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(54) HANDHELD STRAPPING MACHINE AND CONTROL HANDLE

(57) The present invention discloses a handheld strapping machine and a control handle thereof. By providing a handle connecting portion above the front-end working host, a handheld operation area is arranged above the front-end working host, so that when a user grips the handheld strapping machine, the user is closer to the center of gravity thereof, which conforms to the lever principle and makes the operation more convenient and labor-saving. The handheld strapping machine of the present invention comprises a front-end working host, a handle connecting portion, and a rear-end battery assembly; wherein the location of the front-end working host is defined as front, and the location of the rear-end battery assembly is defined as rear; the handle connecting portion extends forward to be connected to the top of the front-end working host, and extends obliquely downward rearward to be connected to the rear-end battery assembly; and a region where a user holds the handle connecting portion to operate the handheld strapping machine is defined as a handheld operation area, and the handheld operation area is arranged above the front-end working host.

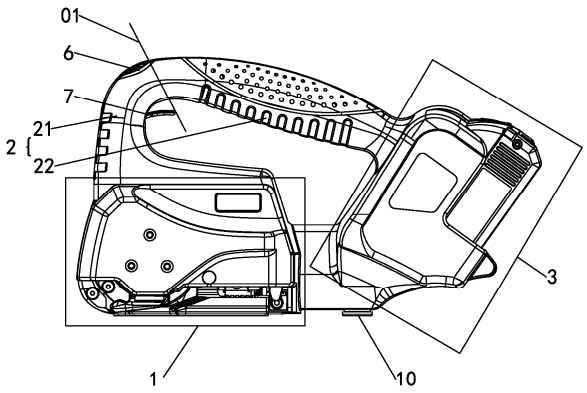


Fig. 1

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Description

Technical Field

[0001] The present invention relates to the field of strapping machines, and more particularly to a handheld strapping machine and a control handle.

Background Art

[0002] A handheld strapping machine is a portable strapping device, which is used to be conveniently carried to a relevant working point for strapping articles.

[0003] Patent No. 201720641936.1 discloses a handheld strapping machine, comprising a machine head, a handle, a connecting rod, and a machine tail, wherein a battery is mounted at the machine tail, and the handle and the connecting rod connect the machine head and the machine tail together. Generally speaking, the machine head portion of the handheld strapping machine is much heavier than the machine tail. For example, in some handheld strapping machines available on the market, the weight of the machine head portion is approximately four times that of the machine tail. Therefore, if the machine tail is not weighted up or the machine head is not weighted down, the existing handheld strapping machine is likely to suffer from a top-heavy condition, which affects a user's operation of the handheld strapping machine. In addition, if the machine head is weighted down, not only is the weight reduction difficult, but the amount of weight reduction is also limited, because the design of the machine head portion of current handheld strapping machines is already relatively streamlined; if the machine tail is weighted up, the overall weight of the handheld strapping machine is increased, thereby increasing the user's operational burden when using the handheld strapping machine.

[0004] The above-mentioned technical defects existing in the prior art have become a major technical problem to be solved urgently by those skilled in the art.

Summary of the Invention

[0005] The present invention discloses a handheld strapping machine. By providing a handle connecting portion above a front-end working host, a handheld operation area is arranged above the front-end working host, so that when a user grips the handheld strapping machine, the user is closer to the center of gravity thereof, which conforms to the lever principle and makes the operation more convenient and labor-saving. To this end, the present invention adopts the following technical solution:

A handheld strapping machine, comprising a front-end working host, a handle connecting portion, a rear-end battery assembly, and a control panel;
wherein the location of the front-end working host is defined as front, and the location of the rear-end battery assembly is defined as rear;
the handle connecting portion extends forward to be connected to the top of the front-end working host, and extends obliquely downward rearward to be connected to the rear-end battery assembly;
an area where a user holds the handle connecting portion to operate the handheld strapping machine is defined as a handheld operation area, and the handheld operation area is arranged above the front-end working host;
the control panel is arranged on the front-end working host, the handle connecting portion, or the rear-end battery assembly, and is used for adjusting functions of the handheld strapping machine.

[0006] Preferably, the handle connecting portion is provided with a control button and/or an operating handle.

[0007] Preferably, the handle connecting portion comprises a front transition area and a gripping area connected to each other, wherein the control button and/or the operating handle is/are arranged in the front transition area, and a user operates the handheld strapping machine by holding the gripping area; the front transition area extends forward to be connected to the top of the front-end working host, and extends rearward to be connected to the gripping area; and the gripping area extends obliquely downward rearward to be connected to the rear-end battery assembly.

[0008] Preferably, an outer surface of the front transition area is an inclined straight surface or a first arc surface.

[0009] Preferably, an outer surface of the handle connecting portion is a second arc surface; with a rear edge of the control button and/or the operating handle as a boundary line, when the handheld strapping machine is viewed from the front, the boundary line divides the handle connecting portion into the front transition area and the gripping area; and the front-end working host comprises a welding mechanism, wherein the control button is located in front of the welding mechanism.

[0010] Preferably, the rear-end battery assembly comprises a battery, and the battery is arranged to incline rearward.

[0011] Preferably, a center of gravity of the handheld strapping machine is located in the handheld operation area.

[0012] Preferably, a cushion block is provided at the bottom of a connection position between the front-end working host and the rear-end battery assembly.

[0013] Preferably, a rear end of a housing of the front-end working host and a front end of a housing of the rear-end battery assembly are integrally connected.

[0014] Preferably, further comprises a wireless communication module and a wireless control handle; the wireless communication module is arranged in the front-end working host, the handle connecting portion, or the

rear-end battery assembly, and is wirelessly connected to the wireless control handle; and the front-end working host is provided with a mounting position for mounting the wireless control handle.

[0015] Preferably, the mounting position is located at a front end or a side surface of the front-end working host.

[0016] Preferably, the wireless control handle comprises a mounting plate and a control handle, wherein the mounting plate is matched with the mounting position; and the control handle comprises a control module, a wireless communication module, and a battery.

[0017] The present invention further discloses a control handle for a handheld strapping machine. By mounting the control grip on the handheld strapping machine by means of a mounting member, on the one hand, a user can assist in holding the handheld strapping machine by means of the control grip, so that the operation is more stable; and on the other hand, the user can directly control the handheld strapping machine by means of the control grip, thereby solving the problems existing in the prior art.

[0018] To this end, the present invention adopts the following technical solution:

> A control handle for a handheld strapping machine, for use in a handheld strapping machine, characterized by comprising a control grip and a mounting member;
> wherein the handheld strapping machine is provided with a mounting position matched with the mounting member;
> the control grip is fixedly mounted at the mounting position through the mounting member;
> the control grip communicates with the handheld strapping machine and is used for controlling the handheld strapping machine.

[0019] Preferably, the control grip comprises a grip handle, a connecting handle, a button module, and a control circuit module, wherein the grip handle, the connecting handle, and the mounting member are arranged in sequence; the button module is used for controlling the handheld strapping machine through the control circuit module; and the control circuit module is arranged in the grip handle or the connecting handle.

[0020] Preferably, the grip handle and the connecting handle form a 7-shaped structure or an L-shaped structure; and the button module is arranged at a connection position between the grip handle and the connecting handle.

[0021] Preferably, the button module comprises at least one of a touch screen, a button, an operating handle, or a knob.

[0022] Preferably, the control grip is further provided with a status indication unit connected to the control circuit module; and the status indication unit comprises at least one of a buzzer, an indicator light, or a speaker.

[0023] Preferably, a first wireless communication module connected to the control circuit module is arranged in the control grip, and the handheld strapping machine is provided with a second wireless communication module; the first wireless communication module establishes a communication link with the second wireless communication module; and the first wireless communication module comprises at least one of a 2.4 GHz wireless communication module, a ZigBee communication module, or a Bluetooth communication module.

[0024] Preferably, a battery and a charging port are further arranged in the control grip; and the control circuit module is provided with a battery circuit for managing the battery.

[0025] Preferably, the mounting member is a mounting plate, wherein the mounting plate is provided with at least two hole positions, the mounting position is provided with screw holes matched with the hole positions, and the mounting plate is mounted at the mounting position by bolts; or the mounting member is a bolt, and the mounting position is provided with a screw hole.

[0026] Preferably, the mounting member is provided with a first electrical connection unit, and the mounting position is provided with a second electrical connection unit matched with the first electrical connection unit, wherein after the mounting member is fixed to the mounting position, the first electrical connection unit is brought into contact with and electrically connected to the second electrical connection unit.

[0027] Preferably, the first electrical connection unit is an electrical contact or a connector.

