

(19)



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

(11)

N° de publication :

LU502358

(12)

BREVET D'INVENTION**B1**

(21)

N° de dépôt: LU502358

(51)

Int. Cl.:

B60K 1/00, H01M 50/20, B60L 50/64

(22)

Date de dépôt: 24/06/2022

(30)

Priorité:

(72)

Inventeur(s):

CUI Lei - Chine, WANG Fan - Chine, SHI Yunyang -
Chine, WANG Yang - Chine, GAO Jiansen - Chine

(43)

Date de mise à disposition du public: 30/12/2022

(74)

Mandataire(s):

Patent42 SA - 4081 Esch-sur-Alzette (Luxembourg)

(47)

Date de délivrance: 30/12/2022

(73)

Titulaire(s):

SUQIAN UNIVERSITY - 223800 Suqian City,
Jiangsu (Chine)

(54)

Protection device for power system of new energy vehicle.

(57)

This invention comprises protective hull, wherein that inner bottom wall of the protective hull is provided with a plurality of shock absorption seat blocks, a plurality of battery packs are arranged on the shock absorption seat block, positioning assemblies are arranged on four sides of the battery packs, protective hull cover is arranged at the upper end of the protective hull, a cooling cavity is arranged inside the protective hull cover, and a plurality of heat conductive copper sheets are arranged at the lower end of the cooling cavity; the side wall of the protective hull is provided with a plurality of air inlets, the inner side of the cooling cavity is provided with a plurality of spiral curved pipes, each spiral curved pipe is internally provided with dry particles, and both sides of the protective hull are connected with integrated expansion parts.

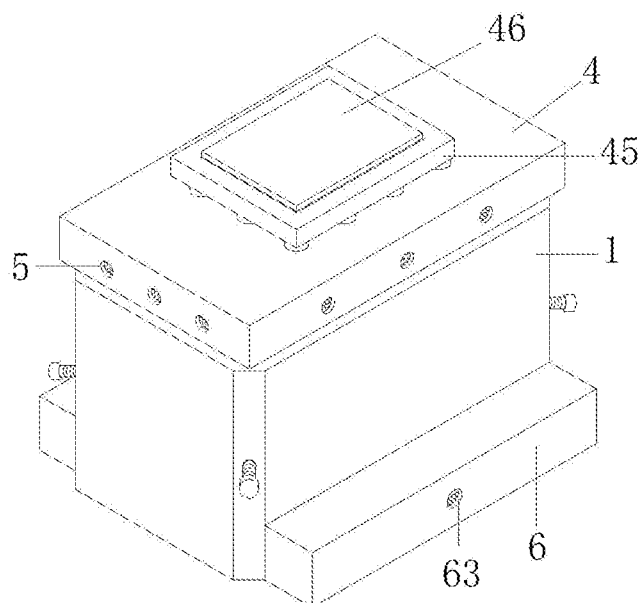


Figure 1

Description

LU502358

Protection device for power system of new energy vehicle**Technical field**

The invention mainly relates to the technical field of new energy vehicles, particularly relates to protection device for power system of new energy vehicle.

Background

New energy vehicles refer to all other energy vehicles except gasoline and diesel engines, including fuel cell vehicles, hybrid vehicles, hydrogen powered vehicles and solar powered vehicles, etc., and their exhaust emissions are relatively low. Electric vehicle is one of new energy vehicles, and its power is provided by on-board battery, which is equivalent to the heart of electric new energy vehicle. Pure electric vehicle technology is relatively simple and mature, and it can be charged wherever there is power supply.

The most important thing for new energy vehicles is battery pack. For the safety of battery pack, the existing new energy vehicles will be equipped with a special device for battery protection. Most current battery protection devices have single function, poor adaptability and stability, and can't be applied to different battery sizes. When driving on a relatively bumpy road, the battery is easy to shake and collide with the inner wall of the protection device, resulting in damage. In order to enhance the heat dissipation effect, the existing battery protection devices will design many heat dissipation holes, and too many heat dissipation holes will make foreign matters easily enter the protection device, causing damage to the battery. Furthermore, the existing battery protection devices only have air cooling, and the heat dissipation effect is general.

Summary

This invention provides protection device for power system of new energy vehicle to solve the problems described above.

This invention provides the technical solution as follows:

Protection device for power system of new energy vehicle comprises a protective hull, and is characterized in that that inn bottom wall of the protective shell is provided with a plurality of shock-absorbing seat blocks, a battery pack is arranged on the plurality

of shock-absorbing seat block, and positioning assemblies are arranged on four sides of the battery pack, the positioning components comprises a moving screw which is in threaded connection with the side wall of the protective hull, and one end of the moving screw is connected with right-angle installation plate located in the protective hull, two upper and lower right-angle rubber plates are installed on the inner wall of the right-angle installation plate, the upper end of the protective hull is provided with a protective hull cover, and the protective hull cover is internally provided with a protective hull cover, cooling cavity, and the cooling cavity is filled with cooling liquid, and a plurality of heat-heat conductive copper sheet are installed at the lower end of the cooling cavity, the other ends of the plurality of the thermally heat conductive copper sheets all extend into the interior of the protective hull; a plurality of air inlets are opened on the side walls of the protective hull, and a plurality of baffles are arranged inside the air inlet, a plurality of the baffles are arranged in a staggered way from top to bottom, and there is no linear air passage inside the several baffles, and each of the baffles is installed with an adhesive cardboard on the side facing the air inlet, several helical curved pipes are arranged on the inner side of the cooling cavity, and the corresponding spiral curved pipes are connected with the air inlet, the inside of the spiral curved pipe is provided with dry particles, and the other end of each of the spiral curved pipes is connected with an air inlet pipe extending into the interior of the protective hull; two sides of the protective hull are connected with integrated expansion parts, two expansion parts are internally provided with rotating screws, and the rotating screws are screwed with moving rings, the moving ring is provided with an exhaust fan, the side wall of the expansion part is provided with an exhaust port, and a telescopic hose is connected between the exhaust fan and the exhaust port.

Preferably, a plurality of shock-absorbing seat blocks are arranged on the inner bottom wall of the protective shell in a rectangular array, and no two shock-absorbing seat blocks are contacted with each other.

Preferably, two upper and lower limiting telescopic rods are connected between the right-angle installation plate and the inner side wall of the protective hull.

Preferably, the lower end of the protective hull cover is provided with a plurality of positioning telescopic rods, and each positioning telescopic rod is internally provided with an extension spring.

Preferably, the upper end of the protective hull cover is provided with a cooling box, the upper end of the cooling box is embedded with heat-dissipating aluminum plate (46), and a plurality of connecting pipe are connected between the cooling box and the cooling cavity.

