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MOTOR WITH VIBRATION REDUCING FUNCTION

TECHNICAL FIELD

The invention relates to a motor, particularly relates to a motor with a vibration reducing function and belongs to the technical field of motors.

BACKGROUND

A motor is an electromagnetic device capable of achieving electric energy conversion or transmission according to the law of electromagnetic induction, is taken as one of common driving devices, and can be used in many places.

The motor used at present can generate certain vibration force during operation. The motor is often mounted on a housing of the device, so that the vibration force generated by the motor during operation drives the whole device to vibrate, and the normal operation of the device is influenced; meanwhile, a protection structure is not arranged outside the motor, so that foreign matters such as the dust and the like easily permeate into the motor through structures such as grooves and holes and the like in the motor shell in use, and electronic components of the motor shell are damaged; furthermore, when the motor is subjected to the external impact force, the motor shell is easily deformed, and electronic components in the motor are damaged by extrusion.

SUMMARY OF INVENTION

The invention provides a motor with a vibration reducing function and effectively solves the problems in the prior art.

In order to solve the above technical problems, the invention provides the following technical solution:

a motor with a vibration reducing function comprises a motor shell, wherein upper and lower ends and front and rear parts of the outside of the motor shell are fixedly connected with protection shells; piston mechanisms are mounted on two sides of the inside of each protection shell; a through hole is formed in one side of each protection shell; the inside of each through hole is clamped with a dustproof cover; a heat dissipation tank is arranged in the middle part of the outer wall of one side of the motor shell; a heat conduction mechanism is mounted in the middle part of the inner wall of one side of the motor shell; an opening is formed in the other side of the motor shell; screw holes are formed in the outer wall of the motor shell at the upper and lower ends of the opening; the inside of the motor shell is clamped with a motor main body; the output end of the motor main body faces towards the other side of the motor

shell, and the output end is located outside the other side of the motor shell; the output end of the motor main body is sleeved and is fixedly connected with a motor plate; one side, close to the motor shell, of the motor plate is fixedly connected with a rubber layer; sliding grooves are formed in the inner walls of the upper and lower ends and the front and rear parts of the motor shell; the inside of each sliding groove is in sliding connection with an extrusion plate; one side, close to the middle part of the motor shell of each extrusion plate abuts against the outer wall of the motor main body; grooves are formed in inner walls of two sides of one end, away from the middle part of the motor shell, of each sliding groove; each groove is opposite to a piston mechanism on the same side; a buffering mechanism is mounted in each groove; and a piston hole is formed in the inner wall of one end, away from the middle part of the motor shell, of each groove.

As a preferred technical solution of the invention, each piston mechanism comprises a housing; each housing is fixedly connected with the outer wall of the motor shell; the inside of each housing is in sliding connection with a piston body; an air hole is formed in the middle part of one side, away from the motor shell, of each housing; and each air hole is communicated with the inside of a protection shell on the same side.

As a preferred technical solution of the invention, the heat conduction mechanism comprises a buffering rubber block; the buffering rubber block is fixedly connected with the inner wall of one side of the motor shell; a first through groove is formed in the middle part of the buffering rubber block; the inside of the first through groove is fixedly connected with a heat conduction plate; the heat conduction plate passes through the inner wall of one side of the motor shell and extends to the inside of the heat dissipation tank; the heat conduction plate is fixedly connected with the side wall of one side of the motor shell; and one side, located in the heat dissipation tank, of the heat conduction plate is fixedly connected with a plurality of heat dissipation plates.

As a preferred technical solution of the invention, each buffering mechanism comprises a mounting plate; each mounting plate is fixedly connected with an extrusion plate on the same side; the middle part of one side, away from each extrusion plate, of each mounting plate is fixedly connected with an extrusion rod; one end, away from each mounting plate, of each extrusion rod passes through a piston hole in the same side and is fixedly connected with a piston body of a piston mechanism on the same side; each extrusion rod is in sliding connection with the inside of the piston hole in the same side; two ends of one side, away from each extrusion plate, of each mounting plate are fixedly connected with buffering springs; and

one end, away from each mounting plate, of each buffering spring is fixedly connected with the inner wall of a groove in the same side.

