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Backpack blower, backpack assembly and backpack power assembly

Abstract

The disclosure provides a backpack blower, a backpack assembly and a backpack power assembly. The backpack blower includes a backpack assembly and a blower body. The backpack assembly is used for an operator to carry and comprises a battery pack cavity to house a battery pack. The blower body is mounted on the backpack assembly. The battery pack supplies power to the blower body. The blower body includes a motor duct assembly, an air inlet assembly assembled and fixed with the backpack assembly, and an air outlet assembly connected with the air inlet assembly. The air inlet assembly includes an air inlet and an air inlet tube connected to the air inlet. The air inlet tube is connected with the air outlet assembly. The motor duct assembly is housed in the air outlet assembly.

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Background/Summary

CROSS REFERENCE TO RELATED APPLICATION (1) The present application is a continuation application of U.S. patent application Ser. No. 18/313,377 filed May 8, 2023, U.S. Ser. No. 18/313,377 being a continuation application of PCT/CN2021/128021 filed Oct. 30, 2019. PCT/CN2021/128021 is related to and claims the benefit of priority of the following commonly-owned, presently-pending Chinese patent applications: serial No. 202120002942.9, filed on Jan. 4, 2021 and serial No. 202022659734.4, filed on Nov. 17, 2020, which the present application is a non-provisional application thereof. The disclosures of the forgoing applications are hereby incorporated by reference in their entirety, including any appendices or attachments thereof, for all purposes.

TECHNICAL FIELD

(1) The disclosure relates to a backpack blower, a backpack assembly and a backpack power assembly, which belongs to the technical field of blowers.

BACKGROUND

(2) In the conventional backpack blower, the motor, fan and PCB board are all located under the backpack, and the parts are compactly arranged, which is not beneficial for heat dissipation. Therefore, when the backpack blower is working, the blown air flow needs to pass through the elbow and the bellows, and then be blown out by the blowing tube. The loss of air speed and air volume is relatively large, and the noise is relatively large.

(3) Moreover, conventionally, various types of cleaning devices, garden tools, etc. have been commonly used in daily life. Common cleaning devices and garden tools on the market, such as hand-held vacuum cleaners, hand-held blowers, etc., are more and more widely known by consumers, and they are widely loved by users because of their lightness, portability, and no need for power cords during use.

(4) In order to facilitate the users to use and avoid that the users feel heavy, the battery pack of the hand-held tool is usually small, so that the battery endurance is limited. Therefore, a backpack-type battery pack is used to supply power for the hand-held tool. In this way, not only can the user's arm burden be reduced, but also the endurance can be effectively improved.

(5) However, because of the high power and high current of the backpack blower, the battery pack has a high temperature during discharge, which leads to incomplete discharge of the battery pack.

SUMMARY

(6) The disclosure provides a backpack blower, the backpack blower can not only effectively reduce the noise, but also has higher air outlet efficiency, and the loss of air speed and air volume is small.

(7) The disclosure provides a backpack blower, the backpack blower includes a backpack assembly and a blower body. The backpack assembly is used to be carried by an operator, and includes a battery pack cavity, used to house a battery pack. The blower body is mounted on the backpack assembly. The battery pack supplies power to the blower body. The blower body includes a motor duct assembly, an air inlet assembly mounted on the backpack assembly, and an air outlet assembly connected with the air inlet assembly, the air inlet assembly includes an air inlet and an air inlet tube connected to the air inlet, the air inlet tube is connected with the air outlet assembly, the motor duct assembly is housed in the air outlet assembly.

(8) In an embodiment of the backpack blower of the disclosure, the motor duct assembly includes a duct body, a motor mounted inside the duct body, a guiding cone and a fan blade, the guiding cone is mounted and matched with one end of the duct body, the fan blade is mounted and matched with

the other end of the duct body, and the fan blade is fixedly mounted on the motor shaft of the motor.

(9) In an embodiment of the backpack blower of the disclosure, the air outlet assembly includes a housing assembly, a bellows, an air outlet tube fixedly connected to the bellows, and a handle assembly mounted on the air outlet tube, the housing assembly is connected with the air inlet tube, and the bellows is connected with the housing assembly.

(10) In an embodiment of the backpack blower of the disclosure, an inner tube is arranged in the housing assembly, a part of the motor duct assembly is housed in the inner tube, and the other part of the motor duct assembly is housed in the bellows, one end of the duct body mounted with the fan blade is connected with the inner tube, the fan blade is arranged in the inner tube, and one end of the duct body mounted with the guiding cone is arranged in the bellows.

