

## Air Cooling Structure of Battery Pack for New Energy Vehicles

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**Abstract:** The utility model discloses an air cooling structure for a battery pack of a new energy vehicle, which comprises a structural body, and both ends of the inner part of the protective frame are provided with limited position rods, and an inserting plate one is provided inside the inserting groove one, and the inserting plate One side is provided with a buffer spring, and the other end of the buffer spring is provided with a plug-in plate two. The two ends of the partitioned storage frame of the present invention are provided with limit slots, and both sides of the storage slot are provided with insertion holes and storage slots. Both sides are equipped with a deflector, one end of the deflector is provided with a plug rod, the middle of the top of the deflector is provided with a positioning hole, the bottom of the deflector is provided with a silicone pad, and the end of the deflector is A diversion hole one is provided on one side, and a diversion hole two is provided on the other end side of the deflector. A separate storage frame is added to facilitate the storage of the battery pack, and a diversion plate, a diversion hole one and a diversion hole are added Second, it is convenient to conduct directional air flow, improve the heat dissipation effect, and increase the silicone pad to enhance the sealing performance and play a buffering role.

### 1. Introduce

Studies have shown that the chemical reaction rate and temperature are in a pole number relationship, and each time the temperature increases by 10°C, the chemical reaction rate doubles. When working at a higher temperature, such as an ambient temperature of 45°C, the number of Ni-MH battery cycles is reduced by approximately 60%. When charging at a high rate, the temperature rises by 5°C and the battery life is halved. On the contrary, in a low-temperature environment, due to low electrolyte activity and slow ion diffusion rate, the internal resistance of the battery is greatly increased, the discharge capacity will be significantly reduced, and the internal pressure will rise faster during charging, affecting the safety of the battery. In summary, an appropriate operating temperature is a prerequisite for the good performance of the battery. For this reason, we have proposed an air cooling structure for rapid cooling of new energy power vehicles [1]. The utility model relates to the technical field of automobile batteries, in particular to an air cooling structure of a battery pack for new energy vehicles [2].

In order to overcome the deficiencies of the existing technology, an air cooling structure for battery packs of new energy vehicles is proposed to solve the problem that the traditional structural body lacks a limit structure and lacks a structure of buffering and decompression; the traditional structural body is not convenient for separate storage [3]. Lack of directional flow structure and lack of protective structure; the traditional structural body lacks positioning structure, and it is not convenient for the entry and discharge of air, so as to increase the limit rod to limit the separation of the storage frame, and increase the buffer spring pair The partitioned storage frame plays a role of buffering and decompression; adding a partitioned storage frame is convenient for partitioned storage of the battery pack, and a deflector, a diversion hole 1 and a diversion hole 2 are added to facilitate the directional flow of air and improve the heat dissipation effect, and Adding silicone pads can enhance the sealing performance and play a buffering role; increase the positioning rod to position and fix the deflector, and increase the air inlet and air outlet to facilitate the entry and discharge of air.

## **2. Utility model content**

### **2.1 Technical solutions**

The utility model is realized by the following technical scheme: the utility model proposes an air cooling structure for a battery pack of a new energy vehicle, which includes a structural body, a protective frame is provided on one side of the structural body, and an inner bottom of the protective frame A connecting rod one is provided at the end, a limit rod is provided at both ends inside the protective frame, a plug slot 1 is provided on both sides of the inner side of the protective frame, and a plug slot is provided inside the plug slot 1 A connecting plate one, a buffer spring is provided on one side of the plugging plate one, a plugging plate two is provided on the other end of the buffer spring, a partitioned storage frame is provided inside the protective frame, and the partitioned storage frame Limiting slots are provided at both ends, two insertion slots are provided on both sides of the partitioned storage frame, connection slots are provided on the front and back of the partitioned storage frame, and a storage slot is provided in the middle of the partitioned storage frame [4]. Both sides of the storage slot are provided with insertion holes, both sides of the storage slot are provided with a deflector, one end of the deflector is provided with a plug rod, and the top of the deflector A positioning hole is provided in the middle, a silicone pad is provided at the bottom end of the deflector, a diversion hole 1 is provided on one side of one end of the deflector, and a guide is provided on one side of the other end of the deflector Flow hole two, a protective cover is provided on the top of the protective frame, a connecting rod two is provided on the inner side of the protective cover, a positioning bar is provided on the inner side of the protective cover, and a surface is provided on one side of the surface of the protective cover Airport, an exhaust port is provided on one side of the bottom end of the protective frame [5].