As a preferred technical solution of the invention, limiting grooves are formed in side walls of two sides of each sliding groove; the inside of each limiting groove is in sliding connection with a limiting plate; and one side, close to the middle part of each sliding groove, of each limiting plate is fixedly connected with an extrusion plate on the same side.

As a preferred technical solution of the invention, the upper and lower ends of the motor plate are in threaded connection with mounting bolts; and the mounting bolts pass through the motor plate and are matched with screw holes formed in the motor shell.

As a preferred technical solution of the invention, the inner wall of the middle part of each protection shell is fixedly connected with a support plate; one end, away from the inner wall of each protection shell, of each support plate is fixedly connected with the outer wall of the motor shell between two piston mechanisms on the same side.

As a preferred technical solution of the invention, each support plate is of a convex structure; and a second through groove is formed in one end, away from the motor shell, of each support plate.

The invention achieves the following beneficial effects:

1. the invention discloses a motor with a vibration reducing function, a motor shell provided with buffering mechanisms and piston mechanisms is arranged outside a motor main body, the vibration force generated by the motor main body during operation is capable of extruding extrusion rods of the buffering mechanisms through extrusion plates, then piston bodies of the piston mechanisms are extruded by the extrusion rods, the piston bodies do piston motion in the shell, the vibration force generated by the motor main body during operation is reduced, and the purpose of reducing vibration is achieved;

2. the motor shell and the protection shells can prevent the external impact force from directly acting on the motor main body, causing deformation of the motor main body shell and causing extrusion damage to electronic components in the motor main body; and the motor shell and the protection shells can also prevent foreign matters such as the dust in the air and the like from permeating into the motor main body and causing the damage to the electronic components in the motor main body.

BRIEF DESCRIPTION OF DRAWINGS

The drawings are used for providing further understanding of the invention, constitutes a part of the specification, are used for explaining the invention together with embodiments of the invention, and do not constitute the limit on the invention. In the drawings,

FIG.1 is a section diagram of the invention;

FIG.2 is an area diagram of a position A in FIG.1;

FIG.3 is an area diagram of a position B in FIG.1;

FIG.4 is a structural schematic diagram of the support plate;

FIG.5 is a side view of the invention.

In the drawings, 1 represents the motor shell; 2 represents the heat dissipation tank; 3 represents the heat conduction mechanism; 31 represents the buffering rubber block; 32 represents the first through groove; 33 represents the heat conduction plate; 34 represents the heat dissipation plate; 4 represents the sliding groove; 5 represents the extrusion plate; 6 represents the buffering mechanism; 61 represents the mounting plate; 62 represents the extrusion rod; 63 represents the buffering spring; 7 represents the piston mechanism; 71 represents the housing; 72 represents the piston body; 73 represents the air hole; 8 represents the protection shell; 9 represents the through hole; 10 represents the dustproof cover; 11 represents the support plate; 12 represents the second through groove; 13 represents the motor main body; 14 represents the motor plate; 15 represents the mounting bolt; 16 represents the screw hole; 17 represents the limiting groove; 18 represents the limiting plate; 19 represents the piston hole; and 20 represents the groove.

DETAILED DESCRIPTION OF DRAWINGS

The technical solutions of the embodiments of the invention will be clearly and completely described below in combination of the drawings in the embodiments of the invention. Obviously, the described embodiments are only part of the embodiments of the invention, but not all of the embodiments. Based on the embodiments of the invention, all other embodiments obtained by those of ordinary skill in the art under the precondition that no creative labor is offered shall fall within the protection scope of the invention.

