



(51) International Patent Classification:

A47L 9/00 (2006.01) A47L 9/28 (2006.01)

A47L 9/10 (2006.01) A47L 5/28 (2006.01)

A47L 9/04 (2006.01)

202121186702.5 28 May 2021 (28.05.2021) CN

202121957432.3 19 August 2021 (19.08.2021) CN

(21) International Application Number:

PCT/CN2022/093995

(22) International Filing Date:

19 May 2022 (19.05.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

202110592718.4 28 May 2021 (28.05.2021) CN

202121190404.3 28 May 2021 (28.05.2021) CN

202121189248.9 28 May 2021 (28.05.2021) CN

202110594825.0 28 May 2021 (28.05.2021) CN

(71) Applicant: **GLOBE (JIANGSU) CO., LTD.** [CN/CN];
No. 65-1 Xinggang Road, Zhonglou District, Changzhou,
Jiangsu 213023 (CN).

(72) Inventors: **WANG, Doushi**; No. 65-1 Xinggang Road,
Zhonglou District, Changzhou, Jiangsu 213023 (CN).
YUAN, Chenglong; No. 65-1 Xinggang Road, Zhonglou
District, Changzhou, Jiangsu 213023 (CN).

(74) Agent: **JZMC LAW OFFICE SHANGHAI**; 4003A, Jin-
mao Tower, No. 88 Century Avenue, Pudong New Area,
Shanghai 200120 (CN).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,

(54) Title: VACUUM CLEANING SYSTEM

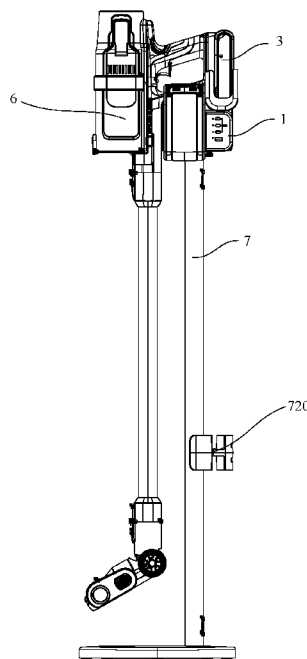


Figure 1

(57) Abstract: The disclosure provides a vacuum cleaning system. The vacuum cleaning system includes a vacuum cleaner and a storage device. The vacuum cleaner includes a battery pack and charging contacts. The storage device includes a vacuum cleaner holder, a bracket and a wall mounted bracket. The vacuum cleaner holder includes a first wall mounted connection structure, a first bracket connection structure and a suspension supporting structure. Two ends of the bracket are respectively provided with a bracket base, and a second bracket connection structure detachably connected with the first bracket connection structure. The wall mounted bracket is mounted on a vertical wall, and is provided with a second wall mounted connection structure detachably connected with the first wall mounted connection structure. The charging contacts are electrically connected with the storage device when the vacuum cleaner is docked with the storage device.

DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

Vacuum cleaning system

TECHNICAL FIELD

[0001] The disclosure belongs to the technical field of charging, and particularly relates to a vacuum cleaning system.

BACKGROUND

[0002] With the increasing frequency of use of power devices, a variety of power devices are usually used at home, such as vacuum cleaners, electric irons, etc. These power devices all need to be connected with a matching supporting charging device for charging and storage, but generally a charging and storage method of the charging device is only a single mode, such as standing on the ground or hanging on the wall, which limits the application range of the charging device to a certain extent. For example, when the application site does not have standing storage conditions for the charging device, the standing charging power device cannot be used. If the application site does not have hanging storage conditions for the charging device, the power device for hanging charging cannot be used.

SUMMARY

[0003] The disclosure provides a vacuum cleaning system. With this disclosure, a charging device may be connected with a fixed base on a horizontal plane to realize a vertical storage of the charging device, and the charging device may also be hung on a vertical wall to realize a hanging storage of the charging device, which enables a user of the charging device to choose a fixing method arbitrarily, is not limited by the conditions of the use site, and has a higher degree of freedom of use.

[0004] The disclosure provides a vacuum cleaning system. The vacuum cleaning system includes a vacuum cleaner and a storage device. The vacuum cleaner includes a battery pack. The vacuum cleaner is provided with charging contacts. The storage device includes a vacuum cleaner holder, a bracket and a wall mounted bracket. The vacuum cleaner holder is provided with a first wall mounted connection structure, a first bracket connection structure, and a suspension supporting structure which may hang the vacuum cleaner. One end of the bracket is provided with a bracket base, which is supported by a plane, and the other end of the bracket is provided with a second bracket connection structure. The second bracket connection structure is

detachably connected with the first bracket connection structure, and when the second bracket connection structure is connected with the first bracket connection structure, the storage device is a floor device. The wall mounted bracket is mounted on a vertical wall, and is provided with a second wall mounted connection structure which is detachably connected with the first wall mounted connection structure to hang the vacuum cleaner holder. When the first wall mounted connection structure is connected with the second wall mounted connection structure, the storage device is a wall-mounted device. When the vacuum cleaner is mounted in the storage device, the charging contacts of the vacuum cleaner are electrically connected with the storage device.

[0005] In an embodiment of the disclosure, the vacuum cleaning system further includes a first accessory clip, a third bracket connection structure is arranged on the first accessory clip, and the third bracket connection structure may be interchangeable with the second bracket connection structure to be connected with the first bracket connection structure.

[0006] In an embodiment of the disclosure, the second wall mounted connection structure includes a slideway and a catch, the first wall mounted connection structure includes a matching slideway and a clamping matching structure, both the matching slideway and the clamping matching structure are arranged on a side wall of the vacuum cleaner holder, the matching slideway matches the slideway and allows the slideway to slide within the matching slideway, and the clamping matching structure is matched with the catch.

[0007] In an embodiment of the disclosure, the catch includes at least a first catch and a second catch, the first catch is arranged on the wall mounted bracket, and the second catch is arranged on a side of the wall mounted bracket close to a bottom of the wall mounted bracket.

[0008] In an embodiment of the disclosure, the first catch is a movable catch and is allowed to be raised and lowered by external force.

[0009] In an embodiment of the disclosure, the bracket further includes a supporting part and a holder base, one end of the supporting part is mounted on the bracket base, the other end of the supporting part extends to a side away from the bracket base, the holder base is arranged on the other end of the supporting part, and the second bracket connection structure is arranged on the holder base.

[0010] In an embodiment of the disclosure, the vacuum cleaner holder includes a charging device, the charging device is mounted on the bracket base through a locking structure, the suspension supporting structure is arranged on the charging device, and a power output

terminal of the charging device is electrically connected with a charging port of the vacuum cleaner when the vacuum cleaner is hung on the suspension supporting structure.

[0011] In an embodiment of the disclosure, the locking structure includes a first locking unit and a second locking unit, the first locking unit includes a locking groove and a plurality of sliding ribs, the second locking unit includes a locking buckle structure and a plurality of matching sliding ribs, and when the locking buckle structure is inserted into the locking groove, the first locking unit and the second locking unit are closed and locked.

[0012] In an embodiment of the disclosure, the charging device includes a casing, a circuit board and an input part and/or the output part, the circuit board is arranged in the casing, the input part and/or the output part is arranged a wall of the casing, and the input part and/or the output part are electrically connected with corresponding ports of the circuit board.

[0013] In an embodiment of the disclosure, the output part includes a plurality of output ports capable of providing power to various devices.

[0014] In an embodiment of the disclosure, the casing includes a first housing, a second housing and a third housing, the second housing is engaged with the first housing to define the casing with an opening in a side wall, the third housing covers the opening, and the suspension supporting structure includes an accommodating groove arranged on the third housing.

[0015] In an embodiment of the disclosure, the charging device includes a battery pack charging port.

[0016] In an embodiment of the disclosure, the charging device further includes an output protection device that provides protection for the battery pack charging port.

[0017] In an embodiment of the disclosure, the output protection device includes a fixing part and a sliding part. The fixing part is arranged in the casing of the charging device and is fixedly connected with the casing. The sliding part is arranged between the fixing part and the casing and is allowed to slide between a first position and a second position; the sliding part covers the battery pack charging port, when the sliding part is in the first position; and the battery pack charging port at least partially exposes the sliding part, when the sliding part is in the second position.

[0018] In an embodiment of the disclosure, the bracket base is provided with a ground supporting structure that capable of being placed on a ground, and the ground supporting structure is provided with at least three supporting legs arranged on a side of the bracket base away from the vacuum cleaner holder.

[0019] In an embodiment of the disclosure, the at least three supporting legs are evenly distributed along a circumference and protruding heights of the supporting legs are adjustable.

[0020] In an embodiment of the disclosure, the bracket base includes a mounting plate, a housing and a counterweight block, and the counterweight block is mounted on the mounting plate and located in a cavity enclosed by the housing and the mounting plate.

[0021] In an embodiment of the disclosure, the storage device of the vacuum cleaner further includes a second accessory clip, the second accessory clip is detachably mounted on the supporting part, and at least one accessory connector is arranged on the second accessory clip.

[0022] In an embodiment of the disclosure, the second accessory clip includes two accessory connectors that are coaxially arranged and face away from each other.

[0023] In an embodiment of the disclosure, the second accessory clip includes a first elastic clamping component, a second elastic clamping component arranged oppositely, and a connecting part connecting the first elastic clamping component and the second elastic clamping component. The first elastic clamping component, the second elastic clamping component and the connecting part define a groove which can be clamped on the supporting part.

[0024] In an embodiment of the disclosure, positions where the first elastic clamping component, the second elastic clamping component and the connecting part are in contact with the supporting part are provided with a clamping curved surface, and a shape of the clamping curved surface is matched with a shape of a surface of the supporting part corresponding to a clamping position.

[0025] In an embodiment of the disclosure, a machine body of the vacuum cleaner is provided with a handle, a side of the handle facing away from the machine body is provided with a base, the battery pack of the vacuum cleaner is mounted on the base, and the suspension supporting structure is the accommodating groove with a part for housing the base and the battery pack of the vacuum cleaner.

[0026] In an embodiment of the disclosure, the first accessory clip is provided with at least two accessory connectors, and the at least two accessory connectors are symmetrically arranged on both sides of the suspension supporting structure.

[0027] The disclosure further provides a wall mounted charging system. The wall mounted charging system includes the vacuum cleaner and the charging device. The charging device is provided with a wall mounted connecting mechanism and a locking structure. The

charging device is connected with the vertical wall through the wall mounted connecting mechanism, or connected with the fixed base through the locking structure. The charging device charges the vacuum cleaner when the vacuum cleaner is placed on the charging device.

[0028] In an embodiment of the vacuum cleaning system of the disclosure, the vacuum cleaning system further includes the wall mounted bracket. The wall mounted bracket is arranged on the vertical wall, and is provided with the slideway. The wall mounted connecting mechanism is provided with the matching slideway. The matching slideway is matched with the slideway on the wall mounted bracket to realize a detachable sliding connection.

[0029] In an embodiment of the vacuum cleaning system of the disclosure, the wall mounted bracket is provided with the first catch and the second catch. The second catch is arranged on a side of the wall mounted bracket close to a bottom of the charging device. The wall mounted connecting mechanism is provided with a first clamping matching structure and a second clamping matching structure. The first clamping matching structure is matched with the first catch, which allows the first catch to be embedded in the first clamping matching structure. The second clamping matching structure is matched with the second catch, which allows the second catch to be embedded in the second clamping matching structure.

[0030] In an embodiment of the vacuum cleaning system of the disclosure, the locking structure includes the first locking unit and the second locking unit. The first locking unit includes the locking groove and the plurality of sliding ribs. The second locking unit includes the locking buckle structure and the plurality of matching sliding ribs, and when the locking buckle structure is inserted into the locking groove, the first locking unit and the second locking unit are closed and locked. The locking groove is located on a side of the first locking unit that is connected with the bottom of the charging device.

[0031] In an embodiment of the vacuum cleaning system of the disclosure, the charging device includes the casing, the circuit board, the input part and the output part, the circuit board is arranged in the casing, the input part and the output part are arranged on a wall of the casing, and the input part and the output part are connected with corresponding ports of the circuit board. The output part includes a plurality of output ports which can provide electrical energy for various devices.

[0032] In an embodiment of the vacuum cleaning system of the disclosure, the second locking unit includes the locking buckle structure. The locking buckle structure is arranged

in the second locking unit, which allows the locking buckle structure to be inserted into the locking groove or separated from the locking groove. When the locking buckle structure is inserted into the locking groove, the first locking unit and the second locking unit are closed and locked. When the locking buckle structure is separated from the locking groove, the first locking unit and the second locking unit are unlocked.

[0033] In an embodiment of the vacuum cleaning system of the disclosure, the second locking unit further includes a locking base. The locking base is arranged on a surface of the fixed base. The locking base is L-shaped and includes a horizontal part and a vertical part. The horizontal part is a part of the L-shaped locking base that is parallel to a plane of the fixed base. The vertical part is a part of the L-shaped locking base that is perpendicular to the plane of the fixed base.

[0034] In an embodiment of the vacuum cleaning system of the disclosure, the second locking unit further includes a locking cover. The locking cover is closed with the vertical part and the horizontal part to define a closed cavity. A locking hole is arranged on a side surface of the locking cover away from the horizontal part of the locking base.

[0035] In an embodiment of the vacuum cleaning system of the disclosure, the locking buckle structure includes a button and a tongue-shaped protruding part. The button passes through the vertical part. One end of the tongue-shaped protruding part is connected with a side of the button adjacent to the closed cavity. An angle is defined between the tongue-shaped protruding part and a horizontal direction on a side away from the vertical part.

[0036] In an embodiment of the vacuum cleaning system of the disclosure, a locking block is sleeved on the tongue-shaped protruding part. The locking block is arranged vertically. One end of the locking block is aligned with the locking hole, which allows the locking block to expand and contract in the locking hole. An elastic component is arranged between the button and the locking cover, and an acting direction of an elastic force of the elastic component is parallel to the horizontal part of the locking base.

[0037] In an embodiment of the vacuum cleaning system of the disclosure, the charging device is further provided with a concave part, and a battery pack may be placed in the concave part to charge the battery pack independently.

[0038] In an embodiment of the vacuum cleaning system of the disclosure, the bottom of the charging device is provided with the first accessory clip, the first accessory clip is provided with a bracket connecting structure, and the first accessory clip is connected with the charging device through the bracket connecting structure.

[0039] In an embodiment of the vacuum cleaning system of the disclosure, a second accessory clip is arranged on the fixed base. The second accessory clip includes two accessory connectors, which are the first accessory connector and the second accessory connector respectively. The two accessory connectors are arranged coaxially and face away from each other.

[0040] The disclosure further provides a vacuum cleaner, applied to the storage device or the wall mounted charging system mentioned above. The vacuum cleaner includes the machine body, the handle, the base and the battery pack. The handle extends at an angle to the machine body. The base is mounted on a side of the handle away from the machine body. The battery pack is detachably mounted on the base and is connected with the machine body. The battery pack is provided with a power source input port and/or output port, and one end of the power source input port and/or output port is connected with a charger/power device.

[0041] In an embodiment of the vacuum cleaner of the disclosure, a plurality of the power source input ports and/or output ports are located at a terminal port of the battery pack, and the plurality of the power source input ports and/or output ports are arranged longitudinally. The power source input port and/or output port is a Type-C port.

[0042] In an embodiment of the vacuum cleaner of the disclosure, the battery pack is provided with an insertion part. The insertion part is inserted into an opening groove on the base. Both sides of the insertion part are provided with sliding rails, and the sliding rails are matched with a guiding groove on a groove wall of the opening groove. A plurality of the power source input ports and/or output ports are respectively located on a top surface and/or side surface of the insertion part, and the power source input ports and/or output ports located on the same top surface or side surface are arranged side by side.

[0043] In an embodiment of the vacuum cleaner of the disclosure, the battery pack is provided with a first power supply terminal. The first power supply terminal is connected with a connecting port on the base. A limiting component is arranged on the battery pack, and the limiting component is matched with a limiting groove on the base.

[0044] In an embodiment of the vacuum cleaner of the disclosure, the handle includes a holding part and a supporting part arranged parallel to each other. The holding part and the supporting part are located between the machine body and the base. The holding part, the supporting part, the machine body and the base together define a parallelogram.

[0045] The disclosure further provides a vacuum cleaner, applied to the the storage device or the wall mounted charging system mentioned above. The vacuum cleaner includes a

casing, a suction generating unit, a dust collecting unit and main unit charging contacts. The casing includes a machine body, a holding handle and a base. The holding handle is arranged between the machine body and the base. The holding handle includes the holding part and the supporting part that are parallel and spaced apart from each other. The suction generating unit is pivotally connected with a side of the casing away from the holding handle. The dust collecting unit is mounted on the suction generating unit. The main unit charging contacts are arranged on a side of the supporting part away from the holding part.

[0046] In an embodiment of the vacuum cleaner of the disclosure, the vacuum cleaner further includes a battery pack. The battery pack is detachably mounted on the base. The machine body is provided with a housing groove arranged along a first direction. The suction generating unit and the dust collecting unit are housed in the housing groove.

[0047] In an embodiment of the vacuum cleaner of the disclosure, the main unit charging contacts are arranged at an end of the supporting part close to the base. The main unit charging contacts include a female charging port.

[0048] In an embodiment of the vacuum cleaner of the disclosure, the main unit is also provided with a locking assembly and a bounce structure. The locking assembly is arranged at a bottom of the housing groove. The locking assembly is matched with the suction generating unit or the dust collecting unit, and the suction generating unit and the dust collecting unit are fixed in the housing groove. The bounce structure is arranged at the bottom of the housing groove, and the bounce structure is facing the suction generating unit or the dust collecting unit.

[0049] The disclosure further provides a vacuum cleaner charging system. The charging system includes a matching vacuum cleaner and a vacuum cleaner hanger. The hand-held vacuum cleaner includes a housing, a suction generating unit, a dust collecting unit and main unit charging contacts. The housing includes a machine body, a holding handle and a base. The holding handle is arranged between the machine body and the base. The holding handle includes a holding part and a supporting part that are parallel and spaced apart from each other. The suction generating unit is pivotally connected with a side of the machine body away from the holding handle. The dust collecting unit is mounted on the suction generating unit. The main unit charging contacts are arranged on a side of the supporting part away from the holding part. The vacuum cleaner hanger includes the charging device, a bracket base and a supporting body connected between the charging device and the bracket base. A side of the charging device facing the base is provided with the accommodating groove and hanger charging contacts. When the vacuum cleaner is

housed on the vacuum cleaner hanger, the accommodating groove partially houses the base, and the hanger charging contacts are in contact with the main unit charging contacts.

[0050] In an embodiment of the charging system of the disclosure, the main unit charging contacts include the female charging port, and the hanger charging contacts include an electrical energy output terminal.

[0051] The disclosure provides a storage device of the vacuum cleaner. The storage device of the vacuum cleaner includes a charging device and an accessory clip. One side of the charging device is provided with a wall mounted connecting mechanism. The wall mounted connecting mechanism is matched with a wall mounted bracket. The wall mounted bracket is arranged on a vertical wall. The accessory clip is detachably mounted on the bottom of the charging device. When the vacuum cleaner is placed on the charging device, the vacuum cleaner is connected with the charging device.

[0052] In an embodiment of the storage device of the vacuum cleaner, the wall mounted bracket is provided with a catch. The catch includes at least a first catch and a second catch. The first catch is arranged on the wall mounted bracket, and the second catch is arranged on the side of the wall mounted bracket close to the bottom of the wall mounted bracket. The wall mounted connecting mechanism is provided with a clamping matching structure, and the clamping matching structure is matched with the catch of the wall mounted bracket, which allows the catch to be inserted into the clamping matching structure. A releasing button is arranged on a side of the clamping matching structure away from the wall mounted bracket.

[0053] In an embodiment of the storage device of the vacuum cleaner, the first catch is a movable catch, which allows the first catch to be raised and lowered by external force. One side of the first catch close to the slideway on the wall mounted bracket is connected with the wall mounted bracket, and the other side of the catch is free to hang.

[0054] In an embodiment of the storage device of the vacuum cleaner, the wall mounted bracket is provided with a first supporting plate. The first supporting plate is arranged at the bottom of the wall mounted bracket. The first supporting plate is arranged along a direction perpendicular to the plane where the wall mounted bracket is located and extends outward. The first supporting plate is provided with a bending part facing a top of the wall mounted bracket. The wall mounted bracket is further provided with a second supporting plate. The second supporting plate is arranged between the slideway on the wall mounted bracket and the first supporting plate.

[0055] In an embodiment of the storage device of the vacuum cleaner, the vacuum cleaner

is provided with the battery pack. The battery pack is connected with the vacuum cleaner through the sliding rail. The charging device is provided with the accommodating groove, which allows the battery pack to be clamped into the accommodating groove.

[0056] In an embodiment of the storage device of the vacuum cleaner, the charging device includes the casing, the circuit board arranged in the casing, the input part and the output part arranged on the casing. Wherein, the input part and the output part are connected with corresponding ports of the circuit board. The output part includes a plurality of output ports which can provide electrical energy to various devices.

