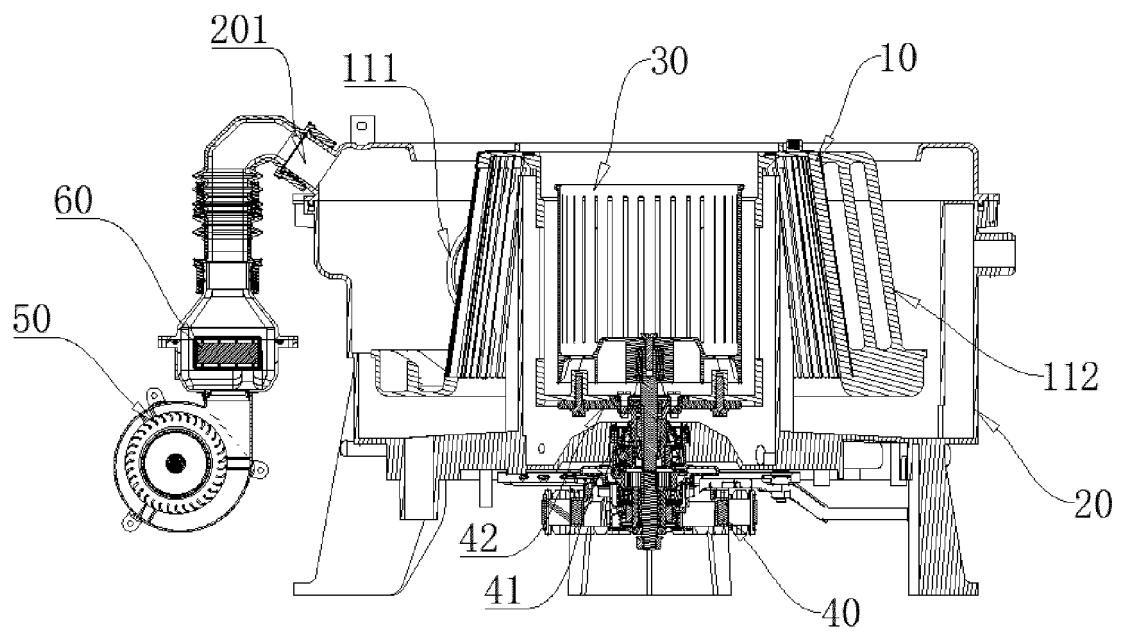


Fig. 8

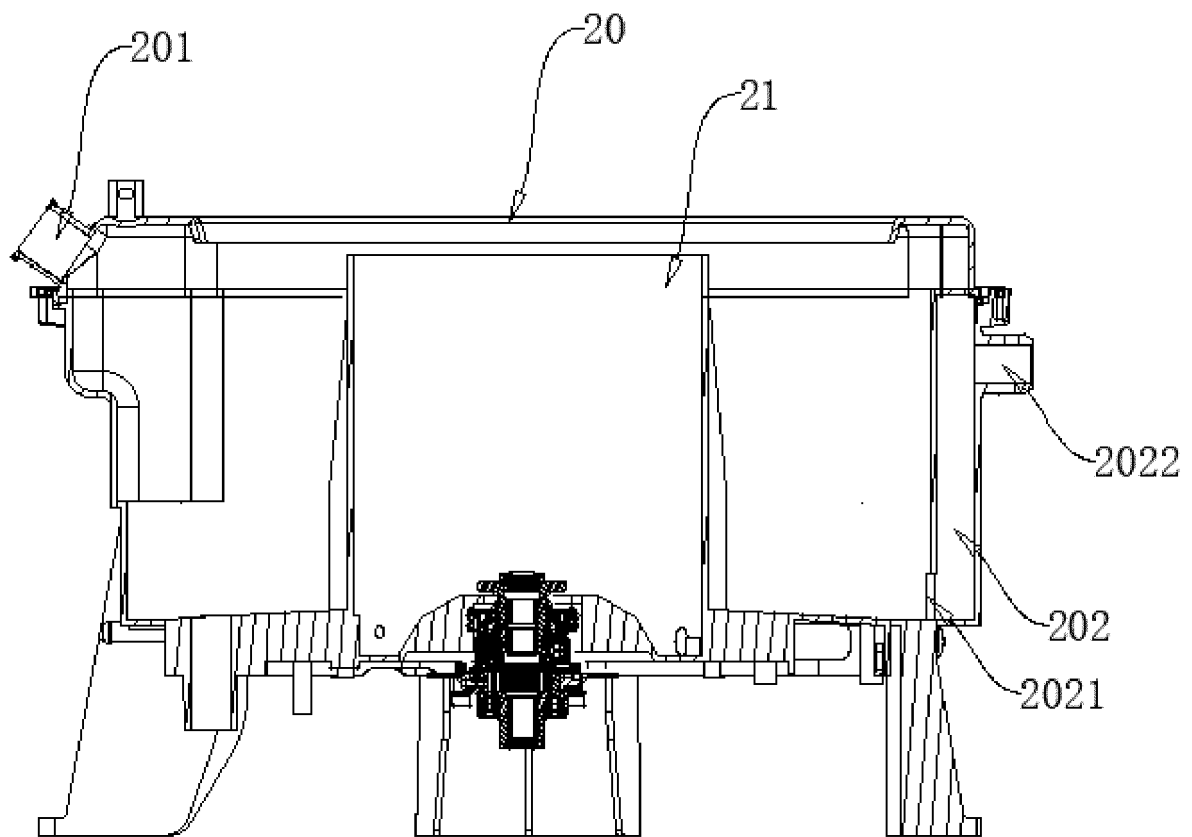


Fig. 9

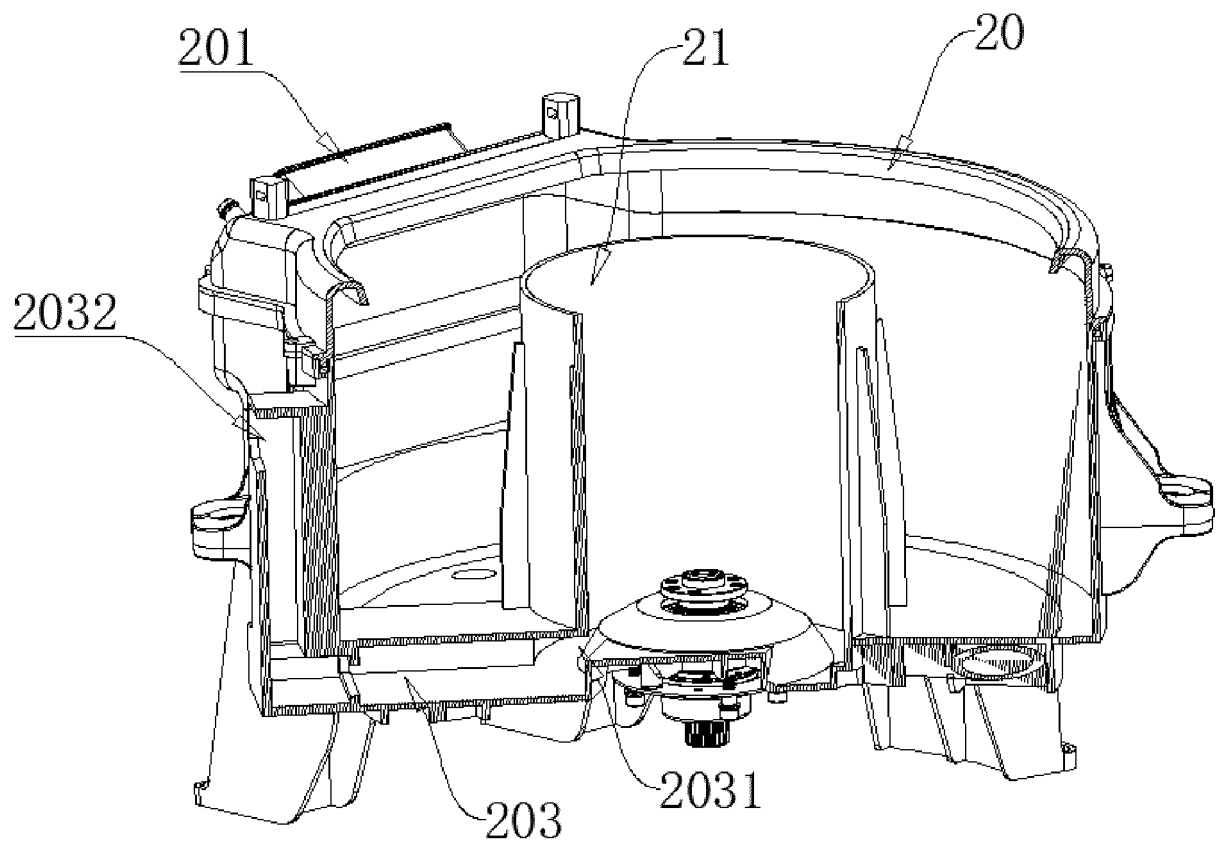


Fig. 10

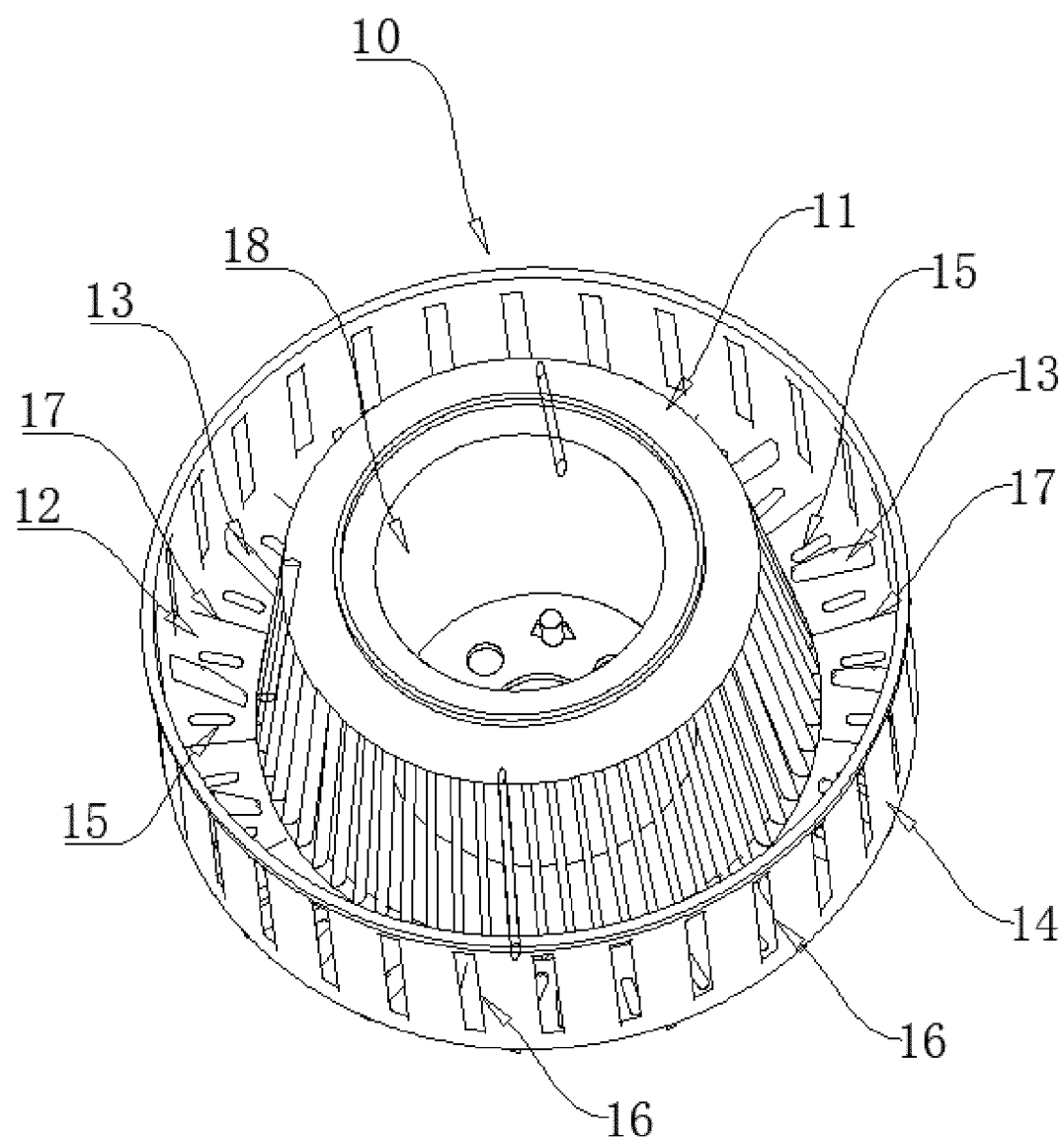


Fig. 11

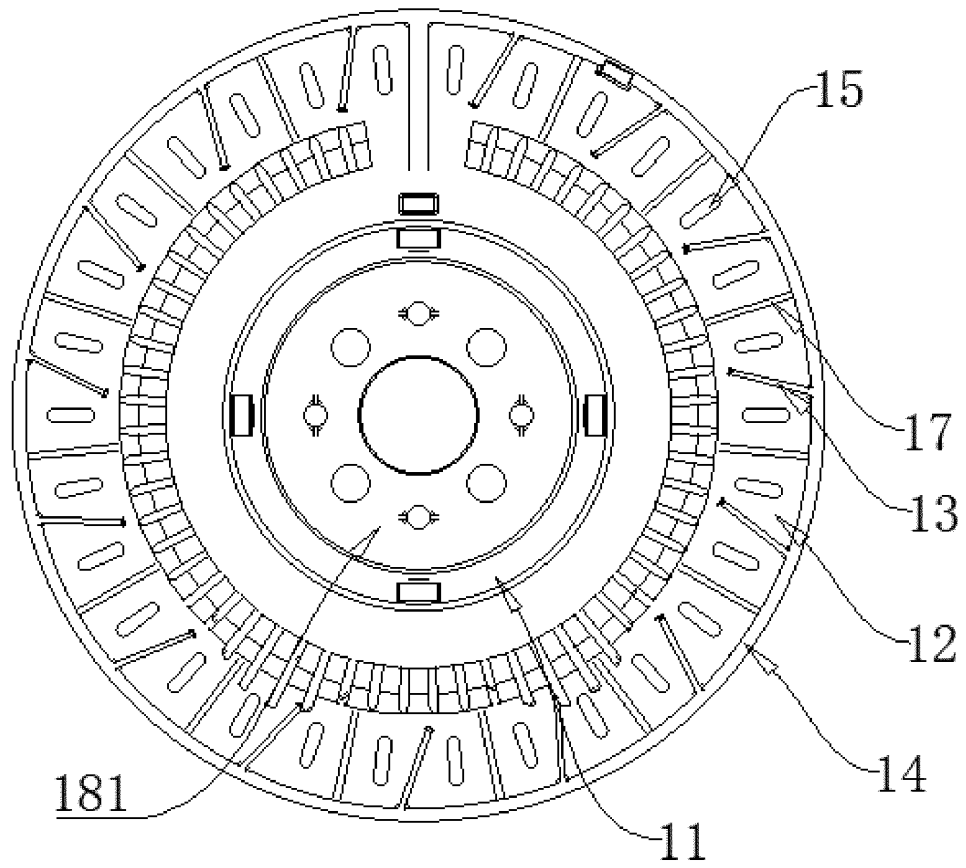


Fig. 12

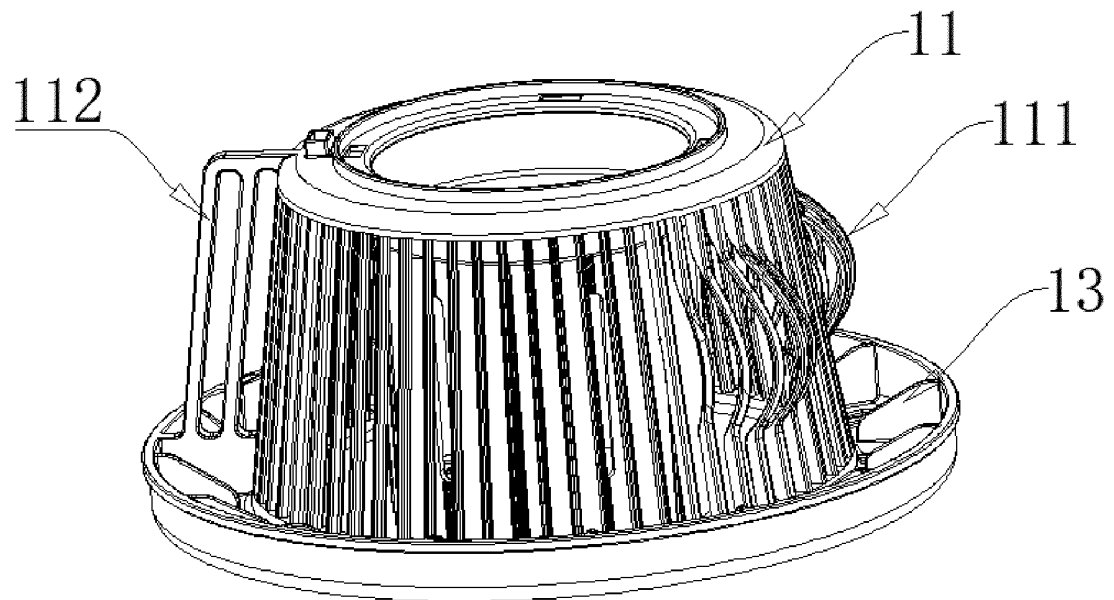


Fig. 13

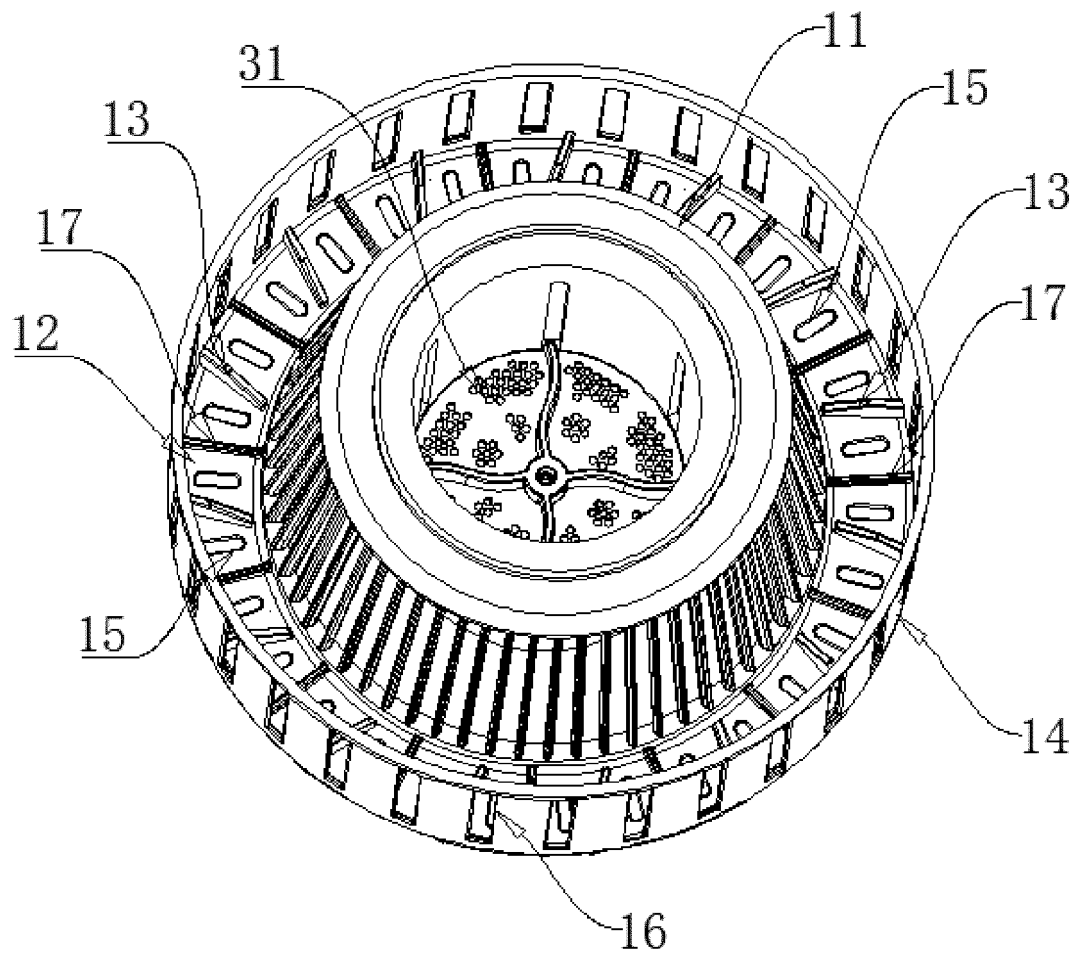


Fig. 14

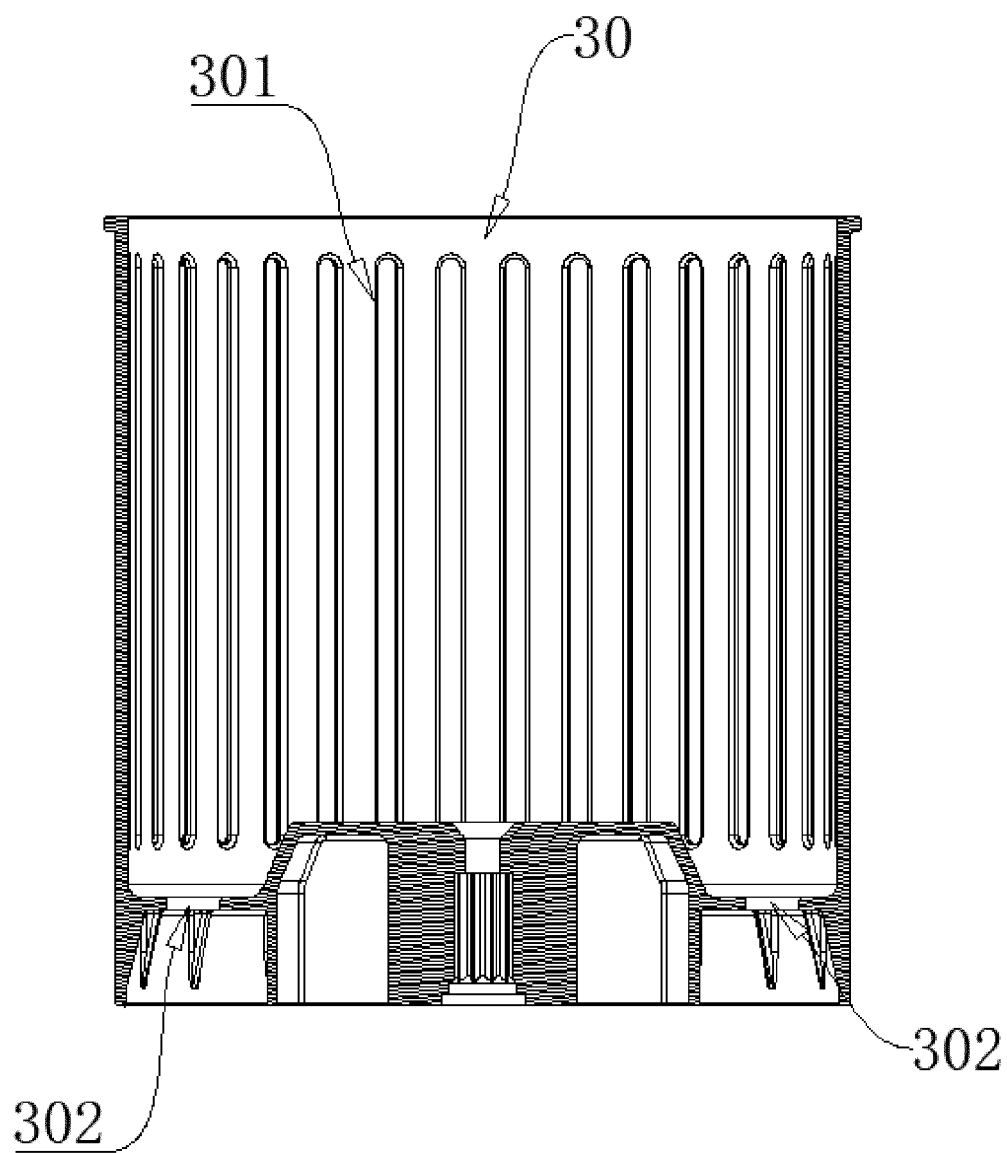


Fig. 15

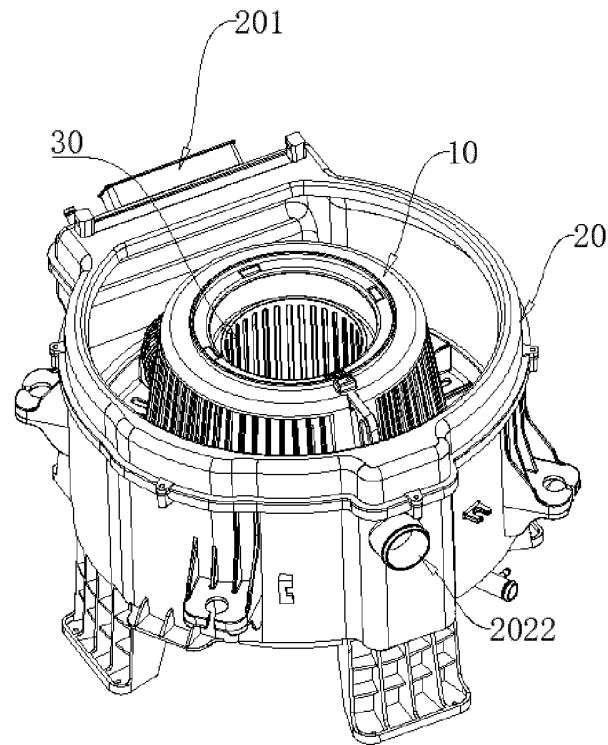


Fig. 16

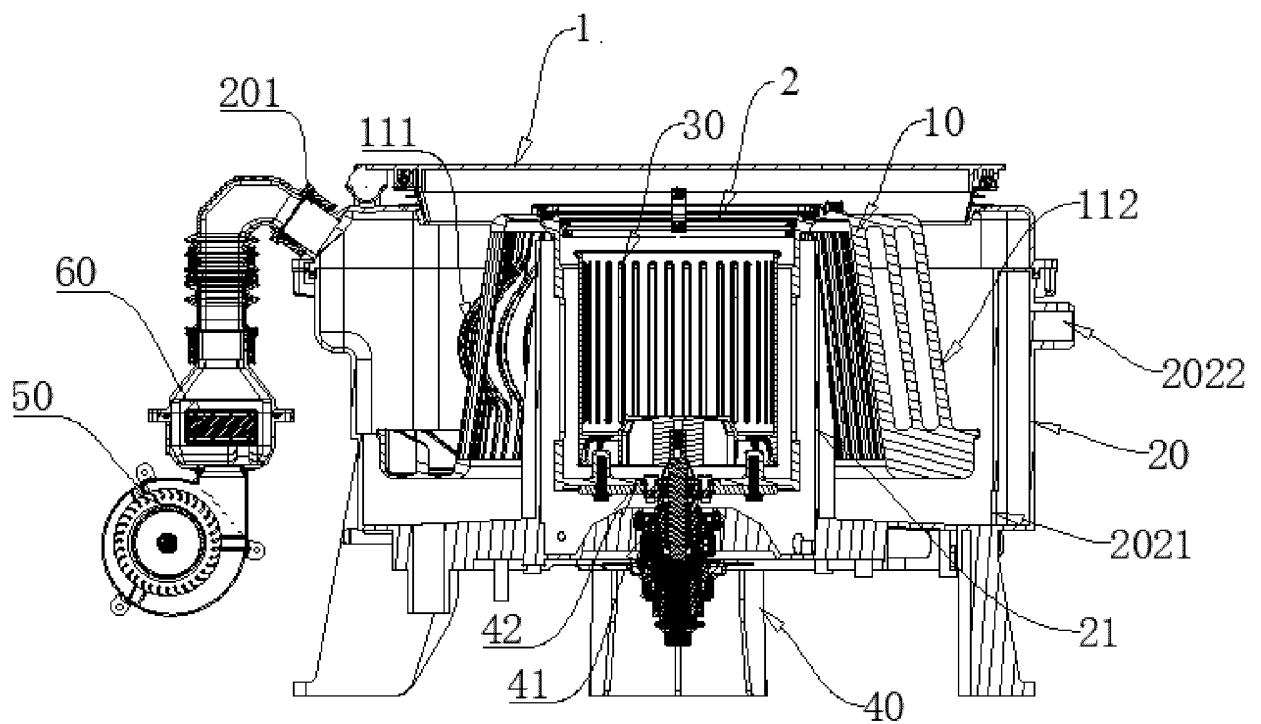


Fig. 17

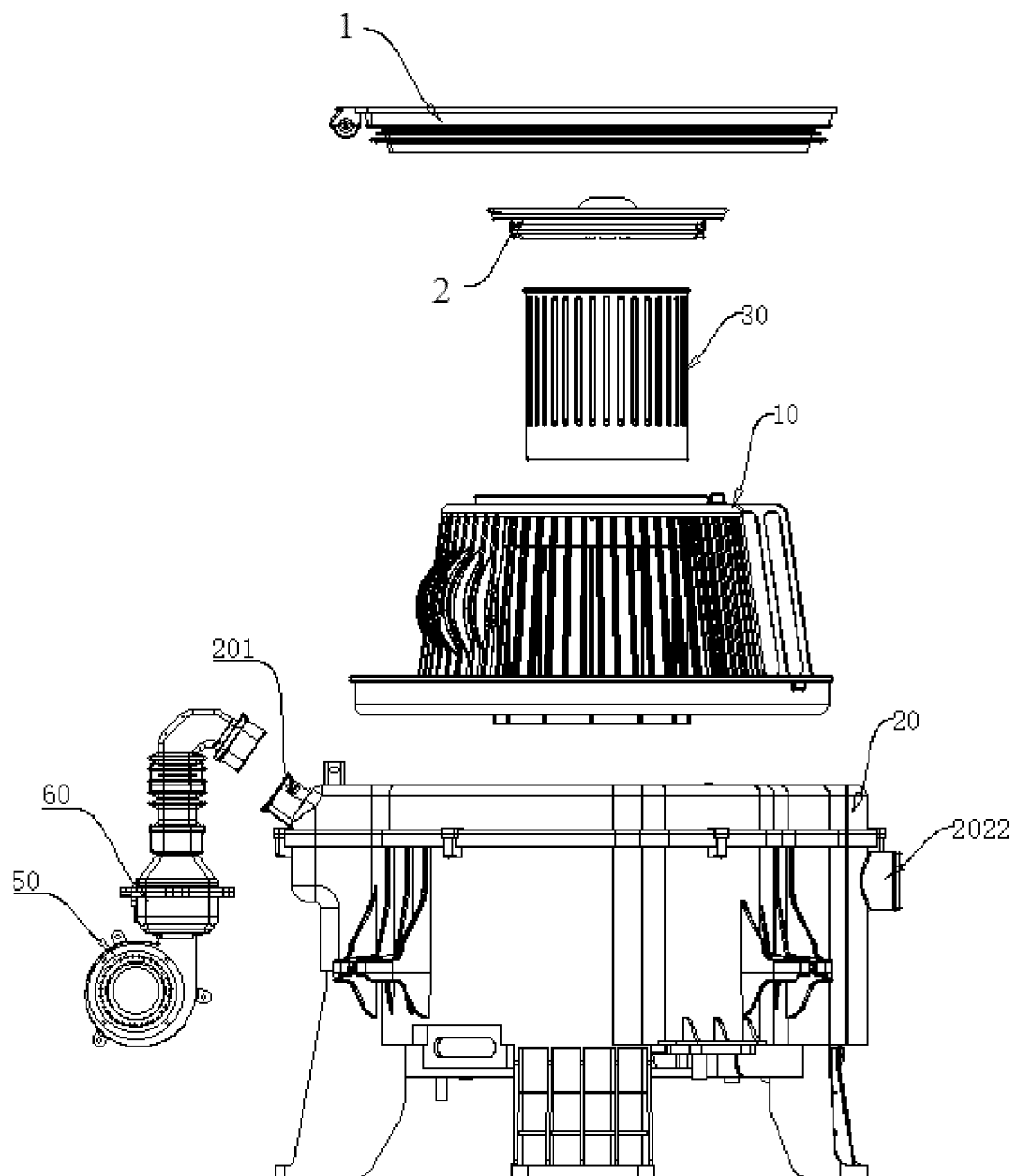


Fig. 18

