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(54) **FILTER SCREEN CLEANING MODULE AND AIR TREATMENT DEVICE**

(57) A filter screen cleaning module (100) and an air processing device (1000), the filter screen cleaning module (100) includes: a cleaning box (1), a roller assembly (6) and a roller drive gear (203) on the cleaning box. The cleaning box has a cleaning cavity (101). The roller assembly is rollably connected between two opposite side walls of the cleaning box, the roller assembly including: an inner shaft (63) of the roller and an outer cylinder (62) of the roller, the outer cylinder (62) of the roller configured for contacting the filter (400) to drive the filter to move. The roller inner shaft is fitted over the roller outer cylinder, and a rotation limiting structure (64) is disposed between the roller outer cylinder and the roller inner shaft. The roller drive gear is connected with the roller assembly.

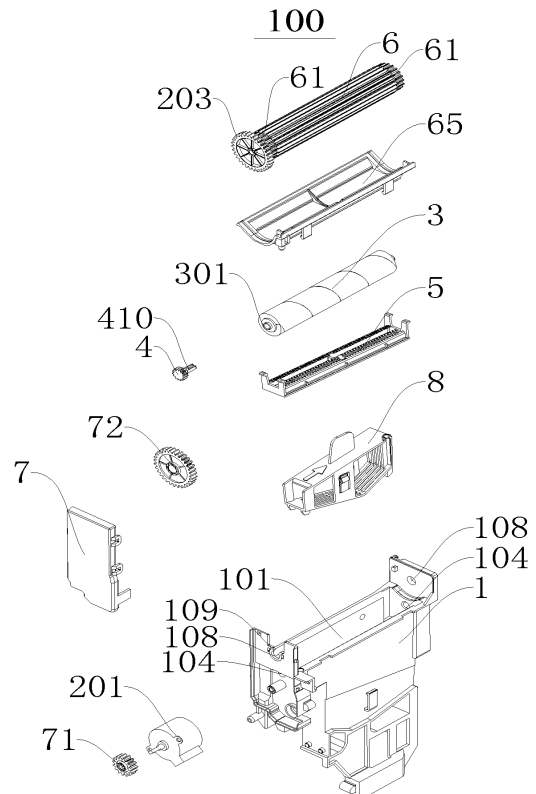


Fig. 3

Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to and is based on Chinese Patent Application Serial No. 201822007298.5, filed on November 30, 2018, entitled "filter screen cleaning module and air processing device" and Chinese Patent Application Serial No. 201822009167.0, filed on November 30, 2018, entitled "filter screen rinsing module and air processing device", the entire contents of which are incorporated herein by reference.

FIELD

[0002] The present application pertains to the technical field of household appliance, and in particular, relates to a filter screen cleaning module and an air processing device.

BACKGROUND

[0003] In an air conditioner, usually, a filter is provided at an air inlet or an air outlet to filter. In the long-term use, much dust would be accumulated on the filter. It takes time and effort to remove and wash the filter manually, and a filter assembly is easily damaged.

[0004] Therefore, more and more air conditioners are equipped with an automatic filter cleaning assembly. Some use a brush to rollably clean a surface of the filter, while some use a solution spray to clean the surface of the filter. However, when the filter is cleaned, in the process of transmitting the filter, abnormal noise is easily generated, and the filter moves obliquely and deviates from a designed washing route, such that the cleaning effect of the filter is poor. There are also problems that the structure of a transmission assembly is unstable and the transmission effect is poor.

SUMMARY

[0005] The present application seeks to solve at least one of the problems existing in the related art to at least some extent.

[0006] To this end, an object of the present application is to provide a filter screen cleaning module which may stably drive the filter to move and wash, and has a roller assembly which is stable when rotated.

[0007] Another object of the present application is to provide an air processing device having the above-mentioned filter screen cleaning module.

[0008] The filter screen cleaning module according to an embodiment of the present application includes: a cleaning box, having a cleaning cavity; a roller assembly, rollably connected between two opposite side walls of the cleaning box, and comprising: a roller inner shaft and a roller outer cylinder, wherein the roller inner shaft is

fitted over the roller outer cylinder, a rotation limiting structure is provided between the roller outer cylinder and the roller inner shaft, and the roller outer cylinder is configured to contact a filter screen to drive the filter screen to move; and a roller drive gear, disposed on the cleaning box and connected with the roller assembly.

[0009] In the filter screen cleaning module according to the of the embodiment of the present application, the cleaning box provides an effective connection position for the roller assembly, such that the roller assembly is relatively stable and has a small offset when rolling. The roller inner shaft serves as a rotating shaft of the roller assembly. The roller outer cylinder on the rotating shaft may drive the filter to move, and also plays a role of cleaning the filter to some extent. The arrangement of the rotation limiting structure between the roller outer cylinder and the roller inner shaft may increase the limit therebetween effectively, avoid a circumferential displacement therebetween or an excessive friction force with the filter due to a large rotational speed, and stabilize the roller assembly when rolling as a whole. The roller drive gear is arranged separately from the roller assembly, which may increase the ease of assembly of the roller drive gear and the roller assembly, reduce the occupied space inside the cleaning box, and increase the available cleaning space of the filter.

[0010] Optionally, a rotation limiting groove is provided on an outer peripheral wall of the roller inner shaft, a rotation limiting projection is provided on an inner peripheral wall of the roller outer cylinder, and the rotation limiting projection is inserted and fitted in the rotation limiting groove.

[0011] Optionally, the roller inner shaft is formed in a hollow cylindrical shape, and a part of the peripheral wall of the roller inner shaft is recessed inwards to form the rotation limiting groove.

[0012] Optionally, the rotation limiting groove extends in an axial direction of the roller inner shaft, and the rotation limiting groove is open at both axial ends of the roller inner shaft.

[0013] Optionally, the roller outer cylinder has a cylindrical shape which is open at two ends.

[0014] Optionally, the roller outer cylinder is configured as a flexible member as a whole.

[0015] Optionally, the roller outer cylinder is provided with a plurality of flexible edges.

[0016] Optionally, the roller assembly further includes: a filter screen drive gear connected to an end of the roller inner shaft and configured to be engaged with the filter screen to drive the filter screen to move.

[0017] Optionally, two filter screen drive gears are provided, and the two filter screen drive gears are detachably connected to two axial ends of the roller inner shaft respectively.

[0018] Optionally, when the roller outer cylinder is provided with a plurality of flexible edges, the flexible edges extend in an axial direction of the roller assembly, and the flexible edges are in one-to-one correspondence to

teeth on the filter screen drive gear.

[0019] Optionally, a portion of an inner peripheral wall of the roller inner shaft forming the rotation limiting groove is configured as an inner projection, the filter screen drive gear is provided with an insertion portion inserted in the roller inner shaft, and the insertion portion is snapped on the inner projection.

[0020] Optionally, the cleaning box is provided with a water inlet, and the bottom of the cleaning box is provided with a water outlet in communication with the cleaning cavity.

[0021] An air processing device according to an embodiment of the present application includes: the above-mentioned filter screen cleaning module.

[0022] The air processing device according to an embodiment of the present application is provided with the roller assembly in the above-mentioned filter screen cleaning module, which may not only stably drive the filter, but also preliminarily wash the filter. The components work stably during the cleaning operation, no abnormal noise is easily generated, and the filter is ensured to be guided and brought to the corresponding position for subsequent cleaning.

[0023] Optionally, the air processing device is configured as an indoor unit of an air conditioner, the filter screen cleaning module is connected on a chassis of the indoor unit of the air conditioner, and the filter screen cleaning module is located above a drain pan of the indoor unit of the air conditioner.

[0024] Additional aspects and advantages of the present application will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] The above/or additional aspects and advantages of the present application will become apparent and more readily appreciated from the following descriptions made with reference to the drawings, in which:

Fig. 1 is a schematic diagram of an overall structure of a filter screen cleaning module according to an embodiment of the present application.

Fig. 2 is schematic diagram of a partial structure of an air processing device provided with the filter screen cleaning module according to an embodiment of the present application.

Fig. 3 is a schematic diagram of an exploded structure of the filter screen cleaning module according to an embodiment of the present application.

Fig. 4 is a schematic diagram of a structure of a screen brush assembly cooperating with the filter according to an embodiment of the present application.

Fig. 5 is a schematic diagram of an overall structure of the screen brush assembly and a screen brush drive gear according to an embodiment of the

present application.

Fig. 6 is a schematic diagram of an exploded structure of the screen brush assembly and the screen brush drive gear according to an embodiment of the present application.

Fig. 7 is a schematic structural diagram of a longitudinal section of Figure 5.

Fig. 8 is a schematic diagram of a structure of the screen brush assembly cooperating with a roller gear and a power assembly according to an embodiment of the present application.

Fig. 9 is a schematic diagram of a structure of a cleaning box cooperating with the screen brush assembly according to an embodiment of the present application.

Fig. 10 is a schematic diagram of an exploded structure of a roller assembly according to an embodiment of the present application.

Fig. 11 is a schematic diagram of an overall structure of a chip filter member according to an embodiment of the present application.

Fig. 12 is schematic diagram of an overall structure of a dedusting member and the chip filter member according to an embodiment of the present application.

Fig. 13 is schematic diagram of an overall structure of the roller assembly, the power assembly and the cleaning box according to an embodiment of the present application.

Reference numerals:

[0026]

air processing device 1000;

filter screen cleaning module 100;

cleaning box 1; cleaning cavity 101; shaft hole 104; water inlet 105; water outlet 106; support wall 107; connecting port 108; connecting groove 109;

power assembly 2; cleaning motor 201; roller drive gear 203;

screen brush assembly 3; end hole 301; notch 302 of the inner shaft; anti-rotation groove 303; mating shaft 304; anti-rotation block 305;

screen brush inner shaft 310; lower cover 311 of the inner shaft; upper cover 312 of the inner shaft;

screen brush body 320;

screen brush drive gear 4; screen brush connecting shaft 410; elastic buckle 411; second flat position 412;

dedusting member 5; comb teeth 51;

roller assembly 6;

filter screen drive gear 61; insertion portion 611; socket 612; transmission shaft 613; first flat position 614; roller outer cylinder 62; flexible edges 621; roller inner shaft 63; inner projection 631; rotation limiting structure 64; rotation limiting groove 641; rotation limiting projection 642; filter screen raceway 65;

chip filter member 8; grating plate 81; top guide plate 82; snap-in portion 83; water hole 84; abutting block 85; connecting plate 86; water inlet pipe 91; water pump assembly 92; water outlet control valve 93; drain pipe 94;

casing 200; air inlet 210; chassis 220; back plate 221; bottom plate 222; drain pan 300; filter screen 400; rib-like protrusion 401

DETAILED DESCRIPTION

[0027] Reference will be made in detail to embodiments of the present application, and the examples of the embodiments are illustrated in the drawings, wherein the same or similar elements and the elements having same or similar functions are denoted by like reference numerals throughout the descriptions. The embodiments described herein with reference to drawings are illustrative, and merely used to explain the present application. The embodiments shall not be construed to limit the present application.