Preferably, a plurality of spiral curved pipes and a plurality of air inlets are all in one-to-one correspondence, and the number of baffles in each air inlet is at least three, and the lower baffle is not less than the upper baffle, and a connecting rod is connected between every two baffles.

Preferably, filter screen is installed inside the air inlet and the air outlet.

Preferably, one side of the protective hull is provided with a driving wheel and a motor, the output end of the motor is connected with the axis of the driving wheel, and both sides of the driving wheel are provided with driven wheels, and a chain belt is connected between the two driven wheels and the driving wheel, and the two driven wheels and the two rotating screws are in one-to-one correspondence and are connected with the axes.

Compared with the prior art, this invention has the following beneficial effects:

(1) When the air enters the air inlet, due to the presence of the baffle, the air contacts with the baffle, and the adhesive cardboard absorbs the impurities in the air, thus ensuring the purity of the air and avoiding the influence of impurities on the battery pack. At the same time, only one exhaust port is adopted, and a telescopic hose is connected between the exhaust port and the exhaust fan, which avoids the problem of external foreign substances entering from the exhaust port on the premise of ensuring effective heat dissipation, and solves the problem that excessive heat dissipation holes easily lead to impurities entering the protective casing;

(2) The heat-conducting copper sheet absorbs the heat generated by the battery pack and transmits it to the cooling cavity, which discharges the heat through evaporation and condensation, thus realizing the circulating water cooling in the whole

process. The exhaust fan can discharge the hot air inside the device and drive the air to flow, thus realizing air cooling, combining air cooling with water cooling, and increasing the heat dissipation efficiency. Moreover, because the exhaust fan keeps moving, the exhaust fan can completely discharge the hot air inside, avoiding only partial air discharge, and further increasing the heat dissipation efficiency;

(3) The shock-absorbing seat block supports the battery pack, the positioning assembly preliminarily fixes the battery pack, and the positioning telescopic rod abuts on the upper end face of the battery pack, so that the battery pack is fixed due to the existence of the extension spring inside the positioning telescopic rod. The device can be adaptively adjusted according to the size of the battery pack, can be suitable for most battery packs, and has strong practicability;

(4) The shock-absorbing seat blocks, the right-angle rubber plates and the extension spring can absorb the shock, and eliminate the impact of the shock on the battery pack, which has a good protection effect, furthermore, this design can prevent the damage of battery pack from shaking and colliding with the inner wall of the protection device when the vehicle runs on a relatively bumpy road, which improves the practicability;

(5) The outside air enters the spiral curved pipe through the air inlet. Due to the special design of the spiral curved pipe, the residence time of the air inside the spiral curved pipe is increased, so that the air is fully cooled, and the high temperature of the outside air can be avoided, which affects the heat dissipation efficiency. When the air passes through the spiral curved pipe, it contact with dry particles and absorb the moisture in the air, thus avoiding the damage of the battery pack caused by the high humidity of the outside air, and further increasing the protection.

Brief Description Of The Figures

Hereinafter, the present invention will be explained in detail with reference to the drawings and specific examples.

Fig. 1 is the three-dimensional schematic diagram of the present invention;

Fig. 2 is the side view structure schematic diagram of the present invention;

Fig. 3 is the enlarged view of A place of the present invention;

4 is a schematic perspective view of a plurality of baffles of the present invention; LU502358

Fig. 5 is a schematic top view structure diagram of the protective hull of the present invention;

Fig. 6 is the three-dimensional schematic diagram of the installation right-angle plate and the rubber right-angle plate of the present invention;

Fig. 7 is a three-dimensional schematic diagram of the moving ring and the exhaust fan of the present invention.

Wherein,

1. protective hull; 11. shock absorbing seat block; 12. filter screen; 2. battery pack; 3. positioning components; 31. Moving screw; 32. right-angle installation plate; 33. right angle rubber plate; 34. limiting telescopic pole; 4. protective hull cover; 41. positioning telescopic rod; 42. extending spring; 43. cooling cavity; 44. heat conductive copper sheet; 45. cooling box; 46. heat-dissipating aluminum plate; 47. connecting pipe; 5. air inlet; 51, spiral curved pipe; 52. baffle; 53. connecting rod; 54. drying particles; 55. air inlet pipe; 56. viscose cardboard; 6. expansion part; 61. rotating screw; 62. moving ring; 63. exhaust port; 64. telescopic hose; 65. driving wheel; 66. motor; 67. driven wheel; 68. chain belt; 69. exhaust fan.

Description of the present invention

In order to facilitate the understanding of the present invention, the present invention will be described more fully below with reference to the relevant drawings, in which several embodiments of the present invention are given. However, the present invention can be implemented in different forms and is not limited to the embodiments described in the text. On the contrary, these embodiments are provided to make the disclosure of the present invention more thorough and comprehensive.

It should be noted that when an element is called "fixed" to another element, it may be directly on another element or there may be an intermediate element. When an element is considered as "connected" to another element, it may be directly connected to another element or there may be an intermediate element at the same time. The terms "vertical", "horizontal", "left", "right" and similar expressions are used in this paper.

Unless otherwise defined, all technical and scientific terms used herein have the same meanings as those commonly connected to those skilled in the technical field of the present invention. The terminology used in the specification of the present invention herein is for the purpose of describing specific embodiments, and is not intended to limit the present invention. The term "and/or" used herein includes any and all combinations of one or more related listed items.

Referring to the attached Fig. 1 and 2, the invention provides a technical scheme: a protective device for battery packs of new energy vehicles, comprising a protective casing 1, wherein a plurality of shock absorbing seat blocks 11 are arranged on the inner bottom wall of the protective hull 1, and battery packs 2 are arranged on a plurality of shock absorbing seat blocks 11. A plurality of shock-absorbing seat blocks 11 are arranged on the inner bottom wall of the protective hull 1 in a rectangular array, and no two shock-absorbing seat blocks 11 are in contact with each other. The shock-absorbing seat blocks 11 support the battery pack 2, which can reduce the impact of vibration on the battery pack 2 and achieve a good protective effect. Moreover, as several shock-absorbing seat blocks 11 are spaced apart, it is convenient for the bottom of the battery pack 2 to radiate heat.