Further, the connecting rod and the protective frame are connected by adhesive bonding, and the limit rod and the protective frame are connected by adhesive bonding. Further, the plug-in slot 1 and the protective frame are used in conjunction, the plug-in board 1 and the plug-in slot 1 are connected by snap connection, and the plug-in board 1 and the plug-in board 2 are connected to the spring by screws. Further, the partitioned storage frame and the protective frame are connected by snap-fitting with the limit bar and the limit slot, the plug-in slot 2 and the partitioned storage frame are used together, and the plug-in board 2 and the plug-in slot 2 pass Click to connect. Further, the connecting rod and the connecting slot are connected by snap-fitting, the storage slot and the partitioned storage frame are used in cooperation, and the deflector and the partitioned storage frame are snap-connected by a plug-in rod and a plug-in hole. Further, the positioning hole and the deflector are used in conjunction, the silicone pad and the deflector are connected by viscose, and the first and second deflector holes cooperate with the deflector use. Further, the protective cover and the protective frame are connected by screws, the connecting rod two and the connecting groove are connected by snap-fit, and the positioning rod and the positioning hole are connected by snap-fit. Further, the air inlet and the protective cover are used together, the air outlet and the protective frame are used together, and the air inlet and the air outlet are used together.

### **2.2 Beneficial effect**

Compared with the prior art, the utility model has the following beneficial effects:

1) In order to solve the structural problem that the traditional structural body lacks a limit structure and lacks buffering and decompression, this design proposes that a protective frame is provided on one side of the structural body, and a connecting rod is provided on the bottom end of the protective frame to protect Both ends of the inside of the frame are provided with limited position rods, and both sides of the inside of the protective frame are provided with a plug slot 1, the plug slot 1 is provided with a plug board 1, and the plug board 1 is provided with a buffer on one side The spring is provided with a plug-in plate design at the other end of the buffer spring, which solves the structural problem that the traditional structural body lacks a limiting structure and lacks buffering and decompression. There is an additional limiting rod to limit the storage frame. And the addition of buffer springs has the beneficial effect of buffering and decompressing the partitioned storage frame.

2) In order to solve the problem that traditional structural bodies are inconvenient to separate storage, lack of directional flow structure, and lack of protective structure, this design proposes that the protective frame is provided with a divided storage frame inside, and both ends of the divided storage frame are provided with limited slot , The two sides of the partitioned storage frame are provided with insertion slots two, the front and back of the partitioned storage frame are provided with connection slots, the middle of the partitioned storage frame is provided with storage slots, and the two sides of the storage slot are provided with insertion holes, Both sides of the storage tank are provided with a deflector, one end of the deflector is provided with a plug rod, the middle of the top of the deflector is provided with a positioning hole, and the bottom end of the deflector is provided with a silicone pad. A diversion hole one is provided on one side of one end, and a diversion hole two is provided on one side of the other end of the deflector, which solves the problem that the traditional structural body is not easy to separate and store, lacks a fixed diversion structure, and lacks a protective structure , A separate storage frame is added to facilitate the storage of the battery pack, a deflector, a diversion hole 1 and a diversion hole 2 are added to facilitate the directional flow of air, improve the heat dissipation effect, and increase the silicone pad to enhance the sealing performance And play a beneficial role as a buffer.