[0028] It should be noted that unless specified or limited otherwise, the terms "mounted", "connected", and "coupled" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integral connections; may also be mechanical or electrical connections; may also be direct connections or indirect connections via intervening structures; may also be inner communications of two elements. The above terms can be understood by those skilled in the art according to specific situations.

[0029] The filter screen cleaning module 100 according to an embodiment of the present application will be described in detail below with reference to the drawings.

[0030] A filter screen cleaning module 100 according to an embodiment of the present application includes a cleaning box 1, a roller assembly 6, and a roller drive gear 203.

[0031] As shown in Fig. 12, the cleaning box 1 has a cleaning cavity 101. Herein, the cleaning cavity 101 has a certain accommodation space, and may accommodate a guide assembly and other functional assemblies.

[0032] As shown in Figs. 1, 2, and 3, the roller assembly 6 is rollably connected between two opposite side walls of the cleaning box 1. As shown in Figs. 8 and 10, the roller assembly 6 includes a roller inner shaft 63 and a

roller outer cylinder 62, wherein the roller inner shaft 63 is fitted over the roller outer cylinder 62, a rotation limiting structure 64 is disposed between the roller outer cylinder 62 and the roller inner shaft 63, and the roller outer cylinder 62 is configured to contact with the filter screen 400 to drive the filter screen 400 to move. The roller inner shaft 63 serves as a rotating shaft of the roller assembly 6, and the rotating shaft is fitted over the roller outer cylinder 62 to drive the filter screen 400 to move. The rotation limiting structure 64 forms a limit between the roller inner shaft 63 and the roller outer cylinder 62 to prevent any circumferential displacement therebetween when the roller assembly 6 is rotated.

[0033] In the description of the present application, it is to be understood that terms such as "circumferential", "axial", "longitudinal", "length", "upper", "lower", "front", "rear", "left", "right", "top", "bottom", "inner", and "outer" should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present application be constructed or operated in a particular orientation, thus cannot be construed to limit the present application.

[0034] As shown in Figs. 1, 2, 3 and 8, the roller drive gear 203 is provided on the cleaning box 1, and is connected with the roller assembly 6. The roller drive gear 203 may transmit external power to the entire roller assembly 6, such that the roller assembly 6 is rollable.

[0035] In the filter screen cleaning module 100 according to the embodiment of the present application, the cleaning box 1 has a cleaning cavity 101, providing the roller assembly 6 with a space for the whole roller assembly 6 to move and an efficient connection position, such that the roller assembly 6 is relatively stable when rolling, with a small position offset and the roller assembly 6 may cooperate with other components subsequently better after driving the filter screen 400 to move.

[0036] On the other hand, when the filter screen cleaning module 100 performs dedusting, the roller assembly 6 preliminarily rinses on the filter screen 400 to some extent, and the scattered dust may fall into the cleaning box 1.

[0037] The roller assembly 6 is fixed on the two side walls of the cleaning box 1, and may roll stably with respect to the cleaning box 1. When the roller assembly 6 is rolling, the filter screen 400 is driven to move, such that different parts of the filter screen 400 may be moved to the filter screen cleaning module 100 to be cleaned.

[0038] The roller inner shaft 63 serves as a rotating shaft of the roller assembly 6, and the rotating shaft is fitted over the roller outer cylinder 62 to drive the filter screen 400 to move. The outer roller 62 of the roller supports, guides and buffers the filter screen 400 to some extent, increases a contact area of the filter screen 400 and the roller assembly 6 due to movement, and increases an acting force for driving the filter screen 400 to move.

[0039] The arrangement of the rotation limiting structure 64 between the roller outer cylinder 62 and the roller

inner shaft 63 may increase the limit therebetween effectively, avoid a circumferential displacement therebetween generated when the filter screen 400 is rotated and transmitted, also avoid an excessive friction force with the filter due to a large rotational speed, and stabilize the roller assembly 6 when rolling as a whole.

[0040] The roller drive gear 203 is arranged separately from the roller assembly 6, which may increase the ease of assembly of the roller drive gear 203 and the roller assembly 6, reduce the occupied space inside the cleaning box 1, and increase the available cleaning space of the filter screen 400.

[0041] In some embodiments of the present application, as shown in Fig. 10, a rotation limiting groove 641 is arranged on an outer peripheral wall of the roller inner shaft 63, a rotation limiting projection 642 is arranged on an inner peripheral wall of the roller outer cylinder 62, and the rotation limiting projection 642 is inserted and fitted in the rotation limiting groove 641. The rotation limiting groove 641 and the rotation limiting projection 642 form a rotation limiting structure 64 which improves the assembly position fixity between the roller inner shaft 63 and the roller outer cylinder 62, and prevents the circumferential slide between the roller inner shaft 63 and the roller outer cylinder 62 to avoid the circumferential displacement.

[0042] Certainly, in some other examples, the rotation limiting projection 642 is arranged on the outer peripheral wall of the roller inner shaft 63, and the rotation limiting groove 641 is arranged on the roller outer cylinder 62.

[0043] In some other examples, a slot is arranged on one of the roller inner shaft 63 and the roller outer cylinder 62, and an elastic buckle is arranged on the other of the roller inner shaft 63 and the roller outer cylinder 62 correspondingly. The elastic buckle is inserted into the slot to form a limit.

[0044] In some other examples, an adhesion structure is adopted between the roller outer cylinder 62 and the roller inner shaft 63 to limit the rotation. The roller outer cylinder 62 and the roller inner shaft 63 are adhered together, and the adhesive structure here is configured as a rotation limiting structure 64.

[0045] Advantageously, the rotation limiting groove 641 extends in an axial direction of the roller inner shaft 63, and is open at both axial ends of the roller inner shaft 63. The rotation limiting groove 641 with a certain length may further improve the cooperation stability between the rotation limiting groove 641 and the rotation limiting projection 642. In addition, the rotation limiting groove 641 plays a guiding role to some extent, such that the roller inner shaft 63 and the roller outer cylinder 62 are easy to assemble. That is, when the roller inner shaft 63 and the roller outer cylinder 62 which are designed separately are assembled along the axial direction, the rotation limiting groove 641 at the end is in butt joint with the rotation limiting projection 642 firstly, and then the roller outer cylinder 62 may be fitted inwards in the extending direction of the rotation limiting groove 641.

[0046] Optionally, the outer wall of the roller inner shaft 63 is provided thereon with a plurality of rotation limiting grooves 641, and the inner wall of the roller outer cylinder 62 is provided thereon with a plurality of rotation limiting projections 642 correspondingly. The cooperation of the plurality of rotation limiting structures 64 greatly improves the internal rotation limiting location fit.

[0047] In some embodiments of the present application, as shown in Fig. 10, the roller inner shaft 63 is formed in a hollow cylindrical shape. The hollow cylindrical design saves materials and makes the roller assembly 6 light in weight, which consumes less power during rotation, saves power resources, and is easily driven.

[0048] Certainly, in some other examples of the present application, the roller inner shaft 63 may also be configured as a solid cylinder which is more durable.

[0049] In some embodiments of the present application, as shown in Figs. 8 and 10, the roller assembly 6 further includes: a filter screen drive gear 61, connected at the end portion of the roller inner shaft 63, for engaging with the filter screen 400 to drive the filter screen 400 to move. The engaging movement is realized between the filter screen drive gear 61 and the filter screen 400, which facilitates the mutual driving therebetween. The filter screen 400 is moved by a distance stably in unit time during the engaging movement, without offset. By the cooperation of the filter screen drive gear 61 and the roller outer cylinder 62 with the filter screen 400, the filter screen 400 may be moved with the filter screen drive gear 61 and the roller outer cylinder 62 to a greater extent, with better coordination, and no abnormal noise generated due to the movement misalignment. The filter screen 400 and the roller assembly 6 are sprayed with or immersed in the washing liquid, which is favorable for rinsing to remove dust on the surface, preventing dust from flying and increasing the degree of cleanliness.

[0050] In some embodiments of the present application, as shown in Figs. 3, 8, 10 and 13, the number of filter screen drive gears 61 is two, and the two filter screen drive gears 61 are detachably connected at two ends of the roller inner shaft 63, which facilitates the assembly of the filter screen drive gears 61 on the roller inner shaft 63, and may improve the stability when the roller inner shaft 63 is rotated.

[0051] Advantageously, as shown in Fig. 10, corresponding to the above-mentioned solution of the arrangement of two filter screen drive gears 61, the roller outer cylinder 62 has a cylindrical shape which is open at both ends. A certain space is reserved at both ends of the cylinder to facilitate installation of the filter screen drive gear 61.

[0052] Optionally, as shown in Fig. 10, a part of the peripheral wall of the roller inner shaft 63 is recessed inwards to form the rotation limiting groove 641 (the rotation limiting groove 641 is configured as a structure fitted with the above-mentioned rotation limiting projection 642), and the portion of the inner peripheral wall of the roller inner shaft 63 forming the rotation limiting

groove 641 is configured as an inner projection. Correspondingly, the filter screen drive gear 61 is provided thereon with an insertion portion 611 inserted in the roller inner shaft 63, and the insertion portion is snapped on the inner projection 631. The insertion portion 611 is inserted in the roller inner shaft 63, such that the connection between the filter screen drive gear 61 and the roller inner shaft 63 is enhanced.