[0057] In an embodiment of the storage device of the vacuum cleaner, the casing includes the first housing, the second housing and the third housing. The second housing is engaged with the first housing to define the casing with the opening in the side wall, and the third housing covers the opening.

[0058] In an embodiment of the storage device of the vacuum cleaner, the accessory clip is provided with a bracket connecting structure, and the accessory clip is connected with the charging device through the bracket connecting structure.

[0059] The disclosure further provides a storage device of the vacuum cleaner. The storage device of the vacuum cleaner includes a base, a supporting part and a vacuum cleaner holder. One end of the supporting part is mounted on the bracket base, and the other end of the supporting part extends to the side away from the bracket base. The vacuum cleaner holder is detachably mounted on the other end of the supporting part, and is provided with a suspension supporting structure which can hang the vacuum cleaner.

[0060] In an embodiment of the storage device of the vacuum cleaner, the vacuum cleaner holder includes the holder base and the charging device. The charging device is detachably mounted on the holder base. The suspension supporting structure is arranged on the charging device. The electrical energy output terminal of the charging device is connected with the charging port of the vacuum cleaner when the vacuum cleaner is hung on the suspension supporting structure.

[0061] In an embodiment of the storage device of the vacuum cleaner, the charging device includes a casing, a circuit board, an input part and an output part, the circuit board is arranged in the casing, the input part and the output part are arranged on the wall of the casing. Wherein, the input part and the output part are connected with corresponding ports of the circuit board. The output part includes a plurality of output ports which can provide electrical energy for various devices.

[0062] In an embodiment of the storage device of the vacuum cleaner, the holder base is

mounted on the supporting part through a quick locking structure. One end of the supporting part facing the bracket base is mounted on the bracket base through a quick locking structure. The charging device is mounted on the bracket base through a locking structure.

[0063] In an embodiment of the storage device of the vacuum cleaner, the quick locking structure includes an insertion rod, an insertion sleeve and a lock. The insertion rod and the insertion sleeve are inserted and connected along a linear guiding structure and locked by the lock. The lock is mounted on the insertion rod, and the insertion rod is provided with a lock hole. The lock hole is matched with the lock, and the lock hole exposes the lock. The linear guiding structure includes a protrusion arranged on the insertion rod or the insertion sleeve and a corresponding groove arranged on the insertion sleeve or the insertion rod. The grooves and the protrusion are correspondingly matched and extend in a straight line.

[0064] In an embodiment of the storage device of the vacuum cleaner, the bracket base is disc-shaped. The supporting part is mounted on one side of the bracket base. When the vacuum cleaner is suspended, an extension line of a center of gravity of the vacuum cleaner along a vertical direction coincides with a central axis of the bracket base.

[0065] In an embodiment of the storage device of the vacuum cleaner, the bracket base includes a mounting plate, a housing and a counterweight block, and the counterweight block is mounted on the mounting plate and located in the cavity enclosed by the housing and the mounting plate. The bracket base is provided with a ground supporting structure that may be placed on a ground, and the ground supporting structure is provided with at least three supporting legs arranged on the side of the bracket base away from the vacuum cleaner holder. The at least three supporting legs are evenly distributed along the circumference and protruding heights of the supporting legs are adjustable.

[0066] In an embodiment of the storage device of the vacuum cleaner, the storage device of the vacuum cleaner further includes an accessory clip. The accessory clip is detachably mounted on the supporting part. The accessory clip is provided with at least one accessory connector. The accessory clip includes the first elastic clamping component, the second elastic clamping component arranged oppositely, and the connecting part connecting the first elastic clamping component and the second elastic clamping component. The first elastic clamping component, the second elastic clamping component and the connecting part define the groove which can be clamped on the supporting part. The positions where the first elastic clamping component, the second elastic clamping component and the connecting part are in contact with the supporting part are provided with the clamping

curved surface, and the shape of the clamping curved surface is matched with the shape of the surface of the supporting part corresponding to the clamping position.

[0067] In an embodiment of the storage device of the vacuum cleaner, the machine body of the vacuum cleaner is provided with a handle, the side of the handle facing away from the machine body is provided with the base, the battery pack of the vacuum cleaner is mounted on the base, and the suspension supporting structure is the accommodating groove partially housing the base and the battery pack of the vacuum cleaner.

[0068] The charging device of the disclosure may be connected with the fixed base on the horizontal plane to realize the vertical storage of the charging device, and the charging device may also be hung on the vertical wall to realize the hanging storage of the charging device, which enables the user of the charging device to choose the fixing method arbitrarily, is not limited by the conditions of the use site, and has the higher degree of freedom of use.

[0069] Of course, it is not necessary for any product of the disclosure to achieve all of the above-described advantages simultaneously.

BRIEF DESCRIPTION OF THE DRAWINGS

[0070] In order to explain the technical solutions of the embodiments of the disclosure more clearly, the following will briefly introduce the drawings used in the description of the embodiments. Obviously, the drawings in the following description are only some embodiments of the disclosure. For those of ordinary skill in the art, other drawings can be obtained from these drawings without creative work.

[0071] FIG. 1 is a schematic structural view of a vacuum cleaning system.

[0072] FIG. 2 is a three-dimensional structural view of a charging device.

[0073] FIG. 3 is a three-dimensional structural view of a part of the charging device.

[0074] FIG. 4 is an exploded view of a casing.

[0075] FIG. 5 is a structural view of a first housing.

[0076] FIG. 6 is a structural view of a fixed component in this embodiment.

[0077] FIG. 7 is a partial internal structural view of the charging device.

[0078] FIG. 8 is a three-dimensional schematic structural view of the charging device.

[0079] FIG. 9 is a front view of the charging device.

[0080] FIG. 10 is a schematic view of a structure and mounting of an output protection device.

[0081] FIG. 11 is a schematic structural view of the output protection device.

- [0082]** FIG. 12 is a schematic structural view of a fixing part in FIG. 11.
- [0083]** FIG. 13 is a schematic structural view of the output protection device of FIG. 11 without the fixing part.
- [0084]** FIG. 14 is a schematic structural view of a sliding part in FIG. 13.
- [0085]** FIG. 15 is a schematic structural view of the first housing in FIG. 13.
- [0086]** FIG. 16 is a schematic structural view of the first housing shown in FIG. 13 from another angle.
- [0087]** FIG. 17 is a structural view of a third housing.
- [0088]** FIG. 18 is a structural view of the third housing from another angle.
- [0089]** FIG. 19 is a schematic structural view of a wall mounted bracket in a wall mounted locking device of the disclosure.
- [0090]** FIG. 20 is a schematic structural view of the wall mounted bracket in the wall mounted locking device of the disclosure from another angle.
- [0091]** FIG. 21 is schematic structural view of the wall mounted bracket in the wall mounted locking device of the disclosure from another angle.
- [0092]** FIG. 22 is a schematic structural view of the wall mounted connecting mechanism in the wall mounted locking device of the disclosure.
- [0093]** FIG. 23 is a schematic structural view of a charging device provided with a wall mounted connecting mechanism.
- [0094]** FIG. 24 is a schematic structural view of a charging device provided with a wall mounted connecting mechanism from another angle.
- [0095]** FIG. 25 is a schematic structural view of a locking structure of the charging device of the disclosure.
- [0096]** FIG. 26 is a schematic structural view of a first locking unit of the disclosure in the charging device.
- [0097]** FIG. 27 is a schematic bottom structural view of the first locking unit of the disclosure in the charging device.
- [0098]** FIG. 28 is a schematic structural view of a second locking unit of the disclosure in a fixed base.
- [0099]** FIG. 29 is a schematic structural view of the locking base in FIG. 27.
- [00100]** FIG. 30 is a schematic structural view of a locking cover in FIG. 27.
- [00101]** FIG. 31 is a schematic structural view of a locking buckle structure in the disclosure.
- [00102]** FIG. 32 is a schematic structural view of the locking structure of the disclosure in a

locked state.

[00103] FIG. 33 is a schematic structural view of the locking structure of the disclosure in an unlocked state.

[00104] FIG. 34 is a view of charging a battery pack with a first terminal and/or a second terminal.

[00105] FIG. 35 is a view of charging a battery pack with a third terminal.

[00106] FIG. 36 is a structural view of a vacuum cleaner.

[00107] FIG. 37 is a schematic structural view of the vacuum cleaner of the disclosure.

[00108] FIG. 38 is a schematic view of inserting the battery pack of the vacuum cleaner of the disclosure into the housing.

[00109] FIG. 39 is a three-dimensional schematic view of the housing of the vacuum cleaner of the disclosure.

[00110] FIG. 40 is an assembling schematic view of the charging device with a first accessory clip.

[00111] FIG. 41 is a schematic structural view of the first accessory clip.

[00112] FIG. 42 is a schematic structural view of a second accessory clip.

[00113] FIG. 43 is a schematic structural view of an embodiment of the battery pack in FIG. 37.

[00114] FIG. 44 is a schematic structural view of an upper housing of the battery pack.

[00115] FIG. 45 is a schematic top view of the upper housing of the battery pack.

[00116] FIG. 46 is an assembling schematic view of a limiting component with a mounting groove cover in the battery pack.

[00117] FIG. 47 is a schematic structural view of the limiting component of the battery pack.

[00118] FIG. 48 is a schematic structural bottom view of the limiting component of the battery pack.

[00119] FIG. 49 is a schematic structural view of a lower housing of the battery pack.

[00120] FIG. 50 is a schematic structural view of a circuit board of the battery pack and a Type-C port.

[00121] FIG. 51 is a schematic structural view of a cell bracket of the battery pack.

[00122] FIG. 52 is a schematic view of a position of the charging port on both sides of the battery pack housing.

[00123] FIG. 53 is a schematic view of a position of the charging port on the same side of the battery pack housing.

[00124] FIG. 54 is a schematic view of a position of the charging port on both sides of an

insertion part.

[00125] FIG. 55 is a schematic view of a position of the same side of the insertion part of the charging port.

[00126] FIG. 56 is a schematic view of a position of the charging port at a terminal port.

[00127] FIG. 57 is a schematic view of a position of the charging port on a top of the battery pack.

[00128] FIG. 58 is a schematic view of another position of the charging port on the top of the battery pack.

[00129] FIG. 59 is a schematic structural view of a combination of the battery pack and the charger.

[00130] FIG. 60 is another schematic structural view of the combination of the battery pack and the charger.

[00131] FIG. 61 is a structural view of an embodiment of a storage device of the vacuum cleaner of the disclosure.

[00132] FIG. 62 is an exploded view of an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00133] FIG. 63 is an exploded view of another embodiment of the storage device of the vacuum cleaner of the disclosure.

[00134] FIG. 64 is a schematic structural view of a vacuum cleaner holder in an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00135] FIG. 65 is a schematic structural view of a bracket base in an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00136] FIG. 66 is a schematic structural view of the bracket base after removing a casing in an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00137] FIG. 67 is a side view of an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00138] FIG. 68 is a cross-sectional view of FIG. 75.

[00139] FIG. 69 is a partial enlarged view of an I region in FIG. 76.

[00140] FIG. 70 is a perspective structural view of the charging device with the bracket base mounted in an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00141] FIG. 71 is a perspective structural view of a part of the charging device in an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00142] FIG. 72 is a position view of a battery pack terminal of the charging device in an

embodiment of the storage device of the vacuum cleaner of the disclosure.

[00143] FIG. 73 is a structural view of the battery pack of the charging device in an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00144] FIG. 74 is a dimension view of a battery pack groove of the charging device in an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00145] FIG. 75 is a dimension view of the battery pack groove of the charging device in an embodiment of the storage device of the vacuum cleaner of the disclosure from another angle.

[00146] FIG. 76 is a dimension view of a guiding rail of the charging device in an embodiment of the storage device of the vacuum cleaner of the disclosure.

[00147] FIG. 77 is a dimension view of the guiding rail of the charging device in an embodiment of the storage device of the vacuum cleaner of the disclosure from another angle.

[00148] FIG. 78 is a bottom view of the charging device in an embodiment of the storage device of the vacuum cleaner of the disclosure.

DETAILED DESCRIPTION

[00149] The technical solutions in the embodiments of the disclosure will be clearly and completely described below with reference to the accompanying figures in the embodiments of the disclosure. Obviously, the described embodiments are only some, but not all embodiments of the disclosure. Based on the embodiments of the disclosure, all other embodiments obtained by those of ordinary skill in the art without creative efforts shall fall within the scope of the disclosure.

[00150] With the increasing frequency of use of power devices, a variety of power devices are usually used at home, such as vacuum cleaners, electric irons, etc. These power devices all need to be connected with a matching supporting charging device for charging and storage, but generally a charging and storage method of the charging device is only a single mode, such as standing on the ground or hanging on the wall, which limits the application range of the charging device. For example, when the application site does not have standing storage conditions for the charging device, the standing charging power device cannot be used. If the application site does not have hanging storage conditions for the charging device, the power device for hanging charging cannot be used.

[00151] Please refer to FIG. 1. The disclosure provides a vacuum cleaning system. The vacuum cleaning system includes a vacuum cleaner 6 and a charging device 1. The

charging device can not only convert a voltage and convert the mains supply into a required specific voltage, but also may store the vacuum cleaner, which has various uses. In addition, the conventional charging device 1 can only output a single voltage, and can only supply power for a specific electronic device at the same time. The charging device 1 in the vacuum cleaning system of the disclosure can output multiple voltages at the same time, which can not only charge the specific vacuum cleaner 6 and a battery pack 3, but also charge relatively common electronic devices, such as pads and computers.

[00152] Please refer to FIG. 1 through FIG. 7. The charging device 1 includes a casing 10, a circuit board 208 arranged in an accommodating cavity of the casing 10, an input part and an output part. The input part and the output part are arranged on a wall of the casing 10. Wherein, the input part and the output part are connected with corresponding ports of the circuit board 208. An output end or an input end of the circuit board 208 is provided with a plurality of terminals, and the casing 10 is provided with a plurality of insertion ports, and the insertion ports are arranged corresponding to the terminals. The terminals pass through the insertion ports on the casing 10 to an outside of the casing 10, thereby defining the corresponding input part and output part. In an embodiment, the output part includes a plurality of output ports, such as a vacuum cleaner charging port, a pad charging port, a mobile phone charging port, etc., which can provide electrical energy for various devices. When an electronic device needs to be charged or discharged, the port (charging port or discharging port) of the electronic device is connected with the terminal of the circuit board 208 to charge or discharge the electronic device or charge the circuit board 208. Electronic devices in this disclosure include but are not limited to vacuum cleaners 6, battery packs 3, mobile phones, pads, computers and other electronic devices.

[00153] Please refer to FIG. 2 through FIG. 4. In an embodiment of the disclosure, the casing 10 includes a first housing 110, a second housing 120 and a third housing 130. The first housing 110 and the second housing 120 are fastened to define an accommodating cavity with a first opening 101 on a side. The third housing 130 is clamped with the first opening 101, and then the first housing 110, the second housing 120 and the third housing 130 define a closed accommodating cavity. In addition, an accommodating groove 134 is further arranged on the third housing 130 for placing electronic devices or battery packs. In the disclosure, the casing 10 is made of a non-conductive material, such as rigid plastic, etc., and may also be made of other non-conductive materials. In an embodiment of the disclosure, the casing 10 is made of acrylonitrile-butadiene-styrene plastic (ABS). This material has excellent impact resistance, heat resistance, low temperature resistance,

chemical resistance and electrical properties and is easy to processing. It has stable product size, good surface gloss and other characteristics, which is easy to paint, color, and secondary processing. For the casing 10 made of this material, a weight of the first housing 110 is, for example, from 80g to 85g, such as 85g. A weight of the second housing 120 is, for example, from 70g to 75g, such as 73g. A weight of the third housing 130 is, for example, from 120g to 125g, such as 120g.

[00154] Please refer to FIG. 2 through FIG. 4. In an embodiment of the disclosure, the casing 10 is a tetrahedron structure provided with a notch 102, and the accommodating groove 134 is arranged on the notch 102. The tetragonal structure is, for example, a right-angled trapezoid shaped, and the notch 102 is located at a connection position between a longer base and a hypotenuse of the right-angled trapezoid.

[00155] Please refer to FIG. 2 through FIG. 5. In this embodiment, the second housing 120 has the same shape as the first housing 110, and a bottom wall of the second housing 120 is provided with a concave part corresponding to the notch 102. The notch 102 is located at the connection position of the longer base and the hypotenuse of the right-angled trapezoid. A plurality of clamping posts 121 (or clamping points 111) are arranged in the concave part of the second housing 120. A plurality of clamping points 111 (or clamping posts 121) are arranged in the concave part of the first housing 110. The first housing 110 and the second housing 120 are clamped together by the plurality of clamping posts 121 and the clamping points 111 to define the casing 10 with the first opening 101. The first opening 101 is located on a side wall of the right-angled trapezoidal casing 10, and is located on the side wall with a shorter base and hypotenuse. The third housing 130 covers the first opening 101 and the notch 102 of the casing 10, and a plurality of annular connecting components 131 are arranged on the third housing 130. A position of the connecting component 131 is arranged corresponding to the clamping post 121 or the clamping point 111. When the clamping post 121 and the clamping point 111 are engaged, the clamping post 121 and the clamping point 111 pass through the connecting component 131, and the third housing 130 is connected with the first housing 110 and the second housing 120 to define the casing 10 with the accommodating groove 134.

[00156] Please refer to FIG. 2 through FIG. 7. In an embodiment of the disclosure, the charging device 1 of the disclosure is provided with a plurality of output parts, and the output parts include a first output part, a second output part and a third output part arranged on the first housing 110. Wherein, the first output part includes a first terminal 203 and a first terminal port 113, the second output part includes a second terminal 204 and a second

terminal port 114, and the third output part includes the output part 205 and a second opening 115. The output part 205 includes a plurality of terminals.

[00157] Please refer to FIG. 2 through FIG. 7 and FIG. 14. In an embodiment of the disclosure, circuit boards include the main circuit board 208 and a secondary circuit board 200. In the accommodating cavity of the casing 10, the main circuit board 208 is arranged close to a side of a sliding part 301, which may be fixed on the first housing 110 by non-conductive bolts. The secondary circuit board 200 is further arranged in the accommodating cavity of the casing 10. The secondary circuit board 200 is connected with the main circuit board 208, and the secondary circuit board 200 includes a first secondary circuit board 201 and a plurality of second secondary circuit boards 202. The first secondary circuit board 201 is located inside the casing 10 and is parallel to the first housing 110. An end of the plurality of the second secondary circuit boards 202 is fixed on the first secondary circuit board 201, and the second secondary circuit boards 202 are arranged perpendicular to the first secondary circuit board 201. In this embodiment, the number of the second secondary circuit boards 202 is, for example, four. Some of the second secondary circuit boards 202 are connected with the plurality of first terminals 203, and other second secondary circuit boards 202 are connected with the second terminals 204. In this embodiment, for example, three second secondary circuit boards 202 close to the accommodating groove 134 are used for connection with the first terminals 203, and for example, one second secondary circuit board 202 far from the accommodating groove 134 is used for electrical connection with the second terminals 204. In this embodiment, the circuit board is made of a non-conductive material, such as rigid plastic. A charging conversion circuit is arranged on the circuit board, which converts a voltage of the alternating current or the battery pack into a required voltage to charge various electronic devices. A power of the circuit board of the disclosure may be from 5W to 400W.

[00158] Please refer to FIG. 2 through FIG. 6. In an embodiment of the disclosure, a cover plate 112 is arranged on the first housing 110, which is located below the accommodating groove 134 and is higher than a surface of the first housing 110. The cover plate 112 is fixed on the first housing 110 and covers the plurality of first terminals 203 and the second terminals 204. The cover plate 112 is further provided with a plurality of terminal ports, which allows the first terminals 203 and the second terminals 204 to pass through. Through holes on the cover plate 112 include a plurality of first terminal ports 113, and the plurality of the first terminal ports 113 are arranged on the cover plate 112 side by side. In this embodiment, a direction of the first opening 101 of the accommodating groove 134 is

defined as an upper side, and the plurality of the first terminal ports 113 are located below the accommodating groove 134. The plurality of the first terminal ports 113 are arranged side by side from top to bottom, and the number of the first terminal ports 113 is, for example, three. In this embodiment, the plurality of the first terminal ports 113 provide passages for the plurality of the first terminals 203, so a size and shape of the first terminal port 113 are adapted to the first terminal 203, which allows the first terminal 203 to pass through the first terminal port 113. The number of the first terminals 203 is the same as the number of the first terminal port 113, for example, three. The first terminal 203 of the disclosure is, for example, a type-c fast charging voltage output terminal, and each first terminal 203 can independently output a voltage. An output power of the first terminal 203 may range from 5W to 55W, and an output current of the first terminal 203 may range from 1A to 10A.

[00159] Further, please refer to FIG. 2 through FIG. 6. The cover plate 112 is further provided with the second terminal port 114. In this embodiment, the second terminal port 114 is located below the accommodating groove 134, the second terminal port 114 and the plurality of first terminal ports 113 are arranged side by side, and the number of the second terminal port 114 is, for example, one. In this embodiment, the second terminal port 114 provides a passage for the second terminal 204, and a size and shape of the second terminal port 114 are adapted to the second terminal 204, which allows the second terminal 204 to pass through the second terminal port 114. The second terminal 204 of the disclosure is, for example, a universal serial bus (USB) voltage output terminal. An output power of the second terminal 204 ranges from 5W to 55W, and an output current of the second terminal 204 ranges from 1A to 10A.

