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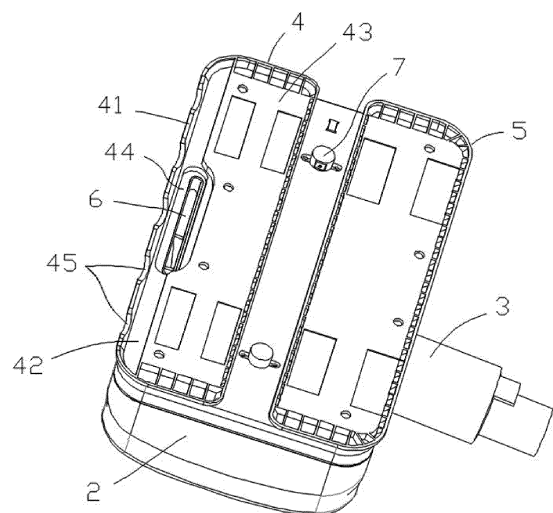
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(54) **DUST COLLECTOR BRUSH HEAD AND DUST COLLECTION METHOD**

(57) The present invention provides a vacuum cleaner brush head and a dust collection method. The vacuum cleaner brush head includes a brush head body, a front wiping plate, a rear wiping plate, a wiping plate driving device, and a water spraying assembly; a dust collection pipe is provided in the brush head body; the dust collection pipe has a dust collection port formed on the front side of the bottom of the brush head body; a water spraying port of the water spraying assembly is provided on the bottom of the brush head body and located between the front wiping plate and the rear wiping plate; the wiping plate driving device is transmittingly connected to the front wiping plate and the rear wiping plate, and is configured to drive the front wiping plate and the rear wiping plate to move reciprocally in opposite directions; the front wiping plate is provided with a dust passing hole penetrating the upper and lower ends thereof, and the dust passing hole is located below the dust collection port, and is configured to keep the dust collection port overlapping the dust passing hole when moving reciprocally along with the front wiping plate. Therefore, the all-in-one cleaning function of dust collection, dry wiping and wet wiping is implemented; and compared with the prior art, the vacuum cleaner brush head can give consideration to the thorough cleaning of multiple types of garbage, thereby significantly increasing the operation area and improving the operation efficiency and cleaning effect of dust collection cleaning of the vacuum cleaner brush head.



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Description

Technical Field

[0001] The present application relates to the field of vacuum cleaners, and in particular, to a vacuum cleaner brush head and a dust collection method.

Background

[0002] Vacuum cleaner is a cleaning device that uses negative pressure to generate suction to remove dirt, and has been used more and more widely. In the prior art, it is difficult to completely remove the dust on the surface of an object to be cleaned by means of suction alone. In order to improve the cleaning effect, a vacuum cleaner brush head with bristles has appeared in the prior art, which uses the bristles to scrape the dust to be sucked into a dust collection port. However, according to the automatic brush head in the prior art, a type of bristles is generally arranged in a cylindrical shape, resulting in a high failure rate due to proneness to tangling by hair; moreover, the acting force is small, thus it can clean floating dust only but is difficult to clean the garbage firmly adhered to the floor, so the cleaning effect is poor. It is very important that the user needs to press the vacuum cleaner brush head hard towards the floor in the prior art, which leads to a physical burden for the user, so the user experience is poor. According to the solution of the prior art, the sweeping area for accumulated dust is small, and the cylindrical bristles neither can dispose of garbage of a relatively large size, nor can dispose of objects such as hair stuck to the floor, so it is hard for the user to clean and the use experience is bad. It is more important that, the linkage action between the cylindrical bristles and the dust collection port makes the two difficult to cooperate effectively, so there is still much room for improvement in the dust collection effect.

[0003] On the other hand, some brush heads in the prior art are provided with water spraying devices, but during use, the water spraying devices are easy to wet the garbage such as hair on the floor, resulting in that the garbage is stuck to the floor surface and very difficult to be sucked up and cleaned. Moreover, moisture is easily sucked into the dust collection system from the dust collection port. Once moisture enters the dust collection system, it is very easy to burn the motor of the dust collection system.

Summary

[0004] In order to overcome the disadvantages of the prior art, the present invention provides a vacuum cleaner brush head and a dust collection method. The specific technical solutions are as follows:

A vacuum cleaner brush head, including a brush head body, a front wiping plate, a rear wiping plate,

a wiping plate driving device, and a water spraying assembly, where a dust collection pipe is provided in the brush head body; the dust collection pipe has a dust collection port formed on the front side of the bottom of the brush head body; the front wiping plate and the rear wiping plate are provided at the bottom of the brush head body, respectively; cleaning cloth is provided on the front wiping plate and the rear wiping plate, respectively; the wiping plate driving device is provided in the brush head body; a water spraying port of the water spraying assembly is provided on the bottom of the brush head body and located between the front wiping plate and the rear wiping plate;

the wiping plate driving device is transmittingly connected to the front wiping plate and the rear wiping plate, and is configured to drive the front wiping plate and the rear wiping plate to move reciprocally in opposite directions; and

the front wiping plate is provided with a dust passing hole penetrating the upper and lower ends thereof, and the dust passing hole is located below the dust collection port, and is configured to keep the dust collection port overlapping the dust passing hole when moving reciprocally along with the front wiping plate.

[0005] In one specific embodiment, in the forward or backward direction of the front wiping plate, the width of the dust passing hole is greater than the width of the dust collection port by the present threshold, to keep the dust collection port overlapping the dust passing hole when the dust passing hole moves reciprocally along with the front wiping plate;

alternatively, in the forward or backward direction of the front wiping plate, the width of the dust passing hole is less than the width of the dust collection port by the present threshold, to keep the dust collection port overlapping the dust passing hole when the dust passing hole moves reciprocally along with the front wiping plate.

[0006] In a specific embodiment, the top of the front wiping plate is transmittingly connected to the wiping plate driving device; the bottom of the front wiping plate has a dust collection groove and a cleaning cloth mounting portion; the front wall of the dust collection groove is located at the front edge of the bottom of the front wiping plate, and the rear wall of the dust collection groove is connected to the cleaning cloth mounting portion; and the dust passing hole is provided in the dust collection groove.

[0007] In a specific embodiment, the front wall of the dust collection groove has a plurality of notches arranged at intervals, and each of the notches respectively communicates with the dust collection groove.

[0008] In a specific embodiment, the dust collection groove extends from the middle to both sides at the bottom front edge of the front wiping plate, and occupies more than half of the length of the bottom front edge of

the front wiping plate.

[0009] In a specific embodiment, the number of the dust collection port is one or multiple, and the number of the dust passing hole is one or multiple; when the number of the dust collection ports is multiple, the dust passing holes correspond one-to-one to the dust collection ports or one of the dust passing holes overlaps a plurality of the dust collection ports.

[0010] In a specific embodiment, the rear wall of the dust collection groove has a plurality of toothed blades, and the cutting edges of the toothed blades face the dust collection groove.

[0011] In a specific embodiment, the front wall of the dust collection groove also has a plurality of toothed blades, and the cutting edges of the toothed blades face the dust collection groove.

[0012] In a specific embodiment, the width of the region of the dust collection groove not provided with the dust passing hole is less than the width of the dust passing hole.

[0013] In a specific embodiment, the wiping plate driving device includes a crankshaft, a first connecting rod, and second connecting rod; the crankshaft includes a crankshaft rod, and a first journal and a second journal formed on the crankshaft rod; one end of the first connecting rod is rotatably sleeved on the first journal, and the other end is hingedly connected to the top of the front wiping plate; one end of the second connecting rod is rotatably sleeved on the second journal, and the other end is hingedly connected to the top of the rear wiping plate.

[0014] In a specific embodiment, the shaft axis of the first journal, the shaft axis of the second journal, and the rotation axis of the crankshaft rod are coplanar; and the distance between the shaft axis of the first journal and the rotation axis of the crankshaft rod is equal to the distance between the shaft axis of the second journal and the rotation axis of the crankshaft rod.

[0015] In a specific embodiment, the wiping plate driving device is further configured to keep the crankshaft self-balanced when driving the front wiping plate and the rear wiping plate to move reciprocally in opposite directions.

[0016] In a specific embodiment, at least one group of guide devices is provided between the front wiping plate and the bottom of the brush head body; and the guide devices include a roller, a roller base, a guide rail bar, and a guide rail base; the roller base is fixed on one of the front wiping plate and the brush head body; the roller is rotatably mounted on the roller base, and is in rolling contact with the other of the front wiping plate and the brush head body; the guide rail base is fixed on one of the front wiping plate and the brush head body, and the guide rail bar is fixed on the other of the front wiping plate and the brush head body; the guide rail base is configured to limit the moving direction of the guide rail bar.

[0017] In a specific embodiment, at least one group of

guide devices is provided between the rear wiping plate and the bottom of the brush head body; and the guide devices include a roller, a roller base, a guide rail bar, and a guide rail base; the roller base is fixed on one of the rear wiping plate and the brush head body; the roller is rotatably mounted on the roller base, and is in rolling contact with the other of the rear wiping plate and the brush head body; the guide rail base is fixed on one of the rear wiping plate and the brush head body, and the guide rail bar is fixed on the other of the rear wiping plate and the brush head body; the guide rail base is configured to limit the moving direction of the guide rail bar.

[0018] In a specific embodiment, the guide rail base includes a first base body and a second base body, and the guide rail bar penetrates a gap between the first base body and the second base body.

[0019] In a specific embodiment, the water spraying port of the water spraying assembly is provided with a nozzle, and the nozzle is detachably mounted at the bottom of the brush head body.

[0020] In a specific embodiment, the dust collection pipe includes an internal pipe and a flexible joint; the internal pipe is located in the brush head body and one end of the internal pipe is connected to the dust collection port; the other end of the internal pipe is inserted into the flexible joint; the flexible joint is fixed on the brush head body.

[0021] In a specific embodiment, the flexible joint includes a first sleeve, a second sleeve, and an outer tube; the first end of the first sleeve is inserted into the brush head body, and the second end of the first sleeve is hingedly connected to the second sleeve; the outer tube is sleeved in the second sleeve; the internal pipe passes through the first sleeve and then is inserted into the outer tube; the outer tube and the second sleeve are locked by a snap lug.

[0022] In a specific embodiment, a wire plug is fixed between the outer tube and the second sleeve, and the wire plug passes through the second sleeve and the first sleeve.

[0023] In a specific embodiment, the water spraying assembly includes a water tank; the water tank includes a tank body, a tank cover, and a water separation pad; the tank cover is provided at the top of the tank body; the lower part of the tank body has a water outlet; the water separation pad is provided in the tank body and divides the tank body into an upper cavity and a lower cavity; the lower cavity is configured to store water; the height of the central region of the water separation pad is less than that of the edge region, and the central region of the water separation pad has a water injection port for injecting water into the lower cavity; the tank cover is configured to open or close the water injection port.

[0024] A dust collection method, where the vacuum cleaner brush head according to any one of the foregoing items is used to perform the following operations:

starting a negative pressure generation device so that garbage is sucked away by the dust collection pipe at the dust collection port;

starting the wiping plate driving device which is configured to drive the front wiping plate and the rear wiping plate to move reciprocally in opposite directions; and

starting the water spraying assembly according to a preset time interval and water volume, so that the front wiping plate performs dry wiping on a surface to be cleaned, and the rear wiping plate performs wet wiping on the surface to be cleaned.

[0025] In a specific embodiment, the method further includes:

detecting whether the brush head body is located on the floor, and shunting down the water spraying assembly when the brush head body leaves the floor. In a specific embodiment, the method further includes:

receiving a control instruction sent by a mobile terminal for controlling the vacuum cleaner brush head to work, where the control instruction includes one or more of a water spraying assembly start and shutdown instruction, a wiping plate driving device start and shutdown instruction, a negative pressure generation device start and shutdown instruction, a water spray time interval, or an air suction amount.

[0026] The present invention at least has the following beneficial effects:

According to the vacuum cleaner brush head and the dust collection method provided by the present invention, in the cleaning process, the front wiping plate and the rear wiping plate move reciprocally in opposite directions. Compared with the cylindrical bristles in conventional vacuum cleaners, the forward and backward movement of the wiping plates enables the wiping plates to have a larger cleaning area, and even extend from the left edge to the right edge of the bottom of the brush head body. Because the cleaning area is larger, the dust collection cleaning efficiency can be significantly improved. Moreover, because the front wiping plate and the rear wiping plate move reciprocally in opposite directions, the cleaning effect of reciprocal wiping is significantly improved as compared with the unidirectional rotating wiping performed by the cylindrical bristles in a conventional vacuum cleaner. Moreover, by no longer wiping the floor by means of rolling wiping, the problem in the prior art of hair entanglement existing in the cylindrical bristles is overcome. Furthermore, compared with the cylindrical bristles, the cleaning cloth in this solution may have a greater acting force with the floor, thereby facilitating the cleaning of garbage firmly adhered to the floor.