Referring to Fig.1, 2, 5 and 6. The four sides of the battery pack 2 are provided with positioning components 3. The positioning components 3 include a moving screw 31 screwed to the side wall of the protective hull 1. One end of the moving screw 31 is connected with an installation right angle plate 32 located in the protective hull 1, two upper and lower limiting telescopic pole 34 are connected between the right-angle installation plate 32 and the inner side wall of the protective casing 1, and the limiting telescopic pole 34 can prevent the right-angle installation plate 32 from rotating stably. The inner wall of the right-angle installation plate 32 is provided with two upper and lower right angle rubber plate 33, the upper end of the protective hull 1 is provided with a protective hull cover 4, and the lower end of the protective hull cover 4 is provided with a plurality of positioning telescopic rods 41, and each positioning telescopic rod 41 is internally provided with an extension spring 42, the upper and lower right-angle rubber plates 33 are used to fix the side of the battery pack 2. On the premise of ensuring the

fixing effect, the right-angle rubber plates 33 can improve the damping effect, and the upper and lower separated right-angle rubber plates 33 are more conducive to heat dissipation. The positioning telescopic rod 41 cooperates with the extension spring 42, which can also improve the damping effect on the premise of ensuring the fixing effect, the battery pack 2 is placed in the protective hull 1, and the shock-absorbing seat block 11 supports the battery pack 2. Then, each moving screw 31 is rotated to make the mounting right-angled plate 32 move until the rubber right-angled plate 33 contacts the battery pack 2, and the battery pack 2 is preliminarily fixed. Then, the protective casing cover 4 is covered, and the positioning telescopic rod 41 abuts on the upper end face of the battery pack 2. Due to the existence of the extension spring 42, the battery pack 2 is fixed. This positioning components 3 can be adaptively adjusted according to the size of the battery pack 2, which is practical.

Referring to the attached Fig. 1 and 2, the inside of the protective hull cover 4 is provided with a cooling cavity 43, and the cooling cavity 43 is filled with cooling liquid. The lower end of the cooling cavity 43 is provided with a plurality of heat-conducting copper sheets 44, and the other ends of the heat-conducting copper sheets 44 all extend into the protective cover 1. The upper end of the protective hull cover 4 is provided with a cooling box 45, and the upper end of the cooling box 45 is embedded with a heat-dissipating aluminum plate 46, a plurality of communication pipes 47 are connected between the cooling box 45 and the cooling cavity 43, the heat-conducting sheet 44 absorbs the heat generated by the battery pack 2 and transmits it to the cooling cavity 43. The cooling liquid in the cooling cavity 43 absorbs the heat and evaporates into steam and enters the cooling box 45. Through the heat dissipation aluminum plate 46, the steam heat is dissipated, and the cooling liquid that has lost heat liquefies and drops down, and returns to the cooling cavity 43, thus realizing the whole process of circulating water cooling and increasing the heat dissipation efficiency of the battery pack 2.

Referring to the attached Fig 1-4, the side wall of the protective casing 1 is provided with a plurality of air inlets 5, the filter screen 12 is installed in the air inlets 5, and a plurality of baffles 52 are arranged in the air inlets 5 in an up-and-down staggered manner, and there are no straight air passages in the baffles 52. Each baffle 52 is

provided with a viscose cardboard 56 on its side facing the air inlets 5, and outside air enters the air inlets 5. First, the filter screen 12 is preliminarily filtered to isolate most of the impurities in the air, thus avoiding the blockage of the pipeline, and the air keeps moving forward. Because the baffles 52 are staggered up and down, and there are no straight air passages in several baffles 52, the air contacts with the baffles 52, and the adhesive cardboard 56 can absorb the impurities in the air, thus ensuring the purity of the air and preventing the impurities from affecting the battery pack 2. A plurality of spiral curved pipes 51 and a plurality of air inlets 5 are in one-to-one correspondence, the number of baffles 52 in each air inlet 5 is at least three, and the lower baffle 52 is not less than the upper baffle 52. A connecting rod 53 is connected between two baffles 52, and a plurality of baffles 52 are connected by the connecting rod 53, so that all baffles 52 can be taken out together, thereby increasing the practicability.

Referring to the attached Fig. 1-4, a plurality of spiral curved pipes 51 are arranged on the inner side of the cooling cavity 43, and the corresponding spiral curved pipes 51 are connected with the air inlet 5. Each spiral curved pipe 51 is internally provided with drying particles 54, and the other end of each spiral curved pipe 51 is connected with an air inlet 55 extending into the protective casing 1, through which the outside air enters the spiral curved pipes 51. Due to the special design of the spiral curved pipe 51, the residence time of the air in the spiral curved pipe 51 can be increased, so that the air can be fully cooled, and the high temperature of the outside air can be avoided, which will affect the heat dissipation efficiency. Then, the air enters the inside of the protective casing 1 through the air inlet pipe 55, and when it passes through the spiral curved pipe 51, the air will contact with the dry particles 54 to absorb the moisture in the air, thus avoiding the damage of the battery pack 2 caused by the high humidity of the outside air.

Referring to the attached Fig. 1, 2, 5 and 7. Both sides of the protective hull 1 are connected with integrated expansion parts 6. Two expansion parts 6 are internally provided with rotating screws 61. The rotating screws 61 are threaded with a moving ring 62, and the moving ring 62 is provided with an exhaust fan 69. The side wall of the expansion part 6 is provided with an exhaust port 63, and a filter screen 12 is installed inside the exhaust port 63. The filter screen 12 can prevent the exhaust fan 69 from

stopping running. The foreign matter enters into the protective casing 1 from the exhaust port 63, and a telescopic hose 64 is connected between the exhaust fan 69 and the exhaust port 63. A driving wheel 65 and a motor 66 are installed on one side of the protective hull 1, and the output end of the motor 66 is connected with the axis of the driving wheel 65. Two driven wheels 67 are arranged on both sides of the driving wheel 65, and a chain belt 68 is connected between the two driven wheels 67 and the driving wheel 65, and the two driven wheels 67 and the two rotating screws 61 are in one-to-one correspondence and connected with the axis. The motor 66 is started to rotate the driving wheel 65, and the two driven wheels 67 are rotated by the chain belt 68, so that the two rotating screws 61 rotate, the moving ring 62 is driven to move, and the exhaust fan 69 is started, so that the exhaust fan 69 can completely exhaust the internal hot air, avoiding only partial air discharge, and only one exhaust port 63 is adopted. A telescopic hose 64 is connected between the exhaust port 63 and the exhaust fan 69, which can avoid the trouble of foreign matters entering from the exhaust port 63 on the premise of ensuring effective heat dissipation.