3) In order to solve the problem that the traditional structural body lacks the positioning structure and is inconvenient for the entry and discharge of air, this design proposes that the protective frame is provided with a protective cover on the top, a connecting rod 2 is provided on the inner side of the protective cover, and an inner side is provided on the protective cover There is a positioning rod, an air inlet is provided on one side of the surface of the protective cover, and an exhaust port design is provided on the side of the bottom end of the protective frame, which solves the problem that the traditional structural body lacks a positioning structure and is inconvenient for air entry and discharge There are additional positioning rods to position and fix the deflector, and the addition of air inlets and air outlets facilitates the entry and exhaust of air.

### 3. Detailed description

In order to make the purpose, technical solution and advantages of the present invention more clear, the following describes the present invention in further detail with reference to the embodiments. It should be understood that the specific embodiments described herein are only used to explain the utility model, and are not intended to limit the utility model.

#### 3.1 Example 1

As shown in FIG. 1, an air cooling structure for a battery pack for a new energy vehicle includes a structural body 1, a protective frame 2 is provided on one side of the structural body 1, and the inner bottom end of the protective frame 2 is provided There are connecting rods 1 and 3, both ends of the inner side of the protective frame 2 are provided with limiting rods 4, and both sides of the inner side of the protective frame 2 are provided with insertion slots 1 and 5, A plug-in plate 6 is provided inside, and a buffer spring 7 is provided on one side of the plug-in plate 6, and a plug-in plate 8 is provided at the other end of the buffer spring 7, which plays a supporting role through the protective frame 2 , Through the connecting rod one 3 to play a fixed role, through the limit bar 4 to play a fixed role, through the slot 5 to facilitate the plug board 1 6 to fix, through the plug board 1 6 and plug board two 8 It is convenient for the installation and disassembly of the buffer spring 7, and the buffer spring 7 plays a role of buffering and shock absorption. The protective frame 2 is provided with a partitioned storage frame 9 inside, and both ends of the partitioned storage frame 9 are provided with limit slots 10 Both sides of the partitioned storage frame 9 are provided with insertion slots III1, the front and back of the partitioned storage frame 9 are provided with connection slots 12, and a storage slot 13 is provided in the middle of the partitioned storage frame 9, Both sides of the storage slot 13 are provided with insertion holes 14, and both sides of the storage slot 13 are provided with a deflector 15, and one end of the deflector 15 is provided with a plug rod 16, the guide A positioning hole 17 is provided in the middle of the top end of the flow plate 15, a silicone

pad 18 is provided at the bottom end of the flow guide plate 15, and a flow guide hole 19 is provided on one side of one end of the flow guide plate 15. A diversion hole 20 is provided on one side of the other end of the flow plate 15. The partition storage frame 9 facilitates partition storage of the battery pack, the limit slot 10 facilitates the fixing of the limit lever 4, and the insertion slot II 11 facilitates insertion the connecting plate two 8 is fixed, and the connecting groove 12 is convenient for fixing, the storage groove 13 is for storing, and the insertion hole 14 and the connecting rod 16 are convenient for installing and removing the deflector 15. The flow plate 15, the flow guide hole 19 and the flow guide hole 20 are convenient for controlling the flow direction of the air, the flow guide plate 15 is positioned through the positioning hole 17, and the silicone pad 18 plays a role of sealing and buffering The protective frame 2 is provided with a protective cover 21 at the top, a connecting rod 22 is provided on the inner side of the protective cover 21, a positioning bar 23 is provided on the inner side of the protective cover 21, and the surface of the protective cover 21 is An air inlet 24 is provided on one side, and an air outlet 25 is provided on one side of the bottom end of the protective frame 2. The protective cover 21 plays a protective role, the connecting rod 22 plays a fixed role, and the positioning rod 23 Reinforce the deflector 15, through the air inlet 24 to facilitate the entry of air, through the air outlet 25 to facilitate the discharge of air.