[00160] Please refer to FIG. 1, FIG. 2, FIG. 5 and FIG. 7. The first housing 110 is further provided with a second opening 115. In this embodiment, when the charging device 1 is placed vertically (the opening of the accommodating groove 134 faces upward), the second opening 115 and the second terminal port 114 on the cover plate 112 are located on a same horizontal plane. The second opening 115 provides a passage for the output part 205, and the output part 205 charges the battery pack 3 or receives a discharge of the battery pack 3. An output power of the output part 205 may range from 10W to 200W, and an output current of the output part 205 may range from 0.5A to 10A. When the charging device 1 is not connected with an external power source, the battery pack 3 may also further connected with the output part 205, the output part 205 may provide a voltage input for the circuit board, and the first terminal 203, the second terminal 204 or a fourth terminal

206 is provided with a voltage output through a charging conversion circuit on the circuit board.

[00161] Please refer to FIG. 2 and FIG. 5. In this embodiment, the output part 205 is an exposed metal terminal. In order to ensure an operation safety, an output protection device 300 is arranged at the second opening 115 to ensure that the output part 205 is covered when there is no electronic device on the output part 205.

[00162] Please refer to FIG. 1, FIG. 5, FIG. 8 through FIG. 16. The output protection device 300 is arranged outside the casing 10, so that the third output part may be exposed when the battery pack 3 is charged, and the third output part may be covered by the output protection device 300 when the battery pack 3 is not charged. When the battery pack 3 needs to be charged, the charging port of the battery pack 3 is connected with the output part 205 to realize the charging of the battery pack 3. When the battery pack 3 is placed in a concave part 320, the output part 205 is exposed, and the charging device 1 is connected with the battery pack 3 to charge the battery pack 3. When the charging is completed, the battery pack 3 is disconnected from the output part 205, the battery pack 3 is taken out from the concave part 320, and the output part 205 is covered, which improves a safety and convenience of the charging device 1.

[00163] Please refer to FIG. 8 through FIG. 16. The output protection device 300 of the disclosure includes the sliding part 301 and a fixing part 307. The fixing part 307 is arranged in the accommodating cavity of the casing and is connected with an inner side of the first housing 110. The sliding part 301 is arranged between the fixing part 307 and the first housing 110, which allows the sliding part 301 to slide between a first position and a second position. An end of the output part 205 passes through the fixing part 307, the sliding part 301 and the first housing 110 in sequence, and exposes the first housing 110. When the sliding part 301 is in the first position relative to the fixing part 307, the sliding part 301 covers the output part 205. When the sliding part 301 is in the second position relative to the fixing part 307, the output part 205 at least partially exposes the sliding part 301.

[00164] Please refer to FIG. 8 through FIG. 16. In some embodiments, the first housing 110 may be provided with the second opening 115, and an end of the output part 205 passes through the fixing part 307, the sliding part 301 and the second opening 115 on the first housing 110 in sequence to expose an outside of the first housing 110.

[00165] Please refer to FIG. 4, FIG. 13, FIG. 15 and FIG. 16. In some embodiments, a plurality of first grooves 302 may be arranged on the inner side of the first housing 110, and the first grooves 302 extend along a sliding direction of the sliding part 301. In this

embodiment, two first grooves 302 are arranged on the inner side of the first housing 110, and the two first grooves 302 are located on a side of the second opening 115. In this embodiment, the two first grooves 302 are located above the second opening 115, and the two first grooves 302 are parallel to each other and have the same length.

[00166] Please refer to FIG. 14 through FIG. 16. In some embodiments, a part of the sliding part 301 close to the second opening 115 is bent to a side of the second opening 115 to define a sliding protruding part 304 mtached with the second opening 115. The sliding protruding part 304 is inserted into the second opening 115 and is allowed to slide in the second opening 115. The output part 205 is covered or exposed through a sliding of the sliding protruding part 304 in the second opening 115.

[00167] Please refer to FIG. 14 through FIG. 16. In some embodiments, a plurality of sliding columns 309 perpendicular to a plane of the sliding part 301 are arranged on a side of the sliding part 301 away from the sliding protruding part 304. The plurality of sliding columns 309 are located on a side of the sliding part 301 away from the sliding protruding part 304. In this embodiment, the sliding part 301 may be provided with, for example, two sliding columns 309, and the two sliding columns 309 are located on two sides of the second opening 115 respectively.

[00168] Please refer to FIG. 14. In some embodiments, a plurality of L-shaped slits 314 are defined on a side of the sliding protruding part 304 close to the sliding column 309. A side of the L-shaped slit 314 is located on the sliding protruding part 304, and the other side of the L-shaped slit 314 is located on the plane of the sliding part. The L-shaped slit 314 allows the output terminal to pass through and be exposed.

[00169] Please refer to FIG. 14 and FIG. 16. In some embodiments, a plurality of first protruding ribs 303 are arranged on a side of the sliding part 301 facing the first housing 110. The first protruding rib 303 is matched with the first groove 302 to allow the first protruding rib 303 to slide in the first groove 302. In this embodiment, the sliding part 301 is provided with two first protruding ribs 303 that are parallel to each other and have the same length. The first protruding rib 303 is matched with the first groove 302 to allow the first protruding rib 303 to slide in the first groove 302.

[00170] Please refer to FIG. 12 through FIG. 16. In some embodiments, at least one first through hole 308 is arranged on the fixing part 307. The first through hole 308 is strip-shaped and extends along a sliding direction of the sliding part 301. In this embodiment, the fixing part 307 is provided with, for example, two first through holes 308. The two first through holes 308 are respectively located on both sides of the second

opening 115 and correspond to positions of the sliding columns 309. The sliding columns 309 may pass through the corresponding first through hole 308, and the sliding columns 309 may move along an extending direction of the first through hole 308, so that the sliding part 301 may slide between the first position and the second position. When the sliding columns 309 are located at an end of the first through hole 308 away from the output part 205, it means that the sliding part 301 is in the first position relative to the fixing part 307. When the sliding columns 309 are located at an end of the first through hole 308 close to the output part 205, it means that the sliding part 301 is in the second position relative to the fixing part 307.

[00171] Please refer to FIG. 11 through FIG. 13. In some embodiments, the plane where the first through hole 308 is located protrudes from a plane where the fixing part 307 is located, and the plane where the first through hole 308 is located is arranged on a side of the fixing part 307 away from the sliding part 301.

[00172] Please refer to FIG. 11 and FIG. 12. In some embodiments, a plurality of fixed components 315 are arranged on a side of the fixing part 307 away from the sliding part 301. The fixed components 315 are located between the output part 205 and the first through hole 308. In this embodiment, the fixing part 307 is provided with two T-shaped fixed components 315, and each T-shaped fixed component 315 is correspondingly arranged between the first through hole 308 and the output part 205.

[00173] Please refer to FIG. 11 through FIG. 14. In some embodiments, an elastic component 310 is arranged between the sliding part 301 and the fixing part 307. The elastic component 310 may be, for example, a spring, or other components that may achieve tension and compression functions. In this embodiment, an end of the elastic component 310 is sleeved on the fixed component 315, and the other end of the elastic component 310 abuts against the sliding column 309.

[00174] Please refer to FIG. 15, in some embodiments, a plurality of second protruding ribs 312 are arranged on the side of the sliding part 301 away from the sliding protruding part 304. In this embodiment, the sliding part 301 is provided with, for example, two second protruding ribs 312, the two second protruding ribs 312 are parallel to each other, and the two second protruding ribs 312 are arranged on both sides of the sliding column 309 respectively.

[00175] Please refer to FIG. 10 through FIG. 15. In some embodiments, a plurality of second grooves 311 are arranged on a side of the fixing part 307 adjacent to the sliding part 301. The second groove 311 extends along the sliding direction of the sliding part 301,

and the second protruding ribs 312 are matched with the second groove 311 to allow the second protruding ribs 312 to slide in the second groove 311. In this embodiment, the fixing part 307 is provided with, for example, two second grooves 311 disconnected from a middle. In other embodiments, the number of the second grooves 311 and the second protruding ribs 312 may also be other values.

[00176] Please refer to FIG. 1 through FIG. 16. During use, the battery pack 3 is slid from a guiding rail 116 into the concave part 320 by external force, and in contact with the sliding protruding part 304 covering the output part 205. During a process of pressing the sliding protruding part 304 down, the battery pack 3 drives the sliding column 309 to slide in a direction of the output part 205 in the first through hole 308. Through a matching between the first groove 302 and the first protruding rib 303 and a matching between the second groove 311 and the second protruding rib 312, the sliding part 301 slides relative to the first housing and the fixing part 307, which enables the elastic component 310 to be transformed from an initial state into a compressed state. Then the sliding part 301 moves from the first position to the second position relative to the fixing part 307. When the sliding part 301 moves to the second position, the output part 205 exposes the sliding protruding part 304. During a process that the battery pack 3 is released from the guiding rail 116 from the concave part 320 by an external force, the elastic component 310 gradually recovers from the compressed state to the initial state, and drives the sliding column 309 to slide in the first through hole 308 in a direction away from the output part 205. Through the matching between the first groove 302 and the first protruding rib 303 and the matching between the second groove 311 and the second rib 312, the sliding part 301 slides relative to the first housing 110 and the fixing part 307 until the sliding part 301 moves from the second position to the first position. When the sliding part 301 moves to the first position, the sliding protruding part 304 covers the output part 205.

[00177] Please refer to FIG. 2, FIG. 4 and FIG. 17. In an embodiment of the disclosure, a fourth output part is further arranged on the third housing 130, and the fourth output part includes the fourth terminal 206 and a fourth terminal port 138. The third housing 130 includes a first plane 132, a second plane 133 and the accommodating groove 134. The first plane 132 is smoothly connected with a side of the second plane 133, and the other side of the second plane 133 is connected with an outer side wall of the accommodating groove 134. The first plane 132 covers the first opening 101 on a shorter base of the casing 10, the second plane 133 covers the first opening 101 on a side of the hypotenuse of the casing 10, and the accommodating groove 134 is placed on the notch 102 of the casing 10.

In this embodiment, the first plane 132 and the second plane 133 are arranged at a first angle, which means that the shorter base and the hypotenuse of the casing 10 are arranged at the first angle, and the first angle ranges, for example, from 90° to 145°. In some embodiments, the first angle is set to 120°. When the first plane 132 and the second plane 133 are arranged at the first angle, the vacuum cleaner 6 of the disclosure is adapted to the battery pack 3 configured with the vacuum cleaner 6. In the disclosure, the first plane 132, the second plane 133 and the accommodating groove 134 of the third housing 130 may be integrally formed, or may be fixed together by welding, or may be connected through clamping or other means.

[00178] Please refer to FIG. 2 and FIG. 17. In an embodiment of the disclosure, a rubber pad 141 is arranged on the first plane 132, which is located on a side of the first plane 132 away from the second plane 133, and the rubber pad 141 is higher than the first plane 132. When the vacuum cleaner 6 is charged by the charging device 1 of the disclosure, the rubber pad 141 provides a buffer force to prevent the vacuum cleaner 6 and the charging device 1 from colliding and causing damage. A material of the rubber pad 141 is, for example, thermoplastic polyurethane (TPU).

[00179] Please refer to FIG. 2 and FIG. 17. In an embodiment of the disclosure, on the second plane 133, a groove 137 is arranged along a direction of the hypotenuse of the casing 10. A depth of the groove 137 is adapted to electronic device which is configured with, and is used to clamp the electronic device that needs to be charged. In this embodiment, the electronic device is the vacuum cleaner 6. Please refer to FIG. 2 and FIG. 7. On the groove 137 of the second plane 133, a plurality of fourth terminal ports 138 are arranged on a side close to the accommodating groove 134. The fourth terminal 206 passes through the fourth terminal port 138 and is exposed on the second plane 133, and the fourth terminal 206 is a special terminal of the vacuum cleaner 6 for charging the special vacuum cleaner 6. An output power of the fourth terminal 206 may range from 10W to 200W. An output current of the fourth terminal 206 may range from 0.5A to 10A. In this embodiment, the number of the fourth terminal ports 138 is, for example, three, and they are arranged in an equilateral triangle.

[00180] Please refer to FIG. 2 and FIG. 17. In an embodiment of the disclosure, on the second plane 133, a display device 143 is arranged at a side of the groove 137. The display device 143 is arranged on a side close to the first housing 110 for displaying a position on the groove 137 in a dark environment. The display device 143 is connected with the main circuit board 208 for displaying a voltage state of the charging conversion circuit. In this

embodiment, a material of the display device 143 is, for example, polycarbonate (PC).

[00181] Please refer to FIG. 2 through FIG. 4, and FIG. 17. In an embodiment of the disclosure, the accommodating groove 134 is U-shaped. A side of the second plane 133 is fixed to the outer side wall of the accommodating groove 134, and a side wall and bottom wall of the accommodating groove 134 connected with the second plane 133 are adapted to the notch 102. In this embodiment, the side wall of the accommodating groove 134 exceeds a height of the second plane 133, so as to maintain a stability of an electronic device placed in the accommodating groove 134. In order to ensure a smooth connection between the side wall of the accommodating groove 134 and the second plane 133, a first concave part 136 is arranged on the side wall of the accommodating groove 134 connected with the second plane 133. A size of the accommodating groove 134 is adapted to a size of the battery pack 3, and both ends of the accommodating groove 134 are provided with symmetrical first opening notches 135. The first opening notch 135 keeps a first preset distance from the bottom wall of the accommodating groove 134 and keeps a second preset distance from the side wall of the accommodating groove 134 to ensure a fixing of the battery pack 3 of the vacuum cleaner 6. When electronic devices such as mobile phones and tablets need to be charged, the electronic devices may be placed on the first opening notch 135.

[00182] Further, please refer to FIG. 2 through FIG. 4, FIG. 17 and FIG. 18. In an embodiment of the disclosure, the connecting component 131 is further arranged at the bottom of the accommodating groove 134. The connecting component 131 is annular. A through hole 122 is arranged on the notch 102 and corresponding to the connecting component 131. The clamping post 121 connecting the first housing 110 with the second housing 120 is arranged in the through hole 122. When the accommodating groove 134 covers the notch 102, the clamping post 121 passes through the annular connecting component 131 to clamp and connect the third housing 130 with the first housing 110 and the second housing 120.

[00183] Please refer to FIG. 7 and FIG. 78. In an embodiment of the disclosure, an input part of the charging device is arranged on a bottom of the charging device 1, which means on a side opposite to the accommodating groove 134. The input part includes a fifth terminal port 123 and a fifth terminal 207. The fifth terminal port 123 allows the fifth terminal 207 of the circuit board to pass through. The fifth terminal 207 is connected with the input end of the circuit board, is a voltage input terminal of the circuit board, and is used to supply power for the charging device 1. In this embodiment, a range of the input voltage of the fifth

terminal 207 is, for example, from 110V to 250V, and the fifth terminal 207 is an alternative current input.

[00184] Please refer to FIG. 1 and FIG. 2. The charging device 1 of the disclosure has various fixing methods. On the outer side wall of the accommodating groove 134, a wall mounted locking device is arranged on a side wall opposite to the second plane 133 to hang the charging device 1 on a wall.

[00185] Please refer to FIG. 2, FIG. 19 through FIG. 24. The wall mounted locking device includes a wall mounted bracket 400 and a wall mounted connecting mechanism 401. The wall mounted bracket 400 is arranged on the vertical wall, and the wall mounted connecting mechanism 401 is arranged on the casing 10, which allows the wall mounted connecting mechanism 401 to be matched with the wall mounted bracket 400 to fix an object to be hung on the vertical wall. The vertical wall can be, for example, a wall, a side wall of a fixed device, a relatively fixed side wall on a movable device, or a movable side wall. The wall mounted bracket 400 is provided with at least one through hole 402, and a fixed component passes through the through hole 402, so that the wall mounted bracket 400 is fixed to the vertical wall. The fixed component may be an expansion screw or a screw bolt or the like. In this embodiment, for example, the through holes 402 are arranged near an upper part and a lower part of the wall mounted bracket 400 respectively, and the wall mounted bracket 400 is fixed and hung on the wall by means of screws and bolts. In other embodiments, as long as the through holes may be used to fix the wall mounted bracket 400 on a vertical wall, the through holes may also be arranged at other positions of the wall mounted bracket 400, which is not limited in the disclosure.

[00186] Please refer to FIG. 19 through FIG. 21. In some embodiments, the wall mounted bracket 400 may include a slideway 403 and a catch. The catch includes at least a first catch 404 and a second catch 405. In some embodiments, the number of slideways 403 may be multiple. The plurality of slideways 403 are vertically fixed on the wall mounted bracket 400, so that the objects to be hung may slide on the slideways 403 and then be fixed to the wall mounted bracket 400. In this embodiment, the slideway 403 includes a first slideway and a second slideway. The first slideway and the second slideway are symmetrically arranged on the wall mounted bracket 400. For example, the first slideway and the second slideway are symmetrically arranged on both sides of the wall mounted bracket 400 and are parallel to a plane where the wall mounted bracket 400 is located.

[00187] Please refer to FIG. 19 through FIG. 21. In some embodiments, the slideway 403 may be a protruding structure. In some other embodiments, the slideway 403 may also be a

groove structure, or a magnetic attraction structure. The slideway 403 here can be sufficient to enable the object to be hung to slide on the slideway 403, and a specific form of the slideway 403 is not limited.

[00188] Please refer to FIG. 19 through FIG. 21. In this embodiment, the first catch 404 is arranged between the slideways 403 on both sides of the wall mounted bracket 400 and is located on a side of the slideway 403. In other embodiments, as long as the first catch 404 may fix the object to be hung, the first catch 404 may also be arranged at other positions on the wall mounted bracket 400, for example, in a middle of the two slideways 403. A specific position of the first catch 404 is not limited in the disclosure. An upper and lower positions of the object to be hung on the wall mounted bracket 400 are fixed by the first catch 404.

[00189] Please refer to FIG. 19 through FIG. 21. In some embodiments, the first catch 404 may be a movable catch, allowing the first catch 404 to move in a direction away from the wall mounted connecting mechanism 401 under an action of an external force. In this embodiment, a side of the first catch 404 close to the slideway 403 is connected with the wall mounted bracket 400, and the other side of the first catch 404 is free to hang. When the external force acts on a side of the first catch 404 away from a connection position with the wall mounted bracket 400, the first catch 404 on this side may move in a direction away from the wall mounted connecting mechanism 401. When the external force is removed, the side of the first catch 404 away from the connection position with the wall mounted bracket 400 returns to an original position, thereby realizing a connection and fixation of the object to be hung and the wall mounted bracket 400.

[00190] Please refer to FIG. 19 through FIG. 21. In some embodiments, the second catch 405 may be arranged on a side of the wall mounted bracket 400 close to a bottom. In some embodiments, the second catch 405 may be a unmovble catch. In some other embodiments, the second catch 405 may also be a movable catch, which is not limited in the disclosure. A forward and backward movement of the object to be hung is limited by the second catch 405.

[00191] Please refer to FIG. 19 through FIG. 21. In some embodiments, the second catch 405 may be in a form of a hook. The second catch 405 may include a connecting rod and a hook. An end of the connecting rod is mounted on a surface of the wall mounted bracket 400, the connecting rod and the surface of the wall mounted bracket 400 are arranged non-parallel, and there is an angle between the connecting rod and the surface of the wall mounted bracket 400. In this embodiment, the angle between the connecting rod and the surface of the wall mounted bracket 400 is, for example, 90°. In other embodiments, the

angle between the connecting rod and the surface of the wall mounted bracket 400 may be selected from 0° to 180°. An end of the connecting rod away from the wall mounted bracket 400 is provided with the hook, and an extension direction of an end of the hook is toward the object to be hung.

[00192] Please refer to FIG. 19 through FIG. 21. In some embodiments, the wall mounted bracket 400 may also be provided with a first supporting plate 406. The first supporting plate 406 may be arranged at the bottom of the wall mounted bracket 400. The first supporting plate 406 extends outward along a direction perpendicular to the plane where the wall mounted bracket 400 is located, and an opening direction of the first supporting plate 406 faces a top of the wall mounted bracket 400.

[00193] In some embodiments, the first supporting plate 406 is provided with a bending part facing the top of the wall mounted bracket 400 for resisting the wall mounted connecting mechanism 401 and preventing the wall mounted connecting mechanism 401 from shaking. For example, the first supporting plate 406 is arranged in a U-shape, an inverted trapezoid or a concave shape.

[00194] Please refer to FIG. 19 through FIG. 21. In some embodiments, a second supporting plate 407 may also be arranged on the wall mounted bracket 400. The second supporting plate 407 may be arranged between the slideway 403 and the first supporting plate 406 to further strengthen a resistance of the wall mounted bracket 400 to the object to be hung. In this embodiment, the second supporting plate 407 is arranged on the wall mounted bracket 400. The second supporting plate 407 includes a connecting plate and a plurality of holding plates. The connecting plate is arranged in the vertical direction. The plurality of holding plates are spaced apart and connected with the connecting plate and the wall mounted bracket 400, and are perpendicular to the connecting plate, so as to resist the objects to be hung in the horizontal direction and prevent a shaking due to a gap between the wall mounted connecting mechanism 401 and the wall mounted bracket 400, so that a connection between the wall mounted connecting mechanism 401 and the wall mounted bracket 400 is more stable.