The specific operation flow of the invention is as follows:

The battery pack 2 is placed in the protective hull 1, the shock-absorbing seat block 11 supports the battery pack 2, then each moving screw 31 is rotated to move the mounting right-angled plate 32 until the rubber right-angled plate 33 contacts the battery pack 2, the battery pack 2 is preliminarily fixed, then the protective hull cover 4 is covered, and the telescopic rod 41 is positioned to abut on the upper end face of the battery pack 2. Because of that existence of the extension spring 42, the battery pack 2 is fixed, the positioning components 3 can be adaptively adjusted, according to the size of the battery pack 2, which can be applied to most battery pack 2, thus having strong practicability, the heat-conducting copper sheet 44 absorbs the heat generated by the battery pack 2 and transmits it to the cooling cavity 43, and the cooling liquid in the cooling cavity 43 absorbs the heat and evaporates into steam and enters the cooling box 45, through the heat dissipation of the heat-dissipating aluminum plate 46, the steam heat is dissipated, and the cooling liquid that has lost heat is liquefied and dripped down, and returns to the cooling cavity 43 again, so that the whole process of circulating water

cooling is realized, and the heat dissipation efficiency of the battery pack 2 is increased. The outside air enters into the air inlet 5, and first, it is preliminarily filtered by the filter screen 12 to isolate most impurities in the air, thus avoiding pipeline blockage, and the air keeps moving forward. Because the baffles 52 are staggered up and down, and there are no straight air passages in several baffles 52.

The viscose cardboard 56 can absorb the impurities in the air, thus ensuring the purity of the air and preventing the impurities from affecting the battery pack 2. The outside air enters the spiral curved pipe 51 through the air inlet 5. Due to the special design of the spiral curved pipe 51, the residence time of the air in the spiral curved pipe 51 can be increased, so that the air can be sufficiently cooled, and the high temperature of the outside air can be prevented from affecting the heat dissipation efficiency. Then, the air enters the protective casing 1 through the air inlet 55. When the air passes through the spiral curved pipe 51, it will contact with the dry particles 54 to absorb the moisture in the air, so as to avoid the damage of the battery pack 2 caused by the high humidity of the outside air. The motor 66 is started to rotate the driving wheel 65, and the two driven wheels 67 are rotated by the chain belt 68, so that the two rotating screws 61 rotate, the moving ring 62 is driven to move, and the exhaust fan 69 is started, so that the exhaust fan 69 can completely exhaust the internal hot air, avoiding only partial air exhaust, and only one exhaust port 63 is adopted, and a telescopic hose 64 is connected between the exhaust port 63 and the exhaust fan 69. On the premise of ensuring effective heat dissipation, the trouble of foreign matters entering from the exhaust port 63 is avoided.

The invention has been described by way of example with reference to the above drawings. Obviously, the specific implementation of the invention is not limited by the above way. As long as the immaterial improvement of the method concept and technical scheme of the invention is adopted, or the idea and technical scheme of the invention are directly applied to other occasions without improvement, it is within the scope of protection of the invention.

Claims

LU502358

1. Protection device for power system of new energy vehicle comprises a protective hull (1), and is characterized in that that inn bottom wall of the protective shell (1) is provided with a plurality of shock-absorbing seat blocks (11), a battery pack (2) is arranged on the plurality of shock-absorbing seat block (11), and positioning assemblies (3) are arranged on four sides of the battery pack (2), the positioning components (3) comprises a moving screw (31) which is in threaded connection with the side wall of the protective hull (1), and one end of the moving screw (31) is connected with right-angle installation plate (32) located in the protective hull (1), two upper and lower right-angle rubber plates (33) are installed on the inner wall of the right-angle installation plate (32), the upper end of the protective hull (1) is provided with a protective hull cover (4), and the protective hull cover (4) is internally provided with a protective hull cover (4), cooling cavity (43), and the cooling cavity (43) is filled with cooling liquid, and a plurality of heat-heat conductive copper sheet (44) are installed at the lower end of the cooling cavity (43), the other ends of the plurality of the thermally heat conductive copper sheets (44) all extend into the interior of the protective hull (1); a plurality of air inlets (5) are opened on the side walls of the protective hull (1), and a plurality of baffles (52) are arranged inside the air inlet (5); a plurality of the baffles (52) are arranged in a staggered way from top to bottom, and there is no linear air passage inside the several baffles (52), and each of the baffles (52) is installed with an adhesive cardboard (56) on the side facing the air inlet (5), several helical curved pipes (51) are arranged on the inner side of the cooling cavity (43), and the corresponding spiral curved pipes (51) are connected with the air inlet (5), the inside of the spiral curved pipe (51) is provided with dry particles (54), and the other end of each of the spiral curved pipes (51) is connected with an air inlet pipe (55) extending into the interior of the protective hull (1); two sides of the protective hull (1) are connected with integrated expansion parts (6), two expansion parts (6) are internally provided with rotating screws (61), and the rotating screws (61) are screwed with moving rings (62), the moving ring (62) is provided with an exhaust fan (69), the side wall of the expansion part (6) is provided with an exhaust port (63), and a

telescopic hose (64) is connected between the exhaust fan (69) and the exhaust port (63).

2. Protection device for power system of new energy vehicle, according to claim 1, is characterized in that a plurality of shock-absorbing seat blocks (11) are arranged on the inner bottom wall of the protective shell (1) in a rectangular array, and no two shock-absorbing seat blocks (11) are contacted with each other.

3. Protection device for power system of new energy vehicle, according to claim 1, is characterized in that two upper and lower limiting telescopic rods (34) are connected between the right-angle installation plate (32) and the inner side wall of the protective hull (1).

4. Protection device for power system of new energy vehicle, according to claim 1, is characterized in that the lower end of the protective hull cover (4) is provided with a plurality of positioning telescopic rods (41), and each positioning telescopic rod (41) is internally provided with an extension spring (42).

5. Protection device for power system of new energy vehicle, according to claim 1, is characterized in that the upper end of the protective hull cover (4) is provided with a cooling box (45), the upper end of the cooling box (45) is embedded with heat-dissipating aluminum plate (46), and a plurality of connecting pipe (47) are connected between the cooling box (45) and the cooling cavity (43).

6. Protection device for power system of new energy vehicle, according to claim 1, is characterized in that a plurality of spiral curved pipes (51) and a plurality of air inlets (5) are all in one-to-one correspondence, and the number of baffles (52) in each air inlet (5) is at least three, and the lower baffle (52) is not less than the upper baffle (52), and a connecting rod (53) is connected between every two baffles (52).

7. Protection device for power system of new energy vehicle, according to claim 1, is characterized in that filter screen (12) is installed inside the air inlet (5) and the air outlet (63).

8. Protection device for power system of new energy vehicle, according to claim 1, is characterized in that one side of the protective hull (1) is provided with a driving wheel (65) and a motor (66), the output end of the motor (66) is connected with the axis of the

driving wheel (65), and both sides of the driving wheel (65) are provided with driven wheels (67), and a chain belt (68) is connected between the two driven wheels (67) and the driving wheel (65), and the two driven wheels (67) and the two rotating screws (61) are in one-to-one correspondence and are connected with the axes.