Embodiments: as shown in FIGS.1-5, a motor with a vibration reducing function comprises a motor shell 1; upper and lower ends and front and rear parts of the outside of the motor shell 1 are fixedly connected with protection shells 8; piston mechanisms 7 are mounted on two sides of the inside of each protection shell 8; a through hole 9 is formed in one side of each protection shell 8; the inside of each through hole 9 is clamped with a dustproof cover

10; a heat dissipation tank 2 is arranged in the middle part of the outer wall of one side of the motor shell 1; a heat conduction mechanism 3 is mounted in the middle part of the inner wall of one side of the motor shell 1; an opening is formed in the other side of the motor shell 1; screw holes 16 are formed in the outer wall of the motor shell 1 at the upper and lower ends of the opening; the inside of the motor shell 1 is clamped with a motor main body 13; the output end of the motor main body 13 faces towards the other side of the motor shell 1, and the output end is located outside the other side of the motor shell 1; the output end of the motor main body 13 is sleeved and is fixedly connected with a motor plate 14; one side, close to the motor shell 1, of the motor plate 14 is fixedly connected with a rubber layer; sliding grooves 4 are formed in the inner walls of the upper and lower ends and the front and rear parts of the motor shell 1; the inside of each sliding groove 4 is in sliding connection with an extrusion plate 5; one side, close to the middle part of the motor shell 1 of each extrusion plate 5 abuts against the outer wall of the motor main body 13; grooves 20 are formed in inner walls of two sides of one end, away from the middle part of the motor shell 1, of each sliding groove 4; each groove 20 is opposite to a piston mechanism 7 on the same side; a buffering mechanism 6 is mounted in each groove 20; a piston hole 19 is formed in the inner wall of one end, away from the middle part of the motor shell 1, of each groove 20; each buffering mechanism 6 passes through each piston hole 19 and is connected with each piston mechanism 7; and the vibration force generated by the motor main body 13 during operation is buffered by driving the piston mechanisms 7 to do piston motion.

Limiting grooves 17 are formed in side walls of two sides of each sliding groove 4; the inside of each limiting groove 17 is in sliding connection with a limiting plate 18; and one side, close to the middle part of each sliding groove 4, of each limiting plate 18 is fixedly connected with an extrusion plate 5 on the same side so as to fix each extrusion plate 5 in each sliding groove 4 and prevent each extrusion plate 5 from separating from each sliding groove 4.

The inner wall of the middle part of each protection shell 8 is fixedly connected with a support plate 11; one end, away from the inner wall of each protection shell 8, of each support plate 11 is fixedly connected with the outer wall of the motor shell 1 between two piston mechanisms 7 on the same side; each support plate (11) is of a convex structure; a second through groove 12 is formed in one end, away from the motor shell 1, of each support plate 11; the middle part of each protection shell 8 is supported by each support plate 11, so that the impact resistance of each protection shell 8 is ensured; meanwhile, the second through grooves 12 are formed, so that the piston motion of the piston mechanisms 7 can be facilitated.

Each piston mechanism 7 comprises a housing 71; each housing 71 is fixedly connected with the outer wall of the motor shell 1; the inside of each housing 71 is in sliding connection with a piston body 72; an air hole 73 is formed in the middle part of one side, away from the motor shell 1, of each housing 71; each air hole 73 is communicated with the inside of a protection shell 8 on the same side; the piston bodies 72 do piston motion in the housings 71, so that the resistance of the buffering mechanisms 6 during moving is improved, and the buffering effects of the buffering mechanisms 6 can be improved.

The heat conduction mechanism 3 comprises a buffering rubber block 31; the buffering rubber block 31 is fixedly connected with the inner wall of one side of the motor shell 1; a first through groove 32 is formed in the middle part of the buffering rubber block 31; the inside of the first through groove 32 is fixedly connected with a heat conduction plate 33; the heat conduction plate 33 passes through the inner wall of one side of the motor shell 1 and extends to the inside of the heat dissipation tank 2; the heat conduction plate 33 is fixedly connected with the side wall of one side of the motor shell 1; one side, located in the heat dissipation tank 2, of the heat conduction plate 33 is fixedly connected with a plurality of heat dissipation plates 34; the buffering rubber block 31 can abut against the tail of the motor main body 13 during mounting and buffer the vibration force of the tail of the motor main body 13; meanwhile, the heat conduction plate 33 and the heat dissipation plates 34 are used for dissipating the heat of the motor main body 13.