[0028] The handheld strapping machine provided by the present invention comprises a front-end working host, a handle connecting portion, and a rear-end battery assembly; wherein the location of the front-end working host is defined as front, and the location of the rear-end battery assembly is defined as rear; the handle connecting portion extends forward to be connected to the top of the front-end working host, and extends obliquely downward rearward to be connected to the rear-end battery assembly; and a region where a user holds the handle connecting portion to operate the handheld strapping machine is defined as a handheld operation area, and the handheld operation area is arranged above the front-end working host. By providing the handle connecting portion above the front-end working host, the handheld operation area is arranged above the front-end working host, so that when a user grips the handheld strapping machine of the present invention, the user is closer to the center of gravity of the handheld strapping machine, which conforms to the lever principle and makes the operation more convenient and labor-saving.

Description of the Drawings

[0029]

> FIG. 1 is a front structural view of the handheld strapping machine of the present invention;

FIG. 2 is a perspective view of the handheld strapping machine of the present invention;
FIG. 3 is another perspective view of the handheld strapping machine of the present invention;
FIG. 4 is a schematic view showing a hand holding the handheld strapping machine of the present invention;
FIG. 5 is a schematic view showing a hand holding the handheld strapping machine of the present invention after a wireless control handle is mounted thereon;
FIG. 6 is another schematic view showing a hand holding the handheld strapping machine of the present invention after a wireless control handle is mounted thereon;
FIG. 7 is a structural view of the wireless control handle in the handheld strapping machine of the present invention;
FIG. 8 is a perspective view of the control handle for the handheld strapping machine of the present invention;
FIG. 9 is a schematic structural view showing the control handle for the handheld strapping machine of the present invention mounted on a side surface of the handheld strapping machine;
FIG. 10 is a schematic structural view showing the control handle for the handheld strapping machine of the present invention mounted at a front end of the handheld strapping machine;
FIG. 11 is a schematic view showing one manner of holding the control handle in the control handle for the handheld strapping machine of the present invention;
FIG. 12 is a schematic view showing another manner of holding the control handle in the control handle for the handheld strapping machine of the present invention;
FIG. 13 is a schematic functional view of a certain handheld strapping machine in the prior art;
FIG. 14 is a schematic view of the control circuit module in the control handle for the handheld strapping machine of the present invention.

Detailed Description of the Embodiments

[0030] The present invention discloses a handheld strapping machine. By providing a handle connecting portion 2 above a front-end working host 1, a handheld operation area is arranged above the front-end working host 1, so that when a user grips the handheld strapping machine, the user is closer to the center of gravity thereof, which conforms to the lever principle and makes the operation more convenient and labor-saving.

[0031] The technical solutions in the embodiments of the present invention are clearly and described in detail below with reference to the drawings in the embodiments of the present invention. Obviously, the described embodiments are merely some embodiments of the present invention, rather than all embodiments. Based on the embodiments of the present invention, all other embodiments obtained by those of ordinary skill in the art without making inventive efforts shall fall within the protection scope of the present invention.

[0032] Please refer to FIGS. 1 to 7. FIGS. 1 to 7 show an embodiment of the handheld strapping machine of the present invention, which comprises a front-end working host 1, a handle connecting portion 2, a rear-end battery assembly 3, and a control panel 5; wherein the location of the front-end working host 1 is defined as front, and the location of the rear-end battery assembly 3 is defined as rear; the handle connecting portion 2 extends forward to be connected to the top of the front-end working host 1, and extends obliquely downward rearward to be connected to the rear-end battery assembly 3; a region where a user holds the handle connecting portion 2 to operate the handheld strapping machine is defined as a handheld operation area, and the handheld operation area is arranged above the front-end working host 1; and the control panel 5 is arranged on the front-end working host 1, the handle connecting portion 2, or the rear-end battery assembly 3, and is used for adjusting functions of the handheld strapping machine.

[0033] In the embodiment of the present invention, in order to make holding and operating the handheld strapping machine more convenient and labor-saving, it is only necessary that the handholding position be as close as possible to the center position of the handheld strapping machine. Generally, the weight of the front-end working host 1 is about four times that of the rear-end battery assembly 3. Therefore, if the handle is arranged between the front-end working host 1 and the rear-end battery assembly 3, a top-heavy condition will occur. However, in existing handheld strapping machines, due to conventional design thinking, the handle is always arranged between the front-end working host 1 and the rear-end battery assembly 3. For such a design, the top-heavy condition can only be left as it is, or solved by increasing the weight of the rear-end battery assembly 3. The present invention breaks through the conventional design by arranging the handle connecting portion 2 above the front-end working host 1. The handle connecting portion 2 extends forward to be connected to the top of the front-end working host 1, and extends obliquely downward rearward to be connected to the rear-end battery assembly 3, so that when a user holds the handheld strapping machine, the user's hand is closer to the front-end working host 1. According to the lever principle, the user's hand is thus closer to the center of gravity of the handheld strapping machine, thereby achieving the effect of convenient and labor-saving operation. The above control panel 5 is generally arranged on a side surface of the front-end working host 1, and may comprise at least one of buttons and a touch screen, wherein a combination design of a touch screen and buttons is preferred, so as to adjust some preset functions of the handheld strapping machine, such as parameters including welding tem-

perature and time. In the absence of the control panel 5, functional adjustment needs to be carried out by connecting to a computer, which is not only troublesome, but also affects working efficiency.

[0034] It should be noted that, since the handle connecting portion 2 is arranged above the front-end working host 1 rather than between the front-end working host 1 and the rear-end battery assembly 3, the overall length of the handheld strapping machine is shortened, that is, the whole machine is more compact.

[0035] Preferably, the handle connecting portion 2 is provided with a control button and/or an operating handle.

[0036] It should be pointed out that the handheld strapping machine of the present invention may comprise a control button 6 and/or an operating handle 7, and the control button and/or the operating handle is mounted on the handle connecting portion 2.

[0037] Preferably, the handle connecting portion 2 comprises a front transition area 21 and a gripping area 22 connected to each other, wherein the control button and/or the operating handle is/are arranged in the front transition area 21, and a user operates the handheld strapping machine by holding the gripping area 22; the front transition area 21 extends forward to be connected to the top of the front-end working host 1, and extends rearward to be connected to the gripping area 22; and the gripping area 22 extends obliquely downward rearward to be connected to the rear-end battery assembly 3.

[0038] Preferably, an outer surface of the front transition area 21 is an inclined straight surface or a first arc surface.

[0039] Preferably, an outer surface of the handle connecting portion 2 is a second arc surface; with a rear edge of the control button and/or the operating handle as a boundary line 01, when the handheld strapping machine is viewed from the front, the boundary line 01 divides the handle connecting portion 2 into the front transition area 21 and the gripping area 22; and the front-end working host 1 comprises a welding mechanism, wherein the control button is located in front of the welding mechanism.

[0040] In the embodiment of the present invention, it should be particularly noted that the handle connecting portion 2 may be divided into a front transition area 21 and a gripping area 22 connected front-to-rear; an outer peripheral surface of the front transition area 21 may be an inclined straight surface or may be an arc transition surface, on which the control button is arranged, and the arrangement position of the control button is at least in front of the welding mechanism, so that when the handheld strapping machine is gripped, it better conforms to ergonomic design and facilitates operation by a finger, generally the thumb. It should be pointed out that, when the outer peripheral surface is an arc transition surface, the handheld strapping machine is smoother and more comfortable to grip; an inner peripheral surface of the front transition area 21 may be arranged in an arc shape, so that when gripped, it facilitates the index finger abutting against and bearing the weight, can better adapt to the curved shape of the finger, thereby providing more stable support and reducing discomfort and fatigue caused by finger loading; in addition, this also better conforms to ergonomics, and particularly when vertical strapping is performed, the finger comfort is higher.

[0041] Preferably, the rear-end battery assembly 3 comprises a battery, and the battery is arranged to incline rearward.

[0042] Here, it should be particularly noted that the present invention creatively adopts an inclined battery design. The inclination angle of the battery is related to the weights of the front-end working host and the rear-end battery assembly 3, as well as the arrangement of the front-end working host 1, the handle connecting portion 2, and the rear-end battery assembly 3. In addition, by mounting the battery at the rear lower side in a rearward-inclined direction, on the one hand, the center of gravity of the tool can be lowered; and on the other hand, the battery can be positioned as close as possible to the front-end working host 1, so that the overall length of the handheld strapping machine is shortened, which helps reduce the weight of the device and better balance the front and rear counterweights, thereby reducing the user's load-bearing burden during use. Meanwhile, this mounting manner can also reduce shaking and vibration of the device, improve the stability of the tool, and provide a better user experience. Still further, the rearward-inclined battery mounting manner at the rear side enables more convenient battery operation, and facilitates installation and removal of the battery. It must be pointed out that, by designing the inclination angle of the battery, namely the inclination angle of the rear-end battery assembly 3, the center of gravity of the entire handheld strapping machine can be located in the handheld operation area, so that when a user holds the handheld strapping machine, the operation is more labor-saving and stable.

[0043] Preferably, a rear end of a housing of the front-end working host 1 and a front end of a housing of the rear-end battery assembly 3 are integrally connected.