Revendications

LU502358

1. Dispositif de protection pour le système d'alimentation d'un véhicule à énergie nouvelle comprend une coque de protection (1), et est caractérisé en ce que la paroi inférieure de la coque de protection (1) est pourvue d'une pluralité de blocs de siège amortisseurs (11), d'une batterie (2) est disposé sur la pluralité de blocs de siège amortisseurs (11), et des ensembles de positionnement (3) sont disposés sur quatre côtés du bloc-batterie (2), les composants de positionnement (3) comprenant une vis mobile (31) qui est en connexion filetée avec la paroi latérale de la coque de protection (1), et une extrémité de la vis mobile (31) est connectée à la plaque d'installation à angle droit (32) située dans la coque de protection (1), deux et des plaques inférieures en caoutchouc à angle droit (33) sont installées sur la paroi intérieure de la plaque d'installation à angle droit (32), l'extrémité supérieure de la coque de protection (1) est pourvue d'un couvercle de coque de coque protecteur (4), et le couvercle de coque protecteur (4) est pourvu à l'intérieur d'un couvercle de coque protecteur (4), d'une cavité de refroidissement (43), et la cavité de refroidissement (43) est remplie de liquide de refroidissement, et une pluralité de feuilles de cuivre (44) thermo conductrices sont installées à l'extrémité inférieure de la cavité de refroidissement (43), les autres extrémités de la pluralité de feuilles thermo conductrices des feuilles de cuivre (44) s'étendent toutes à l'intérieur de la coque de protection (1) ; une pluralité d'entrées d'air (5) sont ouvertes sur les parois latérales de la coque de protection (1) et une pluralité de chicanes (52) sont disposées à l'intérieur de l'entrée d'air (5) ; une pluralité de déflecteurs (52) sont disposés en quinconce de haut en bas, et il n'y a pas de passage d'air linéaire à l'intérieur des plusieurs déflecteurs (52), et chacun des déflecteurs (52) est installé avec un carton adhésif (56) sur le côté faisant face à l'entrée d'air (5), plusieurs tuyaux incurvés hélicoïdaux (51) sont disposés sur le côté intérieur de la cavité de refroidissement (43), et les tuyaux incurvés hélicoïdaux (51) correspondants sont reliés à l'entrée d'air (5), l'intérieur du tuyaux incurvés hélicoïdaux (51) est pourvu de particules sèches (54), et le l'autre extrémité de chacun des tuyaux incurvés hélicoïdaux (51) est reliée à un tuyau d'admission d'air (55) s'étendant à l'intérieur de la coque de protection (1) ; deux côtés de la coque de protection (1) sont reliés à des pièces d'expansion intégrées (6), deux pièces d'expansion (6) sont pourvues à l'intérieur de vis rotatives (61), et les vis rotatives (61)

sont vissées avec des anneaux mobiles (62), l'anneau mobile (62) est pourvu d'un ventilateur d'extraction (69) , la paroi latérale de la partie d'expansion (6) est pourvue d'un orifice d'évacuation (63), et un tuyau télescopique (64) est connecté entre le ventilateur d'évacuation (69) et l'orifice d'évacuation (63).

2. Dispositif de protection pour système d'alimentation de véhicule à énergie nouvelle, selon la revendication 1, caractérisé en ce qu'une pluralité de blocs de siège amortisseurs (11) sont disposés sur la paroi inférieure intérieure de la coque de protection (1) selon un réseau rectangulaire , et aucun bloc de siège amortisseur (11) n'est en contact l'un avec l'autre.

3. Dispositif de protection pour système d'alimentation de véhicule à énergie nouvelle, selon la revendication 1, caractérisé en ce que deux tiges télescopiques de limitation supérieure et inférieure (34) sont connectées entre la plaque d'installation à angle droit (32) et la paroi latérale intérieure du coque de protection (1).

4. Dispositif de protection pour système d'alimentation de véhicule à énergies nouvelles, selon la revendication 1, caractérisé en ce que l'extrémité inférieure du couvercle de coque de protection (4) est munie d'une pluralité de tiges télescopiques de positionnement (41), et chaque tige télescopique de positionnement (41) est muni intérieurement d'un ressort de traction (42).

5. Dispositif de protection pour système d'alimentation de véhicule à énergies nouvelles, selon la revendication 1, caractérisé en ce que l'extrémité supérieure du capot de protection coque (4) est munie d'un caisson de refroidissement (45), l'extrémité supérieure du caisson de refroidissement (45) est encastrée dans une plaque d'aluminium dissipant la chaleur (46), et une pluralité de tuyaux de raccordement (47) sont connectés entre la boîte de refroidissement (45) et la cavité de refroidissement (43).

6. Dispositif de protection pour le système d'alimentation de véhicule à énergie nouvelle, selon la revendication 1, caractérisé en ce qu'une pluralité de tuyaux incurvés en spirale (51) et une pluralité d'entrées d'air (5) sont toutes en correspondance biunivoque, et le nombre de déflecteurs (52) dans chaque entrée d'air (5) est d'au moins trois, et le déflecteur inférieur (52) n'est pas inférieur au déflecteur supérieur (52), et une bielle (53) est connectée entre deux déflecteurs (52).

7. Dispositif de protection pour système d'alimentation de véhicule à énergies

nouvelles, selon la revendication 1, caractérisé en ce qu'un tamis filtrant (12) est installé à l'intérieur de l'entrée d'air (5) et de la sortie d'air (63). LU502358

8. Dispositif de protection pour système d'alimentation de véhicule à énergies nouvelles, selon la revendication 1, caractérisé en ce qu'un côté de la coque de protection (1) est muni d'une roue motrice (65) et d'un moteur (66), l'extrémité de sortie de le moteur (66) est relié à l'axe de la roue motrice (65), et les deux côtés de la roue motrice (65) sont pourvus de roues motrices (67), et une courroie à chaîne (68) est reliée entre les deux roues motrices (67) et la roue motrice (65), et les deux roues motrices (67) et les deux vis rotatives (61) sont en correspondance biunivoque et sont reliées aux axes.