[00195] Please refer to FIG. 19 through FIG. 22. The wall mounted locking device of the disclosure further includes the wall mounted connecting mechanism 401. The wall mounted connecting mechanism 401 is arranged on the object to be hung. The wall mounted connecting mechanism 401 is used to be matched with the wall mounted bracket 400. The wall mounted connecting mechanism 401 may include: a matching slideway 139 and a clamping matching structure. The clamping matching structure at least includes a first

clamping matching structure 140 and a second clamping matching structure 142.

[00196] Please refer to FIG. 19 through FIG. 22. The number of matching slideways 139 may be set according to the number of slideways 403 on the wall mounted bracket 400. In this embodiment, since the slideway 403 on the wall mounted bracket 400 includes the first slideway and the second slideway. Therefore, the matching slideway 139 also includes a first matching slideway and a second matching slideway. The first matching slideway and the second matching slideway are symmetrically arranged on both sides of the wall mounted connecting mechanism 401 and are matched with the first slideway and the second slideway respectively, which allows the slideway 403 to slide in the matching slideway 139.

[00197] Please refer to FIG. 19 through FIG. 22. In some embodiments, the matching slideway 139 may be a protruding structure. In some other embodiments, the matching slideway 139 may also be a groove structure or a magnetic attraction structure. The matching slideway 139 here can be matched with the slideway 403, so that the object to be hung may slide on the slideway 403, and a specific form of the matching slideway 139 is not limited.

[00198] Please refer to FIG. 19 through FIG. 22. For example, the slideway 403 is a protruding structure, and the matching slideway 139 is a groove structure. In an embodiment, the protruding structures may be arranged respectively on both sides of the wall mounted bracket 400, correspondingly, two groove structures may be arranged on the object to be hung, and a size of the groove structure matches a size of the protruding structure, which allows the two protruding structures on the wall mounted bracket 400 to slide in the grooved structures. In this embodiment, the protruding structure is, for example, a strip-shaped structure protruding from the surface of the wall mounted bracket 400. In other embodiments, the protruding structure may also be a protruding point structure protruding from the surface of the wall mounted bracket 400, or a protruding structure in other shapes. In the disclosure, as long as the protruding structure may be embedded in the corresponding groove structure to realize sliding, the shape of the protruding structure is not specifically limited. In some embodiments, a length of the protruding structure may be the same as a length of a side of the wall mounted bracket 400, and in other embodiments, the length of the protruding structure may also be less than the length of the side of the wall mounted bracket 400.

[00199] Please refer to FIG. 19 through FIG. 22. In some embodiments, when the wall mounted bracket 400 is provided with the first catch 404, the wall mounted connecting

mechanism 401 is correspondingly provided with the first clamping matching structure 140. In this embodiment, the first clamping matching structure 140 is arranged on a side of the matching slideway 139 and matched with the first catch 404 to allow the first catch 404 to be embedded in the first clamping matching structure 140. In other embodiments, the specific position of the first clamping matching structure 140 may be arranged according to the position of the first catch 404, which is not limited in the disclosure.

[00200] Please refer to FIG. 2, FIG. 19 through FIG. 22. In some embodiments, a release button 408 is arranged on a side of the first clamping matching structure 140 away from the wall mounted bracket 400. When the object to be hung is fixed on the wall mounted bracket 400, the release button 408 is pressed. Under an action of the release button 408, the first catch 404 is moved in a direction away from the wall mounted connecting mechanism 401, so that the first catch 404 is separated from the first clamping matching structure 140, thereby completing a disassembly process between the wall mounted bracket 400 and the wall mounted connecting mechanisms 401. In addition, the object to be hung and the wall mounted bracket 400 may be separated.

[00201] Please refer to FIG. 19 through FIG. 22. In some embodiments, when the wall mounted bracket 400 is provided with the second catch 405, the wall mounted connecting mechanism 401 is correspondingly provided with the second clamping matching structure 142. In this embodiment, the second clamping matching structure 142 is arranged on a side of the wall mounted connecting mechanism 401 close to the bottom. In other embodiments, a position of the second clamping matching structure 142 may be determined according to a position of the second catch 405. The second clamping matching structure 142 is matched with the second catch 405 to allow the second catch 405 to be embedded in the second clamping matching structure 142. Under a matching action of the second catch 405 and the second clamping matching structure 142, the wall mounted bracket 400 is prevented from sliding relative to the wall clamping connecting mechanism 401, thereby realizing a fixation of the object to be hung with the wall mounted bracket 400. In some embodiments, when the second catch 405 is a movable catch, a side of the second clamping matching structure 142 away from the wall mounted bracket 400 may further be provided with the release button for pressing the second catch 405.

[00202] Please refer to FIG. 2, FIG. 23 and FIG. 24. The wall mounted connecting mechanism 401 may be an independent component, or may be a part of the charging device 1. For example, in this embodiment, the wall mounted connecting mechanism 401 is defined on the outer side wall of the accommodating groove 134 of the charging device 1.

According to a structure of the charging device 1, the wall mounted connecting mechanism 401 is, for example, in a stepped shape, and an upper half part of the stepped shape protrudes from a lower half part. The wall mounted connecting mechanism 401 is matched with the wall mounted bracket 400 fixed on the wall to hang the charging device 1 on the wall.

[00203] Please refer to FIG. 2, FIG. 19 and FIG. 24. In an embodiment of the disclosure, a length of the slideway 403 is, for example, less than the length of the side of the wall mounted bracket 400 and less than or equal to a length of the upper half of the stepped shape of the charging device 1. Correspondingly, the wall mounted connecting mechanism 401 is provided with the matching slideway 139, the first clamping matching structure 140 and the second clamping matching structure 142. In this embodiment, the number of the matching slideways 139 is, for example, two, which are arranged in parallel along a direction of the side wall. The charging device 1 is slidably clamped into the wall mounted bracket 400 by being matched with the slideway 139, so as to be fixed on the wall. The first clamping matching structure 140 is located on a side of the two parallel matching slideways 139 and on a side away from the opening of the accommodating groove 134. The second clamping matching structure 142 is located at the bottom of the charging device 1. When the wall mounted connecting mechanism 401 slides into the wall mounted bracket 400, the first clamping matching structure 140 and the second clamping matching structure 142 limit a position of the wall mounted connecting mechanism 401. The first supporting plate 406 is used to support the bottom of the charging device 1, and the second supporting plate 407 is used to support the upper half part of the step of the charging device 1.

[00204] Please refer to FIG. 25 through FIG. 28. A locking structure 522 of the disclosure may be any suitable structure which can detachably connect and stably lock the charging device 1 (ie, a vacuum cleaner holder 740) with a fixed base 520. The disclosure provides the locking structure 522 of the charging device 1, and the charging device 1 is connected with the fixed base 520 through the locking structure 522. The locking structure 522 includes a first locking unit 501 and a second locking unit 502. The first locking unit 501 and the second locking unit 502 may be matched with each other to realize a locking and separation between the charging device 1 and the fixed base 520. The first locking unit 501 is arranged on the charging device 1. A side of the first locking unit 501 is fixed on the bottom of the charging device 1. The first locking unit 501 is provided with a locking groove 503 therein. The locking groove 503 is arranged on a side of a plurality of sliding ribs, and the locking groove 503 is located on a side of the first locking unit 501 connected with the

bottom of the charging device 1. The second locking unit 502 is arranged on the fixed base 520, and a locking block 504 is arranged in the second locking unit 502. The locking block 504 may be inserted into the locking groove 503 or separated from the locking groove 503 by moving the locking block 504. When the locking block 504 is inserted into the locking groove 503, the first locking unit 501 and the second locking unit 502 are closed and locked. When the locking block 504 is separated from the locking groove 503, the first locking unit 501 and the second locking unit 502 are unlocked.

[00205] Please refer to FIG. 26 and FIG. 27. The first locking unit 501 may be provided with a plurality of sliding ribs therein, the sliding ribs are parallel to the bottom plane of the charging device 1, the plurality of sliding ribs are parallel to each other, and the plurality of sliding ribs are respectively located on both sides of the bottom of the charging device 1.

[00206] Please refer to FIG. 26 and FIG. 27. For example, the first locking unit 501 is provided with two first sliding ribs 505 and two second sliding ribs 506 therein. The first sliding rib 505 and the second sliding rib 506 are parallel to the bottom of the charging device 1, and the first sliding rib 505 and the second sliding rib 506 are parallel to each other. The two first sliding ribs 505 are respectively located on both sides of the bottom of the charging device 1, the two second sliding ribs 506 are also respectively located on both sides of the bottom of the charging device 1, and the second sliding ribs 506 are located on a side of the first sliding rib 505 away from the bottom of the charging device 1.

[00207] Please refer to FIG. 26 and FIG. 27. In some embodiments, lengths of the first sliding rib 505 and the second sliding rib 506 are the same or different. In this embodiment, the lengths of the first sliding rib 505 and the second sliding rib 506 are different, and the length of the first sliding rib 505 is greater than the length of the second sliding rib 506. The sliding rib 505 is flush with an end surface of a side of the second sliding rib 506.

[00208] Please refer to FIG. 26 and FIG. 27. In some embodiments, a width between the two first sliding ribs 505 is different from a width between the two second sliding ribs 506, and the width between the two second sliding ribs 506 is greater than the width between the two first sliding ribs 505. The distance between the two first sliding ribs 505 is, for example, from 20mm to 50mm, in some embodiments, from 30mm to 40mm, and such as 38.7mm. The distance between the two second sliding ribs 506 is, for example, from 30mm to 60mm, in some embodiments, from 40mm to 50mm, and such as 47.3mm.

[00209] Please refer to FIG. 26 and FIG. 27. In some embodiments, a third sliding rib 518 may also be arranged on a side of the second sliding rib 506 away from the first sliding rib 505. The third sliding rib 518 may be arranged in a U shape, and front, middle and rear

parts on a horizontal axis of the charging device 1 are fixed by the first, second and third sliding ribs. A width between two sides of the U shape is, for example, from 40mm to 70mm, in some embodiments, from 50mm to 60mm, and such as 57.8mm. The width between two sides of the third sliding ribs 518 is greater than the width between the two first sliding ribs 505 and greater than the width between the two second sliding ribs 506.

[00210] In addition, a distance between the first sliding rib 505 and the second sliding rib 506 is, for example, from 1mm to 5mm, in some embodiments, from 2mm to 4mm, and such as 2.9mm. A distance between the second sliding rib 506 and the third sliding rib 518 is, for example, from 2mm to 8mm, in some embodiments, from 3mm to 7mm, and such as 4mm.

[00211] Please refer to FIG. 27. In some embodiments, the locking groove 503 is arranged on the bottom of the charging device 1. A length of the locking groove 503 is, for example, from 10mm to 40mm, in some embodiments, from 15mm to 30mm, and such as 29mm. A width of the locking groove 503 is, for example, from 2mm to 6mm, in some embodiments, from 3mm to 5mm, and such as 4.6mm. A distance between the locking groove 503 and the casing of the charging device 1 is, for example, from 8 mm to 15 mm, in some embodiments, from 10 mm to 13 mm, and such as 11.9 mm.

[00212] Please refer to FIG. 27 and FIG.28. In some embodiments, the second locking unit 502 may be provided with a plurality of matching sliding ribs, the matching sliding ribs are parallel to the sliding ribs, and the multiple matching sliding ribs are parallel to each other. The matching sliding ribs in the second locking unit 502 are arranged in dislocation from the sliding ribs in the first locking unit 501. When the first locking unit 501 and the second locking unit 502 are closed, the sliding ribs and the matching sliding ribs in the two locking units define an interpenetrating structure, so that a connection between the first locking unit 501 and the second locking unit 502 after being closed is more stable.

[00213] Please refer to FIG. 27 and FIG. 28. In this embodiment, according to the number of sliding ribs in the first locking unit 501, the second locking unit 502 is provided with, for example, two first matching sliding ribs 507 and two second matching sliding ribs 508. The first matching sliding ribs 507 and the second matching sliding ribs 508 are parallel to the sliding ribs, and the first matching sliding ribs 507 and the second matching sliding ribs 508 are parallel to each other.

[00214] Please refer to FIG. 27 and FIG. 28. When the first locking unit 501 and the second locking unit 502 are closed, the first sliding rib 505 is interspersed and matched with the first matching sliding rib 507, and the second sliding rib 506 is interspersed and matched with

the second matching sliding rib 508. When the charging device 1 is connected with the fixed base 520, the first sliding rib 505 is interspersed and matched with the first matching sliding rib 507, and the second sliding rib position 506 is interspersed and matched with the second matching sliding rib position 508 at the same time, which firmly connects charging device 1 with the fixed base 520 to improve a strength of the structure. In addition, since the first sliding rib 505 is interspersed and matched with the first matching sliding rib 507 and the second sliding rib position 506 is interspersed and matched with the second matching sliding rib position 508, the structure is not easily shaken.

[00215] Please refer to FIG. 27 and FIG. 28. In some embodiments, lengths of the plurality of matching sliding ribs may be different, and the lengths of the matching sliding ribs may be determined according to lengths of the sliding ribs to be matched with and external dimensions of the second locking unit 502. It is only necessary to ensure that the sliding ribs are interspersed and matched with the matching sliding ribs without gaps. In this embodiment, for example, when the first locking unit 501 and the second locking unit 502 are closed, the length of the first matching sliding rib 507 is greater than the length of the second matching sliding rib 508.

[00216] Please refer to FIG. 27 and FIG. 28. In some embodiments, the second locking unit 502 is further provided with a third matching sliding rib 534 to be interspersed and matched with the third sliding rib 518 in the first locking unit 501 to further improve a structural strength of the locking structure and stability.

[00217] Please refer to FIG. 28 through FIG. 31. In some embodiments, the second locking unit 502 may further include a locking base 509, a locking cover 513 and a locking buckle structure 530. For example, the locking base 509 is L-shaped, and a part of the L-shaped locking base 509 that is parallel to a plane of the fixed base 520 is defined as a horizontal part 531, and a part of the L-shaped locking base 509 that is perpendicular to a plane of the fixed base 520 is defined as a vertical part 532. A locking button hole 533 is arranged on the vertical part 532. The plurality of matching sliding ribs are symmetrically distributed on both sides of the locking button hole 533, and an end of the matching sliding ribs is fixed on a side of the vertical part 532 adjacent to the horizontal part 531, and an extending direction of the matching sliding ribs is parallel to the horizontal part 531. For example, the two first matching sliding ribs 507 are located on both sides of the locking base 509 respectively. The two second matching sliding ribs 508 are respectively located on both sides of the locking base 509 and the two third matching sliding ribs 534 are respectively located on both sides of the locking base 509. In this embodiment, an end of the first matching sliding

rib 507, an end of the second matching sliding rib 508, and an end of the third matching sliding rib 534 are fixed on the vertical part 532 and are arranged in order from a side of the vertical part 532 away from the horizontal part 531 towards the horizontal part 531. The first matching sliding ribs 507, the second matching sliding ribs 508 and the third matching sliding ribs 534 are parallel to each other and parallel to the horizontal part 531. In this embodiment, the length of the first matching sliding rib 507 is greater than the length of the second matching sliding rib 508 and less than a length of the third matching sliding rib 534.

[00218] Please refer to FIG. 28 through FIG. 31. A distance between the two first matching sliding ribs 507 is, for example, from 20mm to 50mm, in some embodiments, from 30mm to 40mm, such as 38.6mm. The distance between the two first matching sliding ribs 507 may be less than the distance between the two first sliding ribs 505. The distance between the two second matching sliding ribs 508 is, for example, from 30mm to 60mm, in some embodiments, from 40mm-50mm, such as 46.8mm. The distance between the two second matching sliding ribs 508 may be less than the distance between the two second sliding ribs 506. A distance between the first matching sliding rib 507 and the second matching sliding rib 508 is, for example, from 1mm to 5mm, in some embodiments, from 2mm to 4mm, such as 2.8mm. The distance between the first matching sliding rib 507 and the second matching sliding rib 508 may be less than the distance between the first sliding rib 505 and the second sliding rib 506. A distance between the second matching sliding rib 508 and the third matching sliding rib 534 is from 2mm to 8mm, in some embodiments, from 3mm to 7mm, such as 3mm. The distance between the second matching sliding rib 508 and the third matching sliding rib 534 may be less than a distance between the second sliding rib 506 and the third sliding rib 518.

[00219] Please refer to FIG. 29. In some embodiments, a protruding rib 535 may be arranged on a side adjacent to the locking button hole 533 in the extending direction of the matching sliding rib. A shape of the protruding rib 535 is not limited here. In some embodiments, the protruding ribs 535 may be arranged on all sides of the matching sliding ribs. In some other embodiments, the protruding ribs 535 may also be arranged on the sides of only partial matching sliding ribs. In this embodiment, for example, the protruding rib 535 is arranged on a side adjacent to the locking button hole 533 along an extending direction of the first matching sliding rib 507 and the second matching sliding rib 508.

[00220] Please refer to FIG. 28 through FIG. 30. The locking cover 513 is closed with the vertical part 532 and the horizontal 531 of the locking base 509 to define a closed cavity. Two sides of the locking cover 513 are provided with groove-shaped structures 536 which

are matched with the protruding ribs 535 on the sides of the sliding ribs, and the locking cover 513 is moved horizontally so that the protruding ribs 535 are inserted into the groove-shaped structures 536, and the locking cover 513 is then tightly matched with the locking base 509. A locking hole 514 is arranged on a side of the locking cover 513 away from the horizontal part 531 of the locking base 509.

[00221] Please refer to FIG. 28, FIG. 29 and FIG. 30. The locking buckle structure 530 includes a button 512, a tongue-shaped protruding part 516 and the locking block 504. The button 512 is sleeved in the locking button hole 533 to allow the button 512 to slide relative to the locking button hole 533. An end of the tongue-shaped protruding part 516 is connected with a side of the button 512 adjacent to the closed cavity, and the other end of the tongue-shaped protruding part 516 is located on a side of the locking hole 514 away from the vertical part 532. An angle is defined between the tongue-shaped protruding part 516 and the horizontal direction away from the vertical part 532, and the angle ranges from 0° to 90°. In this embodiment, the angle is, for example, 45°. In this embodiment, the other end surface of the tongue-shaped protruding part 516 is parallel to the vertical part 532. The locking block 504 is sleeved on the tongue-shaped protruding part 516, and the locking block 504 is vertically arranged. An end of the locking block 504 is aligned with the locking hole 514, the end of the locking block 504 may be extended and retracted in the locking hole 514, and the end of the locking block 504 close to the locking hole 514 is set as an inclined plane, which is convenient to be matched with the locking groove 503 on the first locking unit 501. The button 512 slides relative to the locking button hole 533 to drive the tongue-shaped protruding part 516 to move in the horizontal direction. Since the tongue-shaped protruding part 516 are arranged inclined upwardly, a distance from a connection position of the locking block 504 and the tongue-shaped protruding part 516 relative to the horizontal part 531 of the locking base 509 is constantly changing, so that the end of the locking block 504 close to the locking hole 514 is telescopic in the locking hole 514, which means that the end of the locking block 504 close to the locking hole 514 is lower than or higher than the locking hole 514. When the end of the locking block 504 close to the locking hole 514 is higher than the locking hole 514, the locking block 504 at least partially exposes the locking hole 514. A width of the locking block 504 is, for example, from 16mm to 25mm, in some embodiments, from 18mm to 23mm, and for example, 21mm. A distance from the locking block 504 to the vertical part 532 is from 8mm to 15mm, in some embodiments, from 10mm to 13mm, such as 11.6mm. A thickness of the locking block 504 is, for example, from 2mm to 6mm, in some embodiments, from 3mm to 5mm, and for

example, 4.4mm.

[00222] Please refer to FIG. 28, FIG. 29 and FIG. 31. When the button 512 drives the tongue-shaped protruding part 516 to move toward a side close to the locking button hole 533, a connection position between the locking block 504 and the tongue-shaped protruding part 516 is away from the horizontal part 531 of the locking base 509, and the locking block 504 moves toward a direction of the locking hole 514, so that the locking block 504 exposes the locking hole 514. When the button 512 drives the tongue-shaped protruding part 516 to move to a side away from the locking button hole 533, the connection position between the locking block 504 and the tongue-shaped protruding part 516 is close to the horizontal part 531 of the locking base 509, and the locking block 504 moves towards a direction away from the locking hole 514, so that an inclined end surface of the locking block 504 is flush with a plane where the locking hole 514 is located.

[00223] Please refer to FIG. 28, FIG. 29, FIG. 31 and FIG. 33. In some embodiments, the second locking unit 502 further includes an elastic component (not shown). The elastic component is arranged on a side of the tongue-shaped protruding part 516 close to the horizontal portion 531 of the locking base 509, the elastic component is connected between the button 512 and the locking cover 513, an elastic force acting direction of the elastic component is parallel to the horizontal part 531 of the locking base 509, and the elastic component is, for example, a spring. In this embodiment, the button 512 pulls or pushes the tongue-shaped protruding part 516 through a tension or compression of the spring, so that the button 512 drives the tongue-shaped protruding part 516 to move toward or away from the locking button hole 533.