[0044] A cushion block 10 may further be provided at the bottom of a connection position between the housings of the front-end working host 1 and the rear-end battery assembly 3, and the cushion block 10 is mainly provided for support, so as to ensure the stability of the handheld strapping machine when placed flat. Position A in FIG. 2 is the connection position between the rear end of the housing of the front-end working host 1 and the front end of the housing of the rear-end battery assembly 3, and it can be clearly seen from the figure that the two are integrally connected.

[0045] Preferably, further comprises a wireless communication module and a wireless control handle 4; the wireless communication module is arranged in the front-end working host 1, the handle connecting portion 2, or the rear-end battery assembly 3, and is wirelessly con-

nected to the wireless control handle 4; and the front-end working host 1 is provided with a mounting position 11 for mounting the wireless control handle 4.

[0046] Preferably, the mounting position 11 is located at a front end or a side surface of the front-end working host 1.

[0047] Preferably, the wireless control handle 4 comprises a mounting plate 41 and a control handle 42, wherein the mounting plate 41 is matched with the mounting position 11; and the control handle 42 comprises a control module, a wireless communication module, and a battery.

[0048] For ease of operation, the handheld strapping machine of the present invention may further be externally provided with a wireless control handle 4. The wireless control handle 4 may comprise a mounting plate 41 and a control handle 42, wherein the control handle 42 comprises a control module, a wireless communication module, and a battery. After the wireless control handle 4 establishes a communication channel with the built-in wireless communication module in the handheld strapping machine through the wireless communication module, various functions of the handheld strapping machine can be operated directly through the control module on the wireless control handle 4, specifically, buttons, a touch screen. In addition, the control handle 42 may further be provided with a charging port, such as a Type-C charging port, so as to charge the control handle 42. The wireless communication module may specifically be, for example, a 2.4G wireless communication module, a Bluetooth module, or a ZigBee communication module, which is not limited herein. In order to facilitate understanding of the working state of the wireless control handle 4, components such as an indicator light or a buzzer may further be arranged on the wireless control handle 4, which are not limited herein. The wireless control handle 4 may be fixed to the mounting position 11 by bolts, or may be screwed into the mounting position 11 by threads, which is not limited herein.

[0049] The handheld strapping machine provided by the present invention comprises a front-end working host 1, a handle connecting portion 2, and a rear-end battery assembly 3; wherein the location of the front-end working host 1 is defined as front, and the location of the rear-end battery assembly 3 is defined as rear; the handle connecting portion 2 extends forward to be connected to the top of the front-end working host 1, and extends obliquely downward rearward to be connected to the rear-end battery assembly 3; and a region where a user holds the handle connecting portion 2 to operate the handheld strapping machine is defined as a handheld operation area, and the handheld operation area is arranged above the front-end working host 1. By providing the handle connecting portion 2 above the front-end working host 1, the handheld operation area is arranged above the front-end working host 1, so that when a user grips the handheld strapping machine of the present invention, the user is closer to the center of gravity of the handheld strapping machine, which conforms to the lever principle and makes the operation more convenient and labor-saving.

[0050] Please refer to FIGS. 8 to 14. FIGS. 8 to 14 show an embodiment of the control handle for a handheld strapping machine of the present invention, which is for use in a handheld strapping machine and comprises a control grip 100 and a mounting member 200;

wherein the handheld strapping machine is provided with a mounting position 300 matched with the mounting member 200;
the control grip 100 is fixedly mounted at the mounting position 300 through the mounting member 200;
the control grip 100 communicates with the handheld strapping machine and is used for controlling the handheld strapping machine.

[0051] In the present embodiment, it should first be noted that, when use is required, the control handle may simply be mounted to the mounting position 300 through the mounting member 200, and when the control handle is not needed, it may be directly detached. By means of the additionally provided control handle, when carrying out strapping work, the user may either hold the control grip 100 with one hand and then operate and control the handheld strapping machine, or hold the handle area of the handheld strapping machine with one hand and hold the control grip 100 with the other hand, and then operate and control the handheld strapping machine by means of the control grip 100. That is, the control handle of the present invention provides a user with multiple working modes and is more convenient to operate, particularly in specific scenarios where control cannot be performed through the control button of the handheld strapping machine itself.

[0052] Preferably, the control grip 100 comprises a grip handle 111, a connecting handle 112, a button module 113, and a control circuit module, wherein the grip handle 111, the connecting handle 112, and the mounting member 200 are arranged in sequence; the button module 113 is used for controlling the handheld strapping machine through the control circuit module; and the control circuit module is arranged in the grip handle 111 or the connecting handle 112.

[0053] Here, it should be noted that the handheld strapping machine generally may comprise functions such as welding motor control, tightening motor control, and strap-release control. Please refer to FIG. 13, which is a functional diagram of a certain handheld strapping machine. Correspondingly, the control circuit module has control functions corresponding to the functions of the handheld strapping machine, and FIG. 14 is a functional diagram of one implementation of the control circuit module. A user sends a control signal to the control circuit module through the button module 113, and the control circuit module controls the handheld strapping machine according to the control signal. Communication between the control circuit module and the handheld strapping

machine may be wireless or wired, which is not limited herein.

[0054] Preferably, the grip handle 111 and the connecting handle 112 form a 7-shaped structure or an L-shaped structure; and the button module 113 is arranged at a connection position between the grip handle 111 and the connecting handle 112.

[0055] Specifically, control buttons may be arranged on an outer peripheral surface at the connection position between the grip handle 111 and the connecting handle 112, and an operating handle may be arranged on an inner peripheral surface thereof, which is not limited herein.

[0056] Preferably, the button module 113 comprises at least one of a touch screen, a button, an operating handle, or a knob.

[0057] Preferably, the control grip 100 is further provided with a status indication unit connected to the control circuit module; and the status indication unit comprises at least one of a buzzer, an indicator light, or a speaker.

[0058] Preferably, a first wireless communication module connected to the control circuit module is arranged in the control grip 100, and the handheld strapping machine is provided with a second wireless communication module; the first wireless communication module establishes a communication link with the second wireless communication module; and the first wireless communication module comprises at least one of a 2.4 GHz wireless communication module, a ZigBee communication module, or a Bluetooth communication module.

[0059] In one embodiment of the present invention, a first wireless communication module is arranged in the control grip 100, that is, the control circuit module communicates with the handheld strapping machine in a wireless manner. In this case, excessive modifications to the handheld strapping machine are not required, and it is only necessary to additionally provide a second wireless communication module in the handheld strapping machine.

[0060] Preferably, a battery and a charging port are further arranged in the control grip 100; and the control circuit module is provided with a battery circuit for managing the battery.

[0061] The charging port may specifically be a Type-C charging port, and the battery may specifically be a lithium-ion battery.

[0062] Preferably, the mounting member 200 is a mounting plate, wherein the mounting plate is provided with at least two hole positions, the mounting position 300 is provided with screw holes matched with the hole positions, and the mounting plate is mounted at the mounting position 300 by bolts; or the mounting member 200 is a bolt, and the mounting position 300 is provided with a screw hole.

[0063] Preferably, the mounting member 200 is provided with a first electrical connection unit, and the mounting position 300 is provided with a second electrical connection unit matched with the first electrical connection unit, wherein after the mounting member 200 is fixed to the mounting position 300, the first electrical connection unit is brought into contact with and electrically connected to the second electrical connection unit.

[0064] In another embodiment of the present invention, a first electrical connection unit is arranged in the control grip 100, that is, the control circuit module communicates with the handheld strapping machine in a wired manner. In this case, the control handle may be directly powered by the handheld strapping machine, without additionally providing a battery and a charging port.

[0065] Preferably, the first electrical connection unit is an electrical contact or a connector.

[0066] The control handle for a handheld strapping machine provided by the present invention is for use in a handheld strapping machine, and comprises a control grip 100 and a mounting member 200; the handheld strapping machine is provided with a mounting position 300 matched with the mounting member 200; the control grip 100 is fixedly mounted at the mounting position 300 through the mounting member 200; and the control grip 100 communicates with the handheld strapping machine and is used for controlling the handheld strapping machine. By mounting the control grip 100 on the handheld strapping machine by means of the mounting member 200, the control handle for a handheld strapping machine of the present invention, on the one hand, enables a user to assist in holding the handheld strapping machine through the control grip 100, so that the operation is more stable, and on the other hand, enables the user to directly control the handheld strapping machine through the control grip 100.

[0067] The handheld strapping machine provided by the present invention has been described in detail above. For those of ordinary skill in the art, various modifications may be made to the specific implementations and application scope according to the concepts of the embodiments of the present invention. Accordingly, the contents of this specification shall not be construed as limiting the present invention.