[0053] Specifically, as shown in Fig. 10, the insertion portion 611 is provided thereon with a socket 612 in the axial direction, and the socket 612 is snapped on the inner projection 631, which prevents the insertion portion 611 from rotating relative to the roller inner shaft 63, and prevents the filter screen drive gear 61 from being idling. The filter screen drive gear 61 is ensured to effectively drive the roller inner shaft 63 to rotate and to avoid circumferential misalignment. In addition, the synchronously rotating filter screen drive gear 61, the roller inner shaft 63 and the roller outer cylinder 62 may reduce the misalignment of the filter screen 400 when driving the filter screen 400 to move.

[0054] In some embodiments, as shown in Figs. 10 and 13, an outer end of the filter screen drive gear 61 protrudes to form the transmission shaft 613, and a first flat position 614 is formed on the transmission shaft 613 at one end of the filter screen drive gear 61 connected with the roller drive gear 203. Correspondingly, a connecting hole fitted with the first flat position 614 is formed inside the shaft on the roller drive gear 203. The first flat position 614 may enhance the transmission relation between the roller drive gear 203 and the filter screen drive gear 61, preventing the roller drive gear 203 from being idling without driving the filter screen drive gear 61 to rotate. The roller drive gear 203 transmits the external power onto the filter screen drive gear 61 of the roller assembly 6 to drive the whole roller assembly 6 to roll. The feature defined with "first" and "second" may include one or more of this feature explicitly or implicitly, for distinguishing between described features, regardless of order and importance.

[0055] Advantageously, as shown in Figs. 1, 3 and 13, a connecting port 108 is arranged on an upper portion of each of the two side walls of the cleaning box 1 respectively, and the transmission shaft 613 of the filter screen drive gear 61 is fitted in the connecting port 108. The connecting port 108 provides stable support for the rolling movement of the roller assembly 6, preventing the roller inner shaft 63 from shaking.

[0056] Optionally, as shown in Figs. 3 and 13, the upper portion of the connecting port 108 is open to form a connecting groove 109 for conveniently mounting the roller assembly 6 into the connecting port 108 integrally.

[0057] During installation, the filter screen drive gears 61 on both sides are mounted to two ends of the roller inner shaft 63 respectively to form an integral connection, and then the transmission shaft 613 of the filter screen drive gear 61 on one side is mounted in the connecting port 108, afterwards, the transmission shaft 613 of the

filter screen drive gear 61 on the other side is mounted downwards from the connecting groove 109 into the other connecting port 108, and finally, the roller drive gear 203 is aligned with the first flat position 614 of the transmission shaft 613, to be mounted on a side of the cleaning box 1.

[0058] In some embodiments of the present application, as shown in Figs. 8 and 10, the roller outer cylinder 62 as a whole is configured as a flexible member. Herein, when the flexible roller outer cylinder 62 contacts with the filter screen 400, the filter screen 400 may be protected effectively, so as to prevent the filter screen 400 from being scratched during transmission. In addition, the flexible contact and friction between the roller outer cylinder 62 and the filter screen 400 may increase the cleanliness of the filter screen 400. Especially when the filter screen 400 and the roller outer cylinder 62 are sprayed with or immersed in the washing liquid, the relative movement therebetween may also realize the rinsing effect to some extent.

[0059] Optionally, the roller outer cylinder 62 has a Shore hardness of 30 to 70, ensuring smooth movement of the filter screen 400 and reducing abnormal noise during the movement.

[0060] Optionally, as shown in Fig. 10, the roller outer cylinder 62 is provided thereon with a plurality of flexible edges 621. The flexible edges 621 may further enhance the rolling friction force and the degree of contact fit between the roller outer cylinder 62 and the filter screen 400.

[0061] Advantageously, the flexible edges 621 extend in the axial direction of the roller assembly 6, and are disposed in one-to-one correspondence to the teeth on the filter screen drive gear 61. In this way, the filter screen 400 is driven by the filter screen drive gear 61 and the roller outer cylinder 62, and the rib-like protrusion 401 on the filter screen 400 is snapped in the groove between the flexible edges 621, such that the filter screen 400 is not offset in the left and right direction when rotating, and is synchronous with the roller assembly 6 when rotating.

[0062] Optionally, as shown in Figs. 4 and 10, the flexible edges 621 are disposed in one-to-one correspondence to the teeth of the filter screen drive gear 61. As such, the entire filter screen 400 may be provided thereon with the rib-like protrusion 401 in the axial direction, which is engaged with the flexible edge 621 and the filter screen drive gear 61, so as to further enhance the coordination of movement between the roller assembly 6 and the filter screen 400.

[0063] In some embodiments of the present application, as shown in Figs. 3 and 13, a filter screen raceway 65 is provided below the roller assembly 6, the filter screen raceway 65 half surrounding the lower portion of the roller assembly 6 and being formed as a curved plate. The middle of the filter screen raceway 65 is hollowed out, with a contact gap. The filter screen raceway 65 may guide the movement of the filter screen 400, such that the filter screen 400 may return to a filter position in time after washed. The hollow design easily forms better contact between the lower portion of the roller assembly 6

and the screen brush assembly 3 as well as the filter screen 400 rotated to the lower portion and the screen brush assembly 3 to facilitate dust removal.

[0064] In some embodiments of the present application, as shown in Figs. 3 and 12, the shaft hole 104 is arranged on the wall of the cleaning box 1. As shown in Figs. 3-9, the screen brush assembly 3 is rollably connected between the two opposite box walls of the cleaning box 1, for removing impurities on the filter screen 400. The screen brush assembly 3 may be located in the cleaning cavity 101, or above the cleaning cavity 101. The end hole 301 is arranged on at least one end surface of the screen brush assembly 3.

[0065] As shown in Figs. 3, 5 to 9, the screen brush drive gear 4 is located outside the cleaning box 1 to connect a power source, and is coaxially provided with the screen brush connecting shaft 410 which passes through the shaft hole 104 into the end hole 301 and is rotated synchronously with the screen brush assembly 3. Driven by the power source, the screen brush drive gear 4 is rotated, and the power is transmitted onto the screen brush connecting shaft 410 and the screen brush assembly 3 successively to provide continuous power for the rolling movement of the screen brush assembly 3.

[0066] In some embodiments of the present application, as shown in Figs. 6 and 7, the screen brush connecting shaft 410 is provided thereon with an elastic buckle 411 snapped in the end hole 301. The elastic buckle 411 has a certain elastic deformation force, which facilitates the insertion into and detachment from the end hole 301, thereby facilitating the disassembly and assembly of the screen brush drive gear 4 and the screen brush assembly 3.

[0067] In some embodiments of the present application, as shown in Figs. 6 and 7, the screen brush connecting shaft 410 is provided with a second flat position 412, and the end hole 301 is formed in a shape matching the screen brush connecting shaft 410. The arrangement of the second flat position 412 may increase the fitness of the screen brush connecting shaft 410 and the end hole 301, and better realize the limit to the screen brush connecting shaft 410, avoiding the situation where the screen brush connecting shaft 410 is rotated without driving the screen brush assembly 3 to rotate, which facilitates the transmission of the power and the stable rotation of the screen brush assembly 3.

[0068] In some examples of the present application, the screen brush connecting shaft 410 is provided thereon with the above-mentioned elastic buckle 411 and the second flat position 412 at the same time. When the screen brush drive gear 4 with the second flat position 412 is pushed from the shaft hole 104 and the end hole 301, the elastic buckle 411 is buckled up on the inner end surface of the screen brush assembly 3, such that the axial endplay of the screen brush assembly 3 when rolling is limited.

[0069] In some embodiments of the present application, as shown in Figs. 3-9, the screen brush assembly

3 includes: a screen brush inner shaft 310 and a screen brush body 320.

[0070] The two ends of the screen brush inner shaft 310 are connected between the two opposite side walls of the cleaning box 1, and the end hole 301 is disposed on the end surface of the screen brush inner shaft 310.

[0071] The screen brush body 320 is disposed on the peripheral wall of the screen brush inner shaft 310, for contacting the filter screen 400. The screen brush body 320 directly contacts the filter screen 400, for better cleaning the filter screen 400.

[0072] Advantageously, the screen brush body 320 is formed in a cylindrical shape, and the screen brush inner shaft 310 is fitted over the screen brush body 320. The cylindrical screen brush body 320 is easily disassembled from and assembled with the screen brush inner shaft 310 and is replaced conveniently.

[0073] Advantageously, the screen brush body 320 is formed in a sheet-like shape and wrapped around the peripheral wall of the screen brush inner shaft 310 after bent, which facilitates manufacturing, makes the connection between the assembled screen brush body 320 and the screen brush inner shaft 310 closer, and avoids the offset of the screen brush body 320 on the screen brush inner shaft 310 when the screen brush assembly 3 is rolling.

[0074] Specifically, the screen brush body 320 is configured as a layer of carpet with filament fiber, and is connected with the screen brush inner shaft 310 integrally by adhesive.

[0075] Optionally, the screen brush body 320 may also be configured as a flexible cylinder with a layer of filament, and the screen brush inner shaft 310 is fitted over the flexible cylinder.

[0076] Optionally, the screen brush body 320 may also be configured as a cleaning body with smooth fine bristles on the surface.

[0077] In some embodiments of the present application, as shown in Figs. 6 and 7, the screen brush inner shaft 310 includes a lower cover 311 of the inner shaft and an upper cover 312 of the inner shaft.

[0078] The lower cover 311 of the inner shaft is formed in an elongated shape, the lower cover 311 of the inner shaft is provided thereon with a notch 302 of the inner shaft, and one end of the lower cover 311 of the inner shaft is formed with a mating shaft 304.

[0079] Correspondingly, the upper cover 312 of the inner shaft is formed in an elongated shape, the upper cover 312 of the inner shaft is disposed at the notch 302 of the inner shaft, and the upper cover 312 of the inner shaft is fitted with the other end of the lower cover 311 of the inner shaft to form the end hole 301.

[0080] The screen brush connecting shaft 410 passes through the lower cover 311 of the inner shaft and is connected with the upper cover 312 of the inner shaft.

[0081] The elongated lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft are fitted integrally to support the screen brush body 320 together.

[0082] Since the screen brush inner shaft 310 supports the screen brush body 320 to clean the filter screen 400, and the screen brush inner shaft 310 is subjected to a relatively large tangential force and a bending moment, it is necessary to strengthen the structural strength and rigidity of the screen brush inner shaft 310. The screen brush inner shaft 310 is divided into the lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft which are connected with each other to improve the structural strength and rigidity of the screen brush inner shaft 310, and a reinforcing structure, such as a reinforcing rib, is processed on the lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft much more easily. In addition, the lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft which are separately designed enable the screen brush connecting shaft 410 to be snapped at a desired position more easily, thereby facilitating the reliability of the overall assembly.