Wherein, the connecting rod 1 and the protective frame 2 are connected by viscose, the limiting rod 4 and the protective frame 2 are connected by viscose to facilitate the use of the protective frame 2, and the insertion slot 1 It is used in conjunction with the protective frame 2. The plug-in board 6 and the plug-in slot 5 are connected by snap connection. The plug-in board 1 and the plug-in board 2 and 8 are connected to the spring by screws to facilitate plugging. The board one 6 is installed and used. The partitioned storage frame 9 and the protective frame 2 are connected by snap-fitting with the limit lever 4 and the limit slot 10. The plug-in slot 11 and the partitioned storage frame 9 are used together. The plug board two 8 and the plug slot two 11 are connected by snap-fitting to facilitate the installation and use of the partitioned storage frame 9, the connecting rod one 3 and the connecting slot 12 are connected by snap-fitting, and the storage slot 13 and the split storage Used in conjunction with the frame 9, the deflector 15 and the partitioned storage frame 9 are connected by snap-fitting rods 16 and plug holes 14 to facilitate the installation of the deflector 15, the positioning hole 17 and the deflector 15 Used in conjunction with each other, the silicone pad 18 and the deflector 15 are connected by viscose, and the diversion holes 19 and 20 are used in conjunction with the deflector 15 to facilitate the deflector 15 for use, the protective cover 21 and the protective frame 2 are connected by screws, the connecting rod two 22 and the connecting groove 12 are connected by snap-fit, and the positioning rod 23 and the positioning hole 17 are connected by snap-fit to facilitate the protective cover 21 For installation and use, the air inlet 24 and the protective cover 21 are used together, the air outlet 25 and the protective frame 2 are used together, and the air inlet 24 and the air outlet 25 are used together To facilitate air entry and discharge.

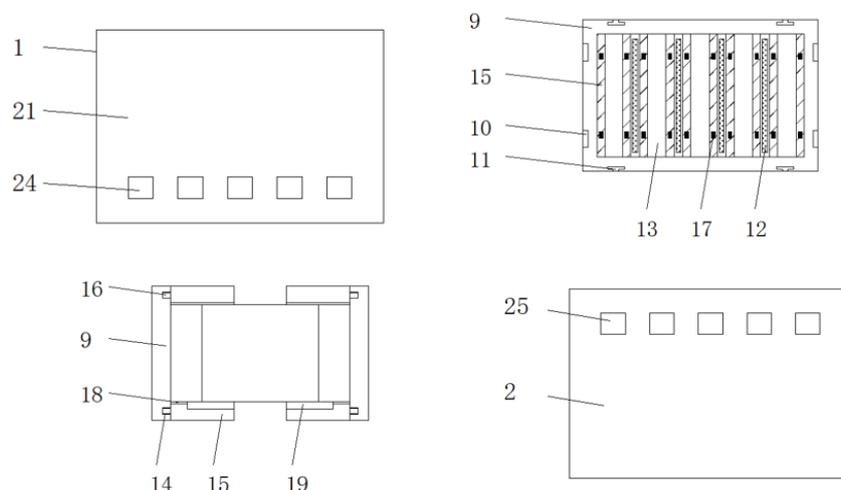


Fig.1 Schematic diagram of the exhaust port of the utility model

### 3.2 Example 2

As shown in FIG. 2, in the present invention, a protective frame 2 is provided on one side of the structural body 1, a connecting rod 1-3 is provided at the bottom end of the protective frame 2, and the internal of the protective frame 2 Both ends of the protective frame 2 are provided with limited position rods 4, and both sides of the inner side of the protective frame 2 are provided with a plug-in slot 5; the plug-in slot 1 is provided with a plug-in board 6; A buffer spring 7 is provided on one side of the plate one 6, and a plug plate two 8 is provided on the other end of the buffer spring 7, which functions as a support through the protective frame 2 and a fixing function through the connecting rod one 3, through The limit lever 4 plays a role of fixing, and it is convenient to fix the plug plate 1 through the plug slot 5; the plug spring 1 and the plug plate 2 8 are convenient for the installation and removal of the buffer spring 7; the buffer spring 7 Plays a role in buffering shock absorption.