Claims

1. A handheld strapping machine, **characterized in that** it comprises a front-end working host (1), a handle connecting portion (2), a rear-end battery assembly (3), and a control panel (5);

   wherein the location of the front-end working host (1) is defined as front, and the location of the rear-end battery assembly (3) is defined as rear;

   the handle connecting portion (2) extends forward to be connected to the top of the front-end working host (1), and extends obliquely downward rearward to be connected to the rear-end

battery assembly (3);
a region where a user holds the handle connecting portion (2) to operate the handheld strapping machine is defined as a handheld operation area, and the handheld operation area is arranged above the front-end working host (1);
the control panel (5) is arranged on the front-end working host (1), the handle connecting portion (2), or the rear-end battery assembly (3), and is used for adjusting functions of the handheld strapping machine.

2. The handheld strapping machine according to claim 1, **characterized in that** the handle connecting portion (2) is provided with a control button and/or an operating handle.

3. The handheld strapping machine according to claim 2, **characterized in that** the handle connecting portion (2) comprises a front transition area (21) and a gripping area (22) connected to each other, wherein the control button and/or the operating handle is/are arranged in the front transition area (21), and a user operates the handheld strapping machine by holding the gripping area (22);

the front transition area (21) extends forward to be connected to the top of the front-end working host (1), and extends rearward to be connected to the gripping area (22);
the gripping area (22) extends obliquely downward rearward to be connected to the rear-end battery assembly (3).

4. The handheld strapping machine according to claim 3, **characterized in that** an outer surface of the front transition area (21) is an inclined straight surface or a first arc surface.

5. The handheld strapping machine according to claim 3, **characterized in that** an outer surface of the handle connecting portion (2) is a second arc surface;

with a rear edge of the control button and/or the operating handle as a boundary line (01), when the handheld strapping machine is viewed from the front, the boundary line (01) divides the handle connecting portion (2) into the front transition area (21) and the gripping area (22);
the front-end working host (1) comprises a welding mechanism, wherein the control button is located in front of the welding mechanism.

6. The handheld strapping machine according to any one of claims 1 to 5, **characterized in that** the rear-end battery assembly (3) comprises a battery, and the battery is arranged to incline rearward.

7. The handheld strapping machine according to claim 6, **characterized in that** a rear end of a housing of the front-end working host (1) and a front end of a housing of the rear-end battery assembly (3) are integrally connected.

8. The handheld strapping machine according to claim 6, **characterized in that** further comprises a wireless communication module and a wireless control handle (4);

the wireless communication module is arranged in the front-end working host (1), the handle connecting portion (2), or the rear-end battery assembly (3), and is wirelessly connected to the wireless control handle (4);
the front-end working host (1) is provided with a mounting position (11) for mounting the wireless control handle (4).

9. The handheld strapping machine according to claim 8, **characterized in that** the mounting position (11) is located at a front end or a side surface of the front-end working host (1).

10. The handheld strapping machine according to claim 8, **characterized in that** the wireless control handle (4) comprises a mounting plate (41) and a control handle (42), wherein the mounting plate (41) is matched with the mounting position (11);
the control handle (42) comprises a control module, a wireless communication module, and a battery.

11. A control handle for a handheld strapping machine, for use in a handheld strapping machine, **characterized in that** it comprises a control grip and a mounting member;

wherein the handheld strapping machine is provided with a mounting position matched with the mounting member;
the control grip is fixedly mounted at the mounting position through the mounting member;
the control grip communicates with the handheld strapping machine and is used for controlling the handheld strapping machine.

12. The control handle for a handheld strapping machine according to claim 11, **characterized in that** the control grip comprises a grip handle, a connecting handle, a button module, and a control circuit module, wherein the grip handle, the connecting handle, and the mounting member are arranged in sequence;

the button module is used for controlling the handheld strapping machine through the control circuit module;

the control circuit module is arranged in the grip handle or the connecting handle.

13. The control handle for a handheld strapping machine according to claim 12, **characterized in that** the grip handle and the connecting handle form a 7-shaped structure or an L-shaped structure;
the button module is arranged at a connection position between the grip handle and the connecting handle.

14. The control handle for a handheld strapping machine according to claim 13, **characterized in that** the button module comprises at least one of a touch screen, a button, an operating handle, or a knob.

15. The control handle for a handheld strapping machine according to claim 12, **characterized in that** the control grip is further provided with a status indication unit connected to the control circuit module;
the status indication unit comprises at least one of a buzzer, an indicator light, or a speaker.

16. The control handle for a handheld strapping machine according to any one of claims 12 to 15, **characterized in that** a first wireless communication module connected to the control circuit module is arranged in the control grip, and the handheld strapping machine is provided with a second wireless communication module;

the first wireless communication module establishes a communication link with the second wireless communication module;
the first wireless communication module comprises at least one of a 2.4 GHz wireless communication module, a ZigBee communication module, or a Bluetooth communication module.

17. The control handle for a handheld strapping machine according to claim 16, **characterized in that** a battery and a charging port are further arranged in the control grip;
the control circuit module is provided with a battery circuit for managing the battery.

18. The control handle for a handheld strapping machine according to claim 17, **characterized in that** the mounting member is a mounting plate, wherein the mounting plate is provided with at least two hole positions, the mounting position is provided with screw holes matched with the hole positions, and the mounting plate is mounted at the mounting position by bolts;
or,
the mounting member is a bolt, and the mounting position is provided with a screw hole.

19. The control handle for a handheld strapping machine according to any one of claims 12 to 15, **characterized in that** the mounting member is provided with a first electrical connection unit, and the mounting position is provided with a second electrical connection unit matched with the first electrical connection unit, wherein after the mounting member is fixed to the mounting position, the first electrical connection unit is brought into contact with and electrically connected to the second electrical connection unit.

20. The control handle for a handheld strapping machine according to claim 19, **characterized in that** the first electrical connection unit is an electrical contact or a connector.