[0083] Optionally, the lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft are integrally formed in a detachable connection manner, such as an engagement hole, a screw, or the like.

[0084] Optionally, the lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft are integrally formed by welding (such as ultrasonic welding) and gluing.

[0085] Optionally, as shown in Fig. 3, a shaft hole 104 is arranged on each of the two opposite side walls of the cleaning box 1, the matching shaft 304 is inserted into one of the shaft holes 104, and the screen brush connecting shaft 410 is fitted and connected in the other shaft hole 104, such that the screen brush assembly 3 is stably connected on the cleaning box 1 to avoid shaking during the cleaning operation.

[0086] In some advantageous implementations of the present application, as shown in Figs. 6 and 7, an anti-rotation block 305 is arranged at each of two ends of the upper cover 312 of the inner shaft in the longitudinal direction, and the inner wall of the notch 302 of the inner shaft is provided thereon with the corresponding anti-rotation groove 303. The anti-rotation block 305 and the anti-rotation groove 303 are fitted to further increase the limit between the lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft, such that the lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft are less likely to rotate after assembled.

[0087] In some embodiments of the present application, as shown in Figs. 9 and 12, the cleaning box 1 is provided thereon with a water inlet 105 and a water outlet 106. When water cleaning is performed, the washing liquid may be introduced from the water inlet 105, and the waste liquid after washing is discharged outwards from the water outlet 106.

[0088] Specifically, the water outlet 106 which is communicated with the cleaning cavity 101 is arranged at the bottom of the cleaning box 1. The water outlet 106 at the bottom facilitates the discharge of water in the cleaning

cavity 101 under gravity.

[0089] Certainly, in some embodiments of the present application, no water inlet 105 may be arranged on the cleaning box 1, but water is sprayed downwards directly from above the cleaning box 1 against the roller assembly 6 and the filter 200, which is also included in the protection scope of the present application.

[0090] When the filter screen cleaning module 100 performs rinsing, the cleaning cavity 101 may accommodate dripping water, and may also store a part of the water to prevent the water from splashing around during the rinsing. After the water stored in the cleaning cavity 101 reaches a certain depth, the roller assembly 6 and the filter screen 400 may be immersed in water to perform rinsing. Optionally, the water inlet 105 is disposed toward the screen brush assembly 3, and the screen brush assembly 3 is disposed at an upper portion of the cleaning cavity 101. At this point, water may be sprayed from the water inlet 105 to the side surface of the screen brush assembly 3, so as to wet the screen brush assembly 3, clean off the dust on the screen brush assembly 3, and improve the ability of the screen brush assembly 3 to clean the filter screen 400.

[0091] Optionally, the water inlet 105 is disposed at an upper portion of the cleaning cavity 101 and water is sprayed toward the screen brush assembly 3. At this point, the water in the water inlet 105 is sprayed from the upper portion onto the screen brush assembly 3, and the clean water is first sent to the contact portion of the screen brush assembly 3 and the filter screen 400, greatly improving the ability of cleaning the filter screen 400 (filter screen 400, as shown in Fig. 4).

[0092] Optionally, at least a portion of the screen brush assembly 3 is immersed within the cleaning cavity 101. When the portion of the screen brush assembly 3 is immersed in the cleaning cavity 101, dirty water on the screen brush assembly 3 may fall in the cleaning cavity 101 accurately, without spilling. In addition, when the water level in the cleaning cavity 101 rises to the screen brush assembly 3, the screen brush assembly 3 immersed in the water may be washed again.

[0093] Optionally, the water inlet 105 is disposed toward the screen brush assembly 3, and the screen brush assembly 3 is immersed in the cleaning cavity 101. When the water level in the cleaning cavity 101 rises high and the top of the screen brush assembly 3 is immersed, the screen brush assembly 3 may be washed in all directions.

[0094] In some embodiments of the present application, as shown in Figs. 3, 4 and 12, a dedusting member 5 is arranged below the screen brush assembly 3, and is provided thereon with a toothed plate which is in contact with the screen brush assembly 3. Comb teeth 51 are provided on the toothed plate, and both ends of the dedusting member 5 are snapped in the cleaning box 1. The dedusting member 5 may comb the impurities, such as hair on the cleaning box 1, into the cleaning cavity 101, thereby increasing the cleaning effect of the screen brush assembly 3.

[0095] In some embodiments of the present application, as shown in Figs. 3, 11, and 12, a fixed position is arranged on the inner wall of the cleaning cavity 101 in the cleaning box 1, and the chip filter member 8 is located below the dedusting member 5. The chip filter member 8 is provided thereon with a grating plate 81 for blocking the flow of impurities in the water toward the water outlet 106. The chip filter member 8 is provided thereon with a snap-in portion 83 snapped at a fixed position. The chip filter member 8 may filter impurities in the dirty water from the screen brush assembly 3, such as hair, to prevent impurities from clogging the water outlet 106.

[0096] Optionally, as shown in Fig. 11, the snap-in portion 83 is configured as an elastic fastener, and each of the two opposite sides of the chip filter member 8 is provided with the elastic fastener. Correspondingly, the inner wall of the cleaning cavity 101 is also provided with two fixed positions which cooperate with the snap-in portion 83. The elastic fastener is easy to mount and has a certain elastic restoring force. After the chip filter member 8 is mounted in the cleaning cavity 101, the elastic force of the elastic fastener may also support the inner wall of the cleaning box 1, effectively preventing the chip filter member 8 from shaking.

[0097] Optionally, as shown in Fig. 11, the chip filter member 8 further includes: a top guide plate 82, disposed obliquely, connected above the grating plate 81, and contacting the inner wall of the cleaning cavity 101 on all four sides in the circumferential direction. The inclined top guide plate 82 may guide the dirty water after the screen brush assembly 3 is washed, such that the dirty water flows downwards along the top guide plate 82 to prevent the dirty water from splashing around in the cleaning cavity 101.

[0098] In addition, as shown in Fig. 11, the top guide plate 82 is provided with a water hole 84 penetrating therethrough vertically. The water hole 84 may introduce the dirty water from the top guide plate 82 to the grating plate 81.

[0099] Optionally, as shown in Figs. 11 and 12, the grating plate 81 includes three sections which are connected foldably, wherein the two sections are located directly below the top guide plate 82 and form the bottom wall of the chip filter member 8, and the third section is bent upwards from the bottom wall of the chip filter member 8 to connect the top guide plate 82. The two sections of the grating plate 81 forming the bottom wall extend downwards in a direction towards each other, and the water outlet 106 is located below a joint of the two sections of the grating plate 81 forming the bottom wall. The water filtered by the grating plate 81 is collected to the water outlet 106 and then discharged.

[0100] Optionally, as shown in Fig. 11, a plurality of connecting plates 86 are connected between the top guide plate 82 and the grating plate 81. A cutout is provided on the connecting plate 86, and the snap-in portion 83 is connected on the inner wall of the cutout. The connecting plate 86 enhances the structural strength of the

chip filter member 8 as a whole, preventing excessive dirty water from directly passing through the side wall of the chip filter member 8.

[0101] Optionally, as shown in Figs. 11 and 12, an abutting block 85 is arranged at the top and bottom of the chip filter member 8 respectively. The top abutting block 85 abuts against the dedusting member 5, and the bottom abutting block 85 abuts against the inner wall of the cleaning box 1.

[0102] Correspondingly, the cleaning box 1 is provided therein with a support wall 107 fitted with the two sections of the grating plate 81 at the bottom, and the bottom abutting block 85 abuts against the support wall 107.

[0103] In some embodiments of the present application, as shown in Figs. 1, 2, 3, and 8, a cleaning motor 201 is used as the power source, the cleaning motor 201 drives the first transmission gear 71 to rotate, the first transmission gear 71 drives the second transmission gear 72 to rotate, and the second transmission gear 72 simultaneously drives the screen brush drive gear 4 and the roller drive gear 203 to rotate. At the same time, the screen brush drive gear 4 transmits power to the screen brush assembly 3 through the screen brush connecting shaft 410, such that the screen brush assembly 3 is rotated; the roller drive gear 203 drives the filter screen drive gear 61 to rotate coaxially, so as to drive the roller outer cylinder 62, or the like to rotate, and the filter screen 400 is also driven by the filter screen drive gear 61 and the roller outer cylinder 62 to rotate. Therefore, in the contact surface of the filter screen 400 and the screen brush assembly 3, the tangential speeds of the filter screen 400 and the roller outer cylinder 62 are opposite, which facilitates the screen brush assembly 3 to better clean the filter screen 400.

[0104] Certainly, in the present application, two cleaning motors 201 may be provided to drive the roller drive gear 203 and the screen brush drive gear 4 respectively, without other intermediate transmission gears, and no specific limitation is made herein.

[0105] In the above embodiment of the present application, the power assembly 2 includes the above-mentioned cleaning motor 201 and roller drive gear 203.

[0106] Optionally, as shown in Figs. 1, 2 and 3, a gear cover 7 is disposed on the side of the cleaning box 1 to close the power assembly 2, such that each of the gears is in a relatively closed working space to prevent the interference with the gear due to foreign matter caught on the gear.

[0107] In some embodiments of the present application, as shown in Fig. 9, the filter screen cleaning module 100 further includes a water inlet pipe 91, a water pump assembly 92, a water outlet control valve 93, and a drain pipe 94, wherein one end of the water inlet pipe 91 is connected with the water inlet 105, the other end of the water inlet pipe 91 is connected with the water pump assembly 92 for pumping down water from a water container and pumping up the water from the water inlet pipe 91 to the water inlet 105, the outlet control valve 93 is

configured for controlling the water outlet 106 to be open or closed, the water outlet 106 is connected with the drain pipe 94, and water is discharged to a drain port of the water container through the drain pipe 94.

[0108] Optionally, the water outlet control valve 93 is connected with the drain pipe 91, and a water outlet control port of the water outlet control valve 93 is disposed dead against the drain port of the water container.

[0109] An air processing device 1000 according to an embodiment of the present application includes: the above-mentioned filter screen cleaning module 100, and the structure of the filter screen cleaning module 100 is not described herein.