[0027] On the other hand, because the front wiping plate is provided with a dust passing hole penetrating the upper and lower ends thereof, the dust collection port is kept overlapping the dust passing hole. Thus, when the negative pressure generation device is started so that the garbage enters the dust collection groove of the front

wiping plate, most of the garbage can be sucked away through the dust collection port before contacting the cleaning cloth on the front wiping plate, and the remaining dust left on the floor that has not been cleaned up is subsequently disposed of by the cleaning cloth on the front wiping plate and the rear wiping plate. In addition, the cleaning cloth on the front wiping plate can push garbage of a relatively large size and weight forward to a region where the dust collection port is located, so that the garbage is sucked in from the dust collection port. That is, in the present invention, the garbage is directionally pushed to the dust collection port by means of the front wiping plate, and the two achieve efficient linkage dust collection cleaning. Compared with combinations in the prior art of a rolling brush and a dust collection port and of cylindrical bristles and a dust collection port which work independent of each other or have poor linkage, the present invention has a significant technological progress, and the significantly improved dust collection cleaning effect brought about by this linkage is difficult to predict in the prior art.

[0028] Further, when the dust collection pipe performs a dust collection operation, the air in the dust collection groove is pumped out to form a negative pressure space, and under the action of an air pressure difference, the cleaning cloth on the wiping plates is in close contact with the floor. On the one hand, the vacuum cleaner brush head can be in close contact with the floor without being pressed hard by the user, and on the other hand, the friction between the cleaning cloth and the floor is significantly enhanced. The garbage firmly adhered to the floor can be removed. This cannot be implemented by the prior art, and thus a significant progress is achieved.

[0029] Further, the front wiping plate is provided with a dust passing hole penetrating the upper and lower ends thereof, which can also significantly reduce the space occupation at the bottom of the brush head body by the dust collection portion, thereby increasing the proportion of the area of the cleaning cloth on the wiping plate at the bottom of the brush head body.

[0030] Further, the water spraying port of the water spraying assembly is provided at the bottom of the brush head body and located between the front wiping plate and the rear wiping plate. Therefore, in the traveling process of the brush head, the front wiping plate is in contact with the dry floor, and the rear wiping plate is in contact with the wet floor, so that the front wiping plate performs dry wiping on the surface to be cleaned to implement the cleaning of garbage such as floating dust, and the rear wiping plate performs wet wiping on the surface to be cleaned. Compared with simple dry wiping or simple wet wiping in the prior art, the brush head can dispose of multiple types of garbage, thereby achieving a better overall cleaning effect. Thus, the all-in-one cleaning function of dust collection, dry wiping and wet wiping is implemented, and the effects of dust collection and cleaning are further significantly improved.

[0031] Further, because the water spraying port is pro-

vided between the front wiping plate and the rear wiping plate, the dust collection port and the water spraying port are separated by the cleaning cloth on the front wiping plate to avoid the possibility that a cleaning liquid sprayed from the water spraying port enters the dust collection port, thereby preventing the motor of the dust collection system from damage by ingress of water. That is, an ingenious structure is used to improve both the cleaning effect and the safety.

[0032] In conclusion, the present invention can achieve the technical effects of significantly increasing the cleaning area and improving the cleaning effect of the vacuum cleaner brush head, and has prominent substantive features and a remarkable progress as compared with the existing ones. Moreover, it should be noted that although the technical effects of the foregoing technical features are described in paragraphs, the parts are not separate but a coordinated and matched overall technical solution.

[0033] To enable the above-mentioned objectives, features, and advantages of the present invention to be more apparent and understandable, preferred embodiments are specially exemplified below in conjunction with the accompanying drawings for making the following described description.

Brief Description of the Drawings

[0034] To describe the technical solutions in embodiments of the present invention more clearly, the accompanying drawings to be used in the embodiments are briefly introduced below. It should be understood that the following accompanying drawings merely show some embodiments of the present disclosure, and should not be considered to limit the scope. A person of ordinary skill in the art can obtain other relevant accompanying drawings from these accompanying drawings without involving an inventive effort.

FIG. 1 is a top perspective view of a vacuum cleaner brush head in Embodiment 1;
 FIG. 2 is a bottom perspective view of the vacuum cleaner brush head in Embodiment 1;
 FIG. 3 is a bottom perspective view of a front wiping plate in Embodiment 1;
 FIG. 4 is a top perspective view of the front wiping plate in Embodiment 1;
 FIG. 5 is a bottom perspective view of the vacuum cleaner brush head after removing the front wiping plate in Embodiment 1;
 FIG. 6 is a schematic diagram of a part of the internal structure of the vacuum cleaner brush head in Embodiment 1;
 FIG. 7 is a schematic diagram of FIG. 6 after removing a dust collection pipe;
 FIG. 8 is a schematic diagram of a crankshaft in Embodiment 1;
 FIG. 9 is a sectional view of the vacuum cleaner

brush head in Embodiment 1;

FIG. 10 is a perspective view of a tank body in Embodiment 1;

FIG. 11 is a perspective view of a water separation pad in Embodiment 1;

FIG. 12 is an exploded view of a tank cover in Embodiment 1;

FIG. 13 is a sectional view of the vacuum cleaner brush head in Embodiment 1;

FIG. 14 is a schematic diagram of a flexible joint in Embodiment 1;

FIG. 15 is an exploded view of the flexible joint in Embodiment 1;

FIG. 16 is a bottom perspective view of a front wiping plate in Embodiment 2; and

FIG. 17 is a bottom perspective view of another front wiping plate in Embodiment 2.

Brief Description of Reference Numerals:

[0035] 1-vacuum cleaner brush head; 2, 126-brush head body; 3-second sleeve; 4-front wiping plate; 41-front wall of dust collection groove; 42-dust collection groove; 43-cleaning cloth mounting portion; 44-dust passing hole; 45-notch; 46-rear wall of dust collection groove; 47-connecting base; 5-rear wiping plate; 6-dust collection port; 7-nozzle; 8, 24-roller base; 9, 22-guide rail bar; 10, 23-roller; 11-guide rail base; 12-water tank; 13-internal pipe; 14-first sleeve; 15-sleeve positioning base; 16-driving motor; 17-pumping device; 18-first connecting rod; 19-second connecting rod; 20-crankshaft; 201-crankshaft rod; 202-first journal; 203-second journal; 25-outer tube; 26-snap lug; 27-wire plug.

Detailed Description

Embodiment 1

[0036] This embodiment provides a vacuum cleaner brush head 1. The vacuum cleaner brush head 1 may be used as a brush head of a vacuum cleaner.

[0037] As shown in FIG. 1 to FIG. 3, the vacuum cleaner brush head 1 includes a brush head body 2, a front wiping plate 4, a rear wiping plate 5, a wiping plate driving device, and a water spraying assembly. A dust collection pipe is provided in the brush head body 2; the dust collection pipe has a dust collection port 6 formed on the front side of the bottom of the brush head body 2; the front wiping plate 4 and the rear wiping plate 5 are provided at the bottom of the brush head body 2, respectively; cleaning cloth is provided on the front wiping plate 4 and the rear wiping plate 5, respectively; the wiping plate driving device is provided in the brush head body 2; a water spraying port of the water spraying assembly is provided on the bottom of the brush head body 2 and located between the front wiping plate 4 and the rear wiping plate 5. The wiping plate driving device is transmittingly connected to the front wiping plate 4 and the

rear wiping plate 5, and is configured to drive the front wiping plate 4 and the rear wiping plate 5 to move reciprocally in opposite directions.

[0038] The front wiping plate 4 is provided with a dust passing hole 44 penetrating the upper and lower ends thereof, and the dust passing hole 44 is configured to have a preset size, so that the dust collection port 6 always overlaps the dust passing hole 44 when the front wiping plate 4 moves reciprocally. Specifically, as shown in FIG. 2, in the forward or backward direction of the front wiping plate 4, the width of the dust passing hole 44 is greater than the width of the dust collection port 6 by a preset threshold, to keep the dust collection port 6 overlapping the dust passing hole 44 when the dust passing hole 44 moves reciprocally along with the front wiping plate 4. The specific value of the preset threshold value can be selected by a person skilled in the art according to the size of one of the dust collection port 6 and the dust passing hole 44, and is a variable number, as long as the dust collection port 6 is kept overlapping the dust passing hole 44 when the dust passing hole 44 moves reciprocally along with the front wiping plate 4. No more examples are listed in this embodiment one by one. It should be noted that, in another embodiment, in the forward or backward direction of the front wiping plate, the width of the dust passing hole may be less than the width of the dust collection port by the present threshold, to keep the dust collection port overlapping the dust passing hole when the dust passing hole moves reciprocally along with the front wiping plate.

[0039] Specifically, the brush head body 2 is formed into a shell structure in order to mount the front wiping plate 4, the rear wiping plate 5, the wiping plate driving device, the water spraying assembly, the dust collection pipe, and other accessories. In this embodiment, the dust collection pipe is connected to a negative pressure generation device in a vacuum cleaner system by means of a joint and an outer tube 25. When the negative pressure generation device is started, a negative pressure is generated at the dust collection port 6 to suck garbage such as dust.

[0040] Preferably, the front wiping plate 4 and the rear wiping plate 5 are respectively long plate-shaped structures, which even extend from the left edge of the bottom of the brush head body 2 all the way to the edge. Therefore, the front wiping plate 4 and the rear wiping plate 5 significantly increase the effective cleaning area of the cleaner brush head 1 as compared with the cylindrical wiping plates in the prior art. Preferably, the cleaning cloth on the front wiping plate 4 and the rear wiping plate 5 is respectively detachably mounted, for example, the cleaning cloth is respectively bonded to the front wiping plate and the rear wiping plate 5 by means of nylon-like buckles.

[0041] FIG. 6 to FIG. 9 show a preferred wiping plate driving device. The wiping plate driving device includes a crankshaft 20, a first connecting rod 18, and a second connecting rod 19. The crankshaft 20 includes a crank-

shaft rod 201, and a first journal 202 and a second journal 203 formed on the crankshaft rod 201; one end of the first connecting rod 18 is rotatably sleeved on the first journal 202, and the other end is hingedly connected to the top of the front wiping plate 4; one end of the second connecting rod 19 is rotatably sleeved on the second journal 203, and the other end is hingedly connected to the top of the rear wiping plate 5. That is, the crankshaft 20, the first connecting rod 18, and the front wiping plate 4 constitute a group of crank connecting rod mechanisms, and the crankshaft 20, the second connecting rod 19, and the rear wiping plate 5 constitute the other group of crank connecting rod mechanisms. In order to enable the crankshaft 20 to rotate, the wiping plate driving device further includes a driving motor 16 and a transmission mechanism provided in the brush head body 2; the driving motor 16 drives the crankshaft 20 to rotate by means of a rotating mechanism, where the transmission mechanism includes a synchronous belt, an eddy current worm gear box, or other structure types.

[0042] Preferably, the shaft axis of the first journal 202, the shaft axis of the second journal 203, and the rotation axis of the crankshaft rod 201 are coplanar; and the distance between the shaft axis of the first journal 202 and the rotation axis of the crankshaft rod 201 is equal to the distance between the shaft axis of the second journal 203 and the rotation axis of the crankshaft rod 201. Therefore, when the crankshaft 20 rotates in one direction, it drives the front wiping plate 4 and the rear wiping plate 5 to move reciprocally in opposite direction.

[0043] Preferably, the wiping plate driving device is further configured to keep the crankshaft 20 self-balanced when driving the front wiping plate 4 and the rear wiping plate 5 to move reciprocally in opposite directions. Specifically, by presetting specific parameter values such as sizes, weights, and shapes of the first journal 202, the second journal 203, the first connecting rod 18, the second connecting rod 19, the front wiping plate 4, and the rear wiping plate 5, the crankshaft 20 is kept self-balanced in a rotation process. Therefore, the entire vacuum cleaner brush head 1 can be kept stable when the front wiping plate 4 and the rear wiping plate 5 move reciprocally in opposite directions, to avoid the generation of unnecessary vibration, so that noise and the wear of the wiping plate driving device can be significantly reduced.

[0044] In this embodiment, the number of the water spraying port is one or multiple, and preferably is multiple. FIG. 2 shows a case where the number of the water spraying ports is two. The two water spraying ports are both provided on the bottom of the brush head body 2 and located between the front wiping plate 4 and the rear wiping plate 5. Specifically, the water spraying assembly further includes a water tank 12, a pumping device 17, and a water supply pipe provided in the brush head body 2. The water tank 12 is connected to each water spraying port by means of the water supply pipe. A water pump is provided in the water supply pipe for pressurizing the cleaning liquid in the water tank 12 and then spraying

same from the water spraying port.

[0045] As shown in FIG. 9 to FIG. 12, the water tank 12 includes a tank body 121, a tank cover 122, and a water separation pad 123. The tank cover 122 is provided at the top of the tank body 121. The lower part of the tank body 121 has a water outlet. The water separation pad 123 is provided in the tank body 121 and divides the tank body 121 into an upper cavity 124 and a lower cavity 125. The lower cavity 125 is configured to store water. The height of the central region of the water separation pad 123 is less than that of the edge region, and the central region of the water separation pad 123 has a water injection port 131 for injecting water into the lower cavity 125. The tank cover 122 is configured to open or close the water injection port 131.

[0046] Preferably, the height of the water separation pad 123 decreases continuously and smoothly from the edge region to the central region.