(11) In an embodiment of the backpack blower of the disclosure, the motor duct assembly and the inner tube are housed in the housing assembly, the inner tube is bent, the housing assembly is correspondingly bent, one end of the housing assembly is threadedly connected with the air inlet tube, and the other end extends into the bellows and is fixedly connected with the bellows.

(12) In an embodiment of the backpack blower of the disclosure, the motor duct assembly is housed in the air outlet tube and located below the handle assembly, and the fan blade is arranged close to the bellows.

(13) In an embodiment of the backpack blower of the disclosure, the air outlet tube includes a first air outlet tube and a second air outlet tube that are assembled and matched with each other, the motor duct assembly is housed in a receiving cavity surrounded and defined by the first air outlet tube and the second air outlet tube, the handle assembly includes a first handle and a second handle that are assembled and matched with each other, the first handle is clamped on the first air outlet tube, and the second handle is clamped on the second air outlet tube.

(14) In an embodiment of the backpack blower of the disclosure, the air outlet assembly further includes a blowing tube connected with the air outlet tube, a ratio of a cross-sectional area of a free end of the blowing tube to a cross-sectional area of the duct body is less than 0.8, and a cross-sectional area of one end of the bellows close to the air outlet tube is smaller than a cross-sectional area of the other end of the bellows.

(15) In an embodiment of the backpack blower of the disclosure, the battery pack is located above the air inlet assembly and is carried on a back of an operator through the backpack assembly.

(16) In an embodiment of the backpack blower of the disclosure, a noise reduction sponge is arranged on an inner side wall of the air inlet tube to reduce noise when air enters, the power assembly includes a battery pack and a circuit board located below the battery pack, a heat dissipation hole is arranged on a top wall of the air inlet tube, and the heat dissipation hole is arranged corresponding to the circuit board, so as to dissipate heat generated during an operation of the circuit board through the heat dissipation hole.

(17) In an embodiment of the backpack blower of the disclosure, the blower body is provided with an input port, and the backpack assembly is provided with a power output port which is matched with the input port.

(18) In an embodiment of the backpack blower of the disclosure, the blower body is further provided with an operating handle and a display unit on the operating handle, the backpack assembly is further provided with an information acquisition unit, and the information acquisition unit is used to obtain power information of the battery pack and display the power information on the display unit through a match of the input port and the power output port.

(19) The disclosure further provides a backpack assembly, the backpack assembly includes a box body and a heat dissipation fan. The box body is provided with a first air channel communicating with the outside and a plurality of battery cavities located around the first air channel, the battery cavities is provided with a first heat dissipation hole and a second heat dissipation hole which corresponds to the first heat dissipation hole and communicates with the first air channel. The heat

dissipation fan drives air to flow into the battery cavities from one of the first heat dissipation hole and the first air channel, and flow out of the battery cavity from the other one of the first heat dissipation hole and the first air channel.

(20) In an embodiment of the backpack assembly of the disclosure, the number of the heat dissipation fans is the same as the number of the battery cavities, and each heat dissipation fan is arranged in the first heat dissipation hole of the corresponding battery cavity.

(21) In an embodiment of the backpack assembly of the disclosure, a receiving groove is further arranged between a bottom wall of the box body and the battery cavity to receive electronic components, a second air channel is further arranged between a side wall of the box body and the battery cavity, one end of the second air channel is communicated with the first heat dissipation hole, and the other end thereof is communicated with the receiving groove.

(22) In an embodiment of the backpack assembly of the disclosure, the receiving groove is provided with a third heat dissipation hole communicating with the outside.

(23) In an embodiment of the backpack assembly of the disclosure, the heat dissipation fan is a centrifugal fan, and includes a first vent and a second vent corresponding to the first vent, wherein an air inlet or an outlet direction of the first vent is perpendicular to an air outlet or an inlet direction of the second vent.

(24) In an embodiment of the backpack assembly of the disclosure, the first vent is communicated with the first heat dissipation hole, and the second vent is communicated with the second air channel.

(25) In an embodiment of the backpack assembly of the disclosure, the heat dissipation fan is located in the first air channel.

(26) In an embodiment of the backpack assembly of the disclosure, a buffer mechanism matched with the battery pack is arranged in the battery cavity.

(27) In an embodiment of the backpack assembly of the disclosure, the backpack assembly further includes an information acquisition unit and a display unit, the information acquisition unit is used to obtain power information of the battery pack, and the display unit is used to display the power information.