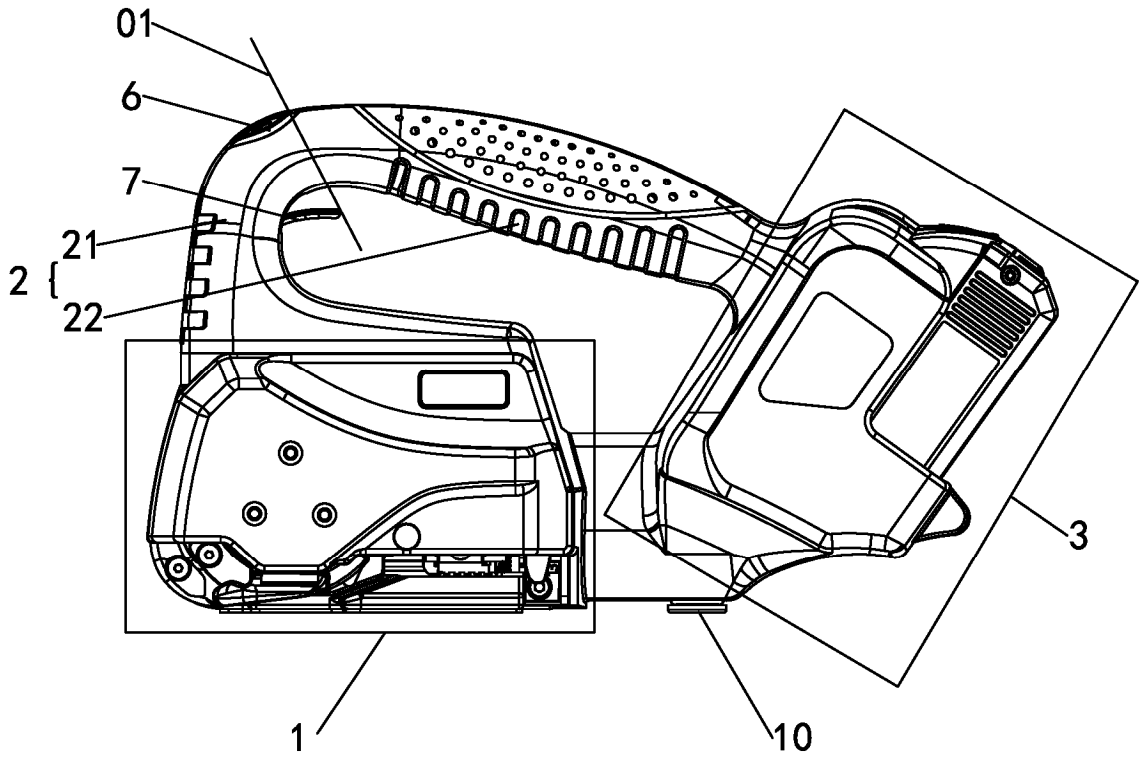


Fig. 1

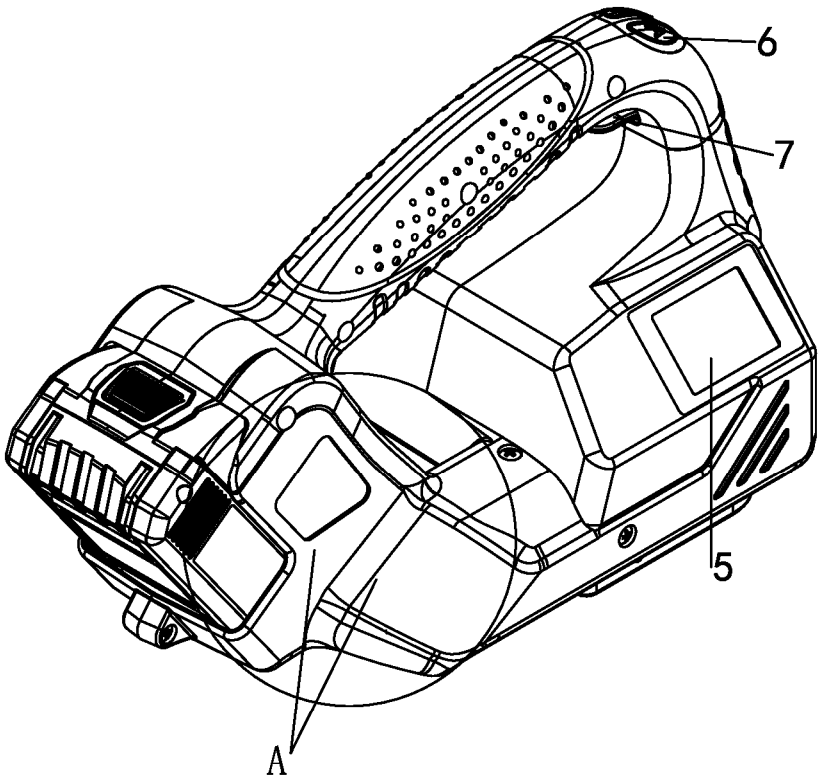


Fig. 2

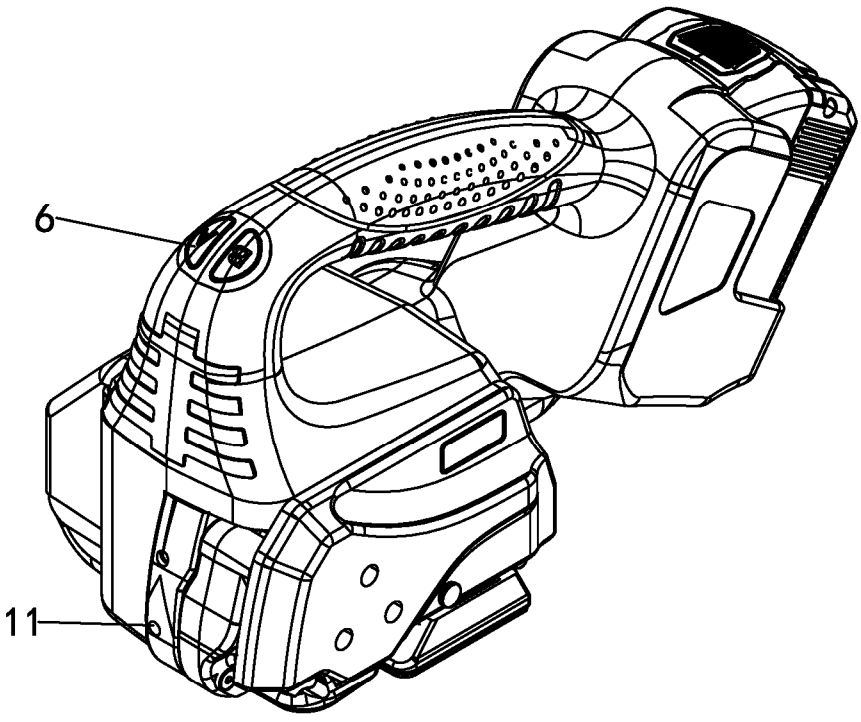


Fig. 3

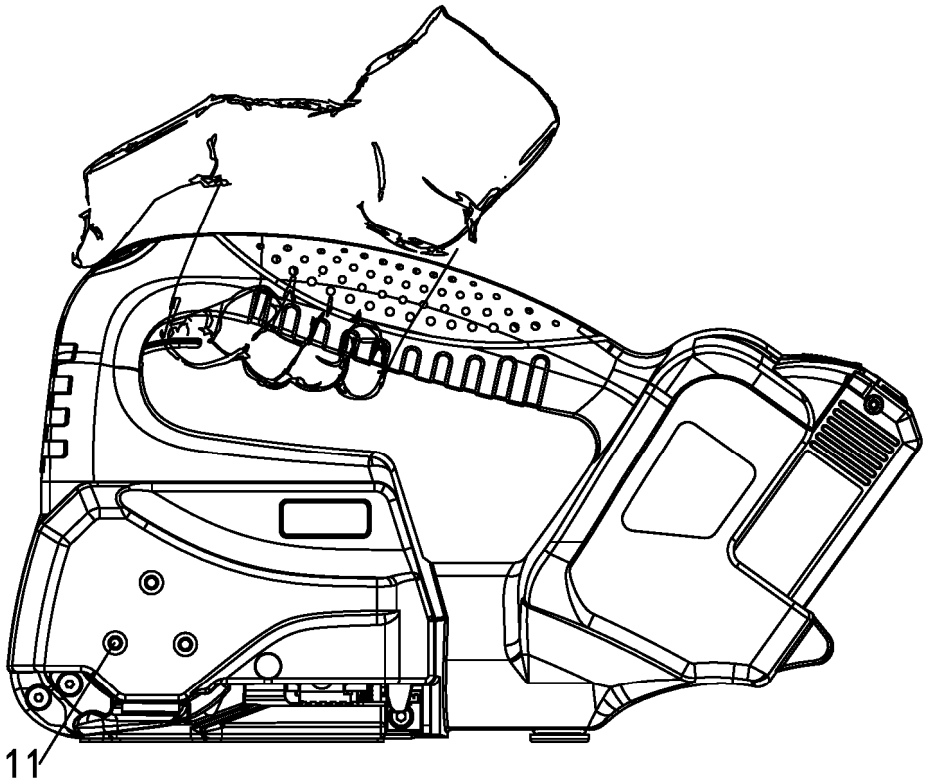


Fig. 4

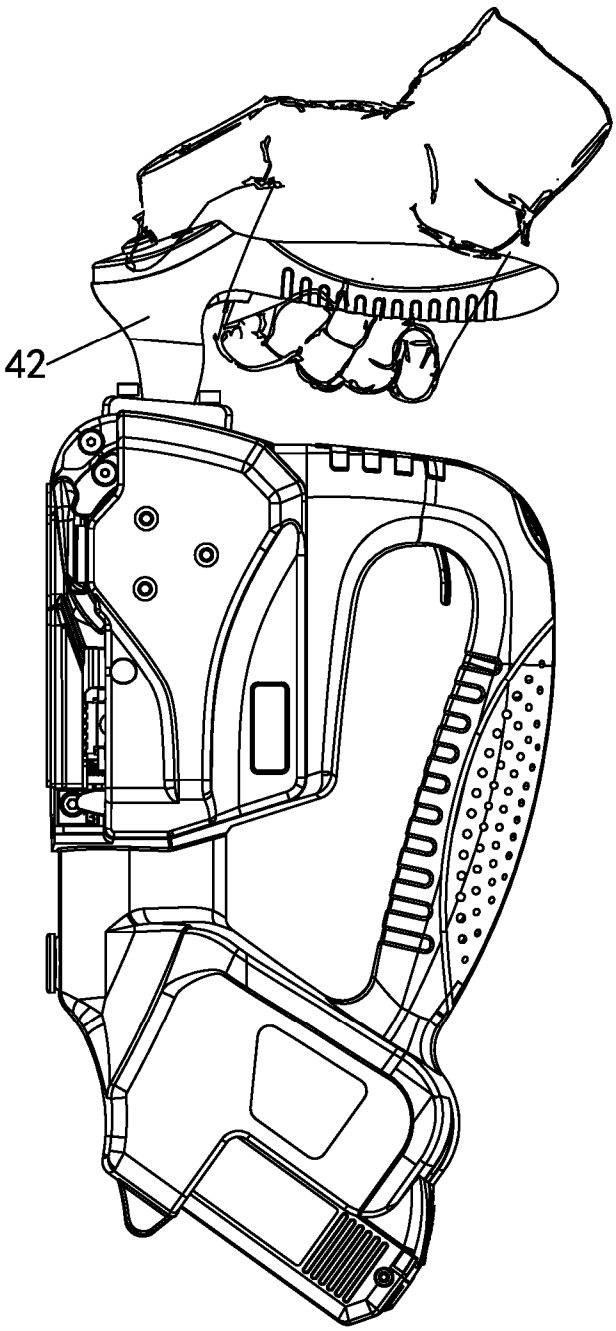


Fig. 5

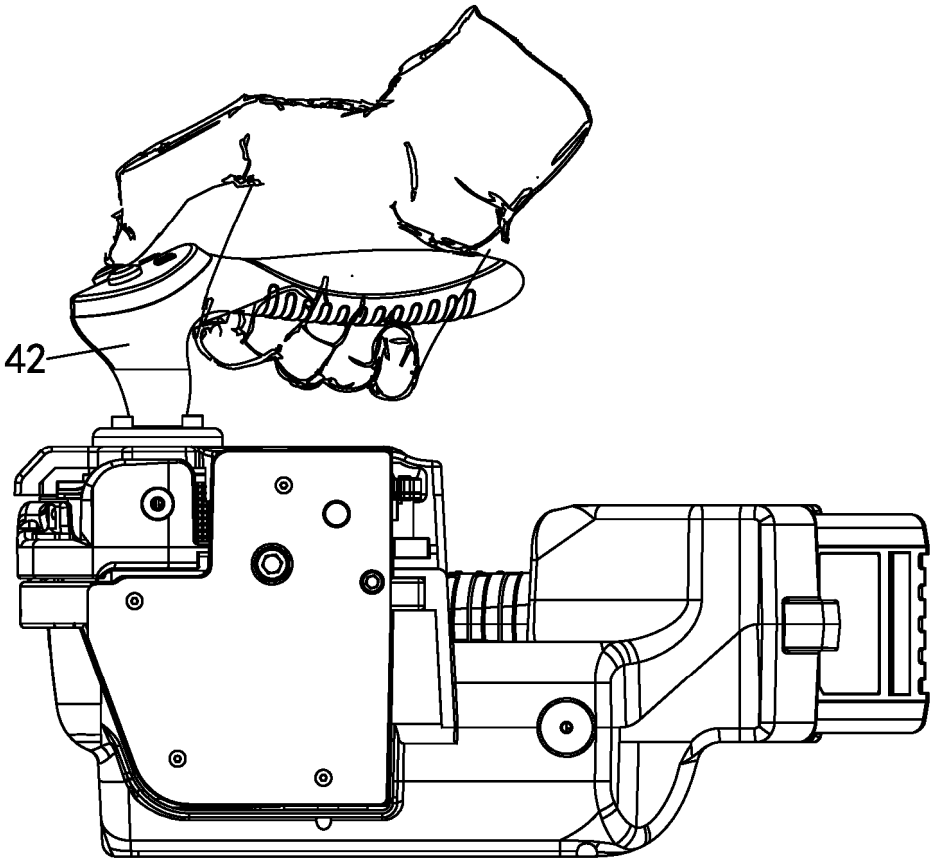


Fig. 6

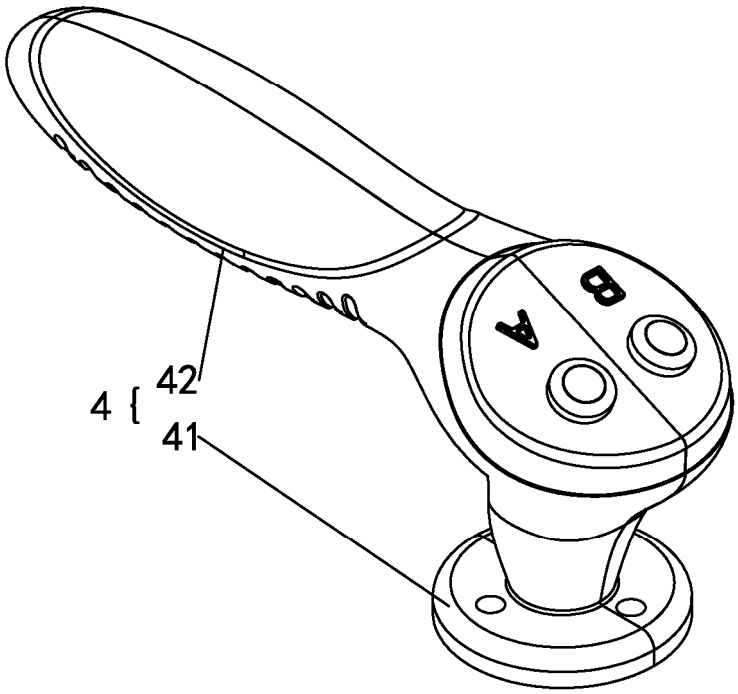


Fig. 7

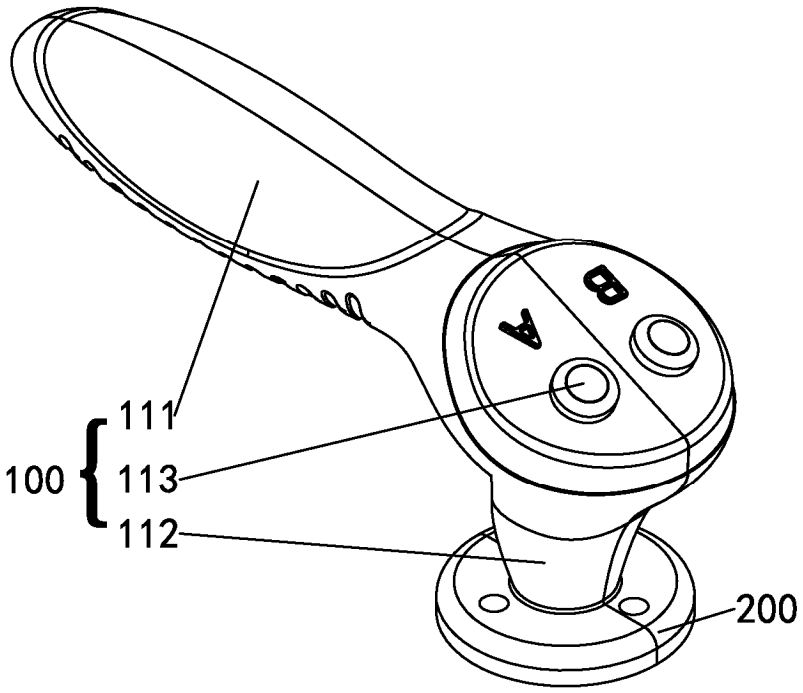


Fig. 8

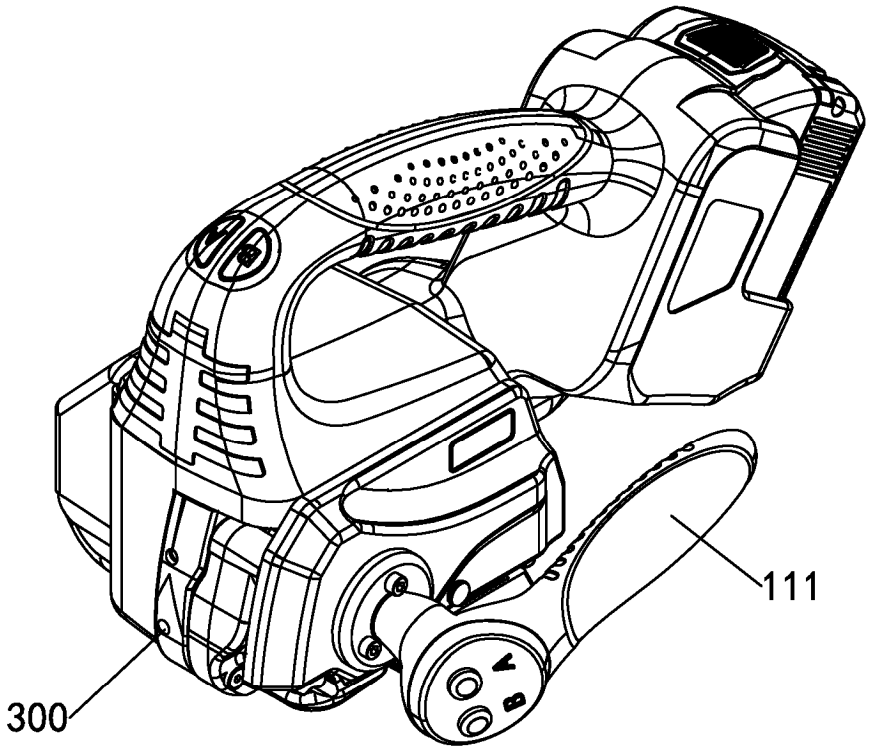


Fig. 9

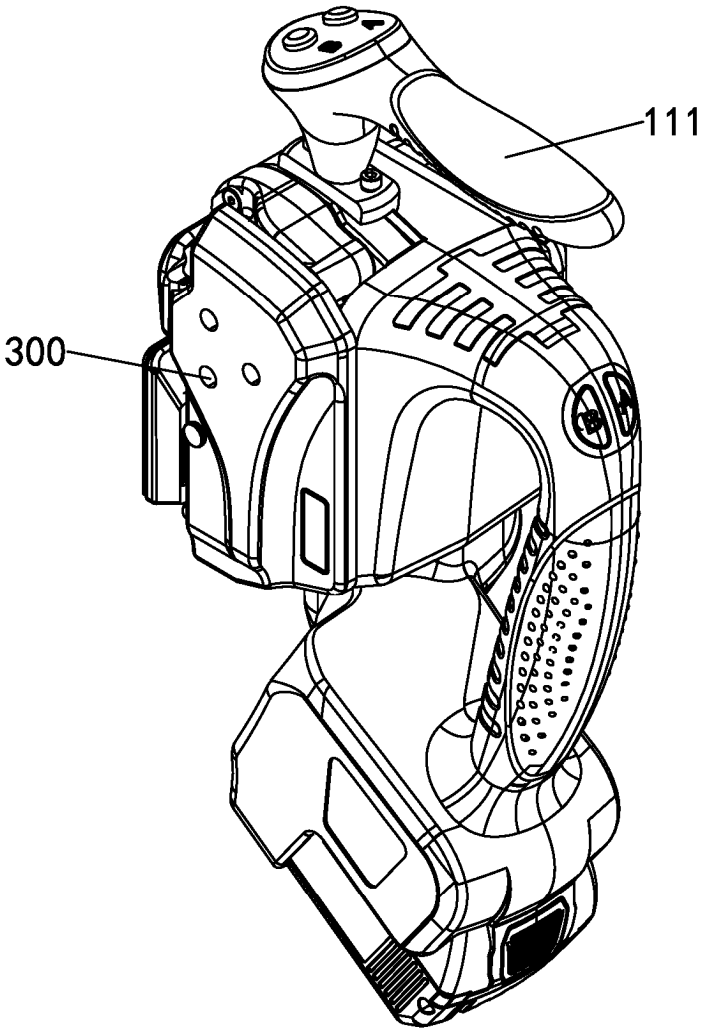


Fig. 10

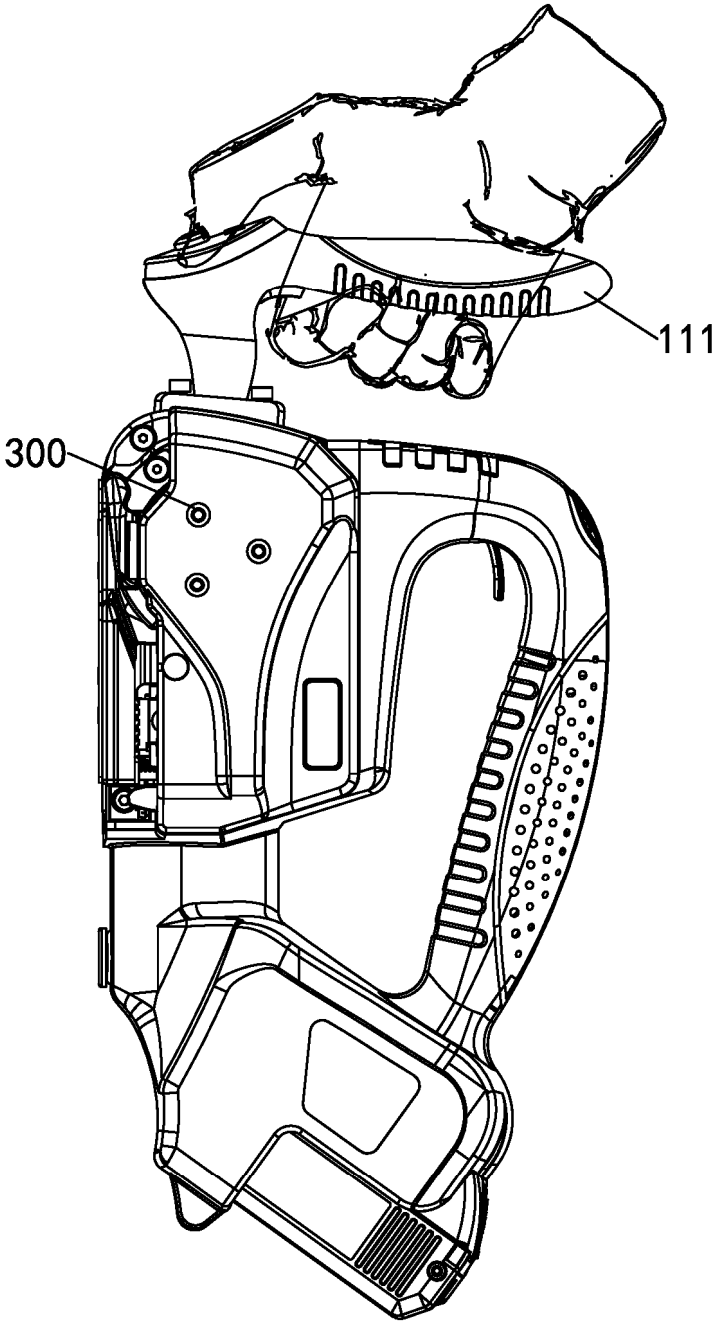


Fig. 11

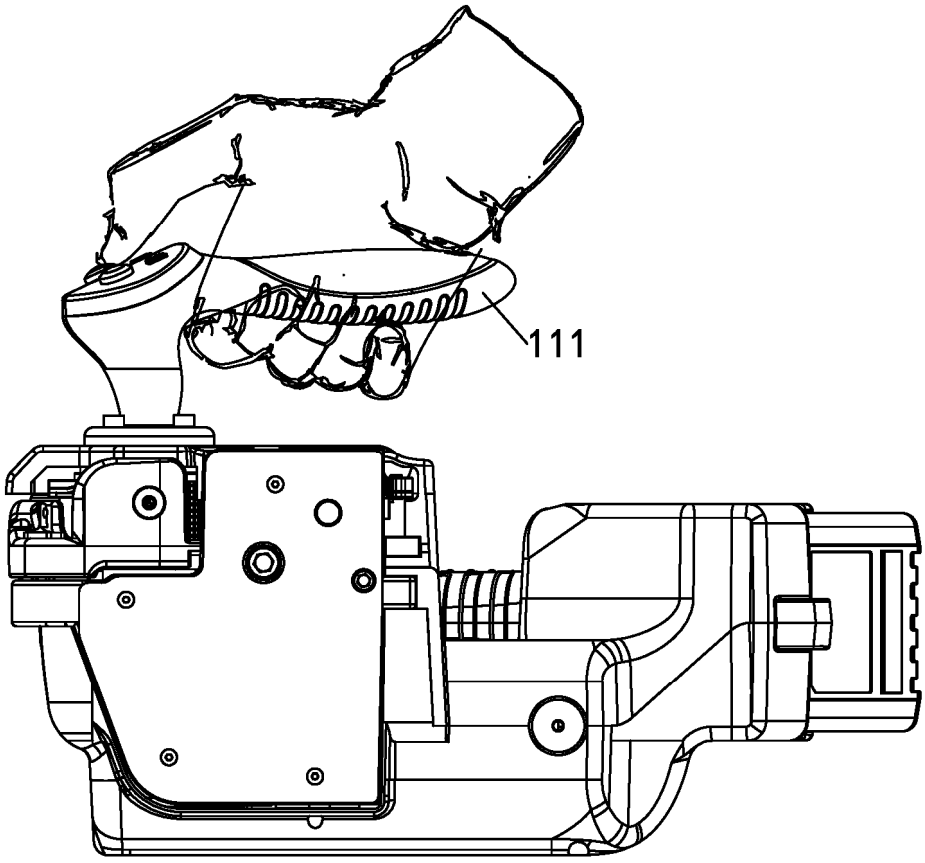


Fig. 12

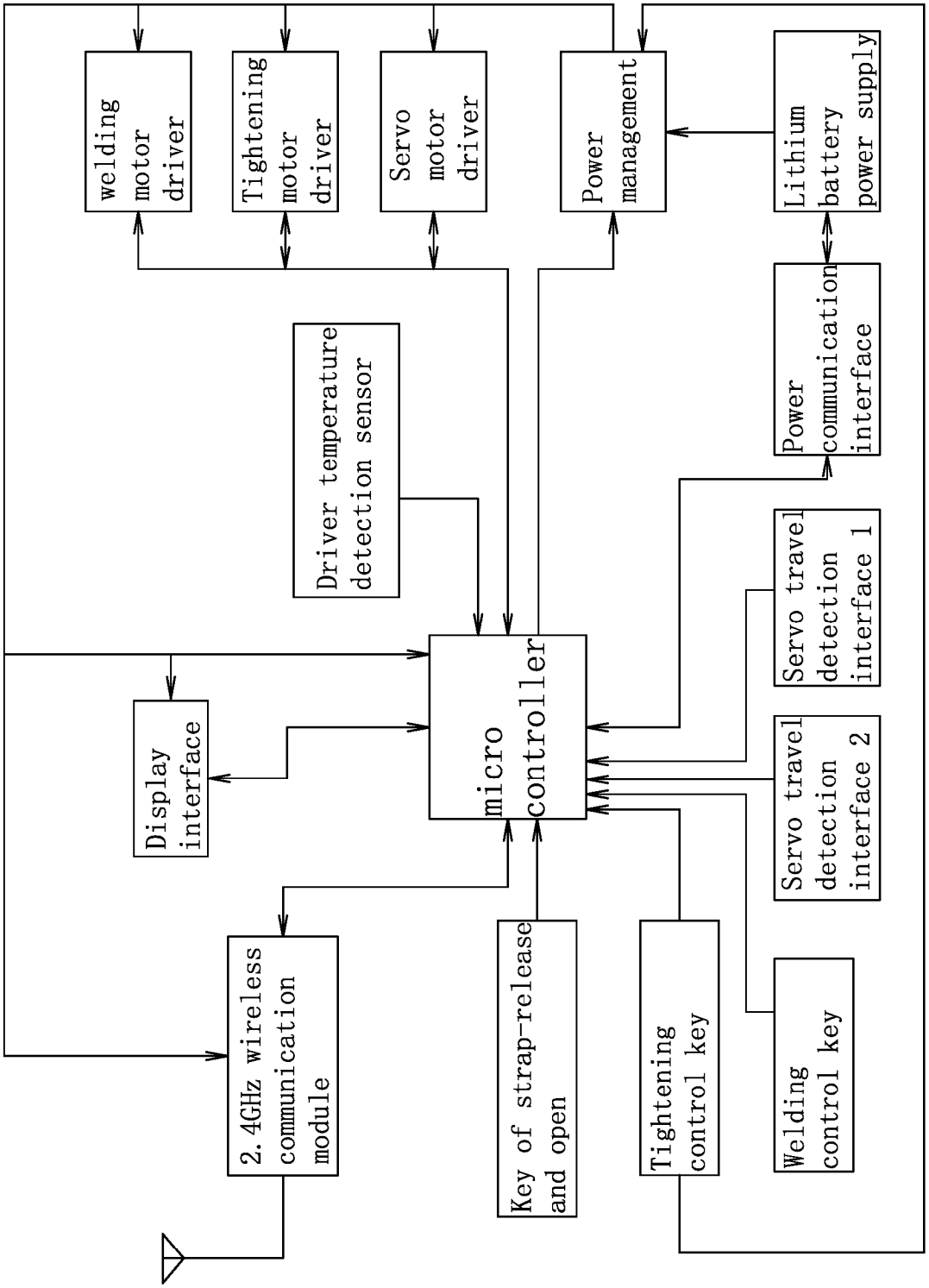

welding motor driver
Tightening motor driver
Servo motor driver
Power management
Lithium battery power supply
Power communication interface
Driver temperature detection sensor