[0047] Preferably, the bottom of the tank body 121 is recessed inwardly to form an accommodating groove 130.

[0048] Preferably, the water separation pad 123 is an elastic body, such as a silicone water separation pad 123 having elasticity.

[0049] The bottom of the brush head body 126 is provided with a nozzle, and the nozzle communicates with a water outlet by means of a water delivery pipe. The water pump is configured to pump the cleaning fluid in the lower chamber 125 to the nozzle for spraying. Specifically, the water pump is connected into the water delivery pipe, and when the water pump is started, pressure is generated to pump the cleaning fluid in the water tank 12.

[0050] In this embodiment, the edge region of the water separation pad 123 has an annular protrusion 127 protruding downwardly and extending around the central region, the top of the tank body 121 has a first annular groove 132, and the annular protrusion 127 is mounted in the first annular groove 132. The upper surface of the annular protrusion 127 is recessed inwardly to form a second annular groove 133. The upper surface of the brush head body 126 has an opening, and the tank cover 122 is openably mounted at the opening. The brush head body 126 has a cylindrical protrusion 128 protruding downwardly on the inner surface at the opening. The cylindrical protrusion 128 is mounted in the second annular groove 133, so that the tank cover 122, the cylindrical protrusion 128, and the tank body 121 enclose a closed space.

[0051] Preferably, the tank cover 122 includes a cover plate 1221 and a cylinder body 1222 connected as an integral whole. The cover plate 1221 exposes the upper surface of the brush head body 126. The cylinder body 1222 is inserted into the opening. An elastic seal ring 129 is sleeved on the cylinder body 1222, and the elastic seal ring 129 abuts against the inner wall of the opening.

[0052] In this embodiment, the cleaning device further includes a wiping plate, a wiping plate driving device, and

a dust collection pipe. The dust collection pipe is provided in the brush head body 126, and has a dust collection port formed on the bottom of the brush head body 126. The wiping plate is provided at the bottom of the brush head body 126. The bottom of the wiping plate is provided with cleaning cloth. The wiping plate driving device is provided in the brush head body 126 to drive the wiping plate to move.

[0053] Therefore, on the one hand, the water separation pad 123 may be used to separate the cleaning fluid storage in the lower cavity 125 from the upper cavity 124, to avoid the possibility of water leakage caused by the impact on the tank cover 122 due to the sloshing of the cleaning liquid in the cleaning device during high speed vibration or movement. Even if a small amount of the cleaning liquid overflows to the top of the water separation pad 123 during sloshing, there is little cleaning liquid that can contact the tank cover 122 due to a certain distance between the water separation pad 123 and the tank cover 122. Moreover, because the height of the central region of the water separation pad 123 is less than that of the edge region, even if a small amount of the cleaning liquid overflows to the top of the water separation pad 123 during sloshing, the cleaning liquid can also be collected into the water injection port 131 and fall into the lower cavity 125 in time under the action of its own gravity. Moreover, during the water injection process, it is unnecessary to completely align the water injection port 131, and the cleaning liquid can be autonomously collected into the water injection port 131 and fall into the lower cavity 125, thereby providing the efficiency of water injection and preventing the cleaning liquid from being spilled during the water injection process.

[0054] In addition, because the water separation pad 123 can skillfully prevent water leakage, there is no need to completely seal the tank cover 122, so that the water tank can be supplemented with air in the process of supplying water to the outside, to eliminate the air pressure difference between the inside and outside of the water tank, which is convenient for the water spraying system to smoothly output the cleaning liquid in the water tank.

[0055] According to the vacuum cleaner brush head 1 provided by the this embodiment, in the cleaning process, the front wiping plate 4 and the rear wiping plate 5 move reciprocally in opposite directions. Compared with the unidirectional rotating wiping performed by the cylindrical bristles in a conventional vacuum cleaner, the cleaning effect of reciprocal wiping is significantly improved. Moreover, by no longer wiping the floor by means of rolling wiping, the problem in the prior art of hair entanglement existing in the cylindrical bristles is overcome. Furthermore, compared with the cylindrical bristles, the cleaning cloth in this solution may have a greater acting force with the floor, thereby facilitating the cleaning of garbage firmly adhered to the floor.

[0056] On the other hand, because the front wiping plate 4 is provided with a dust passing hole 44 penetrating the upper and lower ends thereof, and the dust passing

hole 44 is configured to have a preset size, so that the dust collection port 6 always overlaps the dust passing hole 44 when the front wiping plate 4 moves reciprocally. Thus, when the negative pressure generation device is started so that the garbage enters the dust pass hole 44 of the front wiping plate 4, most of the garbage can be sucked away through the dust collection port 6 before contacting the cleaning cloth on the front wiping plate 4, and the remaining dust left on the floor that has not been cleaned up is subsequently disposed of by the cleaning cloth on the front wiping plate 4 and the rear wiping plate 5. In addition, the cleaning cloth on the front wiping plate can push garbage of a relatively large size and weight forward to a region where the dust collection port 6 is located, i.e., the cleaning cloth on the front wiping plate 4 can push garbage such as dust and hair forward to the region where the dust collection port 6 is located, so that the garbage is sucked in from the dust collection port 6. That is, in this embodiment, the garbage is directionally pushed to the dust collection port 6 by means of the front wiping plate 4, and the two achieve efficient linkage dust collection cleaning. Compared with combinations in the prior art of a rolling brush and a dust collection port 6 and of cylindrical bristles and a dust collection port 6 which work independent of each other or have poor linkage and thus are difficult to convey the garbage on the floor to the dust collection port 6, this embodiment has a significant technological progress, and the significantly improved dust collection cleaning effect brought about by this linkage is difficult to predict in the prior art. Further, when the dust collection pipe performs a dust collection operation, the air in the dust collection groove 42 is pumped out to form a negative pressure space, and under the action of an air pressure difference, the cleaning cloth on the wiping plate is in close contact with the floor. On the one hand, the vacuum cleaner brush head can be in close contact with the floor without being pressed hard by the user, and on the other hand, the friction between the cleaning cloth and the floor is significantly enhanced, thus the garbage firmly adhered to the floor can be removed. This cannot be implemented by the prior art, and thus a significant progress is achieved.

[0057] Further, the front wiping plate 4 is provided with a dust passing hole 44 penetrating the upper and lower ends thereof, which can also significantly reduce the space occupation at the bottom of the brush head body 2 by the dust collection portion 6.

[0058] In conclusion, this embodiment can achieve the technical effects of significantly increasing the cleaning area and improving the cleaning effect of the vacuum cleaner brush head 1, and has prominent substantive features and a remarkable progress as compared with the existing ones. Moreover, it should be noted that although the technical effects of the foregoing technical features are described in paragraphs, the parts are not separate but a coordinated, matched, and linked overall technical solution.

[0059] This embodiment further provides a dust collec-

tion method, where the vacuum cleaner brush head 1 in this embodiment is used to perform the following operations:

- 5 starting a negative pressure generation device so that garbage is sucked away by the dust collection pipe at the dust collection port 6;
- starting the wiping plate driving device which is configured to drive the front wiping plate 4 and the rear wiping plate 5 to move reciprocally in opposite directions; and
- 10 starting the water spraying assembly according to a preset time interval and water volume, so that the front wiping plate 4 performs dry wiping on a surface to be cleaned, and the rear wiping plate 5 performs wet wiping on the surface to be cleaned.
- therefore, in the traveling process of the vacuum cleaner brush head 1, the front wiping plate 4 is in contact with the dry floor, and the rear wiping plate 5 is in contact with the wet floor, so that the front wiping plate 4 performs dry wiping on the surface to be cleaned, and the rear wiping plate 5 performs wet wiping on the surface to be cleaned. Moreover, because the front wiping plate 4 performs dry wiping, it rubs and pushes garbage such as dust in a relatively dry state, and thus is easier to push the garbage of a relatively large size to the dust suction port 6, while the small particles of dry dust are lifted from the floor and then sucked in by the dust collection port 6. In the prior art, simple dry wiping cannot achieve the effect of cleaning the floor, resulting in that the cleaning effect is far inferior to that of this embodiment. In the prior art, simple wet wiping has a poor dust collection capability, and the dust is still on the floor after the moisture evaporates. Because the water spraying port is in the front, it is easy to wet the hair on the floor, and it is difficult to suck up and clean up the hair adhered to the floor, so the cleaning effect is also far inferior to that of this embodiment. Therefore, the solution in this embodiment implements the all-in-one cleaning function of dust collection, dry wiping and wet wiping, and further significantly improves the effects of dust collection and cleaning.

[0060] As shown in FIG. 4 to FIG. 8 and FIG. 13, the top of the front wiping plate 4 is transmittingly connected to the wiping plate driving device. Preferably, the top of the front wiping plate 4 is provided with a connecting base 47, a hinge shaft penetrates the connecting base 47, and the first connecting rod 18 rotatably penetrates the hinge shaft. Correspondingly, the top of the rear wiping plate 5 is transmittingly connected to the wiping plate driving device. Preferably, the top of the rear wiping plate 5 is provided with a connecting base 47, a hinge shaft penetrates the connecting base 47, and the second connecting rod 19 rotatably penetrates the hinge shaft.

[0061] As shown in FIG. 2 to FIG. 5, the bottom of the

front wiping plate 4 has a dust collection groove 42 and a cleaning cloth mounting portion 43; the front wall 41 of the dust collection groove is located at the bottom front edge of the front wiping plate 4, and the rear wall 46 of the dust collection groove is connected to the cleaning cloth mounting portion 43; and the dust passing hole 44 is provided in the dust collection groove 42. Because the components of the front wiping plate 4 include the dust collection groove 42, the cleaning cloth on the cleaning cloth mounting portion 43 at the rear side of the dust collection groove 42 first pushes the garbage into the dust collection groove. Then, the garbage is collected to the dust passing hole 44 in the dust collection groove 42 and then sucked away by the dust collection port 6. Therefore, compared with the prior art, the area of the effective suction region of the dust collection port 6 can be significantly increased, and the dust collection area of the vacuum cleaner brush head 1 can be increased, thereby improving the cleaning efficiency.

[0062] As shown in FIG. 2 to FIG. 4, the front wall 41 of the dust collection groove has a plurality of notches 45 arranged at intervals, and each of the notches 45 respectively communicates with the dust collection groove 42. In this embodiment, because the notch 45 on the front wall 41 of the dust collection groove matches the dust collection groove 42, so that when the vacuum cleaner brush head 1 travels or the dust collection pipe works, the garbage of a relatively large size can enter the dust collection groove 42 through the notch 45, and then is collected to the dust passing hole 44 in the dust collection groove 42 and then sucked away by the dust collection port 6. Therefore, the effects of dust collection and cleaning for the large of a relatively large size are significantly improved.

[0063] Preferably, the dust collection groove 42 extends from the middle to both sides at the bottom front edge of the front wiping plate 4, and occupies more than half of the length of the bottom front edge of the front wiping plate 4. Therefore, the dust collection and cleaning area of the vacuum cleaner brush head 1 can be further increased.

[0064] In this embodiment, the number of the dust collection port 6 is one or multiple, and the number of the dust passing hole 44 is one or multiple. When the number of the dust collection ports 6 is multiple, the dust passing holes 44 correspond one-to-one to the dust collection ports 6 or one of the dust passing holes 44 overlaps a plurality of the dust collection ports 6. That is, one dust passing hole 44 overlaps one dust collection port 6, or one dust passing hole 44 overlaps a plurality of dust collection ports 6.

[0065] Preferably, the width of the region of the dust collection groove 42 not provided with the dust passing hole 44 is less than the width of the dust passing hole 44. Thus, the area of the cleaning cloth mounting portion 43 may be larger, and thus the cleaning area is increased.

[0066] Preferably, at least one group of guide devices is provided between the front wiping plate 4 and the bot-

tom of the brush head body 2. More preferably, the guide devices include a roller 10, a roller base 8, a guide rail bar 9, and a guide rail base 11; the roller base 8 is fixed on one of the front wiping plate 4 and the brush head body 2; the roller 10 is rotatably mounted on the roller base 8, and is in rolling contact with the other of the front wiping plate 4 and the brush head body 2; the guide rail base 11 is fixed on one of the front wiping plate 4 and the brush head body 2, and the guide rail bar is fixed on the other of the front wiping plate 4 and the brush head body 2; the guide rail base 11 is configured to limit the moving direction of the guide rail bar 9.

[0067] Preferably, at least one group of guide devices is provided between the rear wiping plate 5 and the bottom of the brush head body 2. More preferably, the guide devices include a roller 23, a roller base 24, a guide rail bar 22, and a guide rail base (not shown); the roller base is fixed on one of the rear wiping plate 5 and the brush head body 2; the roller is rotatably mounted on the roller base, and is in rolling contact with the other of the rear wiping plate 5 and the brush head body 2; the guide rail base is fixed on one of the rear wiping plate 5 and the brush head body 2, and the guide rail bar is fixed on the other of the rear wiping plate 5 and the brush head body 2; the guide rail base is configured to limit the moving direction of the guide rail bar.

[0068] Preferably, the guide rail base includes a first base body and a second base body, and the guide rail bar penetrates a gap between the first base body and the second base body.