[00224] Please refer to FIG. 26 through FIG. 33. During use, when the locking buckle structure 530 is in an initial position, the second locking unit 502 moves to the first locking unit 501 along the horizontal direction. During a moving process, the plurality of sliding ribs in the first locking unit 501 are interspersed and matched with the plurality of matching sliding ribs in the second locking unit 502. When the inclined end surface of the locking block 504 is in contact with the bottom of the charging device 1, under a pressure of the bottom of the charging device 1, the locking block 504 gradually moves away from the bottom of the charging device 1. The connection position between the locking block 504 and the tongue-shaped protruding part 516 moves close to the horizontal part 531 of the locking base 509, and then drives the tongue-shaped protruding part 516 to move to the side away from the locking button hole 533. At this time, the elastic component gradually changes from an initial state to a compressed state, until the locking block 504 is lowered to

a position flush with the plane where the locking hole 514 is located. The second locking unit 502 and the first locking unit 501 continue to move relatively in the horizontal direction. When the end of the locking block 504 close to the locking hole 514 is aligned with the locking groove 503 on the bottom of the charging device 1, the pressure of the bottom of the charging device 1 on the locking block 504 disappears, and the elastic component gradually resets, which means returning from the compressed state to the initial state. The elastic component pushes the button 512 to slide to a side of the locking button hole 533, and a movement of the button 512 drives the tongue-shaped protruding part 516 to move to the side close to the locking button hole 533. The connection position between the locking block 504 and the tongue-shaped protruding part 516 gradually moves away from a direction of the horizontal part 531 of the locking base 509, and then the locking block 504 moves toward the direction of the locking hole 514 until the elastic component is reset and the locking structure 530 returns to the original position. At this time, the locking block 504 exposes the locking hole 514 and is inserted into the locking groove 503 to realize a fixed locking of the first locking unit 501 with the second locking unit 502. Since the plurality of sliding ribs in the first locking unit 501 are interspersed and matched the plurality of matching sliding ribs in the second locking unit 502, the locking structure 522 has a good structural strength and the gap is small, which avoids a shaking after the first locking unit 501 and the second locking unit 502 are fixed and locked, and improves a stability and safety of the structure.

[00225] Please refer to FIG. 26 through FIG. 33. When the first locking unit 501 and the second locking unit 502 need to be unlocked and separated, the button 512 may be pressed. The button 512 is pressed to drive the tongue-shaped protruding part 516 to gradually move to the side away from the locking button hole 533, and the elastic component gradually changes from the initial state to the compressed state. The connection position between the locking block 504 and the tongue-shaped protruding part 516 gradually moves close to the horizontal part 531 of the locking base 509, and the locking block 504 gradually moves away from the locking hole 514, so that the locking block 504 is lowered to a position flush with the plane where the locking hole 514 is located. At this time, the first locking unit 501 and the second locking unit 502 are unlocked, and the first locking unit 501 and the second locking unit 502 move in opposite directions along the horizontal direction, so that the plurality of sliding ribs in the first locking unit 501 are separated from the plurality of matching sliding ribs in the second locking unit 502 to realize a separation of the first locking unit 501 from the second locking unit 502.

[00226] Please refer to FIG. 2 through FIG. 7. The power of the circuit board in the charging device 1 of the disclosure ranges from 5W to 400W. The circuit board includes various output voltages and various terminals, including the first terminal 203, the second terminal 204, the third terminal 205 and the fourth terminal 206, to provide various charging methods for various electronic devices. Wherein, the battery pack 3 may charge or discharge the circuit board through the third terminal 205.

[00227] The charging device 1 of the disclosure may charge various electronic devices. In an embodiment of the disclosure, the electronic device is, for example, a common mobile phone, pad or notebook computer. When charging, a small mobile phone may be placed in the accommodating groove 134 (the pad or notebook computer is placed on a side of the charging device 1), and the charging port of the mobile phone or pad may be connected with the first terminal 203 through a data cable to charge the electronic devices such as mobile phones or pads. At the same time, the battery pack may also be detached and charged by a charger, which enables a charging position of the vacuum cleaner to be unlimited.

[00228] Please refer to FIG. 2 and FIG. 36. The electronic device may be such as the vacuum cleaner 6. A fourth port 66 is arranged on a side of the vacuum cleaner 6 close to its battery pack 3, which is matched with the fourth terminal 206. When the vacuum cleaner 6 is fixed on the charging device 1, the fourth port 66 is connected with the fourth terminal 206 to charge the battery pack 3 on the vacuum cleaner 6. The fourth port 66 is arranged in front of a supporting part 6124, which means that on a side of the supporting part 6124 facing an air tube unit 64, and the fourth port 66 is arranged on a side of the supporting part 6124 close to a base. As an example, the fourth port 66 is a female charging port, and the number of the fourth ports 66 may be, for example, three, which are arranged in a triangle. Through reasonably arranging the fourth port 66 of the vacuum cleaner 6, the vacuum cleaner 6 can be charged more conveniently and quickly when the vacuum cleaner 6 is stored in the storage device 7 of the vacuum cleaner.

[00229] Please refer to FIG. 37. The vacuum cleaner includes a housing 61, a dirt collection unit 62 mounted on the housing 61, a suction generating unit 63, the air tube unit 64 and a floor brush 65. The housing 61, the dirt collection unit 62 and the suction generating unit 63 together define a main body of the vacuum cleaner 6.

[00230] Please refer to FIG. 38 and FIG. 39. The battery pack 3 of the disclosure may be used as an integral part of the vacuum cleaner 6, or may be a separately configured component independent of the vacuum cleaner 6. The vacuum cleaner of the disclosure

includes the battery pack 3, and the battery pack 3 may be detachably mounted on the vacuum cleaner 6 and connected with the vacuum cleaner to supply power. In some embodiments, a battery fixed base may be arranged on the vacuum cleaner 6 for fixing the battery pack 3 on the vacuum cleaner 6. The battery fixed base and the battery pack 3 may slide relative to each other. For example, a relative sliding between the battery fixed base and the battery pack 3 may be realized through a sliding rail structure. For example, a sliding rail is arranged on the battery fixed base, and a sliding rail groove is correspondingly arranged on the battery pack 3. The sliding rail is matched with the sliding rail groove. In other embodiments, for example, a sliding rail groove may be arranged on the battery fixed base, and correspondingly, a sliding rail may be arranged on the battery pack 3. The sliding rail and the sliding rail groove are matched to each other to allow the battery pack 3 to slide along an extending direction of the sliding rail. In an embodiment of the disclosure, a side of a base 613 away from a handle 612 is provided with an opening groove 6131 with one end open. A guiding groove 6132 is arranged on a groove wall of the opening groove 6131, and the opening groove 6131 is used for accommodating the battery pack 3.

[00231] Please refer to FIG. 38 and FIG. 39. The base 613 is located on a side of the handle 612 away from a machine body 611, and is provided with a connecting port 6134. The connecting port 6134 is used to connect with a first power supply terminal of the battery pack 3 to obtain power of the battery pack 3, and is located in the accommodating groove 134 of the charging device 1 to realize a connection with the charging device 1.

[00232] Please refer to FIG. 1 through FIG. 39. In the charging device 1 of the disclosure, terminals are arranged on different sides of the charging device 1, and each terminal has different output voltages and different types, so as to realize charging of various devices. The wall mounted connection mechanism 401 is arranged on the first housing 110 and the third housing 130, and the corresponding wall mounted bracket 400 is arranged to fix the charging device 1 on a side wall. The locking structure 522 is arranged on the bottom of the charging device 1, which means on a side surface opposite to the accommodating groove 134. The charging device 1 is connected with the fixed base 520 through the locking structure 522, and the charging device 1 is fixed on the fixed base 520 to realize various fixing modes of the charging device 1.

[00233] The charging device 1 of the disclosure may be an independent component or a part of the storage device of the vacuum cleaner. Please refer to FIG. 1 and FIG. 61 through FIG. 71. In an embodiment of the storage device of the vacuum cleaner of the disclosure, the storage device of the vacuum cleaner may reliably store the vacuum cleaner

through the storage device, and the vacuum cleaner holder may be hung on the wall, or be placed on the bracket through the storage device, which may be replaced at will according to needs, and a usage mode is flexible and changeable. Therefore, a problem that the conventional storage device of the vacuum cleaner is single in use and may not be flexibly changed between a wall mounted way and a bracket way may be improved.

[00234] Please refer to FIG. 1 and FIG. 61. In an embodiment of the disclosure, the storage device 7 of the vacuum cleaner includes the vacuum cleaner holder 740, a bracket, a first accessory clip 770 and the wall mounted bracket 400. Those skilled in the art may understand that, if the wall mounted function is not considered, the storage device 7 of the vacuum cleaner may also only include the vacuum cleaner holder 740 and the bracket.

[00235] Please refer to FIG. 63. The vacuum cleaner holder 740 is provided with the wall mounted connecting mechanism 401, a first bracket connecting structure 7420 and a suspension supporting structure 741. The wall mounted connecting mechanism 401 may be matched with the wall mounted bracket 400 to hang the vacuum cleaner holder 740 on the vertical wall. The first bracket connecting structure 7420 can be connected with the bracket to stably arrange the vacuum cleaner holder 740 on a top of the bracket. The suspension supporting structure 741 may hang the vacuum cleaner 6. The suspension supporting structure 741 is the accommodating groove 134 that can partially accommodate the base 613 and the battery pack 3 of the vacuum cleaner. In order to increase a stability, a shape of the accommodating groove is matched a shape of the base and a side of the battery of the vacuum cleaner 6 facing an air inlet of the vacuum cleaner 6. The bracket is provided with a second bracket connecting structure 5210 matched with the first bracket connecting structure 7420. The second bracket connecting structure 5210 may be detachably connected with the first bracket connecting structure 7420, and can stably mount the vacuum cleaner holder 740 to the top of the bracket.

[00236] Please refer to FIG. 41 and FIG. 63. The first accessory clip 770 is provided with a third bracket connecting structure 7710. The third bracket connecting structure 7710 may be interchangeable with the second bracket connecting structure 5210. When using the wall mounted bracket 400 to hang the vacuum cleaner holder 740 to the wall, the second bracket connecting structure 5210 may be removed from the first bracket connecting structure 7420, thereby removing the bracket and connecting the third bracket connecting structure 7710 on the first accessory clip 770 with the first bracket connecting structure 7420, so as to realize a mounting of the first accessory clip 770 on the vacuum cleaner holder 740. The first accessory clip 770 may accommodate many different types of cleaning

heads. The wall mounted bracket 400 may be mounted on the vertical wall. The vertical wall can be, for example, a wall, a side wall of a fixed device, a relatively fixed side wall on a movable device, or a movable side wall. A mounting form of the wall mounted bracket 400 is not limited, and may be any suitable mounting form, such as bonding, connecting by fixed components, etc. The wall mounted bracket 400 is provided with a second wall mounted connecting mechanism. The second wall mounted connecting mechanism is matched with the wall mounted connecting mechanism 401, and may be detachably connected with the wall mounted connecting mechanism 401, so as to hang the vacuum cleaner holder 740 on the wall mounted bracket 400. The suspension supporting structure 741 of the disclosure may be any suitable structure that can realize a stable suspension of the vacuum cleaner, such as a holding groove structure matched with an entire vacuum cleaner head, or other hook structures matched with the vacuum cleaner, which will not be exemplified here.

[00237] Please refer to FIG. 20. In the disclosure, the wall mounted connecting mechanism 401 and the second wall mounted connecting mechanism may be any suitable matching mechanism that may be matched with each other to hang the vacuum cleaner holder 740. In an embodiment of the disclosure, the second wall mounted connecting mechanism includes the slideway 403 and the catch, and the catch at least includes the first catch 404 and the second catch 405.

[00238] Please refer to FIG. 4, FIG. 8 and FIG. 17. In an embodiment of the disclosure, the vacuum cleaner holder 740 is the charging device 1, and the charging device 1 is provided with the suspension supporting structure 741, the fourth terminal 206 and the groove 137. The suspension supporting structure 741 is located on a side of the charging device 1, and the suspension supporting structure 741 can partially accommodate the base 613 and the battery pack 3. In order to increase stability, a shape of the suspension supporting structure 741 is matched with a shape of the base 613 and a side of the battery pack 3 facing the air inlet of the vacuum cleaner 6, and is generally U-shaped.

[00239] Please refer to FIG. 17 and FIG. 61. The groove 137 is matched with a shape of a side of the supporting part 6124 of the handle 612 facing the charging device 1, and is used partially accommodate and fix the supporting part 6124 of the handle 612 when the vacuum cleaner 6 is hung to the suspension supporting structure 741, so as to fix the main body of the vacuum cleaner 6 together with the suspension supporting structure 741.

[00240] Please refer to FIG. 2 and FIG. 61. The fourth terminal 206 is located at a bottom of the groove 137 and is arranged close to the suspension supporting structure 741. The

fourth terminal 206 is arranged toward the supporting part 6124 of the handle 612, which means that the fourth terminal 206 is arranged above the charging device 1. As an example, the fourth terminal 206 is a power output terminal, and the number of the fourth terminals 206 may be, for example, three, which are arranged in a triangle.

[00241] Please refer to FIG. 2 and FIG. 61. When the vacuum cleaner 6 is hung to the suspension supporting structure 741, the main body of the vacuum cleaner 6 falls into the suspension supporting structure 741 and the groove 137 of the charging device 1 by its own weight, so that the fourth terminal 206 of the charging device 1 is in contact with the fourth port 66 of the vacuum cleaner 6 so as to charge the battery pack 3.

[00242] Please refer to FIG. 61. The bracket further includes a bracket base 710, a supporting body 730 and the fixed base 520. The bracket base 710 is provided with a supporting structure that may be placed on the ground or a plane. An end of the supporting body 730 is mounted on the bracket base 710, and the other end of the supporting body 730 extends to a side away from the bracket base 710. An extending direction of the supporting body 730 is not limited, and may be vertically upwardly extending, or may be wave-shaped bending and upwardly extending. The fixed base 520 is detachably mounted on the other end of the supporting body, and the second bracket connecting mechanism 5210 is arranged on the fixed base 520. The vacuum cleaner holder 740 is detachably mounted on an end of the supporting body 730 away from the bracket base 710, and is provided with the suspension supporting structure 741 for hanging the vacuum cleaner 6 thereon. The suspension supporting structure 741 of the disclosure may be any suitable structure that can realize a stable suspension of the vacuum cleaner 6. For example, the holding groove structure matched with the entire vacuum cleaner head, or other hook structures matched with the vacuum cleaner 6, will not be listed one by one here.

[00243] Please refer to FIG. 61 and FIG. 70. The vacuum cleaner holder 740 of the disclosure may be any suitable structure which can hold up the vacuum cleaner 6 stably. Considering an integration of functions, in an embodiment of the disclosure, the vacuum cleaner holder 740 includes the fixed base 520 and the charging device 1. The fixed base 520 is detachably connected with the charging device 1, and the suspension supporting structure is the accommodating groove 134 arranged on the charging device 1. The power output terminals (ie, the fourth terminal 206 and the fourth terminal port 138) of the charging device 1 are connected with the charging port (ie, the fourth terminal port 138 in FIG. 36) of the vacuum cleaner 6 when the vacuum cleaner 6 is hung to the accommodating groove 134. Of course, in another embodiment of the disclosure, although a shape of the vacuum

cleaner holder 740 is substantially the same as the shape of the charging device 1, it is not provided with a corresponding charging structure inside and is not provided with a charging function.

[00244] Please refer to FIG. 62 and FIG. 67. In the disclosure, a mounting method of the supporting body 730 on the bracket base 710 is not limited, and it may be a fixed connection as a whole, or a mounting groove with a sufficient depth and matched with the supporting body 730 may be arranged on the bracket base 710, and the supporting body 730 may be inserted into a mounting groove. In this embodiment, an end of the supporting body 730 facing the bracket base 710 is mounted on the bracket base 710 through a first quick locking structure 750. The first quick locking structure 750 may be similar to a quick mounting locking structure of a suction head of the vacuum cleaner with a suction tube, please refer to FIG. 62 for details. In this embodiment, the first quick locking structure 750 includes a first inserting rod 713, a first inserting sleeve 734 and a first locking buckle (not shown). A lower part of the first inserting rod 713 is arranged on the bracket base 710 and protrudes upwards. The first locking buckle is arranged on the first inserting rod 713, and the first inserting sleeve 734 is arranged at the end of the supporting body 730 facing the bracket base 710. The first inserting sleeve 734 is provided with a first locking buckle hole 731, and the first locking buckle hole 731 is matched with the first locking buckle. After an insertion is locked, the first locking buckle hole 731 exposes the first locking buckle, and a linear guiding structure (not shown) is arranged between the first inserting rod 713 and the first inserting sleeve 734. The first inserting rod 713 and the first inserting sleeve are inserted along the linear guiding structure and locked by the first locking buckle. It should be noted that the first locking buckle of the disclosure may be any suitable locking buckle for realizing an inserting locking of the inserting rod and the inserting sleeve, and may be purchased through general commercial means, which will not be repeated here.

[00245] Please refer to FIG. 62, FIG. 67 through FIG. 70. In the disclosure, a mounting method of the fixed base 520 of the vacuum cleaner holder 740 on the supporting body 730 may be any suitable detachable connection method. For example, the fixed base 520 may be provided with the mounting groove with a sufficient depth and matched with the supporting body 730, and the supporting body 730 may be inserted into the mounting groove. In an embodiment of the disclosure, an end of the supporting body 730 facing the fixed base 520 is mounted on the fixed base 520 through a second quick locking structure 760. The second quick locking structure 760 may be similar to the quick mounting locking structure of the suction head of the vacuum cleaner with the suction tube. In this

embodiment, the second quick locking structure 760 includes a second inserting rod 742, a second inserting sleeve 735 and a second locking buckle 761. The second inserting rod 742 is arranged on the fixed base 520 and protrudes downward. The second locking buckle 761 is arranged on the second inserting rod 742, and the second inserting sleeve 735 is arranged at the end of the supporting body 730 facing the fixed base 520. The second inserting sleeve 735 is provided with a second locking buckle hole 732, and the second locking buckle hole 732 is matched with the second locking buckle 761. The second locking buckle hole exposes the second locking buckle 761, and a linear guiding structure (not shown) is arranged between the second inserting rod 742 and the second inserting sleeve. The second inserting rod 742 and the second inserting sleeve are inserted and connected along the linear guiding structure and locked by the second lock locking buckle 761. In the disclosure, the quick locking structure between the supporting body 730 and the bracket base and the quick locking structure between the supporting body 730 and the fixed base may realize a rapid mounting or disassembly of the supporting body 730 and the bracket base and a rapid mounting or disassembly of the supporting body 730 and the fixed base, which may reduce a transportation space, and accessories may be purchased separately for replacement when damaged, which may save costs. It should be noted that the second locking buckle 761 in the disclosure may be any suitable locking buckle for realizing a locking between a rod and a socket, and may be purchased through general commercial means, which will not be repeated here.

[00246] The linear guiding structure in the disclosure may be any structure that can guide the inserting rod and the inserting sleeve to be positioned and inserted in a straight line. In an embodiment of the disclosure, the linear guiding structure includes a protrusion (not shown) arranged on an inner wall of the inserting sleeve and a corresponding groove (not shown) arranged on an outside of the inserting rod. The groove and the protrusion are correspondingly matched and extend in a straight line. However, in another embodiment of the disclosure, the linear guiding structure includes a protrusion arranged on an outer wall of the inserting rod and a corresponding groove arranged on an inner wall of the inserting sleeve. The groove and the protrusion are correspondingly matched and extend in a straight line. The linear guiding structure facilitates a quick positioning between the supporting body 730 and the bracket base 520, and between the supporting body 730 and the fixed base 710, and ensure a tight locking of the locking buckle.

[00247] Please refer to FIG. 1 through FIG. 61. In the disclosure, the supporting body 730 may be any suitable structure which can mount the vacuum cleaner holder 740 and stably

support the entire vacuum cleaner 6. In one embodiment of the disclosure, the supporting body 730 is a non-stretchable rod-shaped structure, and in another embodiment of the disclosure, the supporting body 730 is a lockable and stretchable rod. The stretchable rod may be extended or shortened as required, which is not only convenient to use, but also saves storage or transportation space. It should be noted that the stretchable rod in the disclosure may be any suitable stretchable rod structure that may be stretchable and used for locking, and can be purchased through general commercial means, which will not be repeated here.

[00248] Please refer to FIG. 65 and FIG. 66. The shape and structure of the bracket base 710 in the disclosure are not limited, and as long as it has sufficient weight and may be stably placed on the ground, the bracket base 710 may be of various structures. In an embodiment of the disclosure, in order to increase a stability of the storage device, the bracket base 710 includes a mounting plate 711, a base housing 712 and a counterweight block 714. The counterweight block 714 is mounted on the mounting plate 711 and is located in a cavity defined by the base housing 712 and the mounting plate 711. In an embodiment of the disclosure, the bracket base is disc-shaped. The disc-shaped bracket base may reduce a risk of bumping the operator's feet from the bracket base to a certain extent. As long as it can be stably supported, a mounting position of the supporting body 730 on the bracket base is not limited. In some embodiments, the supporting body 730 is mounted on a side of a central axis of the bracket base 710, and an extension line of a center of gravity of the vacuum cleaner 6 along the vertical direction when the vacuum cleaner 6 is hung coincides with the central axis of the bracket base 710. Such an arrangement can increase a supporting stability of the storage device, and may prevent instability caused by the vacuum cleaner 6 being raised too high.