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/091475

A. CLASSIFICATION OF SUBJECT MATTER D06F 35/00(2006.01)i; D06F 37/18(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) CNKI; CNABS; CNTXT; DWPI; SIPOABS: 洗衣区, 洗涤区, 分区, 分隔筒, 分隔桶, 筒, 桶, 透气, 出气, 排气, 通气, 盖, 干燥, 烘干, 干衣, 空气, 气流, 风, 进风, 进气, 入口, 第二, 环, 分隔, 空间, 区域, drum, tub, separat???, divid??, partition???, two, second, lid, cover, hole?, bore?, aperture?, air																					
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>PX</td> <td>CN 215925360 U (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 01 March 2022 (2022-03-01) claims 1-12</td> <td>1-12</td> </tr> <tr> <td>PX</td> <td>CN 113481696 A (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 08 October 2021 (2021-10-08) claims 1-12</td> <td>1-12</td> </tr> <tr> <td>PX</td> <td>CN 113463323 A (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 01 October 2021 (2021-10-01) description, paragraphs [0004]-[0035]</td> <td>13-27</td> </tr> <tr> <td>PX</td> <td>CN 215628795 U (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 25 January 2022 (2022-01-25) description, paragraphs [0004]-[0035]</td> <td>13-27</td> </tr> <tr> <td>A</td> <td>CN 