Each buffering mechanism 6 comprises a mounting plate 61; each mounting plate 61 is fixedly connected with an extrusion plate 5 on the same side; the middle part of one side, away from each extrusion plate 5, of each mounting plate 61 is fixedly connected with an extrusion rod 62; one end, away from each mounting plate 61, of each extrusion rod 62 passes through a piston hole 19 in the same side and is fixedly connected with a piston body 72 of a piston mechanism 7 on the same side; each extrusion rod 62 is in sliding connection with the inside of the piston hole 19 in the same side; two ends of one side, away from each extrusion plate 5, of each mounting plate 61 are fixedly connected with buffering springs 63; and one end, away from each mounting plate 61, of each buffering spring 63 is fixedly connected with the inner wall of a groove 20 in the same side; the extrusion rods 62 are used for extruding the piston bodies 72 of the piston mechanisms 7; meanwhile, elastic force of the buffering springs 63 are matched with the piston bodies 72 for buffering the impact force generated by the motor main body 13 during operation.

The upper and lower ends of the motor plate 14 are in threaded connection with mounting bolts 15; and the mounting bolts 15 pass through the motor plate 14 and are matched

with screw holes 16 formed in the motor shell 1; and the mounting bolts 15 are mounted in the screw holes 16 in the same side so as to fix the motor main body 13 in the motor shell 1.

Specifically, when the motor with the vibration reducing function is used, a lead wire connected with the motor main body 13 is pulled outside the motor shell 1 by passing through a hole formed in the motor shell 1, then the motor main body 13 is clamped in the motor shell 1, then the mounting bolts 15 are used for fixing the motor plate 14 on the motor shell 1, so that the motor main body 13 is fixed in the motor shell 1; at the moment, the tail of the motor main body 13 can extrude the buffering rubber block 31 and abuts against the heat conduction plate 33; then the motor with the vibration reducing function is mounted on equipment, then a power supply is switched on; the vibration force generated by the motor main body 13 during operation can extrude the extrusion rods 32 and the buffering springs 63 of the buffering mechanisms 6 through the extrusion plates 5; when the extrusion rods 62 are extruded, the piston bodies 72 of the piston mechanisms 7 can be extruded, so that the piston bodies 72 do piston motion in the housings 71; the air in the housings 71 is discharged into the protection shells 8, then the air in the protection shells 8 is sucked into the housings 71; the dustproof covers 10 can isolate the foreign matters such as the dust in the air and the like outside the protection shells 8 in the process so as to prevent the foreign matters such as the dust in the air and the like from being sucked into the housings 71 when pushing and pulling the piston bodies 72; meanwhile, the buffering springs 63 can apply action force in a direction close to the motor main body 13 to the extrusion plates 5 so as to reduce the vibration force generated by the motor main body 13 during operation together with the piston bodies 72; when the motor main body 13 operates, the heat conduction plate 33 can conduct the heat of a shell of the motor main body 13 to the heat dissipation plates 34, then the heat dissipation plates 34 can dissipate the heat on the heat conduction plate 33 to the air so as to carry out heat dissipation treatment on the motor main body 13.

Although the embodiments of the invention have been shown and described, those of ordinary skill in the art shall understand that the embodiments can be subjected to various changes, modifications, replacements and variations on the premise of not deviating from the principle and the spirit of the invention. The scope of the invention is limited by the appended claims and equivalents thereof.