Servo travel detection interface 1
Servo travel detection interface 2
micro controller
Display interface
2.4GHz wireless communication module
Key of strap-release and open
Tightening control key
Welding control key

Fig. 13

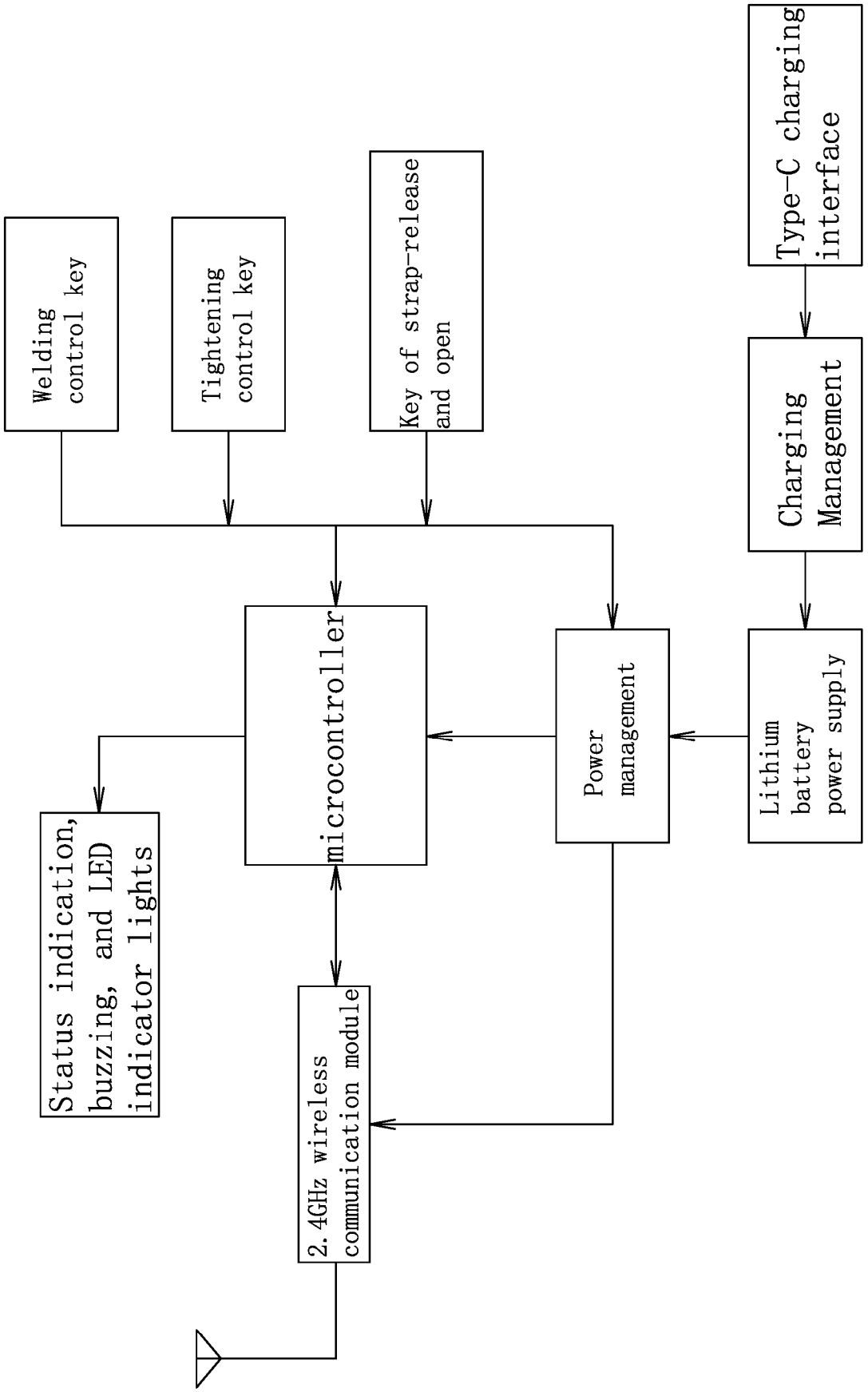

Welding control key
Tightening control key
Key of strap-release and open
Type-C charging interface
Charging Management
microcontroller
Power management
Lithium battery power supply
Status indication, buzzing, and LED indicator lights
2.4GHz wireless communication module

Fig. 14

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2024/111019

A. CLASSIFICATION OF SUBJECT MATTER

B65B57/00(2006.01)i; B65B13/18(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT, ENTXTC, VCN, VEN: 打包, 捆扎, 手柄, 把手, 控制, packer, strap, handle, control