[0110] The air processing device 1000 with the filter screen cleaning module 100 is provided with the roller assembly 6 in the above-mentioned filter screen cleaning module 100, which may not only stably drive the filter screen 400, but also preliminarily wash the filter screen 400. The components work stably during the cleaning operation, no abnormal noise is easily generated, and the filter screen 400 is ensured to be guided and brought to the corresponding position for subsequent cleaning.

[0111] Herein, the air processing device 1000 may be configured as an indoor unit of an air conditioner, or a purifier, or other devices provided with a filter and a dust filter.

[0112] As shown in Fig. 2, in one specific example, the air processing device 1000 is configured as an indoor unit of an air conditioner, the filter screen cleaning module 100 is connected on the chassis 220 of the indoor unit of the air conditioner, and the filter screen cleaning module 100 is located above the drain pan 300 of the indoor unit of the air conditioner.

[0113] Specifically, as shown in Fig. 2, the top of the casing 200 of the indoor unit of the air conditioner has an air inlet 210, and the filter screen 400 is movably disposed at the air inlet 210. The casing 200 includes a chassis for fixing a heat exchanger and a fan.

[0114] As shown in Fig. 2, the chassis 220 includes a back plate 221 and a bottom plate 222, wherein the back plate 221 is arranged in the vertical direction, and the bottom plate 222 is connected in front of the bottom of the back plate 221. A rear end of the drain pan 300 is connected with the a side of the drain pan 300 is connected with the bottom plate 222. The filter screen cleaning module 100 is connected with the back plate 221 and the drain pan 300 respectively.

[0115] The water pump assembly 92 is at the bottom of the filter screen cleaning module 100. The water pump assembly 92 includes a base, a drain port and a suction port, wherein the suction port is disposed at the bottom of the base, and the base is flush with an inner side surface at the bottom of the drain pan 300, which ensures that the water pump assembly 92 may suck water at a lower level in the drain pan 300. The drain port is connected with the water inlet pipe 91. The bottom of the drain pipe 94 is aligned with the drain port on the drain pan 300 for draining water.

[0116] In the present application, the "synchronization" of two moving members means that the two moving members have a certain relative relationship in unit time, the relative change in displacement, or in speed, or in frequency being consistent. More specifically, the "synchronous rotation" of the coaxial rotating members means that the moving direction, the rotational angular velocity, and the time of starting and stopping the rotation of the two moving members are the same.

[0117] For a better understanding of the solution of the embodiment of the present application, the structure of the filter screen cleaning module 100 according to one embodiment of the present application will be described below in conjunction with Figs. 1-13.

[0118] As shown in Fig. 3, a filter screen cleaning module 100 includes: a cleaning box 1, a power assembly 2, a screen brush assembly 3, a screen brush drive gear 4, a dedusting member 5, a roller assembly 6, a gear cover 7, a chip filter member 8, an water inlet pipe 91, a water pump assembly 92, a water outlet control valve 93, and a drain pipe 94.

[0119] Specifically, as shown in Figs. 3, 9 and 12, the cleaning box 1 has a cleaning cavity 101 with an open upper end. The box wall of the cleaning box 1 is provided with a shaft hole 104. A water inlet 105 is arranged at the position of the upper portion of the cleaning box 1 higher than the shaft hole 104. A support wall 107 is arranged at the lower end of the cleaning box 1, and is provided thereon with a downward water outlet 106.

[0120] As shown in Figs. 1 to 4, and Figs. 8, 10 and 13, a connecting port 108 is arranged on each of two opposite side walls at the upper portion of the cleaning box 1. The roller assembly 6 is rollably connected between the two connecting ports 108. The roller assembly 6 includes the filter screen drive gear 61, the roller outer cylinder 62 and the roller inner shaft 63, wherein each of the end portions of the roller inner shaft 63 is connected with one filter screen drive gear 61, the roller inner shaft 63 is fitted over the roller outer cylinder 62, the outer peripheral wall of the roller inner shaft 63 is provided thereon with the rotation limiting groove 641, the inner peripheral wall of the cylindrical roller outer cylinder 62 is provided thereon with the rotation limiting projection 642, and the rotation limiting projection 642 is inserted and fitted in the rotation limiting groove 641. The outer end of the filter screen drive gear 61 protrudes to form the transmission shaft 613 extending into the connecting port 108, and one of the transmission shafts 613 is formed thereon with an axial first flat position 614 which is fitted and connected with the roller drive gear 203. The filter screen drive gear 61 is configured for being engaged with the filter screen 400 to drive the filter screen 400 to move, and the roller outer cylinder 62 is configured for flexibly contacting with the filter screen 400 to drive the filter screen 400 to move for cleaning. The bottom of the filter screen 400 is provided with a rib-like protrusion 401 which cooperates with the filter screen drive gear 61 and the roller outer cylinder 62. As shown in Fig. 3, the filter

screen raceway 65 is provided below the roller assembly 6, half surrounding the lower portion of the roller assembly 6.

[0121] As shown in Figs. 3-9, the screen brush assembly 3 is rollably connected between two opposite side walls of the cleaning box 1, for removing impurities on the filter screen 400. The screen brush assembly 3 includes: the screen brush inner shaft 310 and the screen brush body 320. The screen brush body 320 is disposed on the peripheral wall of the screen brush inner shaft 310, and the screen brush body 320 is configured to contact and clean the filter screen 400. The screen brush inner shaft 310 includes the lower cover 311 of the inner shaft and the upper cover 312 of the inner shaft, which are snapped integrally and connected by screws. One end of the lower cover 311 of the inner shaft is formed with the mating shaft 304, the other end of the lower cover 311 of the inner shaft is fitted with the upper cover 312 of the inner shaft to form an end hole 301, and the mating shaft 304 is inserted into one shaft hole 104.

[0122] As shown in Figs. 3, 5 to 9, the screen brush drive gear 4 is located outside the cleaning box 1 to connect the power source, and is coaxially provided thereon with the screen brush connecting shaft 410. The screen brush connecting shaft 410 passes through another shaft hole 104, extends into the end hole 301 and rotates in synchronization with the screen brush assembly 3.

[0123] As shown in Figs. 3, 4 and 12, a dedusting member 5 is arranged below the screen brush assembly 3, and is provided thereon with a toothed plate which is in contact with the screen brush assembly 3. Comb teeth 51 are provided on the toothed plate, and both ends of the dedusting member 5 are snapped in the cleaning box 1.

[0124] As shown in FIG. 3, FIG. 11, and FIG. 12, a fixed position is arranged on the inner wall of the cleaning cavity 101 in the cleaning box 1, and the chip filter member 8 is located below the dedusting member 5. The chip filter member 8 is provided thereon with a grating plate 81 for blocking the flow of impurities in the water toward the water outlet 106. The chip filter member 8 is provided thereon with a snap-in portion 83 snapped at a fixed position. The lowest portion of the chip filter member 8 is aligned with the water outlet 106. The top abutting block 85 abutting against the dedusting member 5 is arranged on the upper portion of the chip filter member 8, and the bottom abutting block 85 abutting against the support wall 107 is arranged on the lower portion of the chip filter member 8.

[0125] As shown in Fig. 8, the power assembly 2 includes the cleaning motor 201, the roller drive gear 203, and the first and second transmission gears 71 and 72 for drive transmission, wherein the cleaning motor 201 drives the first transmission gear 71 to rotate, the first transmission gear 71 drives the second transmission gear 72 to rotate, and the second transmission gear 72 simultaneously drives the screen brush drive gear 4 and the roller drive gear 203 to rotate.

[0126] As shown in Figs. 1, 2, and 3, the gear cover 7 is disposed at the side of the cleaning box 1 to enclose the power assembly 2 in a space.

[0127] As shown in Fig. 9, one end of the water inlet pipe 91 is connected with the water inlet 105, and the other end of the water inlet pipe 91 is connected with the water pump assembly 92. The water pump assembly 92 is configured for pumping down water from the water container and pumping up water from the water inlet pipe 91 to the water inlet 105. The water outlet control valve 93 is configured for controlling the water outlet 106 to be open or closed, and the water outlet 106 is connected with the drain pipe 94, and water is discharged to a drain port of the water container through the drain pipe 94.

[0128] As shown in Fig. 2, for the air processing device 1000, the indoor unit of the air conditioner is taken as an example. The indoor unit of the air conditioner includes a casing 200, at the top of which, an air inlet 210 is arranged. A movable filter screen 400 is arranged at the air inlet 210. The casing 200 further includes the chassis 220 consisting of the back plate 221 and the bottom plate 222, wherein the back plate 221 is arranged in the vertical direction, and the bottom plate 222 is connected in front of the bottom of the back plate 221. A rear end of the drain pan 300 is connected with the back plate 221, and a side of the drain pan 300 is connected with the bottom plate 222. The filter screen cleaning module 100 is connected with the back plate 221 and the drain pan 300 respectively, and the roller assembly 6 at the top of the filter screen cleaning module 100 is aligned with the filter screen 400.

[0129] In the cleaning work, the power assembly 2 drives the roller drive gear 203 and the screen brush drive gear 4 to rotate, the roller drive gear 203 drives the roller assembly 6 to rotate, the screen brush drive gear 4 drives the screen brush assembly 3 to rotate, and the filter screen 400 follows the roller assembly 6 to rotate and forms a rotational contact surface with the rotating filter assembly 3. The filter screen 400 is rotated on the surface of the roller assembly 6 and is driven in the filter screen raceway 65. The screen brush assembly 3 brushes the dust on the filter screen 400 to its surface, and during the rotation, the dust and hair on the surface are scraped off by the dedusting member 5.

[0130] At the same time, the water pump assembly 92 pumps down water from the drain pan 300, and pumps up water from the water inlet pipe 91 into the water inlet 105, such that the surface of the screen brush assembly 3 is wet and rinsed. The dirty water after washing carries the impurities and hair in the dedusting member 5 to the chip filter member 8, the hair is retained on the chip filter member 8, and the dirty water is discharged from the water outlet 106 to the drain pipe 94 which is aligned with the drain port of the drain pan 300, outside the air conditioner.

[0131] When the filter screen 400 is required to be reset, the cleaning motor 101 in the power assembly 2 is reversed to move the filter screen 400 in the direction

opposite to the washing direction.