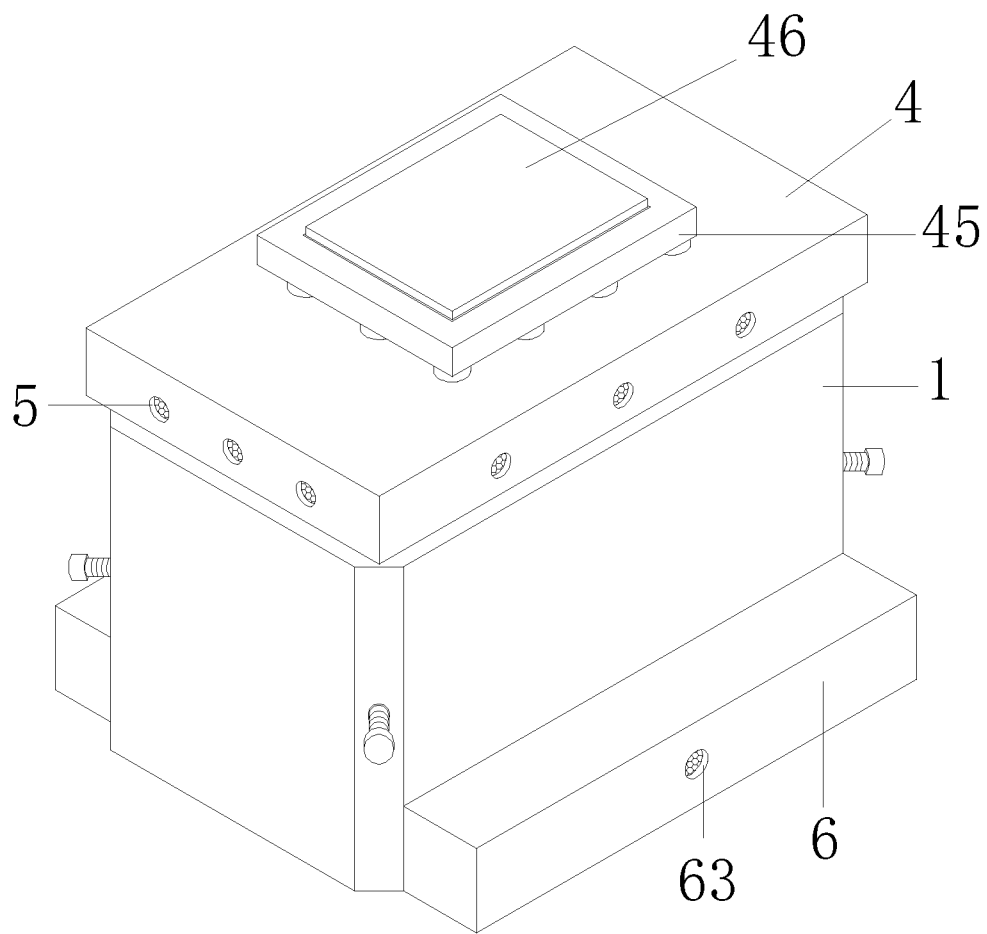


Figure 1

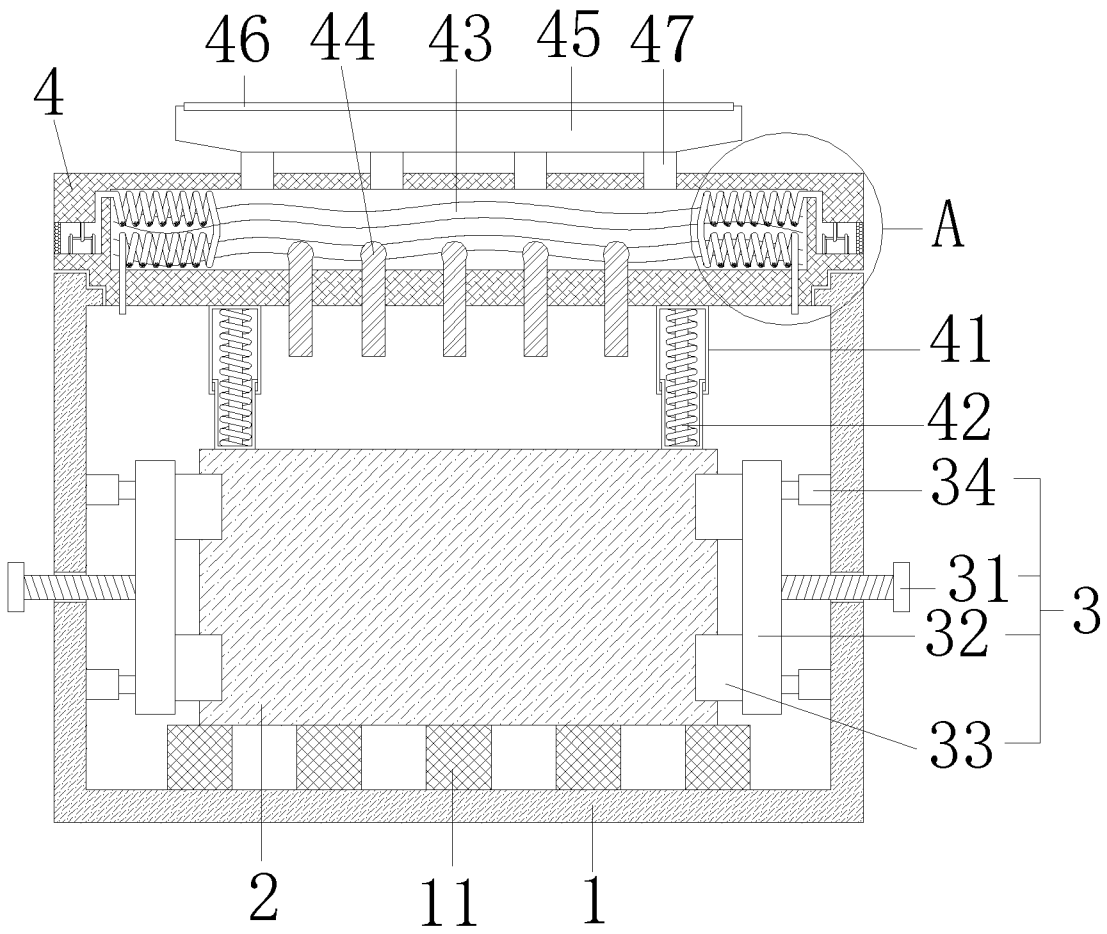


Figure 2