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2021371143 A1 (GOLDEN BEAR, LLC) 02 December 2021 (2021-12-02) description, paragraphs 0053-0066, and figures 1-9	1-10
Y	CN 113784892 A (SIGNODE INDUSTRIAL GROUP LLC) 10 December 2021 (2021-12-10) description, paragraph 0088, and figures 1-4	11-20
Y	CN 218243711 U (SHENZHEN LEQI NETWORK TECHNOLOGY CO., LTD.) 06 January 2023 (2023-01-06) description, paragraphs 0041-0051, and figures 1-5	11-20
PX	CN 117550180 A (ZHEJIANG WEIPAI PACKAGING EQUIPMENT CO., LTD.) 13 February 2024 (2024-02-13) description, specific embodiments, and figures 1-7	1-20
PX	CN 221477774 U (ZHEJIANG WEIPAI PACKAGING EQUIPMENT CO., LTD.) 06 August 2024 (2024-08-06) description, specific embodiments, and figures 1-4	1-10
PX	CN 221477775 U (ZHEJIANG WEIPAI PACKAGING EQUIPMENT CO., LTD.) 06 August 2024 (2024-08-06) claims 1-10	11-20

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

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

Date of the actual completion of the international search	Date of mailing of the international search report
14 October 2024	**18 October 2024**

Name and mailing address of the ISA/CN	Authorized officer
China National Intellectual Property Administration (ISA/CN) **China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088**	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2024/111019

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2024/111019

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CN 221477774 U	06 August 2024	None	
CN 221477775 U	06 August 2024	None	
CN 116946452 A	27 October 2023	None	

Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

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