[0069] Preferably, the water spraying port of the water spraying assembly is provided with a nozzle 7, and the nozzle 7 is detachably mounted at the bottom of the brush head body 2.

[0070] In this embodiment, the dust collection pipe includes an internal pipe 13 and a flexible joint; the internal pipe 13 is located in the brush head body 2 and one end of the internal pipe 13 is connected to the dust collection port 6; the other end of the internal pipe is inserted into the flexible joint; the flexible joint is fixed on the brush head body 2.

[0071] FIG. 6 and FIG. 13 to FIG. 14 show a preferred flexible joint. The flexible joint includes a first sleeve 14, a second sleeve 3, and an outer tube 25; the first end of the first sleeve 14 is inserted into the brush head body 2, and the second end of the first sleeve 14 is hingedly connected to the second sleeve 3; the outer tube 25 is sleeved in the second sleeve 3; the internal pipe 13 passes through the first sleeve 14 and then is inserted into the outer tube 25; the outer tube 25 and the second sleeve 3 are locked by a snap lug 26. Therefore, the flexible connection of the outer tube 25 of the dust collection pipe in the vacuum cleaner brush head 1 is implemented, and quick assembly and disassembly are facilitated.

[0072] Preferably, a wire plug 27 is fixed between the outer tube 25 and the second sleeve 3, and the wire plug 27 passes through the second sleeve 3 and the first sleeve 14.

[0073] In this embodiment, the brush head body 2 is further preferably provided with a position sensor configured to detect whether the brush head body 2 leaves the floor. The dust collection method further includes:

detecting whether the brush head body 2 is located on the floor, and shunting down the water spraying assembly when the brush head body 2 leaves the floor.

[0074] In this embodiment, the dust collection method further includes:

receiving a control instruction sent by a mobile terminal for controlling the vacuum cleaner brush head 1 to work, where the control instruction includes one or more of a water spraying assembly start and shutdown instruction, a wiping plate driving device start and shutdown instruction, a negative pressure generation device start and shutdown instruction, a water spray time interval, or an air suction amount. Therefore, wireless intelligent control of the vacuum cleaner brush head 1 can be implemented by means of devices such as a mobile phone.

Embodiment 2

[0075] This embodiment provides a vacuum cleaner brush head 1. The vacuum cleaner brush head 1 may be used as a brush head of a vacuum cleaner. Compared with Embodiment 1, the main differences of this embodiment are as follows:

As shown in FIG. 16, the rear wall 46 of the dust collection groove has a plurality of toothed blades, and the cutting edges of the toothed blades face the dust collection groove 42. The toothed blades include triangular teeth, trapezoidal teeth, comb teeth, and so on.

[0076] Therefore, when encountering garbage such as hair, the toothed blades may first shovel the garbage, so that the garbage is sucked away through the dust collection port 6. The hair suction effect can be improved, and the situation in which the hair has been caught under the cleaning cloth before the hair is sucked into the dust collection port 6 during hair suction is eliminated or reduced, thereby further improving the cleaning effect.

[0077] Preferably, as shown in FIG. 17, a transition portion between the cleaning cloth mounting portion 43 and the rear wall 46 of the dust collection groove protrudes toward the working surface with respect to the cleaning cloth mounting portion 43, and the toothed blades are formed on the protruding transition portion.

[0078] Other features in this embodiment are the same as those in Embodiment 1. Details are not described herein again.

[0079] The foregoing disclosure is merely several specific implementation scenarios of the present invention, but the present invention is not limited thereto. Any change conceivable by a person skilled in the art shall fall within the scope of protection of the present invention.

Claims

1. A brush head of a vacuum cleaner, comprising a brush head body, a front wiping plate, a rear wiping plate, a wiping plate driving device, and a water spraying assembly, wherein a dust collection pipe is provided in the brush head body; the dust collection pipe has a dust collection port formed on the front side of the bottom of the brush head body; the front wiping plate and the rear wiping plate are provided at the bottom of the brush head body, respectively; cleaning cloth is provided on the front wiping plate and the rear wiping plate, respectively; the wiping plate driving device is provided in the brush head body; a water spraying port of the water spraying assembly is provided on the bottom of the brush head body and located between the front wiping plate and the rear wiping plate; the wiping plate driving device is connected to the front wiping plate and the rear wiping plate, and is configured to drive the front wiping plate and the rear wiping plate to move in opposite directions and move in a reciprocating motion; the front wiping plate is provided with a dust passing hole penetrating the upper and lower ends thereof, and the dust passing hole is located below the dust collection port, and the dust passing hole is configured to keep the dust collection port overlapping the dust passing hole when moving reciprocally along with the front wiping plate.
2. The brush head of the vacuum cleaner according to claim 1, wherein in a forward or backward direction of the front wiping plate, the width of the dust passing hole is greater than the width of the dust collection port by a preset threshold, to keep the dust collection port overlapping the dust passing hole when the dust passing hole moves reciprocally along with the front wiping plate; alternatively, in a forward or backward direction of the front wiping plate, the width of the dust passing hole is less than the width of the dust collection port by the present threshold, to keep the dust collection port overlapping the dust passing hole when the dust passing hole moves reciprocally along with the front wiping plate.
3. The brush head of the vacuum cleaner according to claim 1 or 2, wherein the top of the front wiping plate is connected to the wiping plate driving device; the bottom of the front wiping plate has a dust collection groove and a cleaning cloth mounting portion; the front wall of the dust collection groove is located at the bottom front edge of the front wiping plate, and the rear wall of the dust collection groove is connected to the cleaning cloth mounting portion; the dust passing hole is provided in the dust collection groove.

4. The brush head of the vacuum cleaner according to claim 3, wherein the front wall of the dust collection groove has a plurality of notches arranged at intervals, and each of the notches communicates with the dust collection groove. 5
5. The brush head of the vacuum cleaner according to claim 4, wherein the dust collection groove extends from the middle to both sides at the bottom front edge of the front wiping plate, and occupies more than half of the length of the bottom front edge of the front wiping plate. 10
6. The brush head of the vacuum cleaner according to claim 3, wherein the number of the dust collection port is one or multiple, and the number of the dust passing hole is one or multiple; and when the number of the dust collection ports is multiple, one dust passing hole corresponds to one dust collection port, or one of the dust passing holes overlaps a plurality of the dust collection ports. 15
7. The brush head of the vacuum cleaner according to claim 3, wherein the rear wall of the dust collection groove has a plurality of toothed blades, and the cutting edges of the toothed blades face the dust collection groove. 20
8. The brush head of the vacuum cleaner according to claim 7, wherein the front wall of the dust collection groove also has a plurality of toothed blades, and the cutting edges of the toothed blades face the dust collection groove. 25
9. The brush head of the vacuum cleaner according to claim 3, wherein the width of the region of the dust collection groove not provided with the dust passing hole is less than the width of the dust passing hole. 30
10. The brush head of the vacuum cleaner according to claim 1, wherein the wiping plate driving device comprises a crankshaft, a first connecting rod, and second connecting rod; the crankshaft comprises a crankshaft rod, and a first journal and a second journal formed on the crankshaft rod; one end of the first connecting rod is rotatably sleeved on the first journal, and the other end is hinged to the top of the front wiping plate; one end of the second connecting rod is rotatably sleeved on the second journal, and the other end is hinged to the top of the rear wiping plate. 35
11. The brush head of the vacuum cleaner according to claim 10, wherein the shaft axis of the first journal, the shaft axis of the second journal, and the rotation axis of the crankshaft rod are coplanar; and the distance between the shaft axis of the first journal and the rotation axis of the crankshaft rod is equal to the distance between the shaft axis of the second journal and the rotation axis of the crankshaft rod. 40
12. The brush head of the vacuum cleaner according to claim 1 or 10, wherein the wiping plate driving device is further configured to keep the crankshaft self-balanced when driving the front wiping plate and the rear wiping plate to move in opposite directions and move in a reciprocating motion. 45
13. The brush head of the vacuum cleaner according to claim 1 or 10, wherein at least one group of guide devices is provided between the front wiping plate and the bottom of the brush head body; the guide device comprises a roller, a roller base, a guide rail bar, and a guide rail base; the roller base is fixed on one of the front wiping plate and the brush head body; the roller is rotatably mounted on the roller base, and is in rolling contact with the other of the front wiping plate and the brush head body; the guide rail base is fixed on one of the front wiping plate and the brush head body, and the guide rail bar is fixed on the other of the front wiping plate and the brush head body; the guide rail base is configured to limit the moving direction of the guide rail bar. 50
14. The brush head of the vacuum cleaner according to claim 1 or 10, wherein at least one group of guide devices is provided between the rear wiping plate and the bottom of the brush head body; the guide device comprises a roller, a roller base, a guide rail bar, and a guide rail base; the roller base is fixed on one of the rear wiping plate and the brush head body; the roller is rotatably mounted on the roller base, and is in rolling contact with the other of the rear wiping plate and the brush head body; the guide rail base is fixed on one of the rear wiping plate and the brush head body, and the guide rail bar is fixed on the other of the rear wiping plate and the brush head body; the guide rail base is configured to limit the moving direction of the guide rail bar. 55
15. The brush head of the vacuum cleaner according to claim 13 or 14, wherein the guide rail base comprises a first base body and a second base body, and the guide rail bar penetrates a gap between the first base body and the second base body.
16. The brush head of the vacuum cleaner according to claim 1, wherein the water spraying port of the water spraying assembly is provided with a nozzle, and the nozzle is detachably mounted at the bottom of the brush head body.
17. The brush head of the vacuum cleaner according to claim 1, wherein the dust collection pipe comprises an internal pipe and a flexible joint; the internal pipe is located in the brush head body and one end of the internal pipe is connected to the dust collection port; the

other end of the internal pipe is inserted into the flexible joint; the flexible joint is fixed on the brush head body.

18. The brush head of the vacuum cleaner according to claim 17, wherein the flexible joint comprises a first sleeve, a second sleeve, and an outer tube; a first end of the first sleeve is inserted into the brush head body, and a second end of the first sleeve is hinged to the second sleeve; the outer tube is sleeved in the second sleeve; the internal pipe passes through the first sleeve and then is inserted into the outer tube; the outer tube and the second sleeve are locked by a snap lug. 5
19. The brush head of the vacuum cleaner according to claim 18, wherein a wire plug is fixed between the outer tube and the second sleeve, and the wire plug passes through the second sleeve and the first sleeve. 10
20. The brush head of the vacuum cleaner according to claim 1, wherein the water spraying assembly comprises a water tank; the water tank comprises a tank body, a tank cover, and a water separation pad; the tank cover is provided at the top of the tank body; the lower part of the tank body has a water outlet; the water separation pad is provided in the tank body and divides the tank body into an upper cavity and a lower cavity; the lower cavity is configured to store water; the height of the central region of the water separation pad is less than that of the edge region, and the central region of the water separation pad has a water injection port for injecting water into the lower cavity; the tank cover is configured to open or close the water injection port. 15
21. A dust collection method, wherein the brush head of the vacuum cleaner according to any one of claims 1 to 19 is used to perform the following operations: 20
- starting a negative pressure generation device so that garbage is sucked away by the dust collection pipe at the dust collection port; 25
- starting the wiping plate driving device which is configured to drive the front wiping plate and the rear wiping plate to move in opposite directions and move in a reciprocating motion; and 30
- starting the water spraying assembly according to a preset time interval and water volume, so that the front wiping plate performs dry wiping on a surface to be cleaned, and the rear wiping plate performs wet piping on the surface to be cleaned. 35
22. The dust collection method according to claim 20, further comprising: 40
- detecting whether the brush head body is located on 45
- the floor, and shunting down the water spraying assembly when the brush head body leaves the floor. 50
23. The dust collection method according to claim 20, further comprising: 55
- receiving a control instruction sent by a mobile terminal for controlling the brush head of the vacuum cleaner to work, wherein the control instruction comprises one or more selected from a water spraying assembly start and shutdown instruction, a wiping plate driving device start and shutdown instruction, a negative pressure generation device start and shutdown instruction, a water spray time interval, or an air suction amount.