CLAIMS

1. A motor with a vibration reducing function, comprising a motor shell (1), characterized in that upper and lower ends and front and rear parts of the outside of the motor shell (1) are fixedly connected with protection shells (8); piston mechanisms (7) are mounted on two sides of the inside of each protection shell (8); a through hole (9) is formed in one side of each protection shell (8); the inside of each through hole (9) is clamped with a dustproof cover (10); a heat dissipation tank (2) is arranged in the middle part of the outer wall of one side of the motor shell (1); a heat conduction mechanism (3) is mounted in the middle part of the inner wall of one side of the motor shell (1); an opening is formed in the other side of the motor shell (1); screw holes (16) are formed in the outer wall of the motor shell (1) at the upper and lower ends of the opening; the inside of the motor shell (1) is clamped with a motor main body (13); the output end of the motor main body (13) faces towards the other side of the motor shell (1), and the output end is located outside the other side of the motor shell (1); the output end of the motor main body (13) is sleeved and is fixedly connected with a motor plate (14); one side, close to the motor shell (1), of the motor plate (14) is fixedly connected with a rubber layer; sliding grooves (4) are formed in the inner walls of the upper and lower ends and the front and rear parts of the motor shell (1); the inside of each sliding groove (4) is in sliding connection with an extrusion plate (5); one side, close to the middle part of the motor shell (1) of each extrusion plate (5) abuts against the outer wall of the motor main body (13); grooves (20) are formed in inner walls of two sides of one end, away from the middle part of the motor shell (1), of each sliding groove (4); each groove (20) is opposite to a piston mechanism (7) on the same side; a buffering mechanism (6) is mounted in each groove (20); a piston hole (19) is formed in the inner wall of one end, away from the middle part of the motor shell (1), of each groove (20); each piston mechanism (7) comprises a housing (71); each housing (71) is fixedly connected with the outer wall of the motor shell (1); the inside of each housing (71) is in sliding connection with a piston body (72); an air hole (73) is formed in the middle part of one side, away from the motor shell (1), of each housing (71); each air hole (73) is communicated with the inside of a protection shell (8) on the same side; the heat conduction mechanism (3) comprises a buffering rubber block (31); the buffering rubber block (31) is fixedly connected with the inner wall of one side of the motor shell (1); a first through groove (32) is formed in the middle part of the buffering rubber block (31); the inside of the first through groove (32) is fixedly connected with a heat conduction plate (33); the heat conduction plate (33) passes through the inner wall of one side of the motor shell (1) and extends to the inside of the heat dissipation tank (2); the heat conduction plate (33) is fixedly connected with the side wall of one side of the motor shell (1); one side, located in the heat dissipation tank (2), of the heat conduction plate (33) is fixedly connected with a plurality of heat dissipation plates (34); each buffering mechanism (6) comprises a mounting plate (61); each mounting plate (61) is fixedly

connected with an extrusion plate (5) on the same side; the middle part of one side, away from each extrusion plate (5), of each mounting plate (61) is fixedly connected with an extrusion rod (62); one end, away from each mounting plate (61), of each extrusion rod (62) passes through a piston hole (19) on the same side and is fixedly connected with a piston body (72) of a piston mechanism (7) on the same side; each extrusion rod (62) is in sliding connection with the inside of the piston hole (19) in the same side; two ends of one side, away from each extrusion plate (5), of each mounting plate (61) are fixedly connected with buffering springs (63); and one end, away from each mounting plate (61), of each buffering spring (63) is fixedly connected with the inner wall of a groove (20) in the same side.

2. The motor with the vibration reducing function according to Claim 1, characterized in that limiting grooves (17) are formed in side walls of two sides of each sliding groove (4); the inside of each limiting groove (17) is in sliding connection with a limiting plate (18); and one side, close to the middle part of each sliding groove (4), of each limiting plate (18) is fixedly connected with an extrusion plate (5) on the same side.

3. The motor with the vibration reducing function according to Claim 1, characterized in that the upper and lower ends of the motor plate (14) are in threaded connection with mounting bolts (15); and the mounting bolts (15) pass through the motor plate (14) and are matched with screw holes (16) formed in the motor shell (1).

4. The motor with the vibration reducing function according to Claim 1, characterized in that the inner wall of the middle part of each protection shell (8) is fixedly connected with a support plate (11); one end, away from the inner wall of each protection shell (8), of each support plate (11) is fixedly connected with the outer wall of the motor shell (1) between two piston mechanisms (7) on the same side.

5. The motor with the vibration reducing function according to Claim 4, characterized in that each support plate (11) is of a convex structure; and a second through groove (12) is formed in one end, away from the motor shell (1), of each support plate (11).