The utility model relates to an air cooling structure of a battery pack for new energy vehicles. In the process of use, the partitioned storage frame 9 is snapped inside the protective frame 2 and the limit lever 4 is snapped into the limit slot 10 Inside, the connecting rod 1-3 is snapped inside the connecting slot 12, so that the partition storage frame 9 is fixed, the plug board 1-6 is snapped inside the plug slot 1-5, and the plug board 2.8 is snapped into the plug slot The inside of the second 11 makes the buffer spring 7 play a role in buffering and damping the partitioned storage frame 9, and the battery pack is snapped inside the storage slot 13, and the battery pack and the storage slot 13 are formed with cavities on both sides of the storage slot. One 19 and the diversion hole 20 are both in communication with the cavity, the plug rod 16 is snapped inside the plug hole 14 so that the deflector 15 and the partition storage frame 9 are fixed, and the silicone pad 18 is in contact with the battery pack for protection The frame 2 is snapped inside the protective cover 21, the connecting rod 22 is snapped inside the connecting groove 12, the positioning rod 23 is snapped inside the positioning hole 17, so that the deflector 15 is fixed, and air flows from the air inlet 24 enters the interior of the partitioned storage frame 9, the air flows along the deflector 15, and the air flows through the guide hole 19 and guide hole 20 in a curved shape, and finally the air flows out from the exhaust hole 25, so that Heat dissipation of the battery pack.

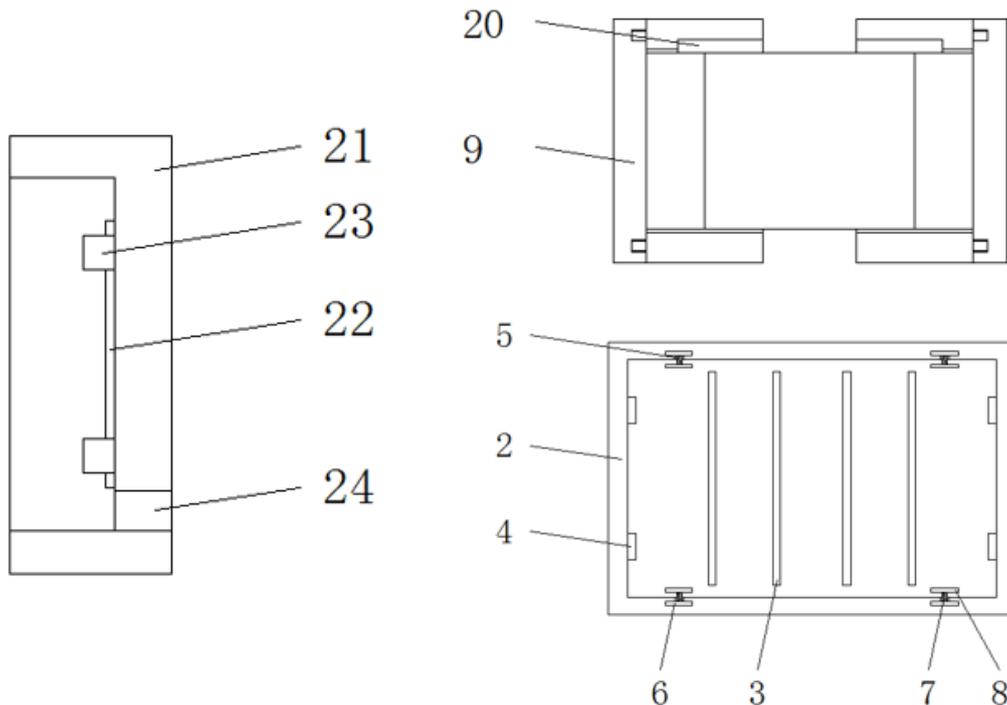


Fig.2 Schematic diagram of the utility model's protective frame

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