[0132] In the description of the present specification, reference throughout this specification to "an embodiment" and "an example" means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present application. In the specification, the schematic expressions to the above-mentioned terms are not necessarily referring to the same embodiment or example. Furthermore, the described particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples.

[0133] Although embodiments of the present application have been shown and illustrated, it shall be understood by those skilled in the art that various changes, modifications, alternatives and variants without departing from the principle and idea of the present disclosure are acceptable. The scope of the present application is defined by the claims and its equivalents.

Claims

1. A filter screen cleaning module, comprising:
 - a cleaning box, having a cleaning cavity;
 - a roller assembly, rollably connected between two opposite side walls of the cleaning box, and comprising: a roller inner shaft and a roller outer cylinder, wherein the roller inner shaft is fitted over the roller outer cylinder, a rotation limiting structure is provided between the roller outer cylinder and the roller inner shaft, and the roller outer cylinder is configured to contact a filter screen to drive the filter screen to move; and
 - a roller drive gear, disposed on the cleaning box and connected with the roller assembly.
2. The filter screen cleaning module according to claim 1, wherein a rotation limiting groove is provided on an outer peripheral wall of the roller inner shaft, a rotation limiting projection is provided on an inner peripheral wall of the roller outer cylinder, and the rotation limiting projection is inserted and fitted in the rotation limiting groove.
3. The filter screen cleaning module according to claim 2, wherein the roller inner shaft is formed in a hollow cylindrical shape, and a part of the peripheral wall of the roller inner shaft is recessed inwards to form the rotation limiting groove.
4. The filter screen cleaning module according to claim 2 or 3, wherein the rotation limiting groove extends in an axial direction of the roller inner shaft, and the rotation limiting groove is open at both axial ends of the roller inner shaft.
5. The filter screen cleaning module according to any one of claims 1 to 4, wherein the roller outer cylinder has a cylindrical shape with two open ends.
6. The filter screen cleaning module according to any one of claims 1 to 5, wherein the roller outer cylinder is configured as a flexible member as a whole.
7. The filter screen cleaning module according to any one of claims 1 to 6, wherein the roller outer cylinder is provided with a plurality of flexible edges.
8. The filter screen cleaning module according to any one of claims 2, 3 and 4, wherein the roller assembly further comprises: a filter screen drive gear connected to an end of the roller inner shaft and configured to be engaged with the filter screen to drive the filter screen to move.
9. The filter screen cleaning module according to claim 8, wherein two filter screen drive gears are provided, and the two filter screen drive gears are detachably connected to two axial ends of the roller inner shaft respectively.
10. The filter screen cleaning module according to claim 8 or 9, wherein when the roller outer cylinder is provided with a plurality of flexible edges, the flexible edges extend in an axial direction of the roller assembly, and the flexible edges are in one-to-one correspondence to teeth on the filter screen drive gear.
11. The filter screen cleaning module according to claim 8, 9 or 10, wherein a portion of an inner peripheral wall of the roller inner shaft forming the rotation limiting groove is configured as an inner projection, the filter screen drive gear is provided with an insertion portion inserted in the roller inner shaft, and the insertion portion is snapped on the inner projection.
12. The filter screen cleaning module according to any one of claims 1 to 11, wherein the cleaning box is provided with a water inlet, and the bottom of the cleaning box is provided with a water outlet in communication with the cleaning cavity.
13. An air processing device, comprising: a filter screen cleaning module according to any one of claims 1 to 12.
14. The air processing device according to claim 13, wherein the air processing device is configured as an indoor unit of an air conditioner, the filter screen cleaning module is connected on a chassis of the indoor unit of the air conditioner, and the filter screen cleaning module is located above a drain pan of the indoor unit of the air conditioner.