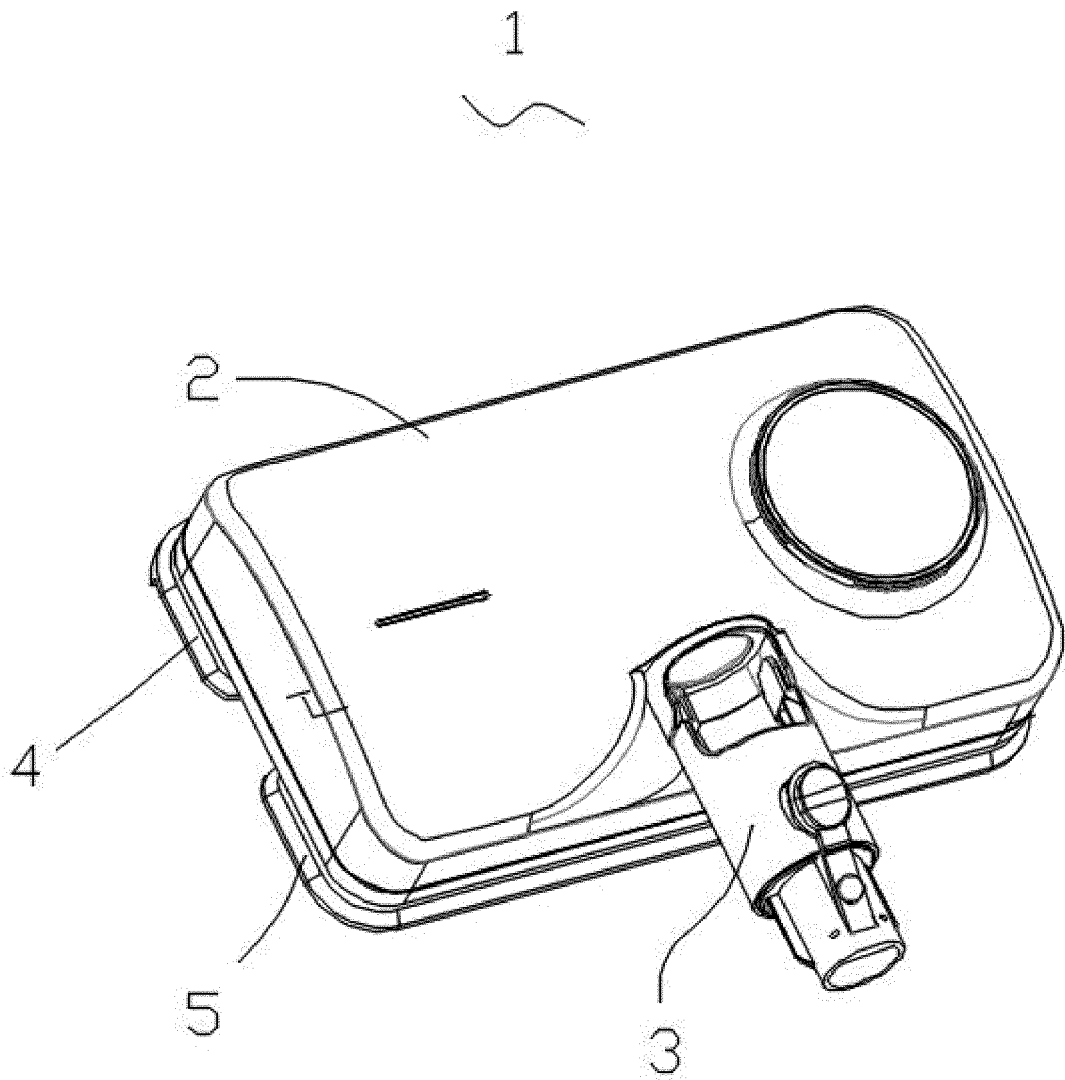


FIG. 1

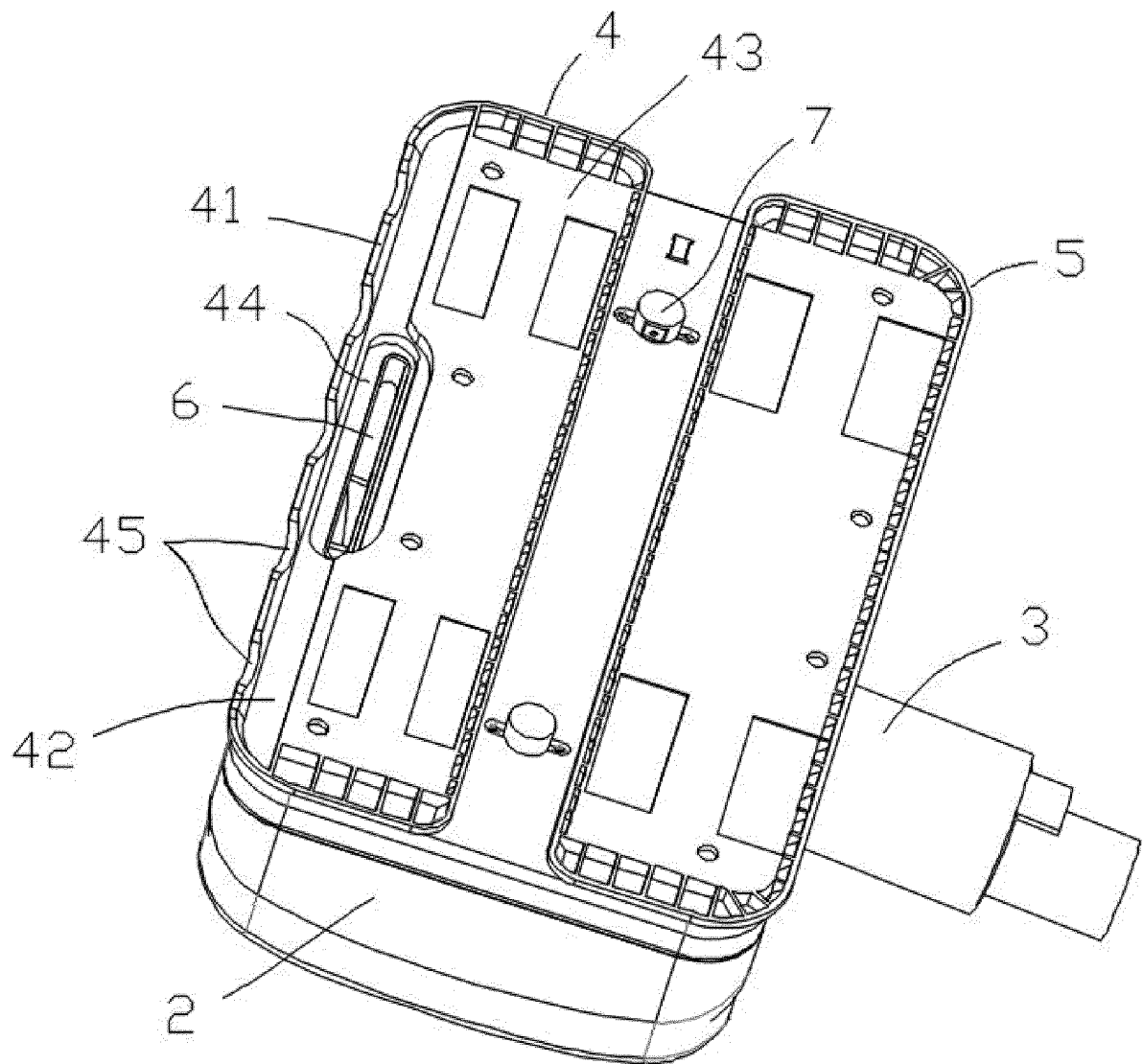


FIG. 2

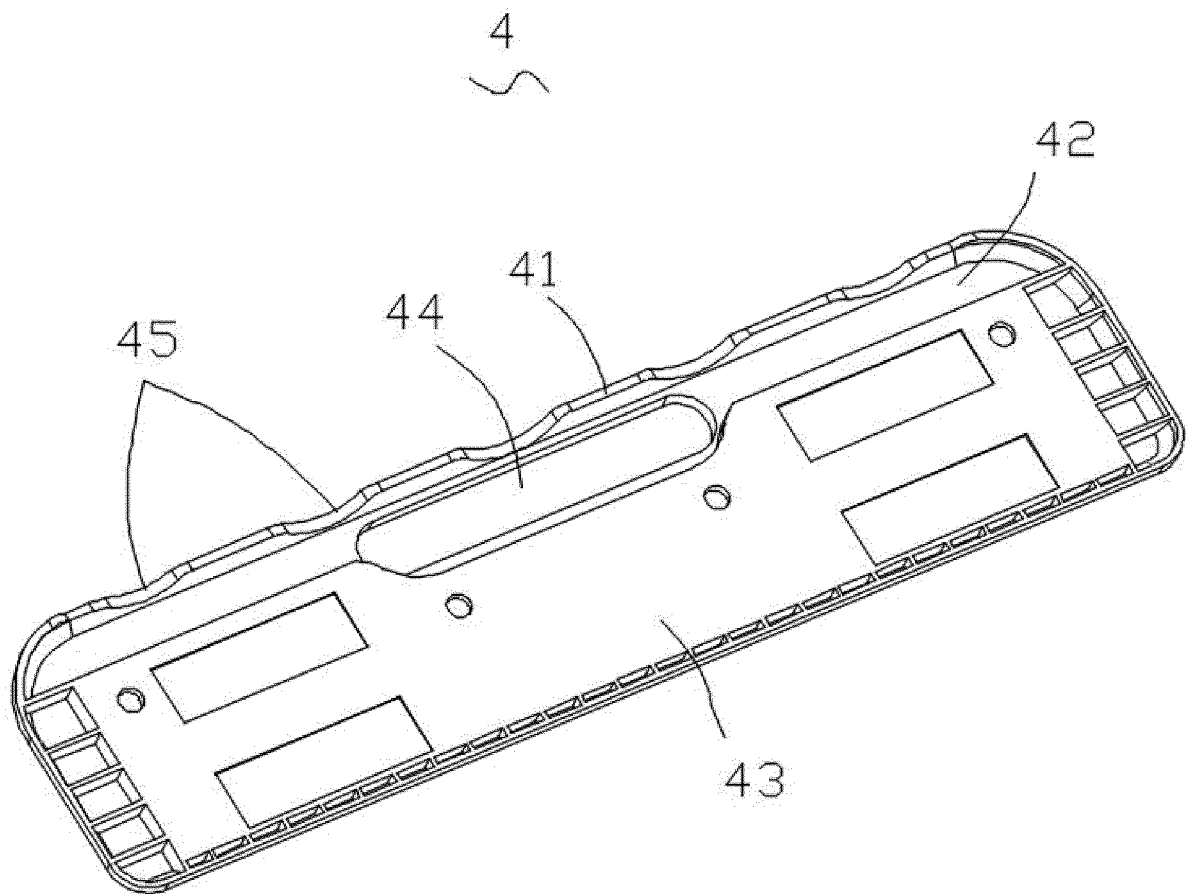


FIG. 3

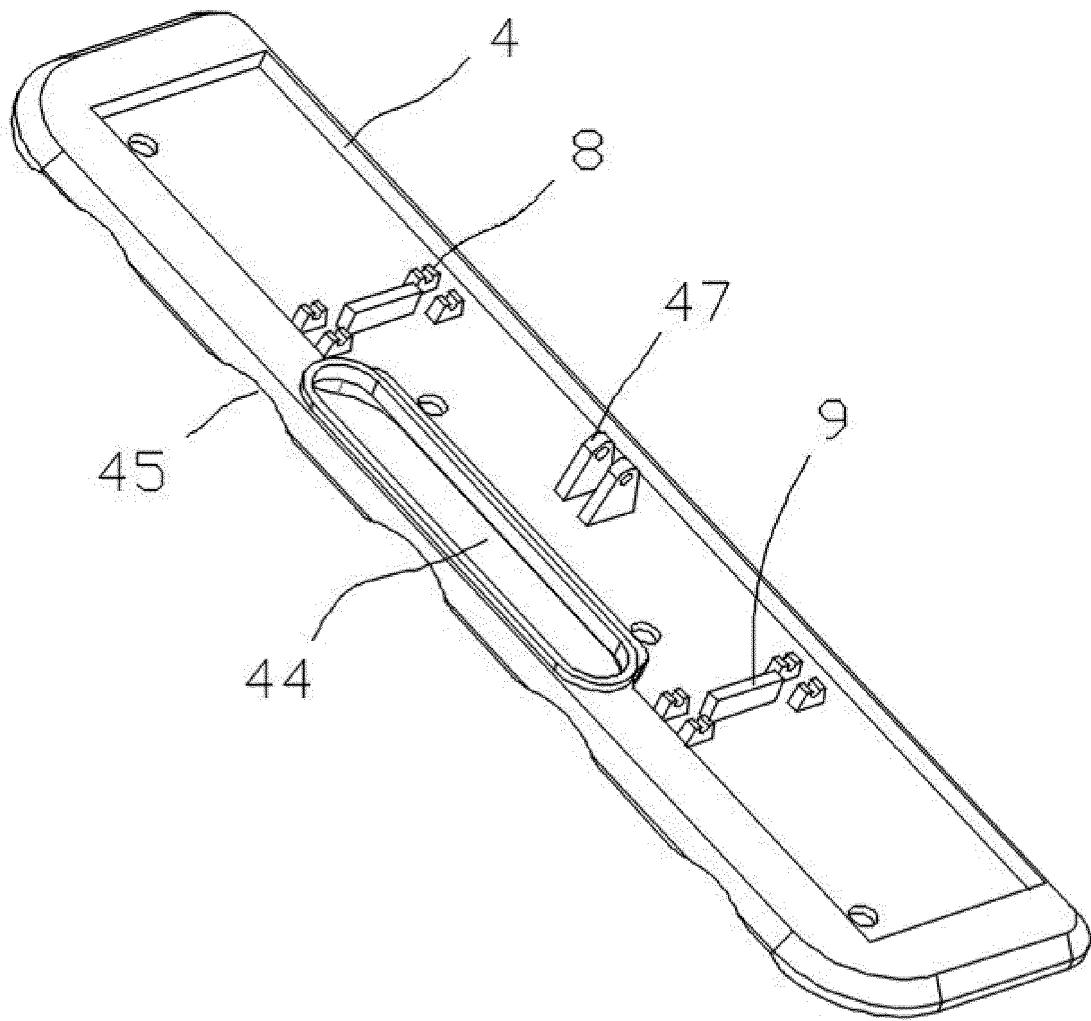


FIG. 4

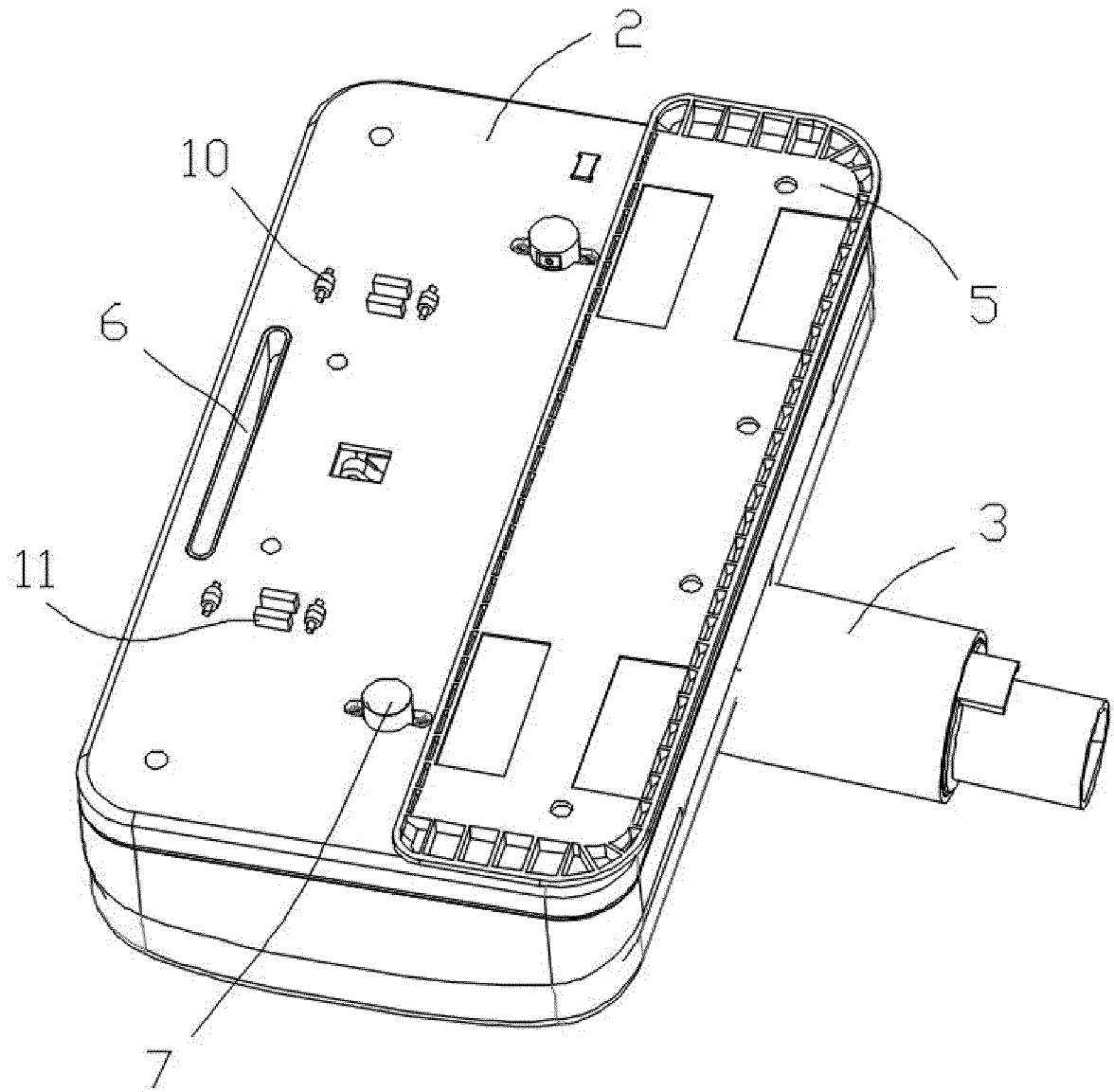


FIG. 5

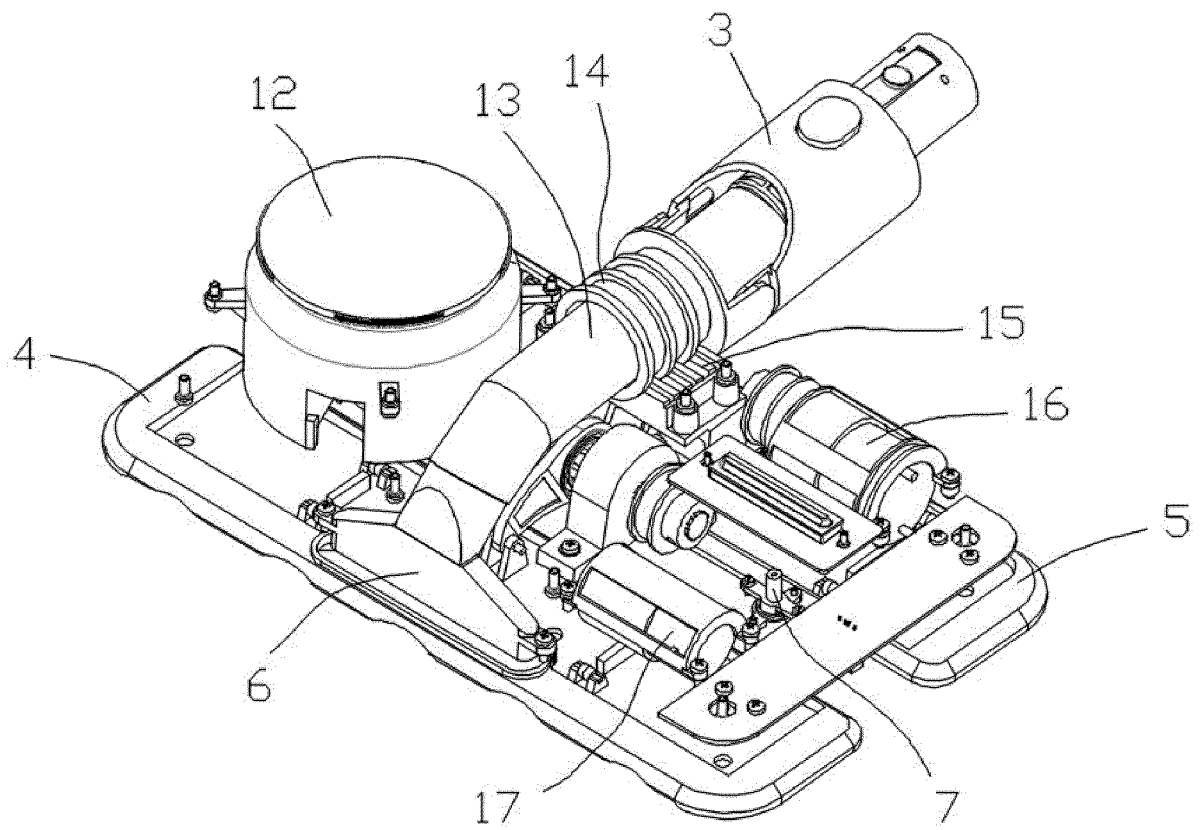


FIG. 6

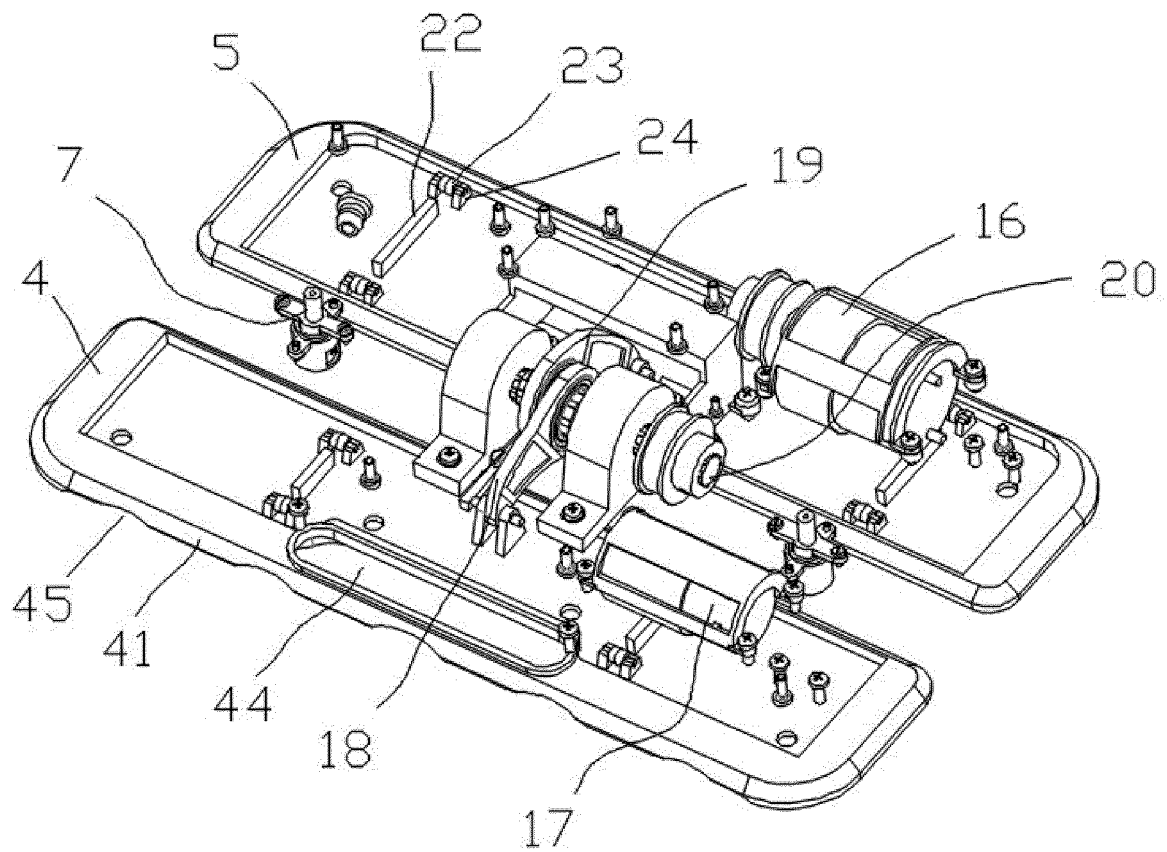


FIG. 7

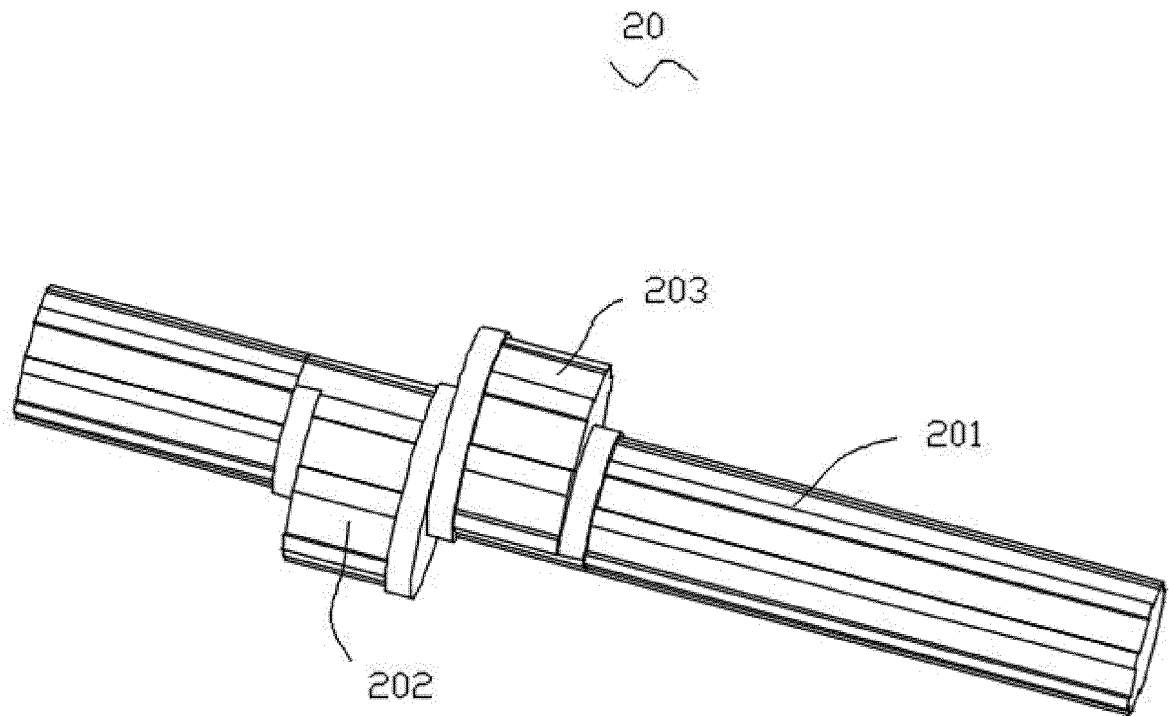


FIG. 8

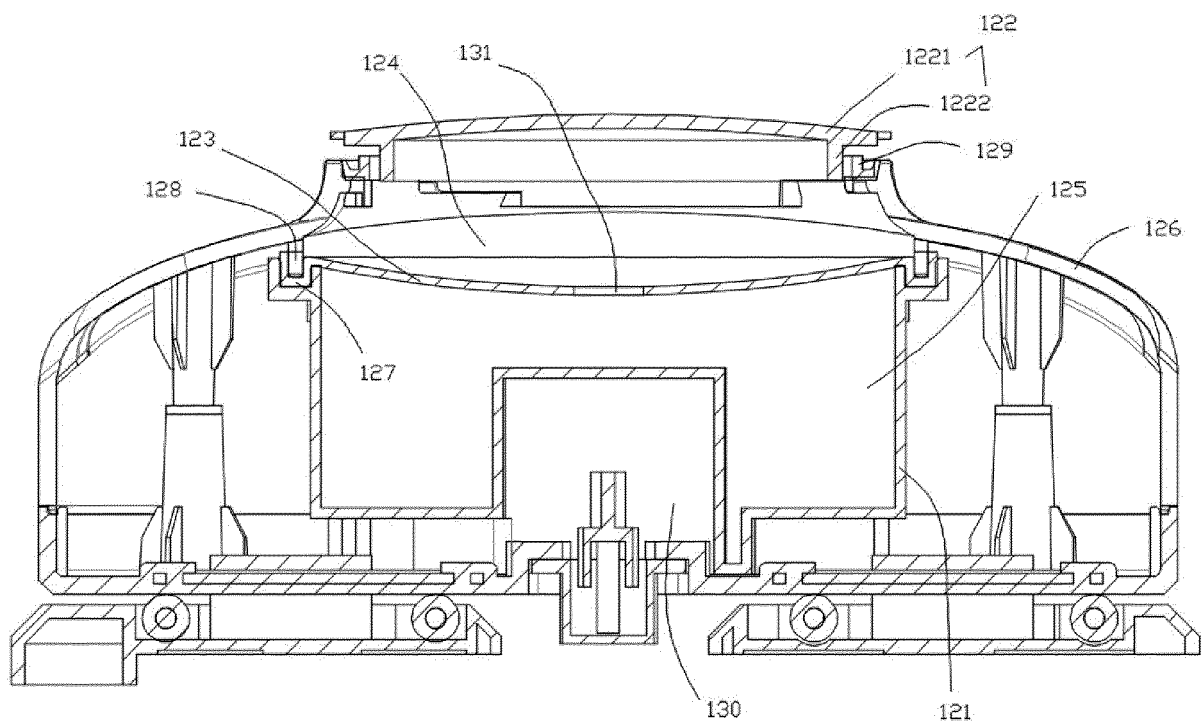


FIG. 9

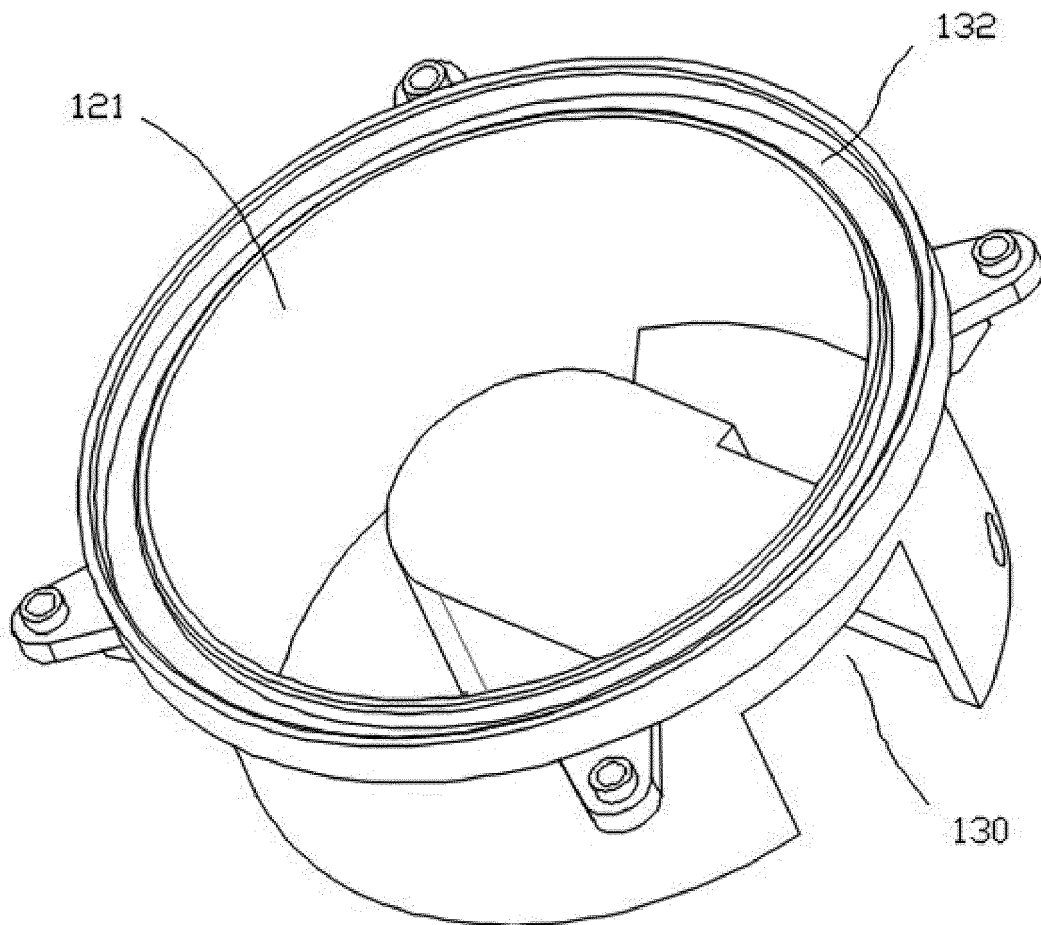


FIG. 10

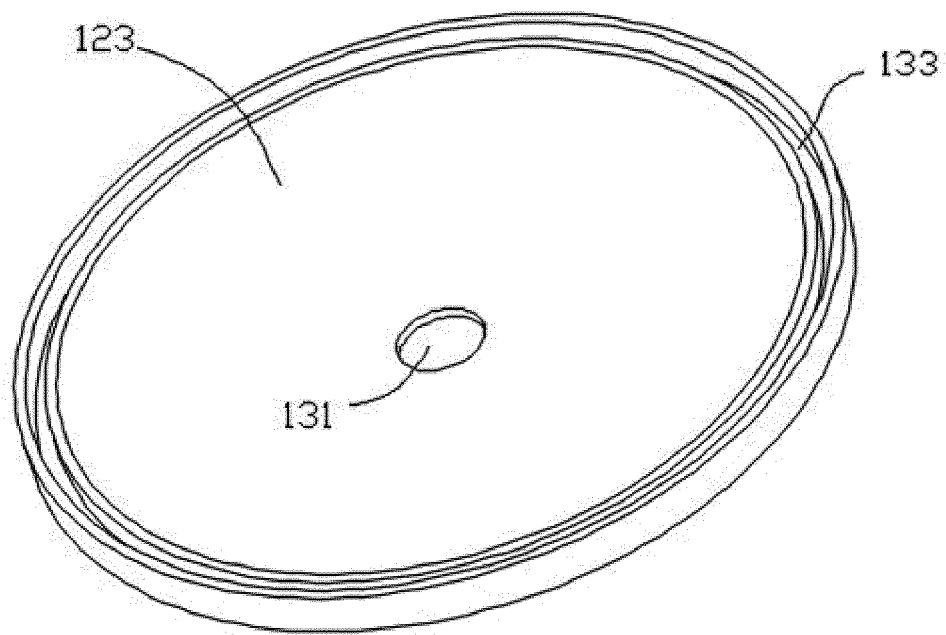


FIG. 11

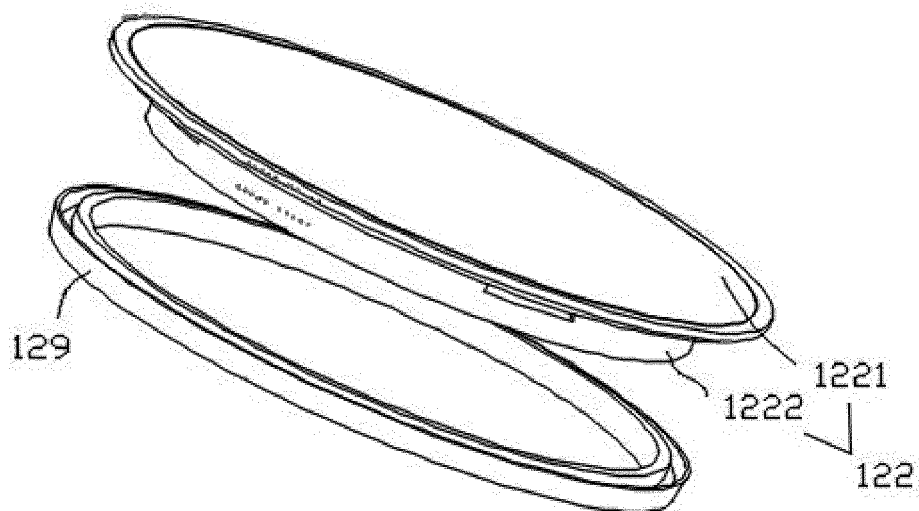


FIG. 12

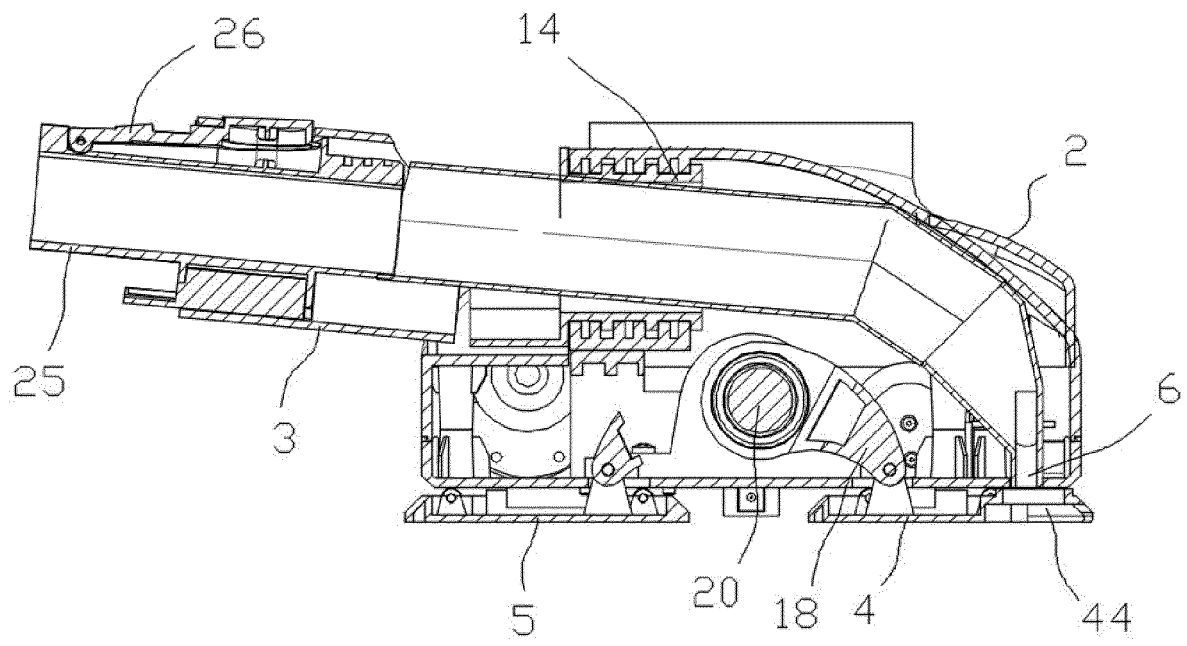