[00249] Please refer to FIG. 66. The structure of the supporting structure on the bracket base 710 of the disclosure is not limited. For example, it may be a plane arranged on the bracket base 710, or a protrusion that is integrated with the bracket base 710 and protrudes to a side surface of the bracket base 710 away from the supporting body 730, or may be an independent leg, and may be mounted on the bracket base through a detachable mounting method. In some embodiments, the supporting structure is at least three legs 715 arranged on a side of the bracket base away from the vacuum cleaner holder 740, and the at least three legs 715 are evenly distributed along a circumference and protruding heights thereof are adjustable. The adjustable legs 715 may adjust the height at which the feet 715 extend according to a flatness of the ground, so as to ensure a stability of the bracket. In other

embodiments, the legs 715 may be lockable rollers. When the rollers are unlocked, the storage device 7 of the vacuum cleaner may be pushed to move, and the rollers may be locked after moving in place to ensure a stability of the storage device 7 of the vacuum cleaner. It should be noted that such the lockable roller may be purchased through general commercial means, and details are not described herein again.

[00250] Please refer to FIG. 1. In an embodiment of the disclosure, the supporting body 730 is a non-stretchable rod-shaped structure. In order to ensure that after various types of cleaning heads are mounted, the vacuum cleaner 6 may still be hung on the vacuum cleaner holder 740. A distance from the suspension supporting structure 741 on the vacuum cleaner holder 740 to an upper surface of the bracket base is greater than a maximum body length of the vacuum cleaner 6.

[00251] Please refer to FIG. 40 and FIG. 41. In this embodiment, when a dirt suction system is hung on a vertical wall, the bottom of the charging device 1 (or the vacuum cleaner bracket 740) may be provided with the first accessory clip 770 for placing different assembled brush heads, cleaning brushes and suction nozzles, so as to facilitate a replacement of the floor brushes of the vacuum cleaner 6 and adapt to different usage situations. The first accessory clip 770 is provided with the third bracket connecting structure 7710, and the first accessory clip 770 is connected with the charging device 1 through the third bracket connecting structure 7710, so as to realize a mounting of the first accessory clip 770 on the charging device. The first accessory clip 770 may accommodate many different types of cleaning heads. In the disclosure, the first accessory clip 770 may be any suitable structure which can store and hang various cleaning heads of the vacuum cleaner. In an embodiment of the disclosure, the accessory clip is provided with at least two accessory connectors. In an embodiment of the disclosure, the two accessory connectors are a first accessory connector 7701 and a second accessory connector 7702. After the first accessory clip 770 is mounted to the bottom of the charging device 1, the two accessory connectors are symmetrically arranged on both sides of the charging device 1. In this way, when the vacuum cleaner 6 is hung, a storage of the accessory connectors on both sides is not affected.

[00252] Please refer to FIG. 42. When the dirt suction system is connected with the fixed base through the locking structure, the first accessory clip 770 may be removed and replaced with the fixed base, so as to fix the dirt suction system on the fixed base. Please refer to FIG. 61, FIG. 62 and FIG. 42. In an embodiment of the disclosure, the storage device 7 of the vacuum cleaner (on the fixed base) is further provided with a second

accessory clip 720. The second accessory clip 720 is detachably mounted on the supporting body 730, and at least one accessory connector is arranged on the second accessory clip 720. In an embodiment of the disclosure, the second accessory clip 720 includes two accessory connectors, which are a first accessory connecting head 724 and a second accessory connecting head 725, respectively. The two accessory connecting heads are coaxially arranged and face away from each other, one faces the ground and the other faces away from the ground. Axes of the two connecting heads are parallel to the extending direction of the supporting body 730. It should be noted that the two connecting heads have the same structure as ports of the vacuum cleaner 6 and are interchangeable. The connecting head are used to mount other types of suction heads of the vacuum cleaner 6. The form of the connecting head may be the one commonly used in the conventional vacuum cleaner 6, which will not be repeated here.

[00253] Please refer to FIG. 42. In an embodiment, the second accessory clip 720 includes a first elastic clamping component 721 and a second elastic clamping component 722 arranged opposite to each other, and a connecting body 723 connecting the first elastic clamping component 721 and the second elastic clamping component 722. The first elastic clamping component 721, the second elastic clamping component 722 and the connecting body 723 define a circle that can be clamped on the fixed base. A clamping curved surface 726 is arranged at a position where the first elastic clamping component 721, the second elastic clamping component 722 and the connecting body 723 are in contact with the supporting body 730. The clamping curved surface 726 matches a shape of a surface of a connecting part of the fixed base corresponding to the clamping position.

[00254] Please refer to FIG. 41 and FIG. 63. In an embodiment of the disclosure, the third bracket connecting structure 7710 on the first accessory clip 770 has the same structure as the second bracket connecting structure 5210 on the fixed base 520. When the fixed base 520 is removed, the third bracket connecting structure 7710 may be interchangeably mounted to the first bracket connecting structure 7420 at the bottom of the vacuum cleaner holder 740.

[00255] The disclosure may charge various electronic devices through the charging device 1. In an embodiment of the disclosure, the electronic device is, for example, a common mobile phone, pad or notebook computer. When charging, a small mobile phone may be placed in the accommodating groove 134 (the pad or notebook computer is placed on a side of the charging device 1), and the charging port of the mobile phone or pad may be connected with the first terminal 203 through a data cable to charge the electronic devices

such as mobile phones or pads.

[00256] Please refer to FIG. 35, FIG. 72 and FIG. 73. In an embodiment of the disclosure, the electronic device is, for example, the battery pack 3. The battery pack 3 of the disclosure has three ports, a first port 31, a second port 32 and a third port 33. The first port 31 and the second port 32 are type-c and/or USB ports, and the first terminal 203 and/or the second terminal 204 may charge or discharge the battery pack 3 through the first port 31 and the second port 32. The output part 205 is matched with the third port 33, and may charge or discharge the battery pack 3 through the third port 33. In addition, a convex part 34 is arranged on a top surface of the battery pack 3, sliding grooves 35 are arranged on both sides of the convex part 34, and the two sliding grooves 35 are arranged in parallel. The third port 33 is arranged at an end of the convex part 34 and is located between the sliding grooves 35 on both sides of the convex part 34.

[00257] Please refer to FIG. 72 through FIG. 77. The disclosure provides the battery pack 3 which may be mounted on the vacuum cleaner to supply power for the vacuum cleaner. Each port arranged on the battery pack 3, including the first port 31, the second port 32 and the third port 33, may be charged independently. The first port 31 and the second port 32 may be charged at the same time. The third port 33 and the first port 31 may be charged at the same time. The third port 33 and the second port 32 may be charged at the same time.

[00258] Please refer to FIG. 6, FIG. 8, FIG. 9, FIG. 34, FIG. 72 and FIG. 73. The battery pack 3 is clamped with the first housing 110, the sliding groove 35 is clamped with the guiding rail 116, and the output part 205 is connected with the third port 33 to charge or discharge the battery pack 3. At this time, the first port 31 or the second port 32 of the battery pack 3 may further be connected with the first terminal 203 and/or the second terminal 204 through a data cable, so as to quickly charge or discharge the battery pack 3. Please refer to FIG. 35, the battery pack 3 may further be clamped onto the accommodating groove 134, and the first terminal 203 and/or the second terminal 204 are connected with the first port 31 and/or the second port 32 through a data cable to charge or discharge the battery pack 3.

[00259] Please refer to FIG. 72 through FIG. 77. In order to ensure that the battery pack 3 is clamped with the charging device 1, sizes of the sliding groove 35 on the battery pack and the guiding rail 116 on the charging device 1 are limited. A distance A2 between inner guiding rails of the two parallel guiding rails 116 is matched with an inner sliding groove width D1 of the sliding groove 35, and the inner sliding groove width D1 of the sliding groove 35 is slightly less than the distance A2 between the inner rails of the guiding rails

116. In this embodiment, a range of the inner sliding groove width D1 of the sliding groove 35 is, for example, from 45.8mm to 46mm, and a range of the distance A2 between the inner rails of the guiding rails 116 is, for example, from 46.75mm to 47mm. A distance B2 between outer guiding rails of the two parallel guiding rails 116 is matched with an outer sliding groove width C1 of the sliding groove 35, and the outer sliding groove width C1 of the sliding groove 35 is slightly less than the distance B2 between the outer guiding rails of the guiding rails 116. In this embodiment, the distance B2 between the outer guiding rails of the guiding rails 116 ranges from 55.9mm to 56.1mm, for example, and the outer sliding groove width C1 of the sliding groove 35 ranges from 56.8mm to 56mm, for example. An inner guiding rail thickness D2 of the guiding rail 116 is matched with an inner sliding groove height A1 of the sliding groove 35, and the inner guiding rail thickness D2 of the guiding rail 116 is slightly greater than the inner sliding groove height A1 of the sliding groove 35. In this embodiment, a range of the inner guiding rail thickness D2 of the guiding rail 116 is, for example, from 5.8mm to 6mm, and a range of the inner sliding groove height A1 of the sliding groove 35 is, for example, from 4.85mm to 5.15mm. An outer guiding rail thickness E2 of the guiding rail 116 is matched with an outer sliding groove height B1 of the sliding groove 35, and the outer guiding rail thickness E2 of the guiding rail 116 is slightly greater than the outer sliding groove height B1 of the sliding groove 35. In this embodiment, the outer guiding rail thickness E2 of the guiding rail 116 ranges from 11.85mm to 12.15mm, for example, and the outer sliding groove height B1 of the sliding groove 35 ranges from 10.9mm to 10.1mm, for example.

[00260] Please refer to FIG. 72 through FIG. 77. In this embodiment, a thickness C2 of the sliding part 301 on the charging device 1 is further defined, and the thickness C2 of the sliding part 301 ranges from, for example, 9mm to 11mm. A distance E1 from the sliding groove 35 to a front end of the battery pack 3 is defined, and a range of the distance E1 from the sliding groove 35 to the front end of the battery pack 3 is, for example, from 23mm to 23.2mm. And a distance F1 from an end of the sliding groove 35 to the other end of the sliding groove 35 is defined, the distance F1 from the end to the other end of the sliding groove 35 ranges from, for example, 73mm to 73.2mm.

[00261] Please refer to FIG. 39 and FIG. 43. A battery pack 50 includes a battery pack housing 501 and an inserting part 5101 arranged on a side of the battery pack housing 501. A side of the battery pack 50 close to the handle 612 is provided with the inserting part 5101 which is matched with the opening groove 6131. The inserting part 5101 of the battery pack 50 may be inserted into the opening groove 6131 from an open end of the opening

groove 6131 along the first direction, and the opening groove 6131 at least partially wraps the inserting part 5101 to prevent the inserting part 5101 of the battery pack 50 from coming out of the opening groove 6131 from an orientation other than the opening of the opening groove 6131, so as to ensure a stability of the battery pack 50.

[00262] Please refer to FIG. 39 and FIG. 43. Sliding rails 5102 are arranged on both sides of the inserting part 5101. The sliding rails 5102 are used for connecting with the machine body 611 of the vacuum cleaner. The battery pack housing 501 includes an upper housing 5011 and a lower housing 5012. The upper housing 5011 is connected with the lower housing 5012, and the inserting part 5101 is arranged on a top surface of the upper housing 5011. The sliding rails 5102 are arranged on both sides of the inserting part 5101. A terminal port 5131 is arranged at an end of the inserting part 5101 on a top surface of the battery pack housing 501, and the terminal port 5131 is located between the sliding rails 5102 on both sides of the inserting part 5101.

[00263] Please refer to FIG. 43 through FIG. 46. The upper housing 5011 of the battery pack housing 501 is provided with a limiting component mounting groove 5112. A limiting component 5111 is mounted in the limiting component mounting groove 5112 and sealed by a mounting groove cover 5121, and the limiting component 5111 is used to allow the battery pack 50 to be easily detached when the battery pack 50 is inserted and removed. In this embodiment, the inserting part 5101 is located on the upper housing 5011, and the terminal port 5131 is mounted on a top of the battery pack housing 501. The terminal port 5131 is located at an end of the inserting part 5101 and between the sliding rails 5102 on both sides of the insertion part 5101.

[00264] Please refer to FIG. 39, FIG. 44, FIG. 47 through FIG. 49. The limiting component 5111 includes a limiting pressing part 6111 and a limiting column 6112. The limiting pressing part 6111 and the limiting column 6112 are integrally formed, and the limiting pressing part 6111 is used for the operator to operate to release a lock between the battery pack 50 and the machine body 611 of the vacuum cleaner 1. A limiting groove 133 is arranged in the opening groove 6131 of the base 613, and the limiting column 6112 is matched with the limiting groove 133. When the battery pack 50 is inserted into the base 613, the limiting column 6112 extends into the limiting groove 133. The limiting column 6112 and the limiting groove 133 are matched with each other to limit the battery pack 50 to come out from the opening groove 6131 of the base 13 along an insertion direction. The limiting column 6112 is used to realize a fixed connection between the limiting component 5111 and the machine body 611 of the vacuum cleaner 1. In addition, in this embodiment,

two ends of the bottom of the limiting component 5111 are provided with a spring mounting column 6113 and a guiding sleeve 6114. A limiting spring is mounted on the spring mounting column 6113. A bottom end of the limiting spring abuts on the limiting component mounting groove 5112 of the upper housing 5011 in order to reset the limiting component 5111. The guiding sleeve 6114 is sleeved on a guiding column 6116 on the limiting component mounting groove 5112, and plays a guiding role in a process of the limiting component 5111 being pressed down and raised.

[00265] Please refer to FIG. 50 through FIG. 53. In this embodiment, the battery pack 50 includes a first circuit board 5103, a cell bracket 504, a plurality of cell assemblies and a plurality of power input and output ports. The cell assembly and the first circuit board 5103 are housed in a housing space defined by an assembly of the upper housing 5011 and the lower housing 5012. The cell assembly includes a plurality of cells, and the plurality of the cells are mounted in the cell bracket 504. The cell bracket 504 is located in the battery housing 501, and the cells are connected with each other by electrode sheets 5141. The first circuit board 5103 and the cell are also connected through the electrode sheet 5141, and the first circuit board 5103 is located above the cell bracket 504. The power input or output ports are connected with the first circuit board 5103. The power input or output ports may be used as a port for providing external power, such as charging mobile phones, notebook computers and other electronic devices. In this embodiment, the power input or output ports are Type-C ports.

[00266] Please refer to FIG. 49 and FIG. 50. In this embodiment, the battery pack housing 501 is provided with an inserting port 6115. The battery pack 50 further includes a Type-C port mounted in the battery pack housing 501 and partially located in the inserting port 6115. The Type-C port is connected with the first circuit board 5103 to realize an electrical connection between the cell and the Type-C port, so as to facilitate a use of the Type-C port to realize a power output or input of the cell assembly.

[00267] Please refer to FIG. 49 through FIG. 51. In this embodiment, the power input or output ports include at least a first Type-C port 122a and a second Type-C port 122b. Ends of the first Type-C port 122a and the second Type-C port 122b are mounted on the first circuit board 5103, and the other ends of the first Type-C port 122a and the second Type-C port 122b are located in the inserting port 6115 on the battery pack housing 501. In this embodiment, the first circuit board 5103, the cell bracket 504 and the cell assembly are all located in the battery pack housing 501.

[00268] Please refer to FIG. 53 and FIG. 54. In this embodiment, the first Type-C port 122a

and the second Type-C port 122b are located on the same side or both sides of the battery pack housing 501. When the first Type-C port 122a and the second Type-C port 122b are located on both sides of the battery pack housing 501, the two are arranged symmetrically. They may also be arranged asymmetrically, and in some embodiments, the Type-C ports are arranged approximately flush with the circuit board in a height direction, and a distance L1 between the two Type-C ports ranges from 0mm to 140mm. In this embodiment, the first Type-C port 122a and the second Type-C port 122b are substantially flush with the first circuit board 5103 in the height direction. When the battery pack 50 is used on the vacuum cleaner 1, the two Type-C ports may also supply power for an external device at the same time, or may supply power for the external device through the two Type-C ports separately. When the two Type-C ports are located on the same side of the battery pack case, a distance L2 between the two Type-C ports ranges from 0mm to 160mm.

[00269] Please refer to FIG. 54 and FIG. 55. In some embodiments, the first Type-C port 122a and the second Type-C port 122b are located on both sides or the same side of the inserting part 5101. The first Type-C port 122a and the second Type-C port 122b are located at the sliding rails 5102, so that when the battery pack 50 is used on the vacuum cleaner 1, the first Type-C port 122a and the second Type-C port 122b are completely blocked, and foreign objects generated when the vacuum cleaner 1 is used may be prevented from entering the battery pack 50.

[00270] Please refer to FIG. 55 and FIG. 56. In some embodiments, the first Type-C port 122a and the second Type-C port 122b are located at the terminal port 5131 and are arranged longitudinally. When the battery pack 50 is used on the vacuum cleaner 1, the first Type-C port 122a and the second Type-C port 122b are completely blocked, and the foreign objects generated when the vacuum cleaner 1 is used may be prevented from entering the battery pack 50. A height L3 from the top surface of the battery pack 50 to a bottom surface of the sliding rail 5102 ranges from 0mm to 30mm, for example 11.85mm. The two Type-C ports are located between the top surface of the battery pack 50 and the bottom surface of the sliding rail 5102.

[00271] Please refer to FIG. 57 and FIG. 58. In some embodiments, the first Type-C port 122a and the second Type-C port 122b are located on a top surface of the inserting part 5101 and are arranged side by side. When the battery pack 50 is used on the vacuum cleaner 1, the first Type-C port 122a and the second Type-C port 122b are completely blocked, and the foreign objects generated when the vacuum cleaner 1 is used may be

prevented from entering the battery pack 50. Or one of the Type-C ports is on the top surface of the inserting part 5101 and the other on a side surface of the inserting part 5101.

[00272] Please refer to FIG. 39, FIG. 43 and FIG. 51. In this embodiment, a first power supply terminal 5132 is further integrated on the first circuit board 5103. The first power supply terminal 5132 is further connected with the cell assembly through the first circuit board 5103. The terminal port 5131 is opened at an end of the inserting part 5101 on the top surface of the battery pack housing 501, and the first power supply terminal 5132 is arranged in the terminal port 5131. Arrangements of the first power supply terminal 5132 and the terminal port 5131 enable the battery pack 50 of the disclosure to be placed in the opening groove 6131 of the base 613 of the vacuum cleaner 1 and connected with the vacuum cleaner 1 to supply power for the vacuum cleaner 1. When the guiding grooves 6132 on the base 613 of the vacuum cleaner 1 are assembled with the sliding rails 5102, the vacuum cleaner 1 and the battery pack 50 are assembled together. The terminal port 5131 is connected with the base 613 of the vacuum cleaner 1 to supply power for the vacuum cleaner 1. In addition, in this embodiment, the limiting component 5111 is mounted on the upper housing 5011. The limiting component 5111 is mounted on a side of the upper housing 5011 away from the terminal port 5131, and is used for locking when the battery pack 50 is connected with the machine body of the vacuum cleaner 1, so as to prevent the battery pack 50 from falling off the vacuum cleaner 1.

[00273] Please refer to FIG. 50. In this embodiment, the first circuit board 5103 is integrated with the first power supply terminal 5132, a first power supply system and a second power supply system. The first power supply system is connected with the first power supply terminal 5132, and the second power supply system is connected with the first Type-C port 122a and/or the second Type-C port 122b, so that a first power supply circuit and a second power supply circuit are defined in the battery pack 50.

[00274] Please refer to FIG. 59 and FIG. 60. In this embodiment, an end of the power input or output port is connected with a connection line 5001, and the other end of the connection line 5001 is connected with a charger or a power device.

[00275] Please refer to FIG. 59 and FIG. 60. In this embodiment, the charger includes a charger housing 720, a charging port and a second power supply terminal 7122. The charging port and the second power supply terminal 7122 are located on different sides of the charger housing 720, for example, on opposite sides of the charger housing 720. A second circuit board is mounted in the charger housing 720. An end of the charging port is connected with the second circuit board, and the other end of the charging port is located in

a through hole on a side surface of the charger housing 720 to be connected with the battery pack 50 through a connecting wire. The second power supply terminal 7122 is connected with the second circuit board, and the second power supply terminal 7122 is used to connect an external power supply. In this embodiment, the charging port is a third Type-C port 7121. An AC-DC module, a control module and a protocol module, and a DC-DC module may be integrated on the second circuit board. The AC-DC module is connected with the DC-DC module, the DC-DC module is connected with the charging port, and the control module and protocol module are respectively connected with the DC-DC module and the charging port. The charging port includes a plurality of Type-C ports, and each Type-C port is connected with the DC-DC module, and the control module and protocol module are respectively connected with each of the DC-DC modules and each of the Type-C ports. The AC-DC module is used to convert alternating current to direct current. The DC-DC module is used to provide an appropriate charging voltage according to a control signal. The control module and protocol module are used to control the entire charging system, and used for a protocol analysis and charging control of each Type-C port. The charging port is connected with the battery pack 50 to charge the battery pack 50.