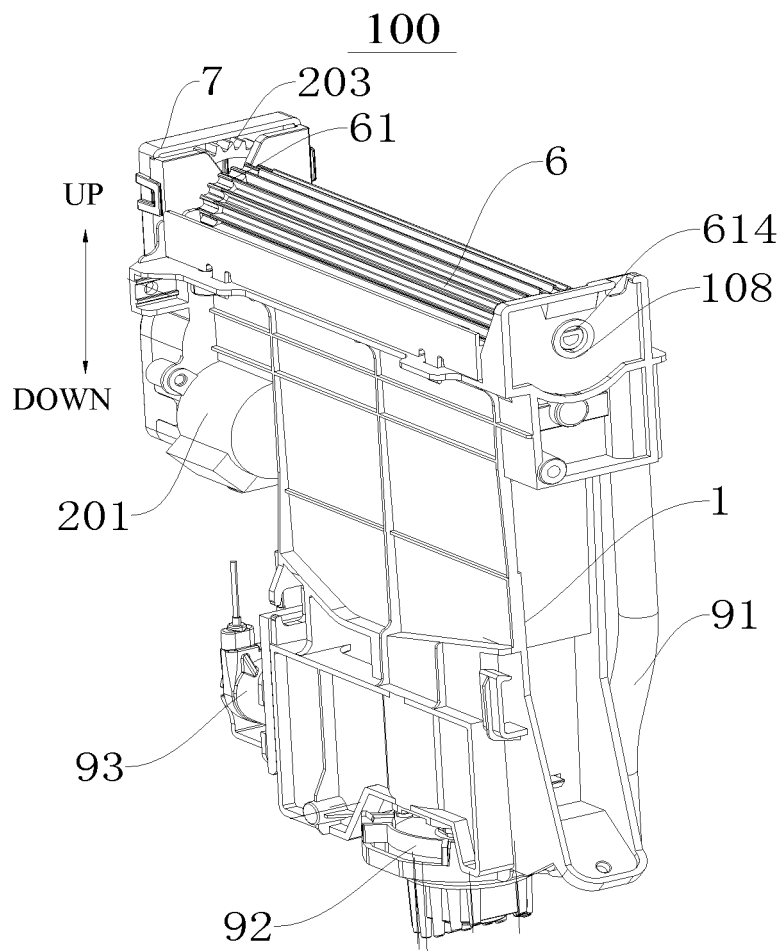


Fig. 1

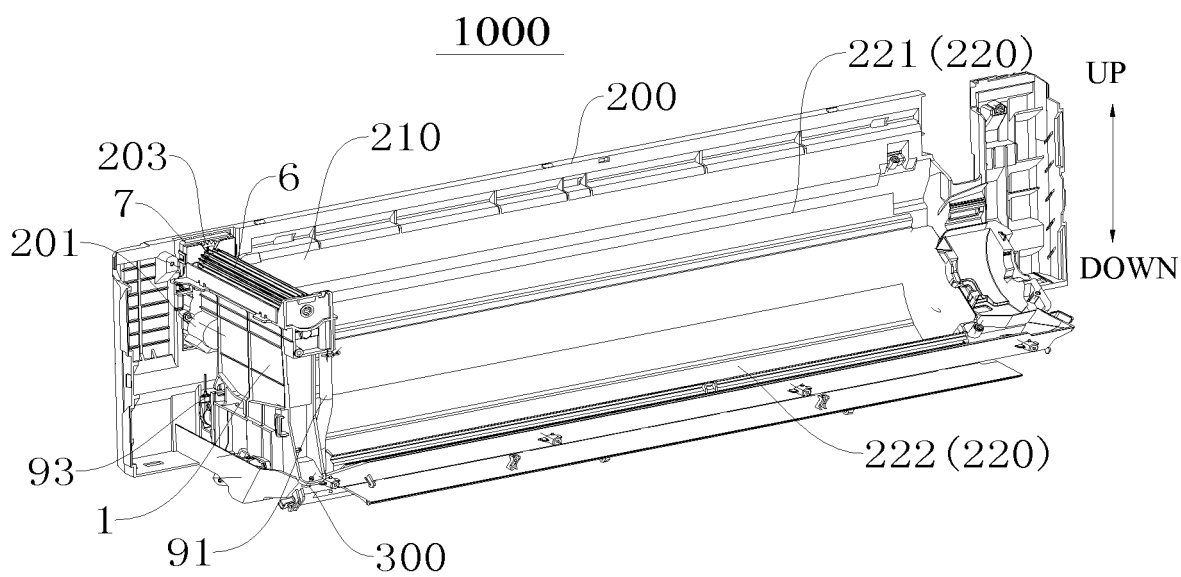


Fig. 2

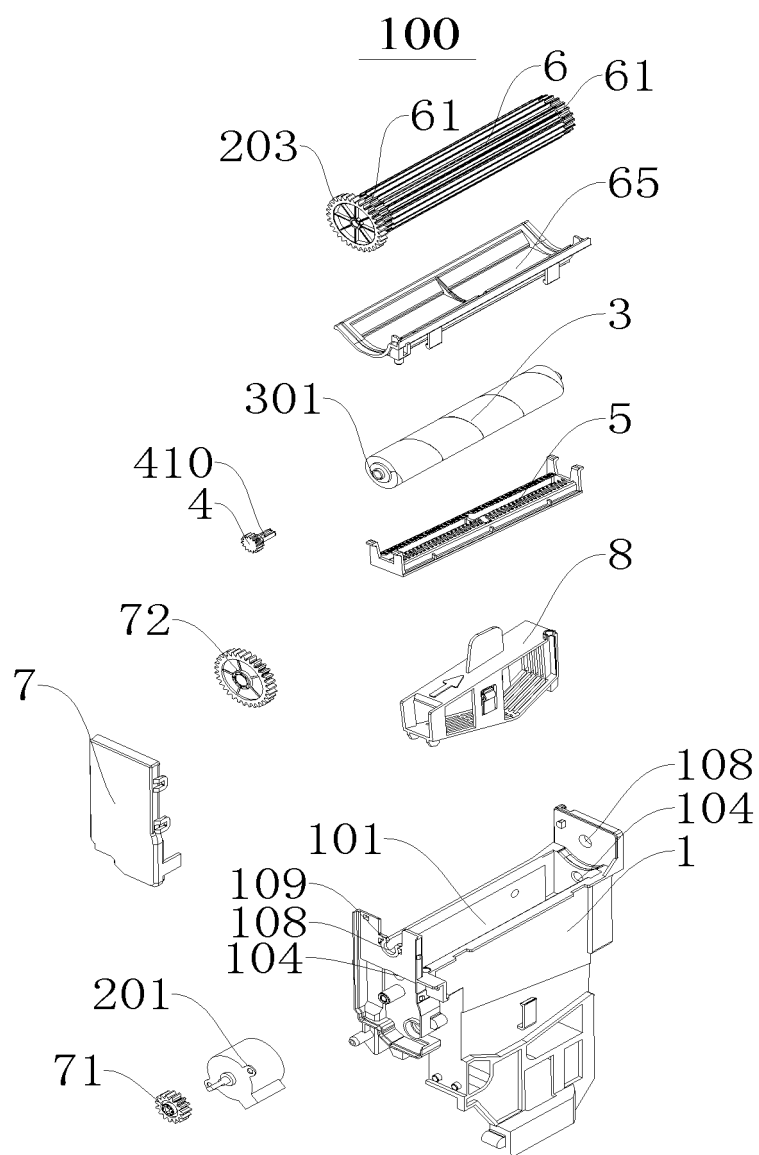


Fig. 3

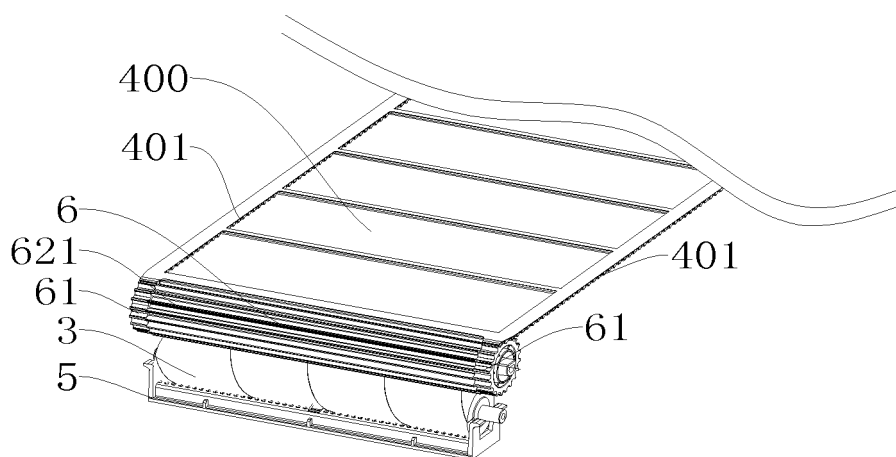


Fig. 4

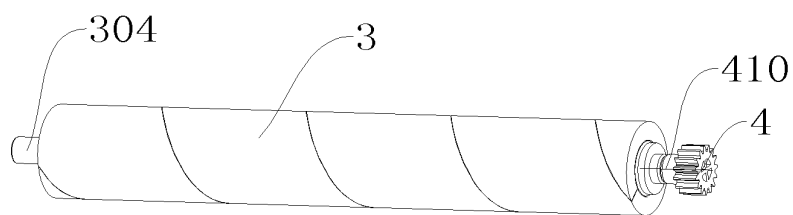


Fig. 5

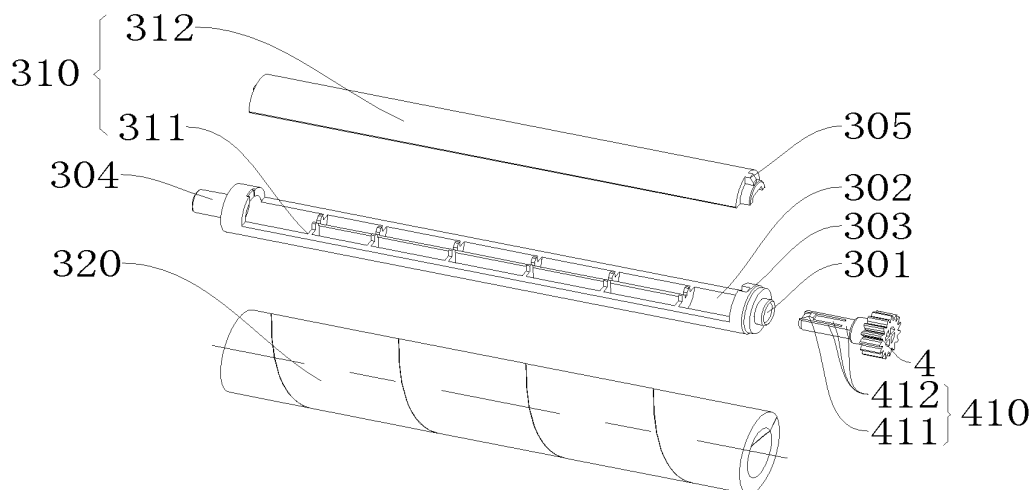


Fig. 6

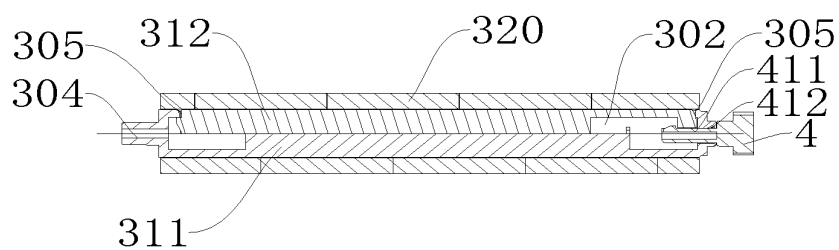


Fig. 7

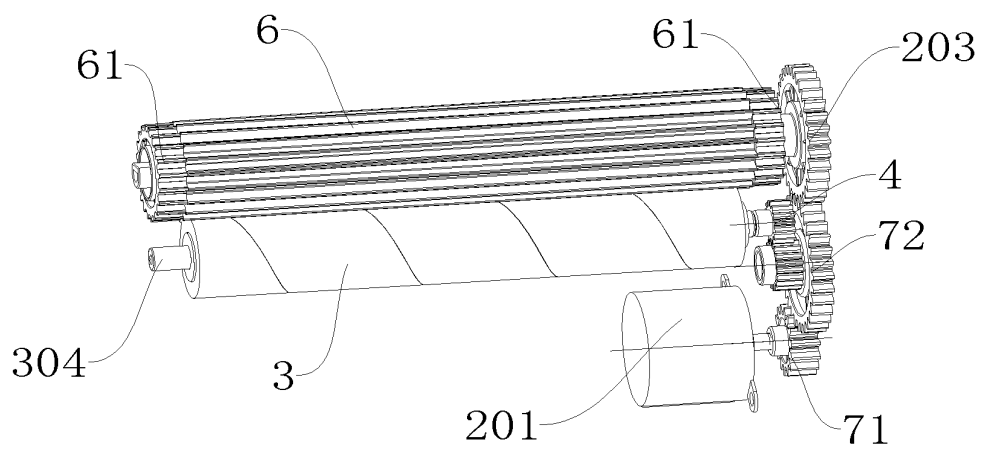


Fig. 8

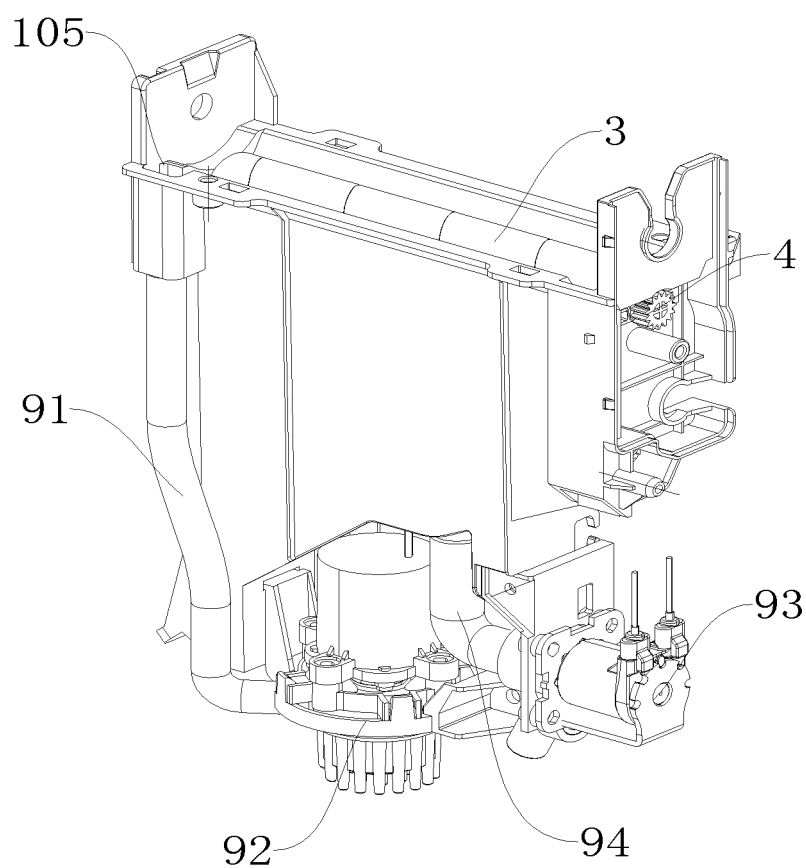


Fig. 9

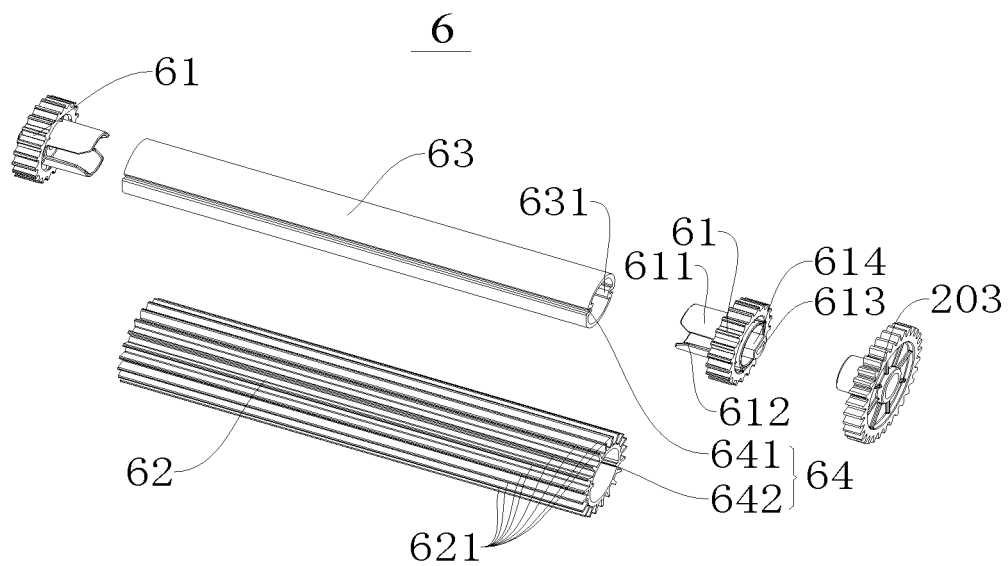


Fig. 10

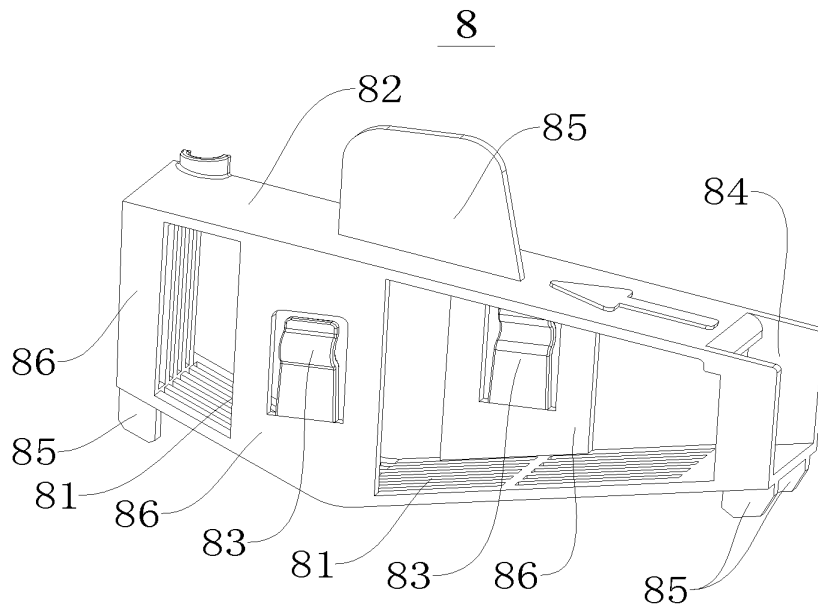


Fig. 11

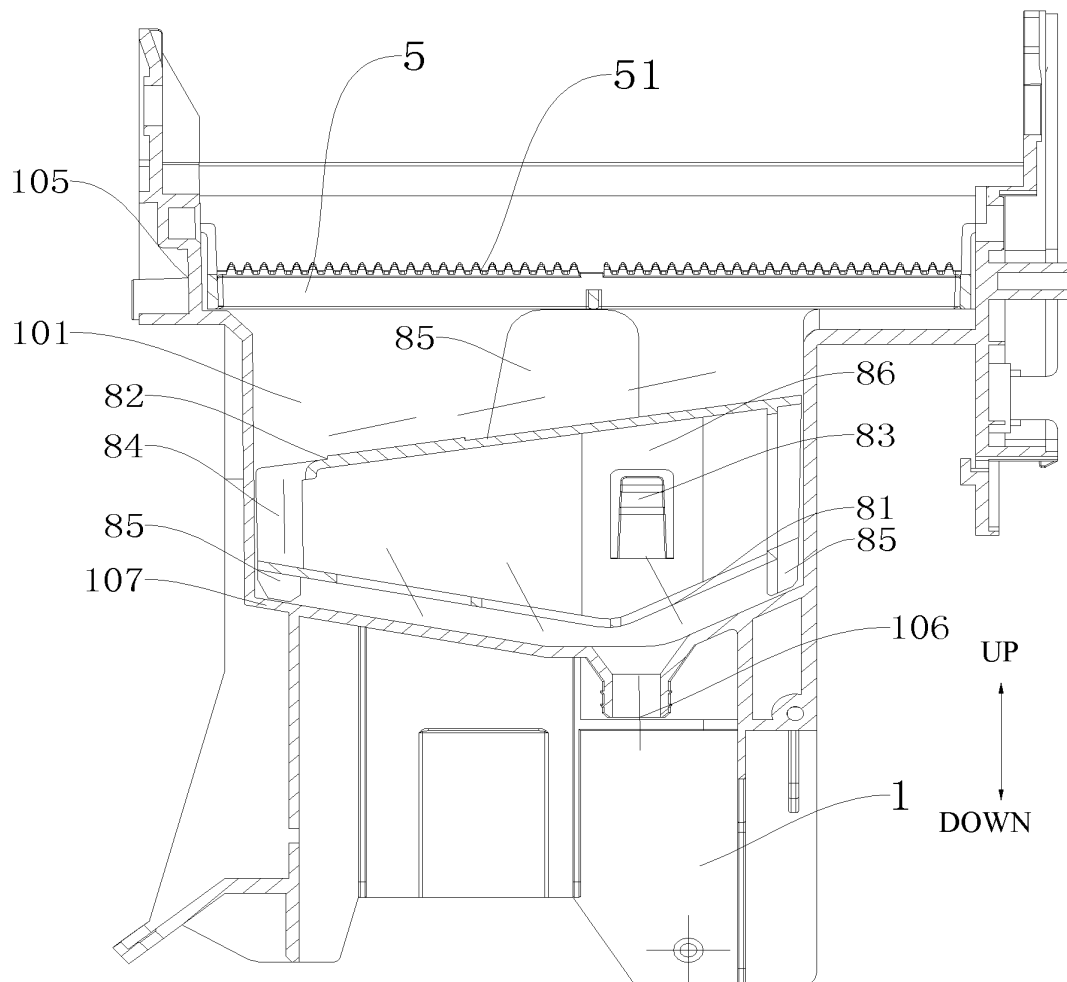


Fig. 12

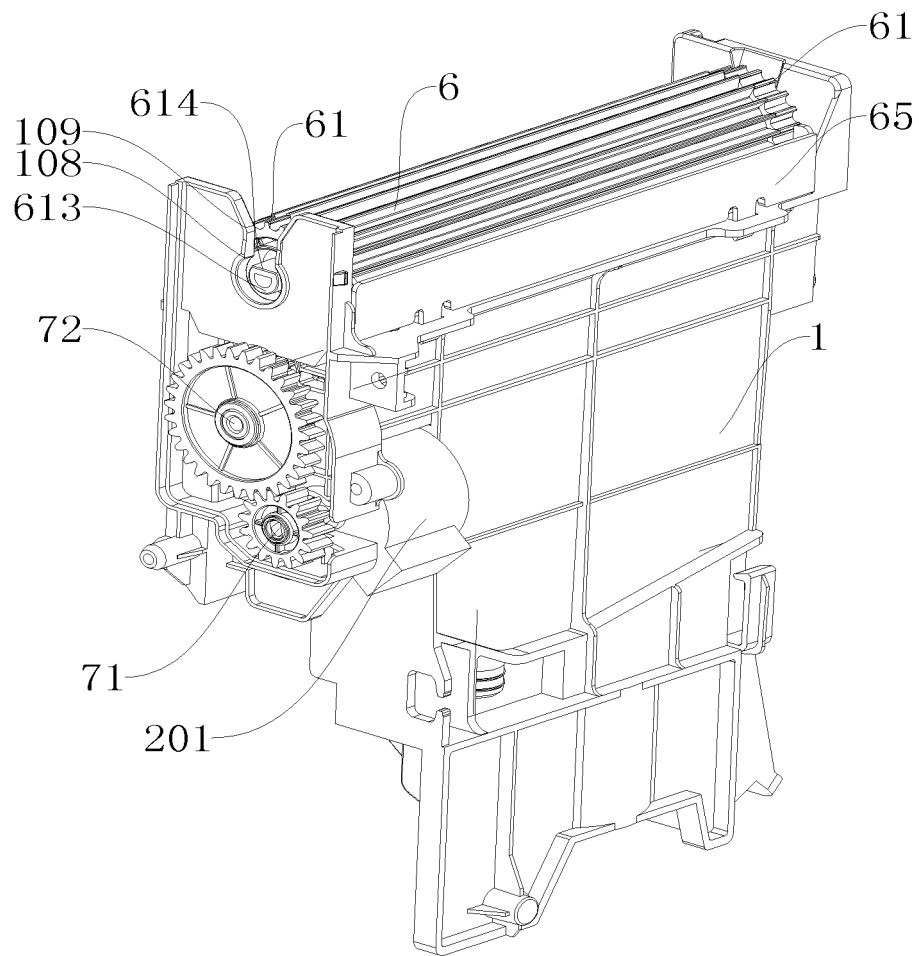


Fig. 13

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/113329

A. CLASSIFICATION OF SUBJECT MATTER

F24F 1/0073(2019.01)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)

F24F1/0073;; F24F1/00710;; F24F1/0071;; F24F13/00;; F24F1/00;; B01D46/10;; B01D46/00;; B08B1/04;; B08B1/00

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)

WPI, CNABS, CNKI: 制冷; 空调; 室内机; 换热器; 清洁; 筒; 套; 滤网; 齿轮; 凹槽; 凸起; 柔性; 接水盘; cool???; indoor?; heat exchanger; clean; drum ; sleeve ; filter; gear; groove; convex; flexibility; drip pan

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 106839123 A (MIDEA GROUP WUHAN REFRIGERATION EQUIPMENT CO., LTD. et al.) 13 June 2017 (2017-06-13) description, paragraphs 0027-0088, and figures 1-10	1-11, 13
X	CN 206730731 U (MIDEA GROUP WUHAN REFRIGERATION EQUIPMENT CO., LTD. et al.) 12 December 2017 (2017-12-12) description, paragraphs 0027-0088, and figures 1-10	1-11, 13
PX	CN 109185987 A (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD. et al.) 11 January 2019 (2019-01-11) description, particular embodiments	1, 5, 12-14
PX	CN 208936301 U (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD. et al.) 04 June 2019 (2019-06-04) description, particular embodiments	1-7, 12-14
PX	CN 208936323 U (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD. et al.) 04 June 2019 (2019-06-04) description, particular embodiments	1, 5, 12-14

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

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“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

07 January 2020

Date of mailing of the international search report

05 February 2020

Name and mailing address of the ISA/CN

China National Intellectual Property Administration
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INTERNATIONAL SEARCH REPORT

International application No.

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