(28) In an embodiment of the backpack assembly of the disclosure, the backpack assembly further includes a box cover matched with the box body, the box cover is provided with a first lock, and the box body is provided with a second lock matched with the first lock.

(29) The disclosure further provides a backpack power assembly, the backpack power assembly includes a backpack assembly and a plurality of battery packs. Wherein, the backpack assembly is used to be carried by an operator. The backpack assembly includes a box body and a heat dissipation fan. The box body is provided with a first air channel communicating with the outside and a plurality of battery cavities located around the first air channel, the battery cavities is provided with a first heat dissipation hole and a second heat dissipation hole which corresponds to the first heat dissipation hole and communicates with the first air channel. The heat dissipation fan drives air to flow into the battery cavities from one of the first heat dissipation hole and the first air channel, and flow out of the battery cavity from the other of the first heat dissipation hole and the first air channel. The plurality of the battery packs are mounted in the plurality of the battery cavities.

(30) The beneficial effects of the present disclosure are: the backpack blower of the disclosure provides the motor duct assembly in the air outlet assembly, so that when the air enters, the air passes through the elbow to reduce the air speed, which is beneficial to reduce noise. And when the air is blown, it will not go through the elbow, which avoids the air from the elbow and reducing the air speed, so that the air outlet efficiency is higher.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

- (1) FIG. 1 is a perspective view of a first embodiment of a backpack blower of the disclosure.
- (2) FIG. 2 is a cross-sectional view of the backpack blower shown in FIG. 1.
- (3) FIG. 3 is a partial exploded view of the backpack blower shown in FIG. 1.
- (4) FIG. 4 is an exploded view of a backpack assembly in FIG. 3.
- (5) FIG. 5 is an exploded view of an air inlet assembly in FIG. 3.
- (6) FIG. 6 is an exploded view of an air outlet assembly in FIG. 3.
- (7) FIG. 7 is an exploded view of a motor duct assembly and a housing assembly in FIG. 3.
- (8) FIG. 8 is a perspective view of a second embodiment of a backpack blower of the disclosure.
- (9) FIG. 9 is a cross-sectional view of the backpack blower shown in FIG. 8.
- (10) FIG. 10 is an exploded view of the backpack blower shown in FIG. 9.
- (11) FIG. 11 is an exploded view of a motor duct assembly and part of an air outlet assembly in FIG. 10.
- (12) FIG. 12 is a perspective schematic view of a backpack assembly of the disclosure.
- (13) FIG. 13 is a perspective schematic view of the backpack assembly shown in FIG. 1 from another angle.
- (14) FIG. 14 is a perspective schematic view of the backpack assembly shown in FIG. 1 without a box cover.
- (15) FIG. 15 is an internal schematic view of the backpack assembly shown in FIG. 1.
- (16) FIG. 16 is a schematic view of the backpack assembly matched with a battery pack.
- (17) FIG. 17 is an internal schematic view of the backpack assembly matched with the battery pack.
- (18) FIG. 18 is a bottom schematic view of the backpack assembly matched with the battery pack.
- (19) FIG. 19 is a perspective schematic view of a backpack power assembly of the disclosure.
- (20) FIG. 20 is a perspective schematic view of a blower of the disclosure.

DETAILED DESCRIPTION

- (21) In order to make the objectives, technical solutions and advantages of the disclosure clearer, the disclosure will be described in detail below with reference to the drawings and specific embodiments.
- (22) Please refer to FIG. 1 through FIG. 7, it is a first embodiment of a backpack blower **1100** of the disclosure. In this embodiment, the backpack blower **1100** includes a backpack assembly **110**, a power assembly **120** mounted in the backpack assembly **110**, an air inlet assembly **130** mounted and fixed with the backpack assembly **110**, and an air outlet assembly **140** connected with the air inlet assembly **130**.
- (23) The backpack assembly **110** is used to be carried by an operator. The power assembly **120** includes a battery pack. The battery pack is detachably mounted on the backpack assembly **110**. The backpack assembly **110** includes a back plate **111**, a back strap (not shown), a casing **112** mounted and matched with the back plate **111**, and a bracket **113** mounted and fixed with the back plate **111** to support the casing **112**. The casing **112** is assembled and fixed with one side wall of the back plate **111**. The back strap could be arranged on the other side wall of the back plate **111**. When the back strap surrounds the operator's body, the other side wall of the back plate **111** fits the operator's back. A cross section of the bracket **113** is roughly L-shaped. On one hand, it realizes a fixed connection between the bracket **113** and the back plate **111**, and on the other hand, the bracket **113** is used to support the casing **112** and the air inlet assembly **130**. And when the backpack blower **1100** is in a non-working state, the backpack blower **1100** can be stably placed on the ground by the bracket **113**.
- (24) The casing **112** includes a first casing **1121** and a second casing **1122** that are assembled and fixed with each other. The power assembly **120** is mounted in a receiving space (not labeled) surrounded and defined by the first casing **1121** and the second casing **1122**. The power assembly