[00276] Please refer to FIG. 59 and FIG. 60. In this embodiment, when the charger housing 720 is provided with the third Type-C port 7121, the battery pack 50 is connected with the third Type-C ports 7121 of two chargers respectively through the first Type-C port 122a and the second Type-C port 122b. In this embodiment, when the charger housing 720 is provided with two Type-C ports 7121 and the two ports are the third Type-C port 7121a and the third Type-C port 7121b, the battery pack 50 is connected with the third Type-C port 7121a and the third Type-C port 7121b on the same charger respectively through the first Type-C port 122a and the second Type-C port 122b. In some other embodiments, the charger may further charge different battery packs 50 with different charging ports.

[00277] In summary, the vacuum cleaner 1, the battery pack 50 and the machine body 611 of the vacuum cleaner 1 of the disclosure may be easily and quickly mounted and disassembled, and the stability of the battery pack 50 may be ensured. When charging the battery pack 50, the battery pack 50 may be charged together with the entire vacuum cleaner 1, or the battery pack 50 may be charged independently, and there is no need to limit the charging position of the vacuum cleaner 1. The battery pack 50 of the disclosure is provided with at least two Type-C ports so that the battery pack 50 can supply power for the vacuum cleaner 1, and the battery pack 50 may further be charged by connecting two chargers, so as to improve charging efficiency. In addition, by arranging two Type-C ports

on the charger, one charger can charge multiple battery packs 50 at the same time, or one charger may be used to charge the same battery pack 50, so as to improve the charging efficiency.

[00278] In the description of this specification, a description with reference to the terms "this embodiment", "embodiment", "specific embodiment", etc. means that a specific feature, structure, material or characteristic described in connection with this embodiment or example is included in at least one embodiment or example of the disclosure. In this specification, schematic representations of the above terms do not necessarily refer to the same embodiment or example. Furthermore, the particular features, structures, materials or characteristics described may be combined in any suitable manner in any one or more embodiments or examples.

[00279] The embodiments of the disclosure described above are only used to help illustrate the disclosure. The embodiments do not exhaustively describe all the details, nor do they limit the disclosure to the specific embodiments described. Obviously, many modifications and variations are possible according to this specification. The embodiments are specifically described in the specification in order to better explain the principles and practical applications of the disclosure, so that those skilled in the art can well understand and utilize the disclosure. The disclosure is limited only by the claims and their full scope and equivalents.

WHAT IS CLAIMED IS:

1. A vacuum cleaning system, comprising:
a vacuum cleaner, comprising a battery pack and provided with charging contacts; and
a storage device, comprising:
 a vacuum cleaner holder, provided with a first wall mounted connection structure, a first bracket connection structure, and a suspension supporting structure capable of hanging the vacuum cleaner,
 a bracket, one end of the bracket being provided with a bracket base supported by a plane, and the other end of the bracket being provided with a second bracket connection structure, the second bracket connection structure being detachably connected with the first bracket connection structure, and the storage device being a floor device when the second bracket connection structure is connected with the first bracket connection structure, and
 a wall mounted bracket, mounted on a vertical wall and provided with a second wall mounted connection structure detachably connected with the first wall mounted connection structure to hang the vacuum cleaner holder, the storage device being a wall-mounted device when the first wall mounted connection structure is connected with the second wall mounted connection structure, wherein
the charging contacts of the vacuum cleaner are electrically connected with the storage device when the vacuum cleaner is docked with the storage device.
2. The vacuum cleaning system according to claim 1, further comprising a first accessory clip, wherein
a third bracket connection structure is arranged on the first accessory clip, and the third bracket connection structure is interchangeable with the second bracket connection structure to be connected with the first bracket connection structure.
3. The vacuum cleaning system according to claim 1, wherein
the second wall mounted connection structure comprises a slideway and a catch, the first wall mounted connection structure comprises a matching slideway and a clamping matching structure, both the matching slideway and the clamping matching structure are arranged on a side wall of the vacuum cleaner holder, the matching slideway matches with the slideway and allows the slideway to slide within the matching slideway, and the clamping matching structure is matched with the

catch.

4. The vacuum cleaning system according to claim 3, wherein the catch comprises at least a first catch and a second catch, the first catch is arranged on the wall mounted bracket, and the second catch is arranged on a side close to a bottom of the wall mounted bracket.
5. The vacuum cleaning system according to claim 4, wherein the first catch is a movable catch and allowed to be raised and lowered by external force.
6. The vacuum cleaning system according to claim 1, wherein the bracket further comprises a supporting part and a holder base, one end of the supporting part is mounted on the bracket base, the other end of the supporting part extends to a side away from the bracket base, the holder base is arranged on the other end of the supporting part, and the second bracket connection structure is arranged on the holder base.
7. The vacuum cleaning system according to claim 6, wherein the vacuum cleaner holder comprises a charging device, the charging device is mounted on the bracket base through a locking structure, the suspension supporting structure is arranged on the charging device, and a power output terminal of the charging device is electrically connected with a charging port of the vacuum cleaner when the vacuum cleaner is hung on the suspension supporting structure.
8. The vacuum cleaning system according to claim 7, wherein the locking structure comprises a first locking unit and a second locking unit, the first locking unit comprises a locking groove and a plurality of sliding ribs, the second locking unit comprises a locking buckle structure and a plurality of matching sliding ribs, and when the locking buckle structure is inserted into the locking groove, the first locking unit and the second locking unit are locked.
9. The vacuum cleaning system according to claim 7, wherein the charging device comprises a casing, a circuit board and an input part and/or the

output part, the circuit board is arranged in the casing, the input part and/or the output part are arranged a wall of the casing, and the input part and/or the output part are electrically connected with corresponding ports of the circuit board.

10. The vacuum cleaning system according to claim 9, wherein the output part comprises a plurality of output ports capable of providing power to various devices.