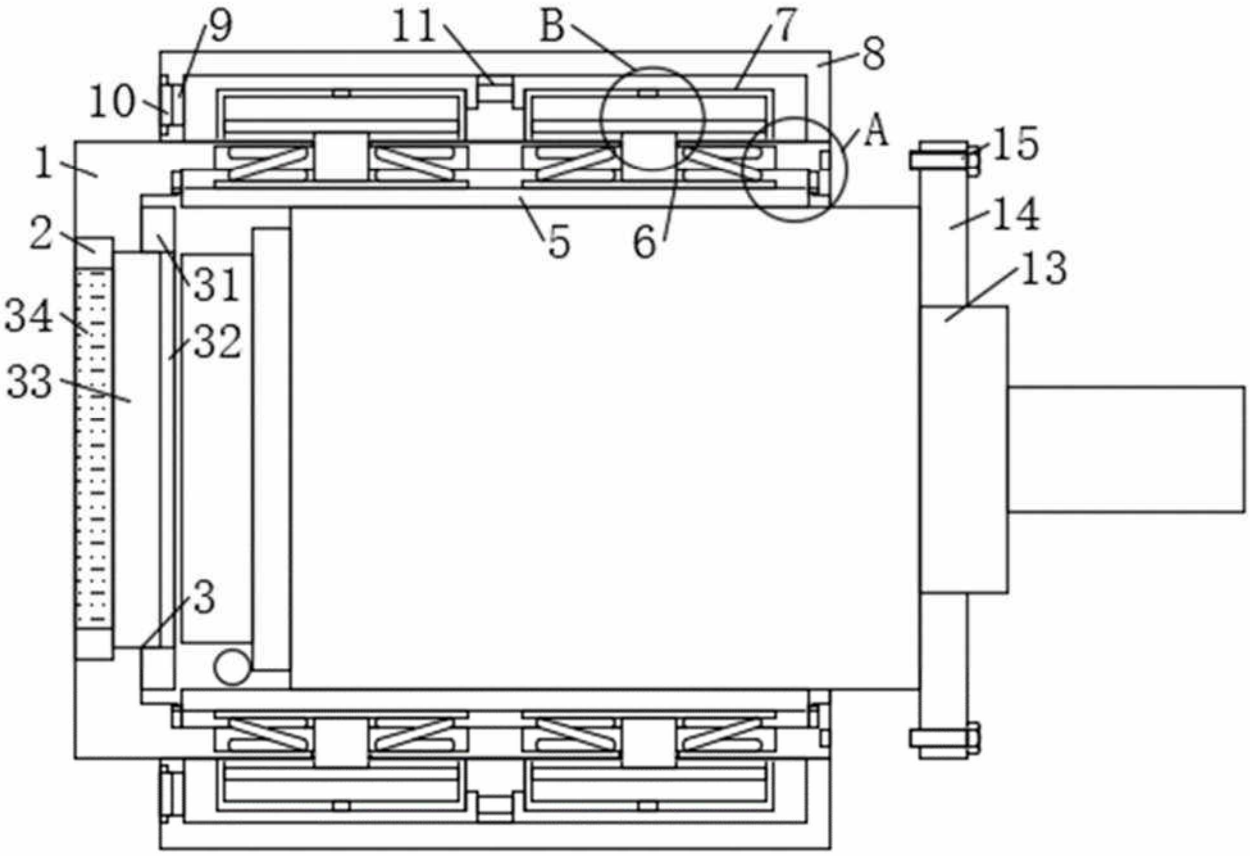

FIGURE 1

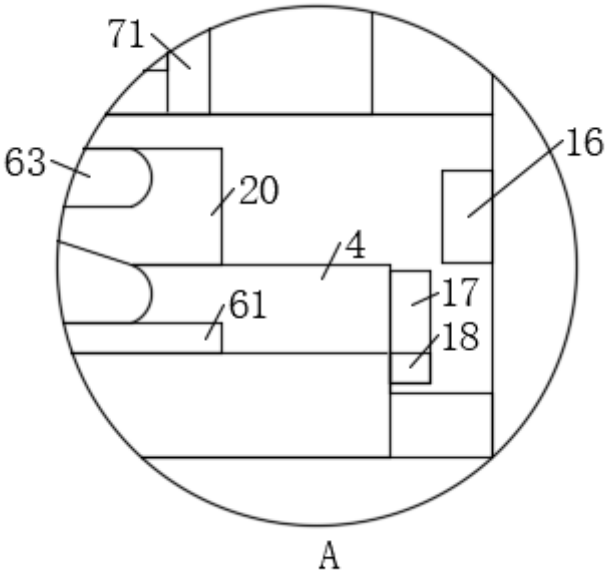

FIGURE 2

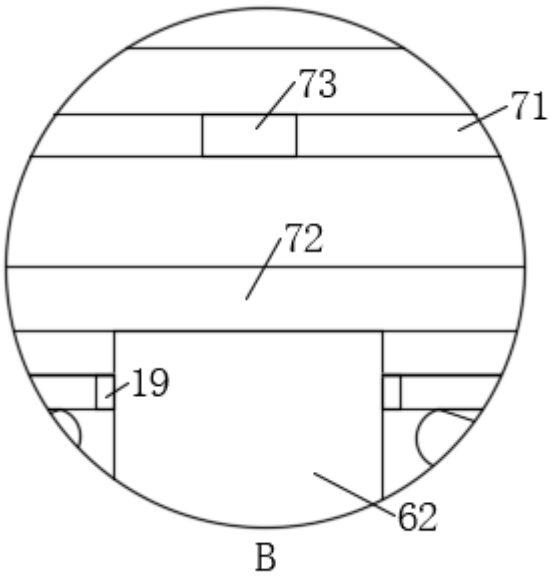