120 is used to supply power to a motor **152** below. The power assembly **120** is carried on the back of an operator through the backpack assembly **110**, and includes a battery pack (not shown) and a circuit board **121** located below the battery pack. The circuit board **121** is electrically connected with the motor **152** and the battery pack, and power output by the battery pack is transferred to the circuit board **121** and then to the motor **152** to supply power to a blower body. A battery pack cavity **1123** for housing the battery pack is defined in the second casing **1122**, and the battery pack is detachably slidably inserted into the battery pack cavity **1123**. In this embodiment, there are two battery packs and two battery pack cavities **1123**, but it should not be limited to this.

(25) The air inlet assembly **130** is arranged below the battery pack cavity **1123** and includes an air window **131** and the air window **131** is mounted on an air inlet tube **132**. The air outlet assembly **140** includes an inner tube **133**, and the inner tube **133** is mainly used to connect with the air inlet tube **132**. A plurality of air inlets **1311** are arranged on the air window **131**. The air inlets **1311** communicate with an inner cavity of the air inlet tube **132** and an inner cavity of the inner tube **133** to define a whole air inlet channel. The inner tube **133** is arranged in a curved shape. In this embodiment, the inner tube **133** and the air inlet tube **132** are not contact directly, and the inner tube **133** is directly attached to an inner side wall of a housing assembly **160** below.

(26) In order to reduce noise during air intake, a noise reduction sponge (not shown) is arranged on an inner side wall of the air inlet tube **132**. A top wall of the air inlet tube **132** is provided with a heat dissipation hole **1321**, and the heat dissipation hole **1321** is arranged corresponding to the circuit board **121** to increase air flow at the position of the circuit board **121**, so that the heat generated during the operation of the circuit board **121** can be dissipated through the heat dissipation holes **1321**, which reduces temperature of the circuit board **121**.

(27) The backpack blower **1100** further includes a motor duct assembly **150**. The motor duct assembly **150** is housed in the air outlet assembly **140** and extends away from the air inlet tube **132**. A power source of the motor duct assembly **150** is provided by the power assembly **120**. The motor duct assembly **150** includes a duct body **151**, a motor **152** fixed inside the duct body **151**, a guiding cone **153** mounted and matched with one end of the duct body **151**, and a fan blade **154** mounted and matched with the other end of the duct body **151**. One end of the duct body **151** where the fan blade **154** is mounted is connected with the inner tube **133**, and the duct body **151** extends toward the air outlet assembly **140**, so that the end of the duct body **151** where the guiding cone **153** is mounted is located in the air outlet assembly **140**. The fan blade **154** is fixed and mounted on a motor shaft of the motor **152**. With this arrangement, when the motor **152** is started, the fan blade **154** will be driven to rotate, a negative pressure will be generated at the air inlet **1311**, which promotes external air to enter the air inlet tube **132** through the air inlet **1311** and flow to the motor duct assembly **150** along the air inlet channel, and then flows out along the air outlet assembly **140** under the action of the guiding cone **153**.

(28) In this embodiment, the motor duct assembly **150** is assembled in the air outlet assembly **140**, so that when air enters, the air speed will be reduced after the air passes through the curved inner tube **133**, which is beneficial to reduce noise. Compared with conventional blowers in which the motor duct assembly is assembled in the backpack assembly, the airflow will not pass through the curved inner tube **133** when blowing, which avoids the reduction of the air speed when the air flow out from the curved tube, so that parameters are better and efficiency is higher.

(29) The air outlet assembly **140** further includes a bellows **141** connected with the inner tube **133**, an air outlet tube **142** fixed and connected with the bellows **141**, a handle assembly **143** mounted on the air outlet tube **142**, and a blowing tube **144** connected to the air outlet tube **142**. A cross-sectional area of one end of the bellows **141** close to the air outlet tube **142** is smaller than a cross-sectional area of the other end of the bellows, and a smaller air outlet area can be obtained, which is beneficial to increase the air speed. A ratio of the cross-sectional area of the free end of the blowing tube **144** to a cross-sectional area of the duct body **151** is less than 0.8, so that the backpack blower **1100** can obtain a greater air speed.