FIG. 13

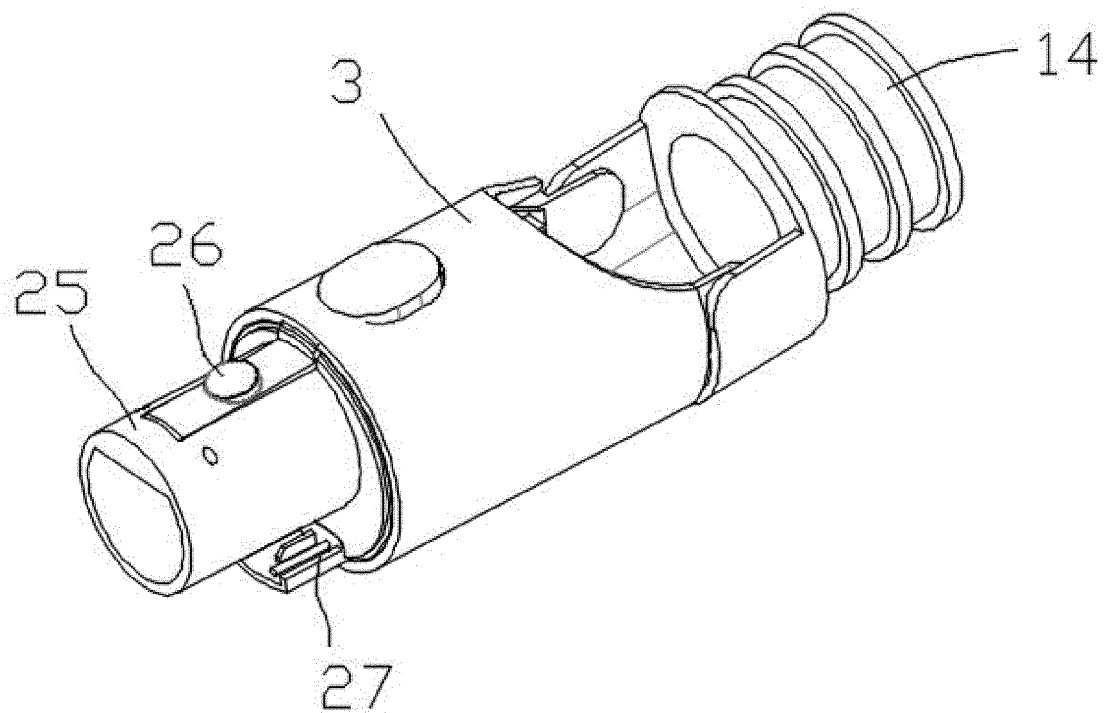


FIG. 14

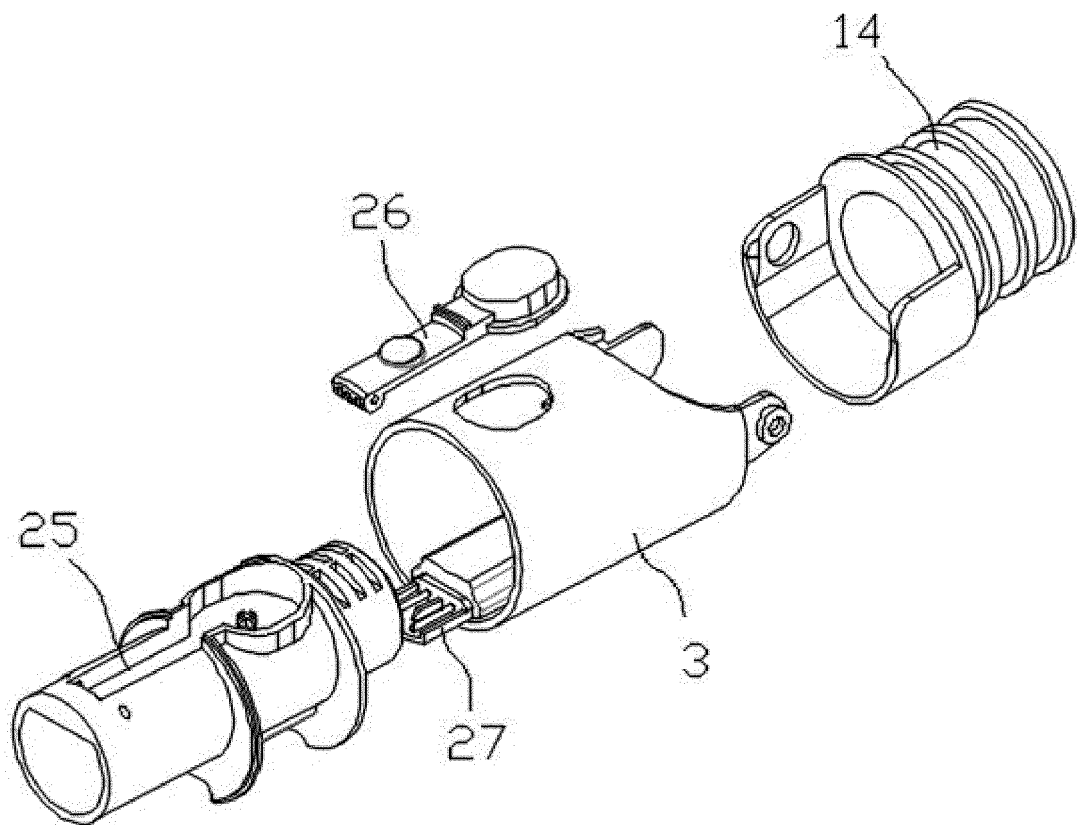


FIG. 15

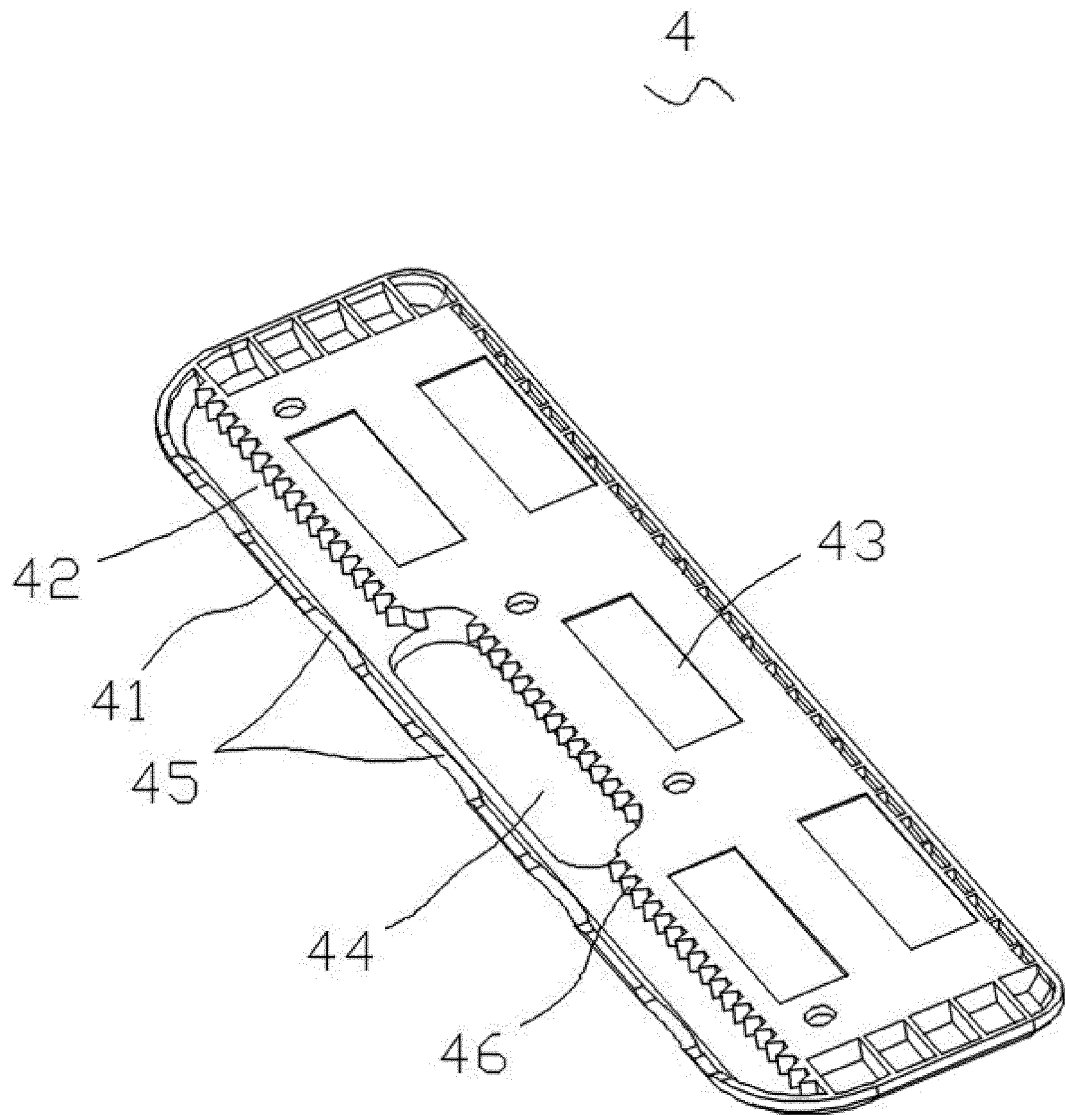


FIG. 16

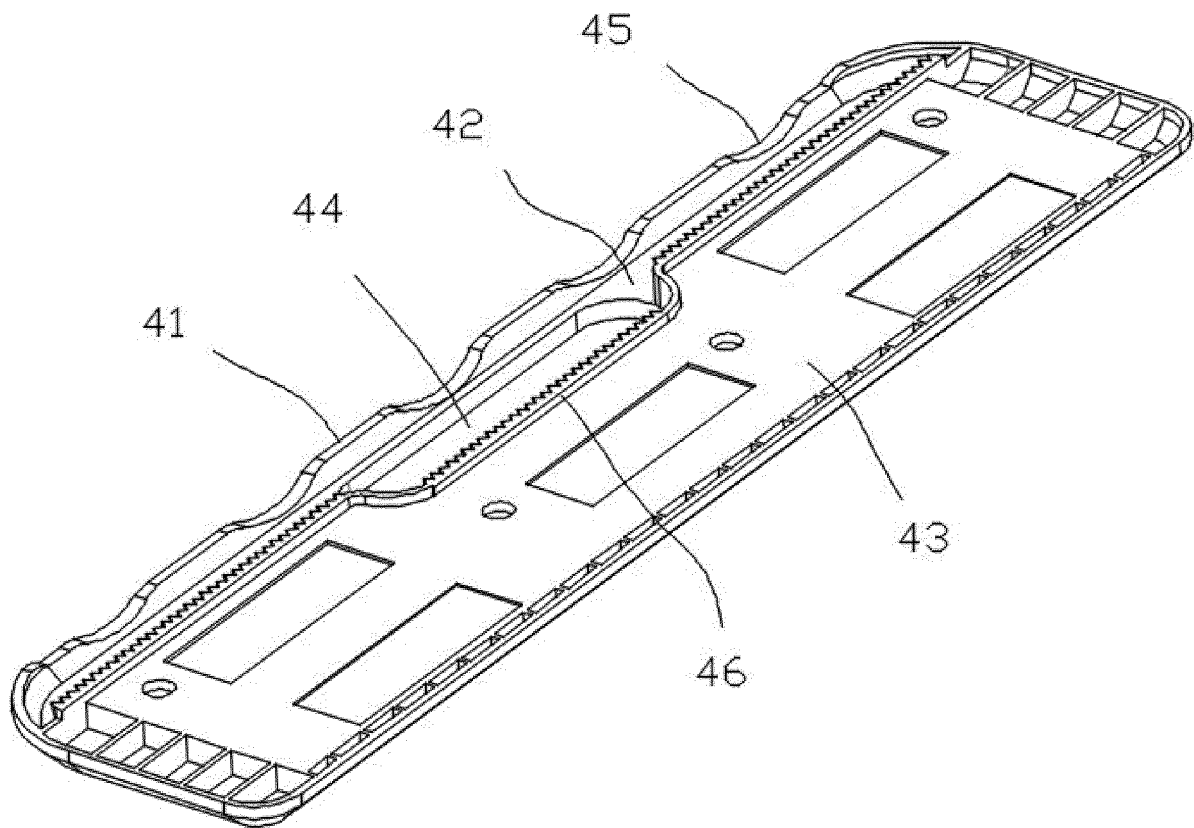


FIG. 17

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/105375

A. CLASSIFICATION OF SUBJECT MATTER

A47L 11/284(2006.01)i; A47L 11/24(2006.01)i; A47L 9/00(2006.01)i; A47L 9/02(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)

A47L

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, CNPAT, EPODOC, WPI, 邢栋, 板, 擦, 来回, 前后, 往复, 相对, 移动, 滑动, 运动, 曲柄, 曲轴, 连杆, board, plate, rub, wipe, reciprocate, move, slide, crank, link, arm, rod, lever