FIGURE 3

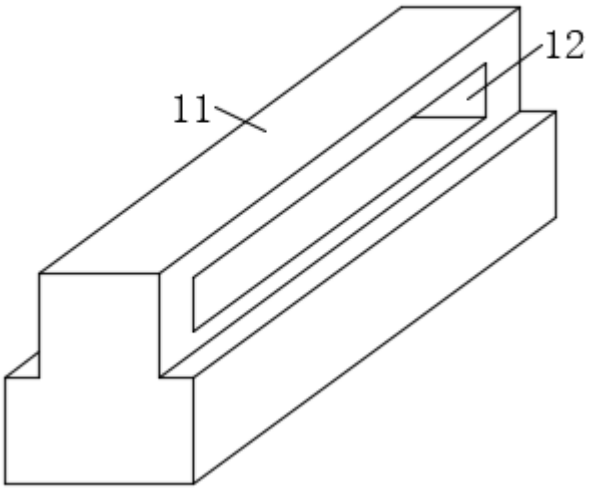

FIGURE 4

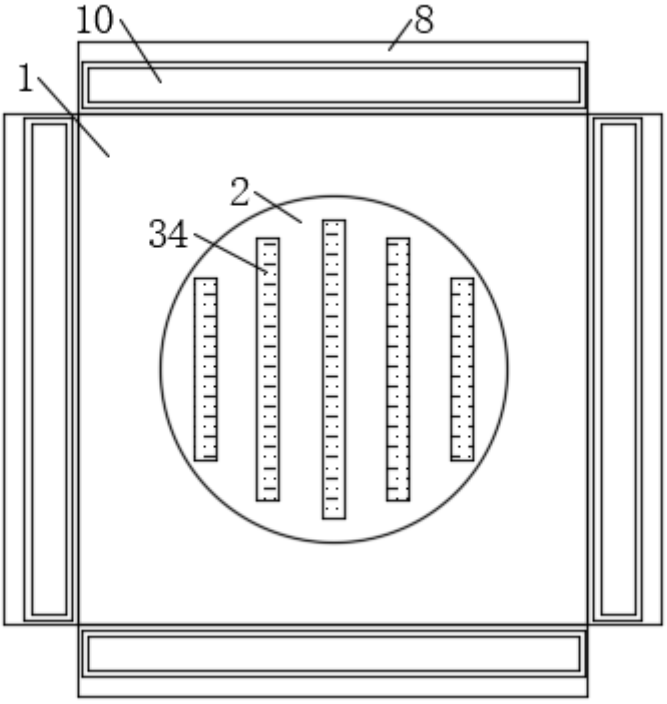

FIGURE 5