(30) Part of the motor duct assembly **150** is housed in the inner tube **133**, and the other part of the motor duct assembly **150** is housed in the bellows **141**. Specifically, one end of the duct body **151** where the fan blade **154** is mounted is connected with the inner tube **133**, and the fan blade **154** is placed in the inner tube **133**. One end of the duct body **151** where the guiding cone **153** is mounted is placed in the bellows **141**. The backpack blower **1100** further includes a housing assembly **160** that is arranged outside the motor duct assembly **150** and the inner tube **133**. The inner tube **133** is bent. The housing assembly **160** is bent correspondingly. One end of the housing assembly **160** is threadedly connected with the air inlet tube **132**, and the other end of the housing assembly **160** extends into the bellows **141** and is fixed and connected with the bellows **141**.

(31) Specifically, the housing assembly **160** includes an upper housing **161** and a lower housing **162** that are assembled up and down. Part of the motor duct assembly **150** and the inner tube **133** are housed in the receiving cavity of the upper housing **161** and the lower housing **162**. Since the housing assembly **160** needs to completely cover the inner tube **133**, both the upper housing **161** and the lower housing **162** need to be set to be bent, and a size of the upper housing **161** and the lower housing **162** needs to be larger than a size of the inner tube **133**. In order to fix and connect the air inlet assembly **130** with the air outlet assembly **140**, one end of the upper housing **161** and the lower housing **162** is provided with external threads to match internal threads on the air inlet tube **132** to realize the locking and fixing of the housing assembly **160** with the air inlet assembly **130**. The other ends of the upper housing **161** and the lower housing **162** are clamped and fixed with the bellows **141** to realize the locking and fixing of the housing assembly **160** with the air outlet assembly **140**. Of course, there can be many ways of fixing, which will not be described in detail here.

(32) The handle assembly **143** is used for the operator to grasp and start the backpack blower **1100**, and the handle assembly **143** is connected with the power assembly **120** (specifically the circuit board **121**) through a control line **145**, so as to realize a normal start of the backpack blower **1100**. Since the specific structure of the handle assembly **143** and the connection relationship between the handle assembly **143** and the circuit board **121** can be realized through conventional technical solutions, it will not be described in detail and limited here.

(33) The blowing tube **144** is connected to an end of the air outlet tube **142**, and the inner cavity of the blowing tube **144** defines an air outlet channel for air outlet. In this embodiment, the blowing tube **144** includes two parts which are assembled in an up and down direction. On one hand, the air outlet channel of the blowing tube **144** can be extended according to actual needs. On the other hand, it can be disassembled and stored after use, which is very convenient. Of course, in other embodiments, only a part of the blowing tube **144** may be arranged, and a design of the other part is cancelled, which is not limited here.

(34) Please refer to FIG. 8 through FIG. 11, it is a second embodiment of the backpack blower of the disclosure. In the second embodiment, a structure of a backpack blower **1100'** is substantially the same as a structure of the backpack blower **1100**, and the main differences are: in this embodiment, a motor duct assembly **150'** is housed in an air outlet tube **142'** and is located below a handle assembly **143'**, and a fan blade **154'** is arranged close to a bellows **141'**. In this way, during an operation of the backpack blower **1100'**, air directly passes through the motor duct assembly **150'** and is blown out from the air outlet assembly **140'** without passing through the bellows **141'**, so a loss of air speed and air volume is smaller. The situation when the air enters is the same as in the first embodiment, and will not be described here.

(35) Specifically, the air outlet tube **142'** includes a first air outlet tube **1421'** and a second air outlet tube **1422'** which are assembled and matched with each other in a left-right direction (which means the left-right direction during a normal operation, and the same below). The motor duct assembly **150'** is housed in a receiving cavity surrounded and defined by the first air outlet tube **1421'** and the second air outlet tube **1422'**. The handle assembly **143'** includes a first handle **1431'** and a second handle **1432'** that are assembled and matched in a left-right direction. The first handle **1431'** is

clamped on the first air outlet tube **1421'**, and the second handle **1432'** is clamped on the second outlet tube **1422'**. The air outlet tube **142'** is fixed and connected with one end of the bellows **141'** through a connecting ring **145'** and a clamp **146'**, and the other end of the bellows **141'** is also connected with one end of the housing assembly **160** through the clamp **146'**. The other end of the housing assembly **160** is directly threadedly connected with the air inlet tube **132**.

(36) In addition, the inner tube **133** in the first embodiment is eliminated. Of course, the housing assembly **160** is still arranged in a curved shape at this time, so that the air speed and noise can be reduced during air inlet.