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 110710927 A (XING, Dong) 21 January 2020 (2020-01-21) claims 1-23	1-23
X	CN 108523778 A (SHANXI JIA SHI DA ROBOT TECHNOLOGY CO., LTD.) 14 September 2018 (2018-09-14) description, paragraphs [0049]-[0076], and figures 2-10	1, 2, 10-23
X	CN 203042145 U (SUZHOU INDWAC ELECTRIC APPLIANCE CO., LTD.) 10 July 2013 (2013-07-10) description, paragraphs [0071], [0077] and [0087]-[0088], and figures 2-7	1, 2, 10-23
Y	CN 108523778 A (SHANXI JIA SHI DA ROBOT TECHNOLOGY CO., LTD.) 14 September 2018 (2018-09-14) description, paragraphs [0049]-[0076], and figures 2-10	3-9
Y	CN 1939202 A (SAMSUNG KWANGJU ELECTRONICS CO.) 04 April 2007 (2007-04-04) description, page 4 paragraph 4, figure 5	3-9
A	CN 108577696 A (JIANGSU MIDEA CLEAN ELECTRIC APPLIANCE CO., LTD. et al.) 28 September 2018 (2018-09-28) entire document	1-23

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

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

Date of the actual completion of the international search

02 April 2020

Date of mailing of the international search report

26 April 2020

Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/105375

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