110832133 A (LG ELECTRONICS INC.) 21 February 2020 (2020-02-21) description, paragraphs [0025]-[0027]</td> <td>1-27</td> </tr> <tr> <td>A</td> <td>CN 107761304 A (PENG CHENG) 06 March 2018 (2018-03-06) entire document</td> <td>1-27</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	PX	CN 215925360 U (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 01 March 2022 (2022-03-01) claims 1-12	1-12	PX	CN 113481696 A (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 08 October 2021 (2021-10-08) claims 1-12	1-12	PX	CN 113463323 A (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 01 October 2021 (2021-10-01) description, paragraphs [0004]-[0035]	13-27	PX	CN 215628795 U (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 25 January 2022 (2022-01-25) description, paragraphs [0004]-[0035]	13-27	A	CN 110832133 A (LG ELECTRONICS INC.) 21 February 2020 (2020-02-21) description, paragraphs [0025]-[0027]	1-27	A	CN 107761304 A (PENG CHENG) 06 March 2018 (2018-03-06) entire document	1-27
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.																					
<table border="1"> <tr> <td> * Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “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) “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 </td> <td> “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 </td> </tr> <tr> <td>Date of the actual completion of the international search 13 July 2022</td> <td>Date of mailing of the international search report 05 August 2022</td> </tr> <tr> <td>Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451</td> <td>Authorized officer Telephone No.</td> </tr> </table>	* Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “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) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family	Date of the actual completion of the international search 13 July 2022	Date of mailing of the international search report 05 August 2022	Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	Authorized officer Telephone No.															
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/091475

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 207699861 U (PENG CHENG) 07 August 2018 (2018-08-07) entire document	1-27
A	JP 2004167263 A (HITACHI LTD.) 17 June 2004 (2004-06-17) entire document	1-27

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 215925360 U	01 March 2022	None	
CN 113481696 A	08 October 2021	None	
CN 113463323 A	01 October 2021	None	
CN 215628795 U	25 January 2022	None	
CN 110832133 A	21 February 2020	KR 20190004445 A	14 January 2019
		US 2020102691 A1	02 April 2020
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		AU 2018296986 A1	05 December 2019
		WO 2019009615 A1	10 January 2019
CN 107761304 A	06 March 2018	None	
CN 207699861 U	07 August 2018	None	
JP 2004167263 A	17 June 2004	None	

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