(37) Although a use of a backpack battery pack to power the hand-held tool can reduce burden on users' arm and effectively improve endurance, there are also backpack blowers that cause higher temperature during battery pack discharge process due to higher power and current, which causes the battery pack discharging incompletely. In view of this, the disclosure further provides a new backpack assembly, which can quickly dissipate heat for a battery pack because it is provided with a heat dissipation system, thereby effectively ensuring that the battery pack can work normally.

(38) Please refer to FIG. 12, FIG. 13, FIG. 14, and FIG. 15. The disclosure provides a backpack assembly **2100** for a user to carry a power assembly. The power assembly includes a plurality of battery packs for powering tools. The backpack assembly **2100** includes a box body **210**, a box cover **220** matched with the box body **210**, and a heat dissipation fan **230**.

(39) Please refer to FIG. 14 and FIG. 15, the box body **210** includes a bottom wall **2101**, a front wall **2102**, a rear wall **2103** arranged opposite to the front wall **2102**, and a side wall **2104** located between the front wall **2102** and the rear wall **2103**. The bottom wall **2101**, the front wall **2102**, the rear wall **2103**, and the side wall **2104** jointly define a receiving space. The rear wall **2103** is provided with a fixing component **21031** to fix and mount a carrying mechanism (not shown) on the rear wall **2103** so as to facilitate users to carry the box body **210** on their back through the carrying mechanism. The carrying mechanism may be a back strap or a back plate with a back strap. The side wall **2104** is provided with a power output port **21041**, so that the backpack assembly **2100** can output power in the battery pack to outside through the power output port **21041**. The box body **210** is further provided with a first air channel **211** and a plurality of battery cavities **212**. The first air channel **211** and the battery cavities **212** are located in the receiving space. The first air channel **211** communicates with outside. In this embodiment, the rear wall **2103** is further provided with a ventilation hole **21032** communicating with the first air channel **211**, so that the first air channel **211** is connected with outside. Of course, it can be understood that, in other embodiments, the ventilation hole **21032** communicating with the first air channel **211** may also be arranged on any one of the bottom wall **2101**, the front wall **2102**, and the side wall **2104**.

(40) Please refer to FIG. 14 and FIG. 15, the battery cavities **212** are used for storing battery packs. The plurality of the battery cavities **212** are located around the first air channel **211**. A bottom wall of the battery cavity **212** is provided with a connecting port **2121** and a buffer mechanism **2122**. The connecting port **2121** is used to match the battery pack to obtain power from the battery pack and transmit the power to the power output port **21041** so as to output power to outside through the power output port **21041**. The buffer mechanism **2122** is used to match the battery pack to buffer the battery pack, so that a rigid collision between the battery pack and the battery cavity **212** will be prevented. The buffer mechanism **2122** includes a fixed plate **21221** fixed and mounted in the battery cavity **212** and an elastic component **21222** mounted on the fixed plate **21221**. When a user puts a battery pack into the battery cavity **212**, the battery pack slides along the battery cavity **212** and resists the elastic component **21222**. At this time, the elastic component **21222** is elastically deformed under the action of the battery pack, and at the same time plays a buffering effect on the battery pack to prevent the battery pack from rigidly colliding with the battery cavity **212**. In this embodiment, the elastic component **21222** is a spring. However, in other embodiments, the elastic component **21222** may also be made of other elastic materials, such as elastic pins, elastic plastics, etc. The side wall of the battery cavity **212** is provided with a first heat dissipation hole **2123** and a

second heat dissipation hole **2124** corresponding to the first heat dissipation hole **2123**. The first heat dissipation hole **2123** directly or indirectly communicates with outside. The second heat dissipation hole **2124** communicates with the first air channel **211**.

(41) Please refer to FIG. **15**, the box body **210** is further provided with a second air channel **213** and a receiving groove **214**. The second air channel **213** is located between the battery cavity **212** and the side wall **2104**. One end of the second air channel **213** is communicated with the first heat dissipation hole **2123**, and the other end of the second air channel **213** is communicated with the receiving groove **214**. Although in this embodiment, the second air channel **213** is located between the battery cavity **212** and the side wall **2104**, in other embodiments, the second air channel **213** may also be arranged between the battery cavity **212** and the front wall **2102**, or between the battery cavity **212** and the rear wall **2103**. The receiving groove **214** is located between the battery cavity **212** and the bottom wall **2101** for housing electronic components, such as control circuits. The receiving groove **214** is provided with a third heat dissipation hole **2141** communicating with outside, so that the electronic components in the receiving groove **214** can dissipate heat. In this embodiment, as shown in FIG. **18**, the third heat dissipation hole **2141** is arranged on the bottom wall **2101**. However, in other embodiments, the third heat dissipation hole **2141** may also be arranged on a side wall of the receiving groove **214**.