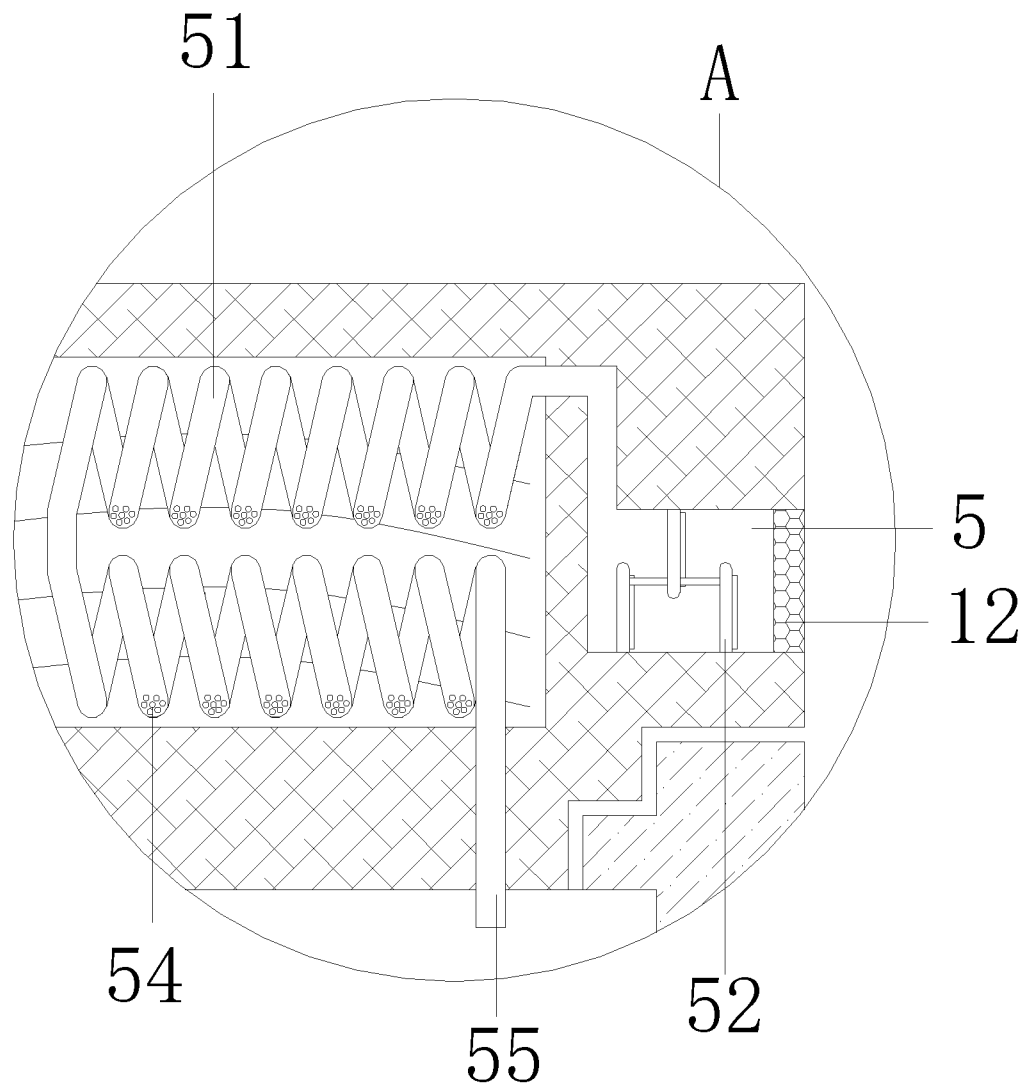


Figure 3

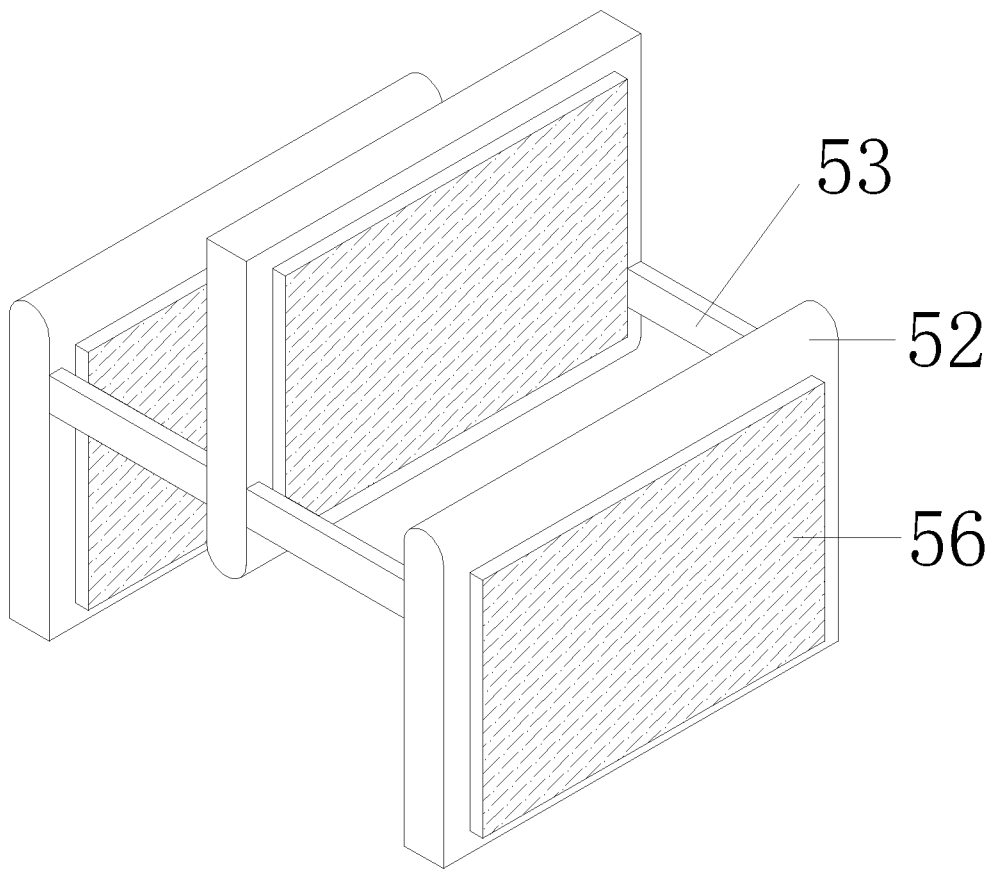


Figure 4

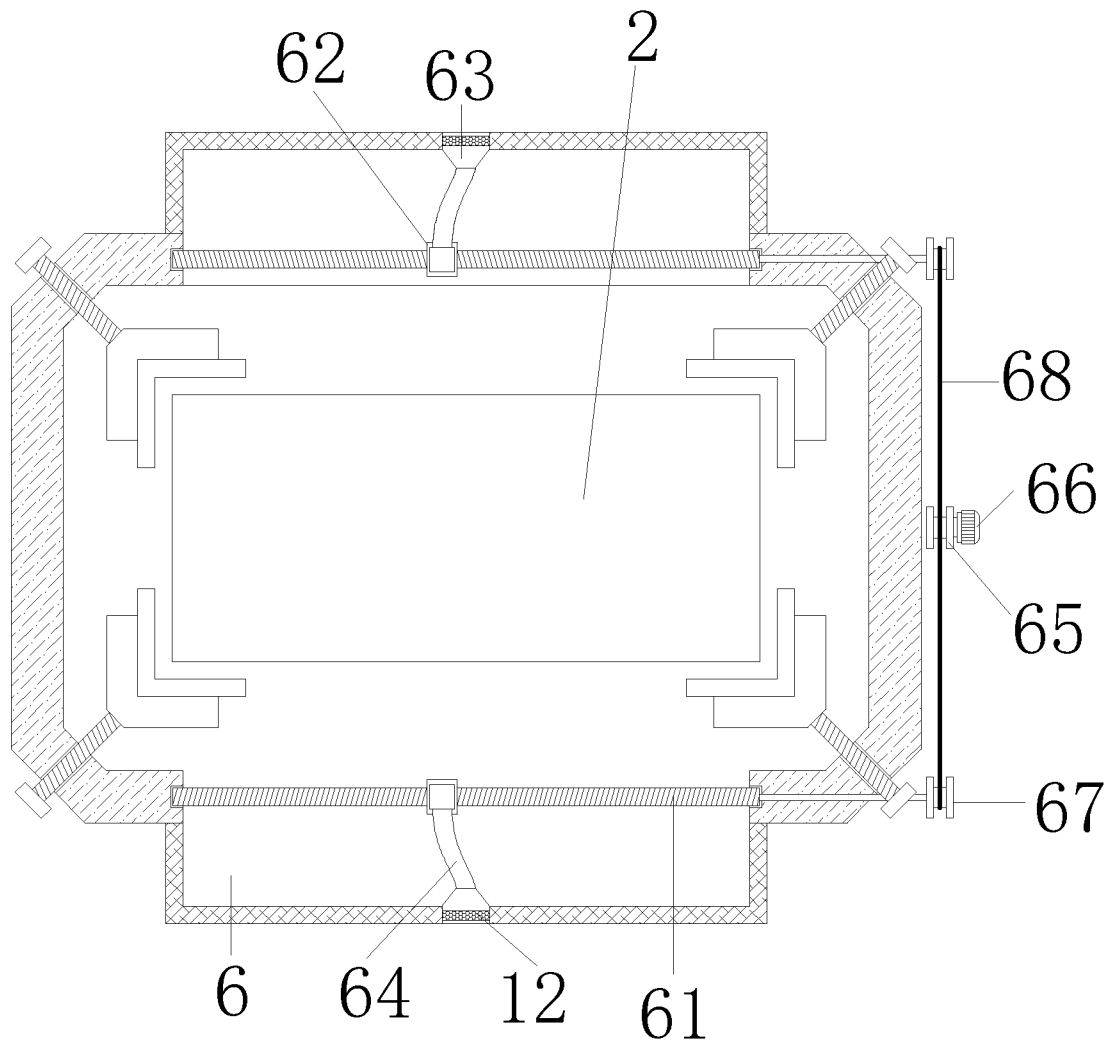