(42) Please refer to FIG. **12**, FIG. **13** and FIG. **14**, the box cover **220** is used to match the box body **210** to seal the receiving space, thereby protecting the battery pack housed in the battery cavity **212**. The box cover **220** is provided with a first lock **221**, and the box body **210** is provided with a second lock **215**. The first lock **221** matches the second lock **215** to fix the box cover **220** on the box body **210**. In this embodiment, the first lock **221** is a clasp groove. The second lock **215** includes a handle **2151** pivotally mounted on the box body **210**, and a clasp arm **2152** pivotally mounted on the handle **2151** and matched with the clasp groove. When in use, first the handle **2151** is turned upwards, and the clasp arm **2152** is housed in the clasp groove. And then the handle **2151** is turned downwards, the clasp arm **2152** buckles the clasp groove so that the box cover **220** is fixed on the box body **210**.

(43) Please refer to FIG. **15**, the heat dissipation fan **230** is used to drive air flow into the battery cavity **212** from one of the first heat dissipation hole **2123** and the first air channel **211** and flow out of the battery cavity **212** from the other of the first heat dissipation hole **2123** and the first air channel **211**. In this way, heat of the battery pack in the battery cavity **212** is dissipated, so that the battery pack in the battery cavity **212** can work normally. The number of the heat dissipation fans **230** is the same as the number of the battery cavities, and each heat dissipation fan **230** is arranged in the first heat dissipation hole **2123** of the corresponding battery cavity **212**. The heat dissipation fan **230** is a centrifugal fan, and includes a first vent **231** and a second vent **232** corresponding to the first vent **231**. An air inlet/outlet direction of the first vent **231** is perpendicular to an air outlet/inlet direction of the second vent **232**. The first vent **231** communicates with the first heat dissipation hole **2123**, and the second vent **232** communicates with the second air channel **213**. Although in this embodiment, the heat dissipation fan **230** is arranged in the first heat dissipation hole **2123**, in other embodiments, the heat dissipation fan **230** may also be arranged in the first air channel **211**.

(44) Please refer to FIG. **16**, FIG. **17**, and FIG. **18**, when in use, the heat dissipation fan **230** drives air to flow from the ventilation hole **21032** into the first air channel **211**, and enters the battery cavity **212** through the first air channel **211**, thereby dissipating heat of the battery pack **240** located in the battery cavity **212**. Then, the air passes through the heat dissipation fan **230**, flows into the second air channel **213** and enters the receiving groove **214** for heat dissipation of the electronic components in the receiving groove **214**. Finally, the air is discharged to outside through the third heat dissipation hole **2141**.

(45) Preferably, the backpack assembly **2100** is further provided with an information acquisition unit (not shown) and a display unit (not shown). The information acquisition unit performs

handshake communication with the battery pack in the battery cavity **212** through the connecting port **2121**, thereby acquiring power information of the battery pack, and displaying the power information through the display unit. This arrangement is convenient for a user to judge whether the remaining power meets the demand, whether the battery pack needs to be precharged, etc. according to the power information of the battery pack.

(46) Compared with the conventional art, since the backpack assembly **2100** of the disclosure is provided with a heat dissipation system, it can quickly dissipate heat for the battery pack, thereby effectively ensuring that the battery pack can work normally.

(47) Please refer to FIG. **19**. The disclosure further provides a backpack power assembly **2200**, the backpack power assembly includes a plurality of battery packs **240** and any one of the above-mentioned backpack assembly **2100**. The battery packs **240** are housed in the battery cavities **212**.

(48) Please refer to FIG. **20**, the disclosure further provides a blower **2300**. The blower **2300** includes a blower body **2301** and the backpack power assembly **2200**. The blower body **2301** is provided with an input port (not shown), an operating handle **2302**, and a display unit **2303** located on the operating handle **2302**. The blower body matches the power output port **21041** through the input port, so as to obtain power of the backpack power assembly **2200** and power information of the battery pack **240** in the backpack power assembly **2200**. The display unit **2303** is used to display the power information.