Figure 5

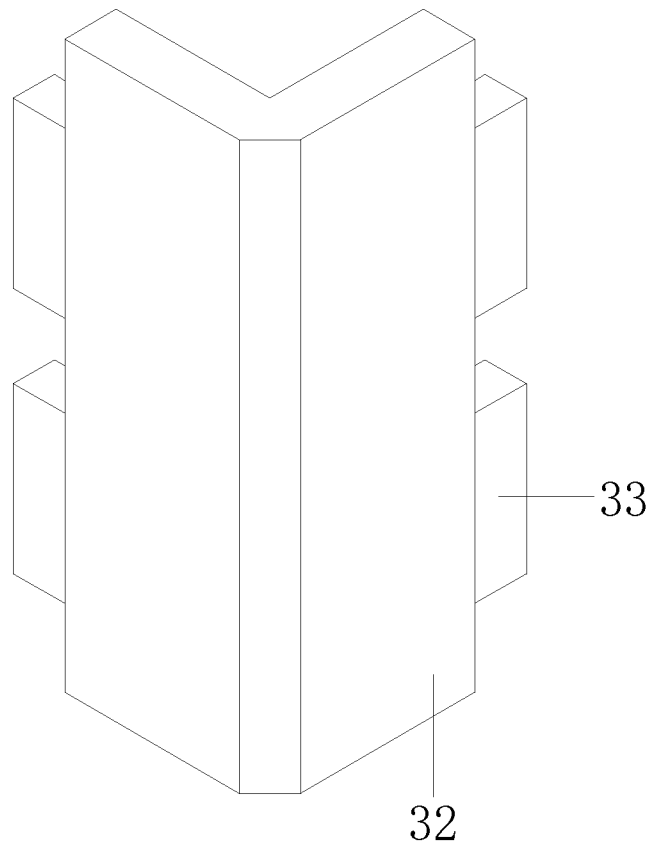


Figure 6

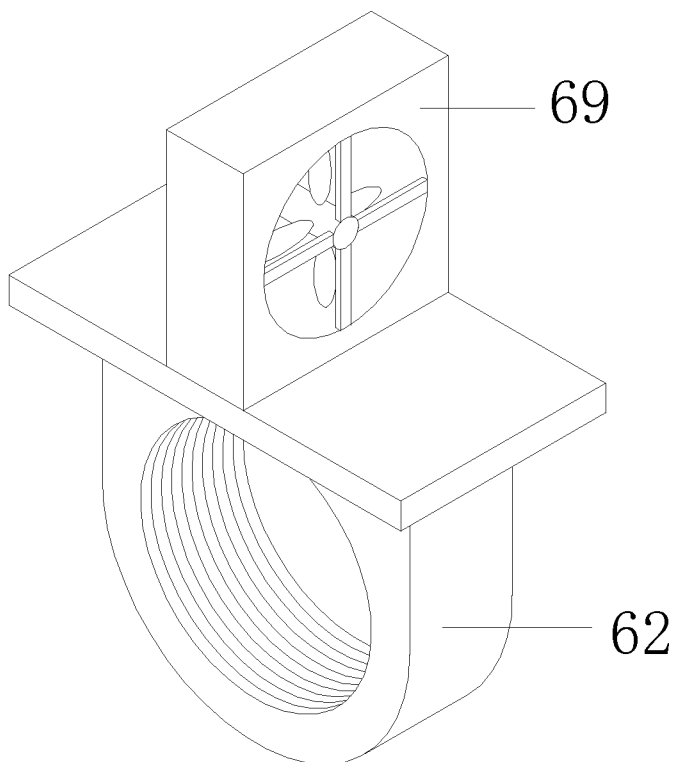


Figure 7