(49) In summary, in the backpack blower **1100**, **1100'** of the disclosure, the motor duct assembly **150**, **150'** are arranged in the air outlet assembly **140**, **140'** and are away from the air inlet tube **132**, so that when air enters, the air passes through the curved housing assembly **160** and the air speed is reduced, which is beneficial to reduce the noise, and the air will not pass through the elbow when blowing. It avoids the reduction of the air speed when the air is discharged from the elbow, so that the air outlet efficiency is higher. Compared with the conventional art, the backpack blower **1100**, **1100'** of the disclosure has the advantages of lower air volume and air speed loss during operation, which is beneficial to reduce noise.

(50) The above embodiments are only used to illustrate the technical solutions of the disclosure and not to limit them. Although the disclosure has been described in detail with reference to the preferred embodiments, those of ordinary skill in the art should understand that the technical solutions of the disclosure are capable of being modified or equivalently replaced without departing from the spirit and scope of the technical solution of the disclosure.

Claims

1. A backpack blower, comprising: a backpack assembly, used to be carried by an operator, comprising a battery pack cavity, used to house a battery pack, and a blower body, mounted on the backpack assembly, the battery pack supplying power to the blower body, wherein the blower body comprises a motor duct assembly, an air inlet assembly mounted on the backpack assembly, and an air outlet assembly connected with the air inlet assembly, wherein the air outlet assembly comprises a housing assembly, a bellows connected to the housing assembly, and an air outlet tube fixedly connected to the bellows, wherein a part of the motor duct assembly is housed in the housing assembly, and the other part of the motor duct assembly is housed in the bellows.
2. The backpack blower according to claim 1, wherein the air inlet assembly comprises an air inlet and an air inlet tube connected to the air inlet, the air inlet tube is connected with the air outlet assembly.
3. The backpack blower according to claim 2, wherein the motor duct assembly comprises a duct body, a motor mounted inside the duct body, a guiding cone and a fan blade, the guiding cone is mounted and matched with one end of the duct body, the fan blade is mounted and matched with the other end of the duct body, and the fan blade is fixedly mounted on the motor shaft of the motor.

4. The backpack blower according to claim 3, wherein an inner tube is arranged in the housing assembly, one end of the duct body mounted with the fan blade is connected with the inner tube, the fan blade is arranged in the inner tube, and one end of the duct body mounted with the guiding cone is arranged in the bellows.
 5. The backpack blower according to claim 4, wherein the motor duct assembly and the inner tube are housed in the housing assembly, the inner tube is bent, the housing assembly is correspondingly bent, one end of the housing assembly is threadedly connected with the air inlet tube, and the other end extends into the bellows and is fixedly connected with the bellows.
 6. The backpack blower according to claim 2, wherein the battery pack is located above the air inlet assembly and is carried on a back of an operator through the backpack assembly.
 7. The backpack blower according to claim 6, wherein a circuit board located below the battery pack, a heat dissipation hole is arranged on a top wall of the air inlet tube, and the heat dissipation hole is arranged corresponding to the circuit board, so as to dissipate heat generated during an operation of the circuit board through the heat dissipation hole.
 8. The backpack blower according to claim 2, wherein a noise reduction sponge is arranged on an inner side wall of the air inlet tube to reduce noise when air enters.
 9. The backpack blower according to claim 1, wherein a handle assembly is mounted on the air outlet tube, the motor duct assembly is housed in the air outlet tube and located below the handle assembly, and the fan blade is arranged close to an end of the bellows connected with the air outlet tube.
 10. The backpack blower according to claim 9, wherein the air outlet tube comprises a first air outlet tube and a second air outlet tube that are assembled and matched with each other, the handle assembly comprises a first handle and a second handle that are assembled and matched with each other, the first handle is clamped on the first air outlet tube, and the second handle is clamped on the second air outlet tube.
 11. The backpack blower according to claim 10, wherein the motor duct assembly is housed in a receiving cavity surrounded and defined by the first air outlet tube and the second air outlet tube.
 12. The backpack blower according to claim 1, wherein the air outlet assembly further comprises a blowing tube connected with the air outlet tube, a ratio of a cross-sectional area of a free end of the blowing tube to a cross-sectional area of the duct body is less than 0.8, and a cross-sectional area of one end of the bellows close to the air outlet tube is smaller than a cross-sectional area of the other end of the bellows.
 13. The backpack blower according to claim 1, wherein the blower body is provided with an input port, and the backpack assembly is provided with a power output port matched with the input port.
 14. The backpack blower according to claim 13, wherein the blower body is further provided with an operating handle and a display unit on the operating handle, the backpack assembly is further provided with an information acquisition unit, and the information acquisition unit is used to obtain power information of the battery pack and display the power information on the display unit through a match of the input port and the power output port.
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