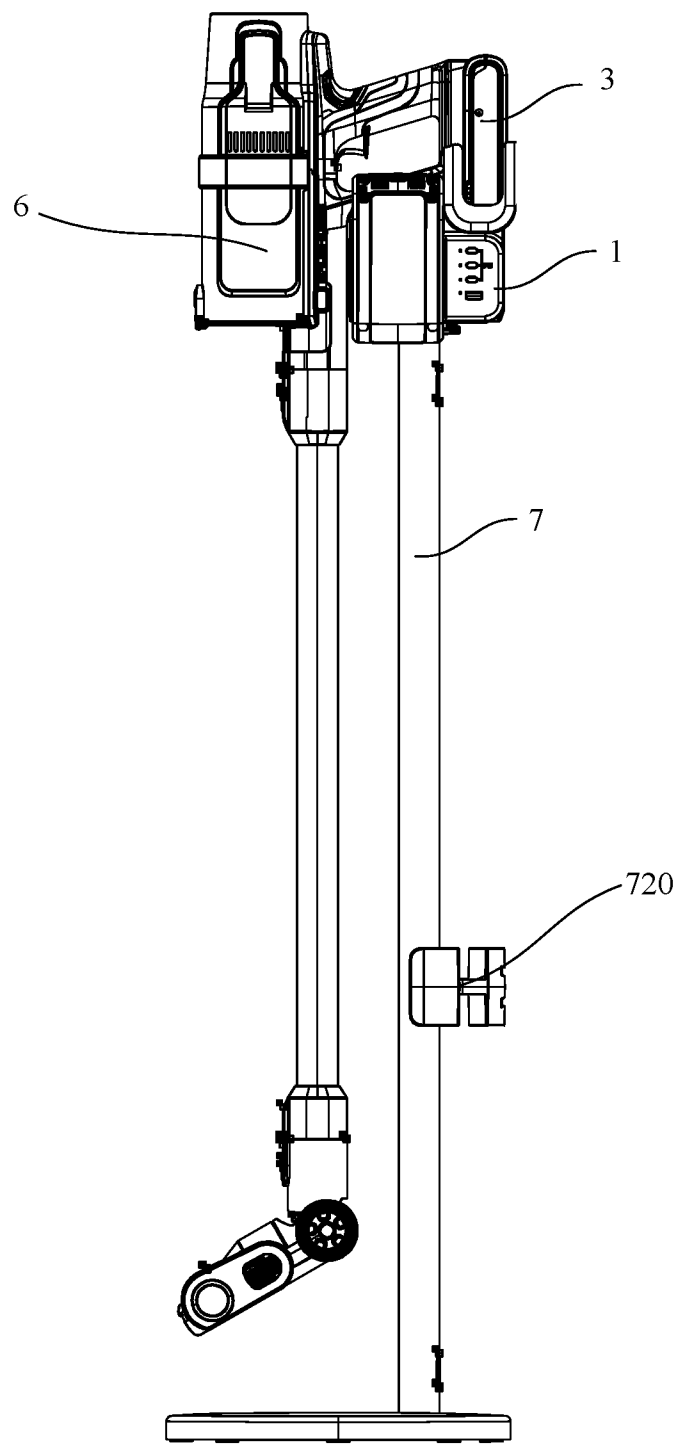


Figure 1

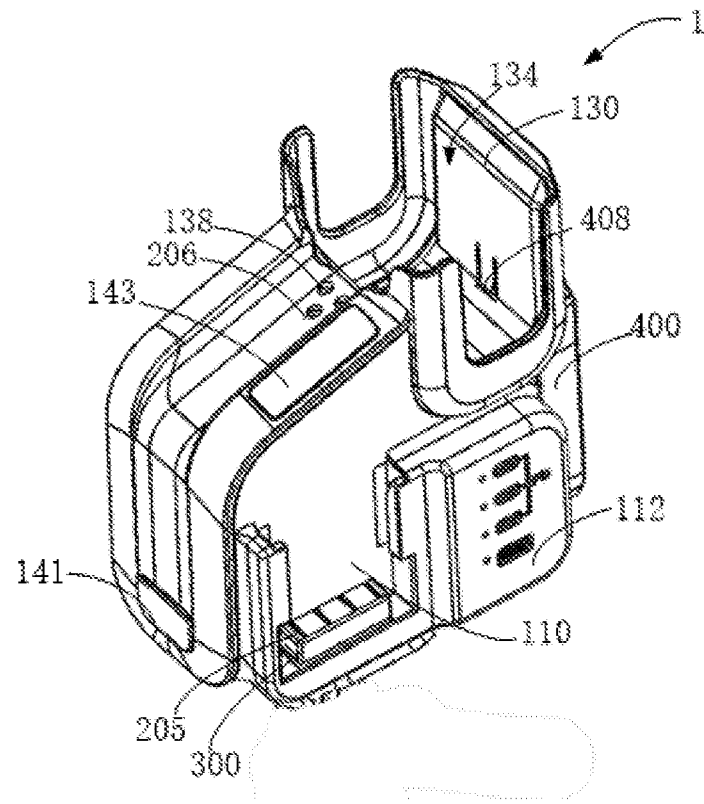


Figure 2

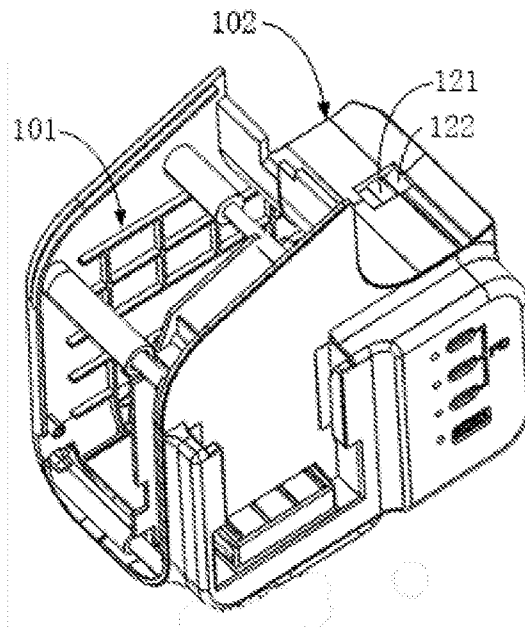


Figure 3

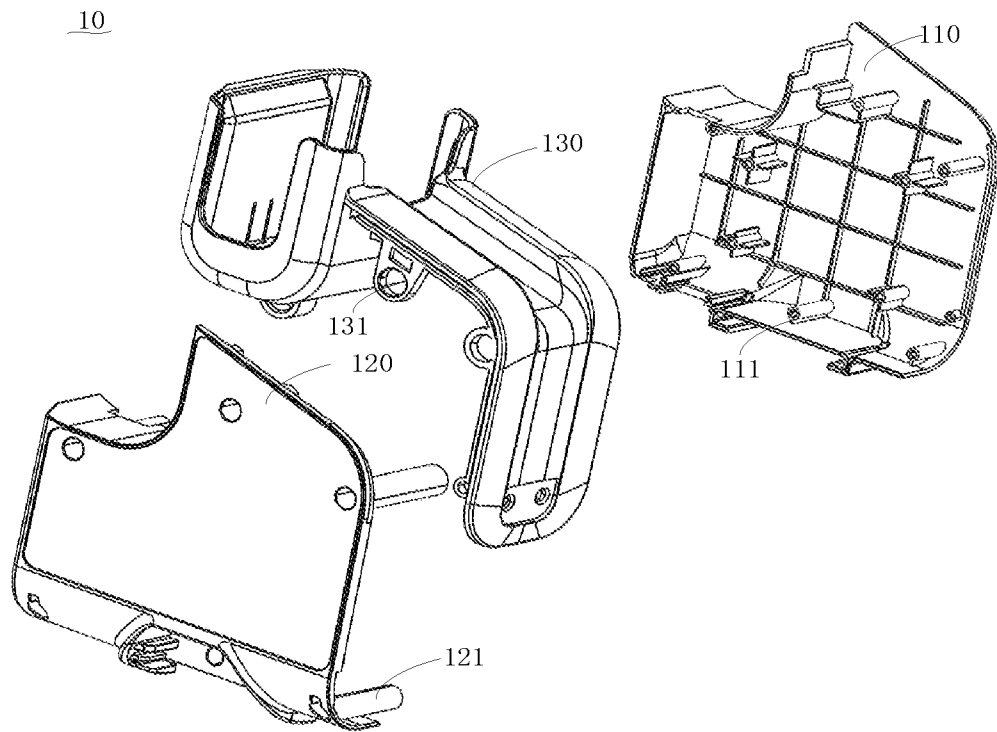


Figure 4

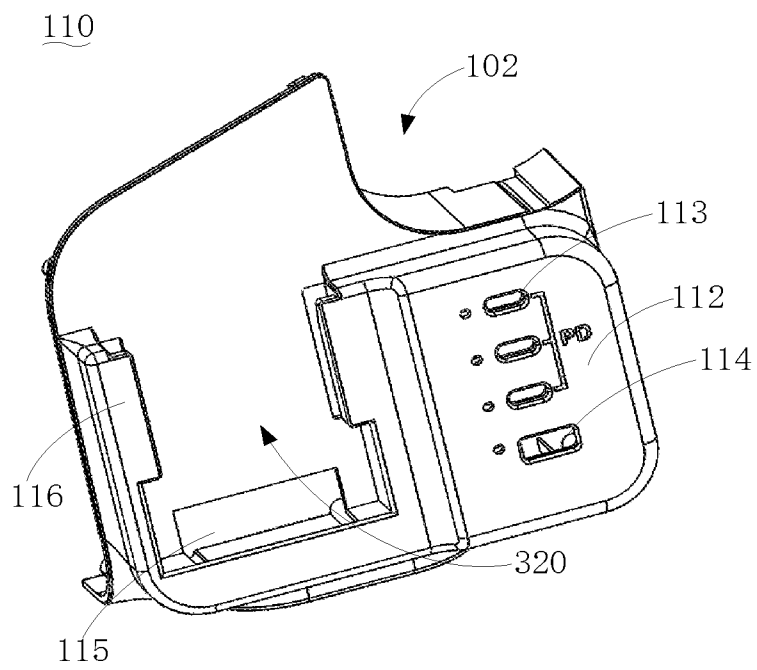


Figure 5

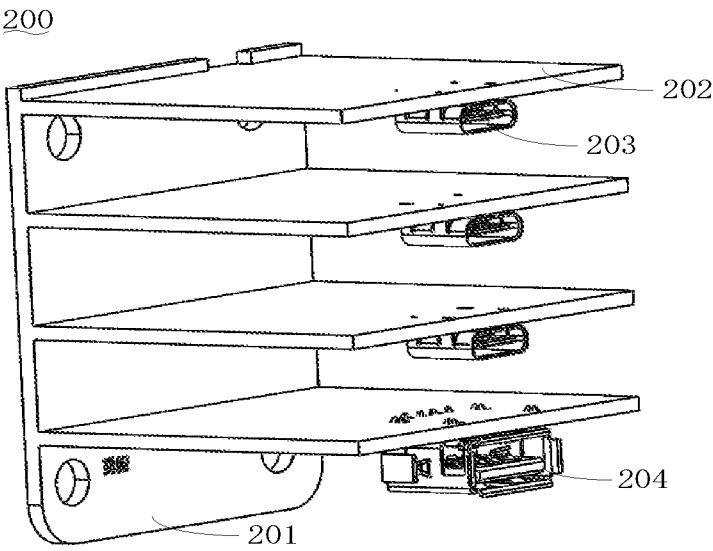


Figure 6

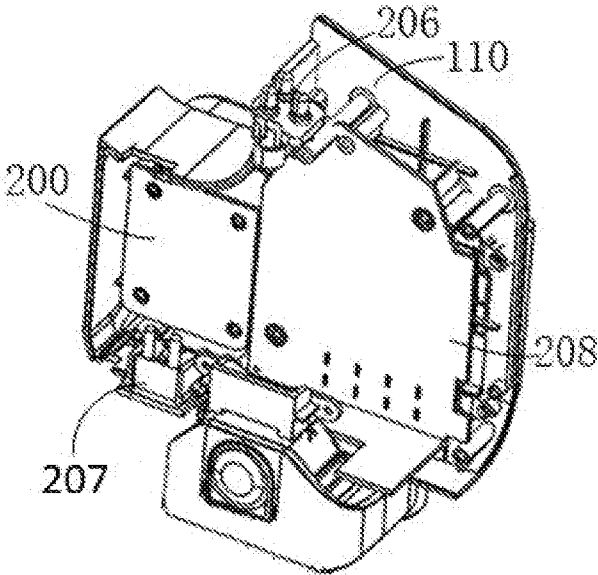


Figure 7

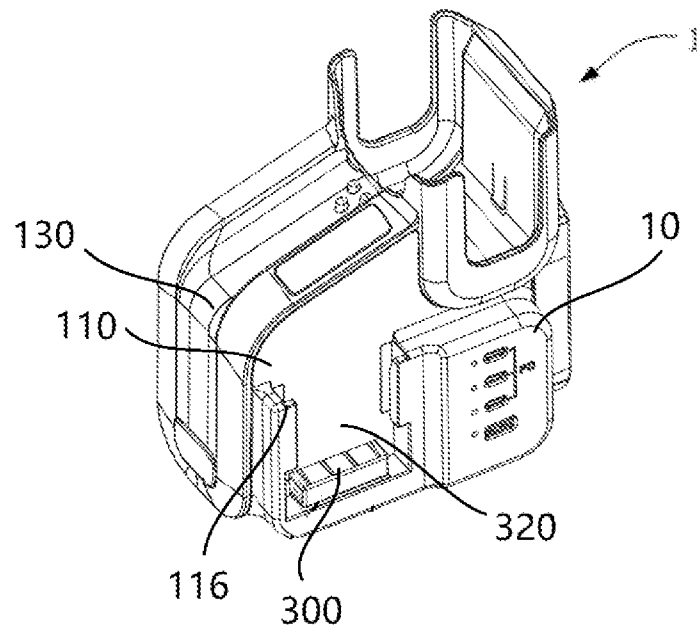


Figure 8

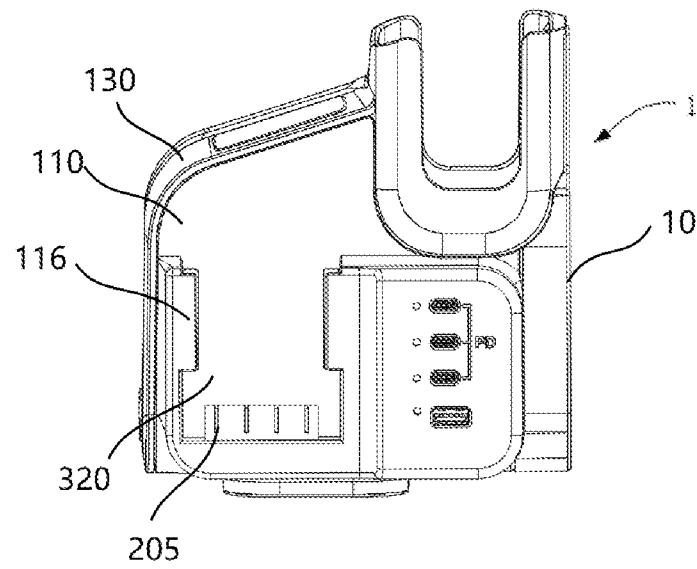


Figure 9

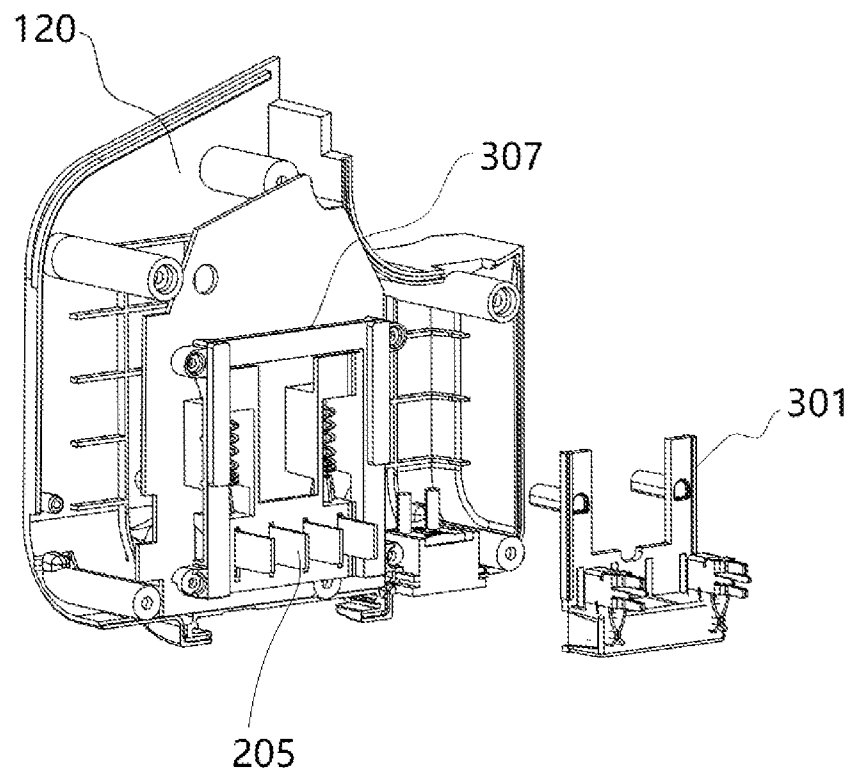


Figure 10

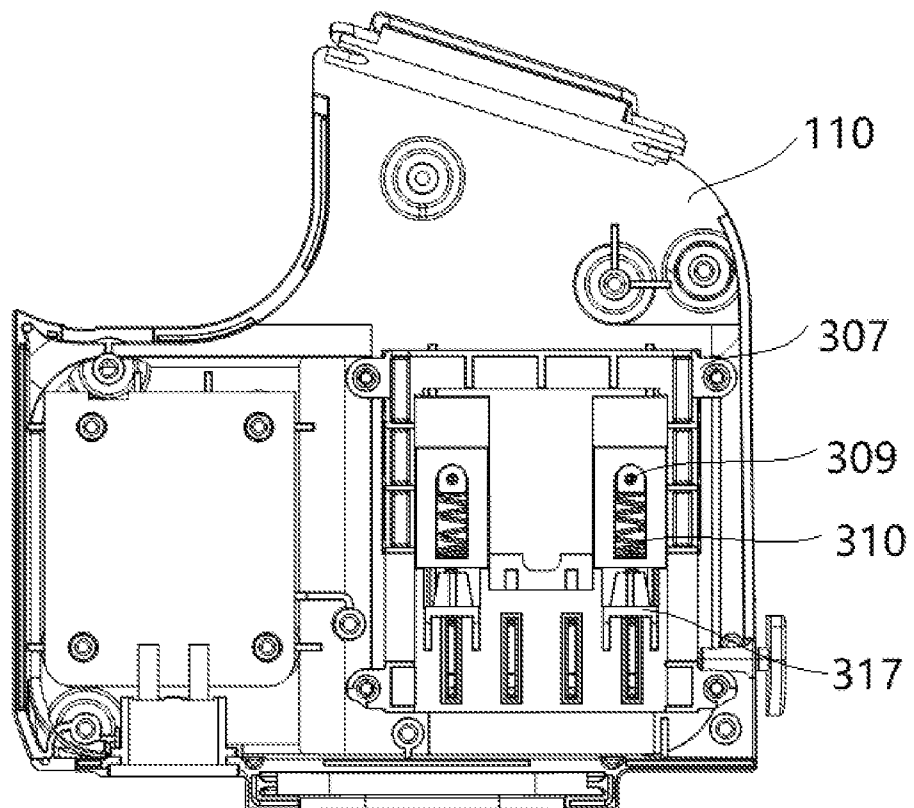


Figure 11

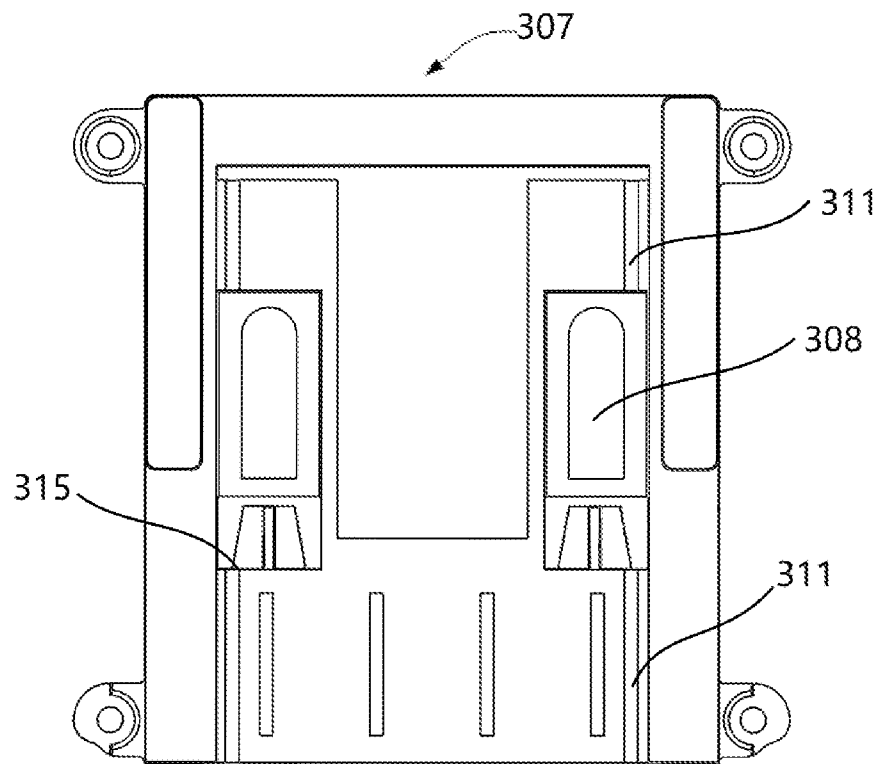


Figure 12

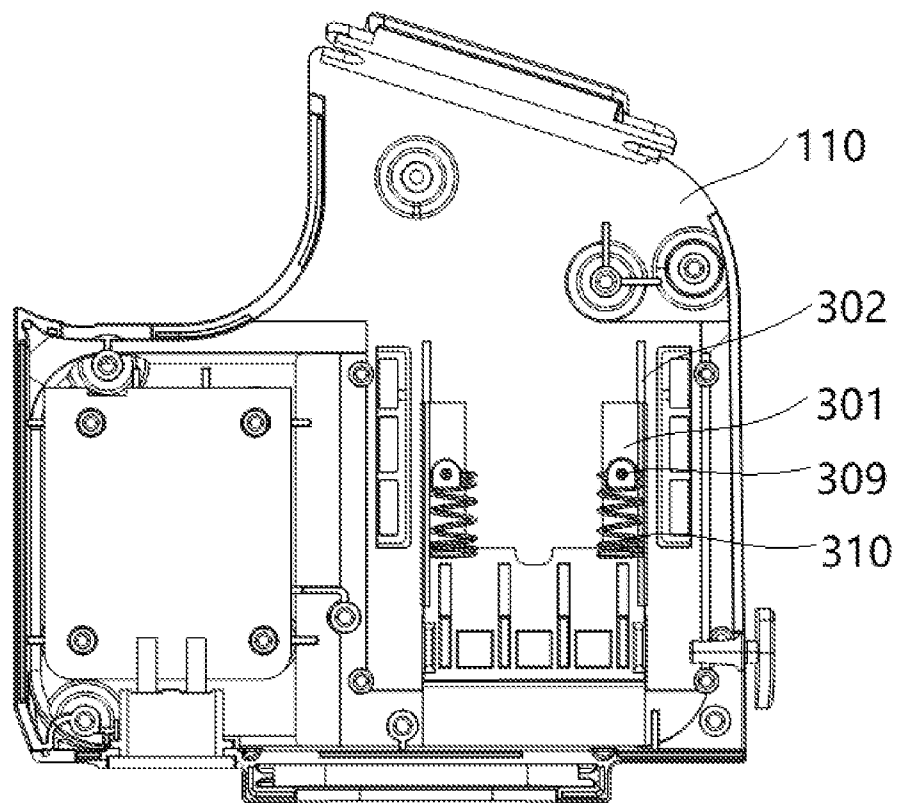


Figure 13

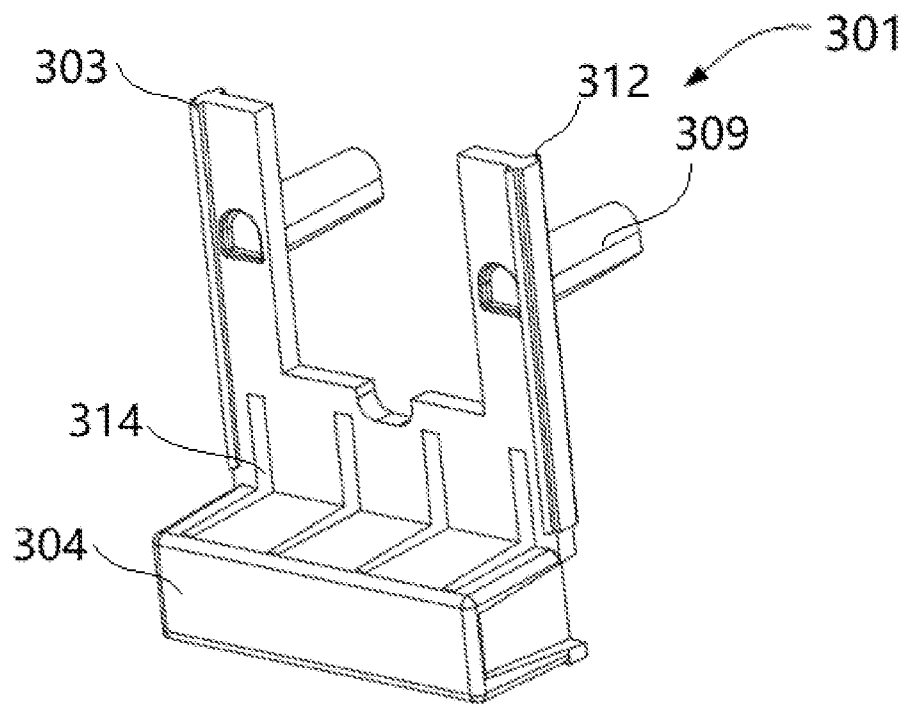


Figure 14

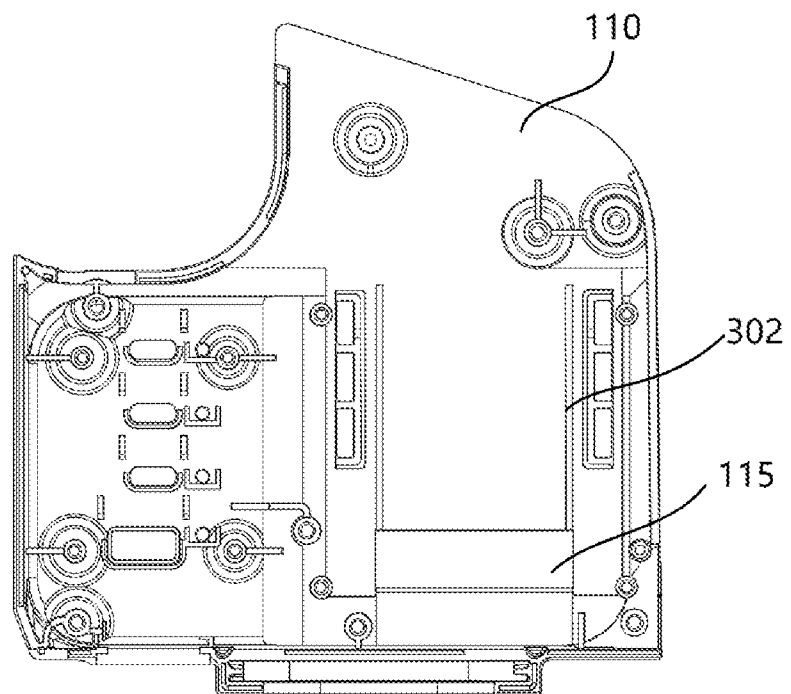


Figure 15

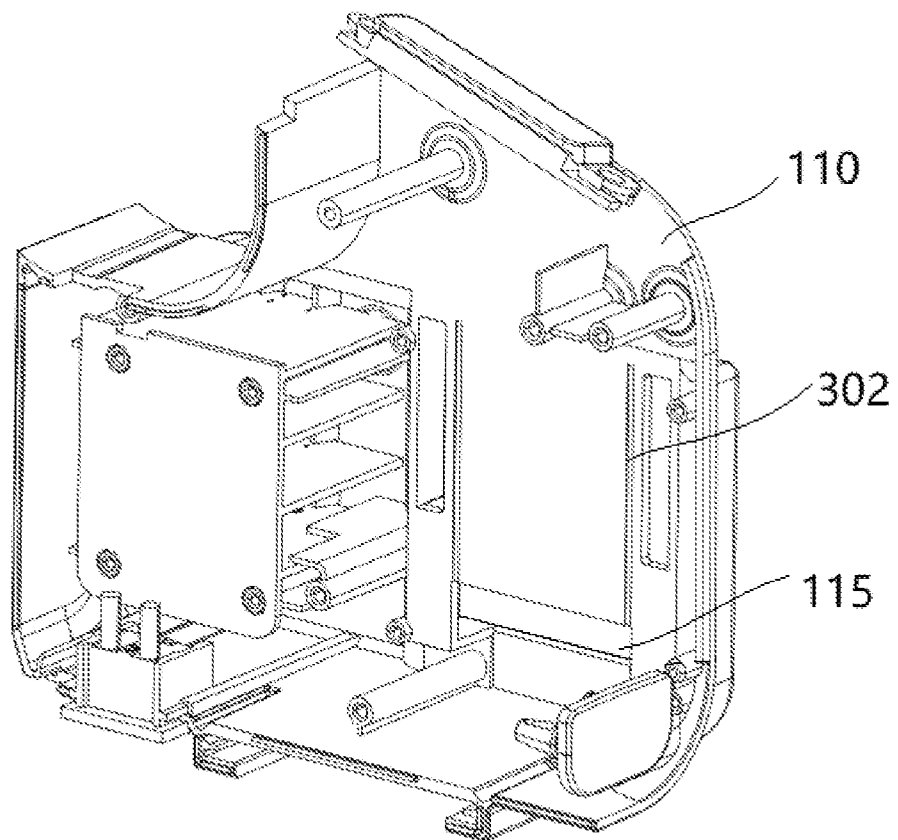


Figure 16

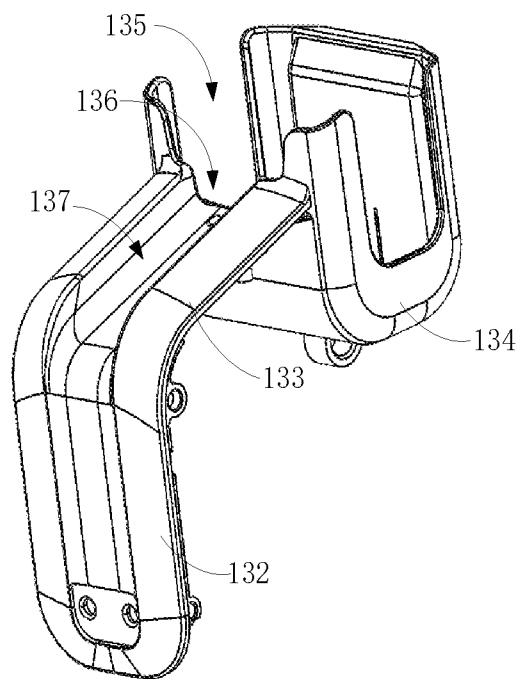


Figure 17

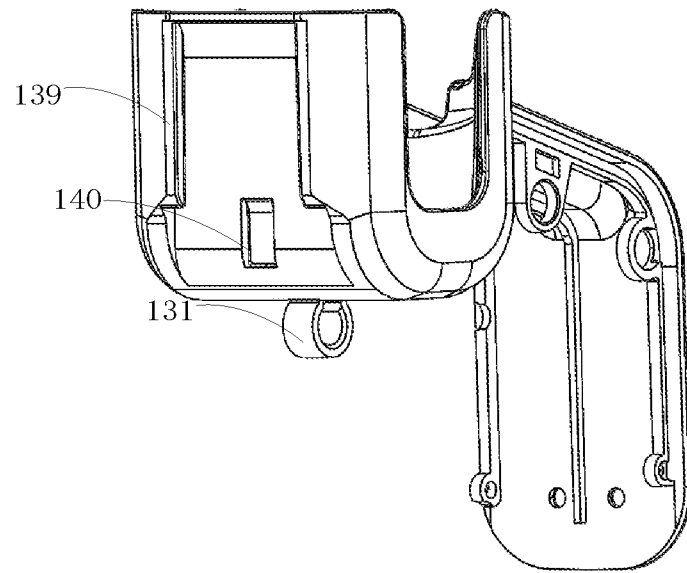


Figure 18

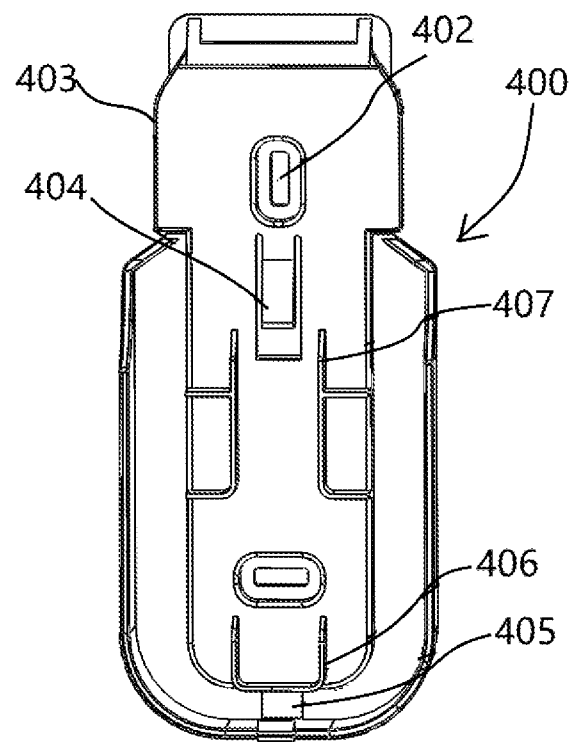


Figure 19

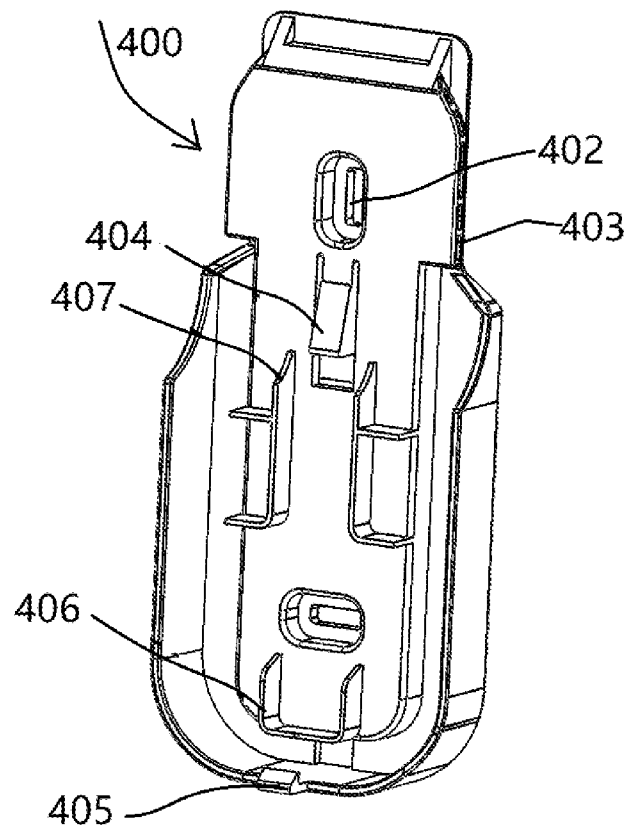


Figure 20

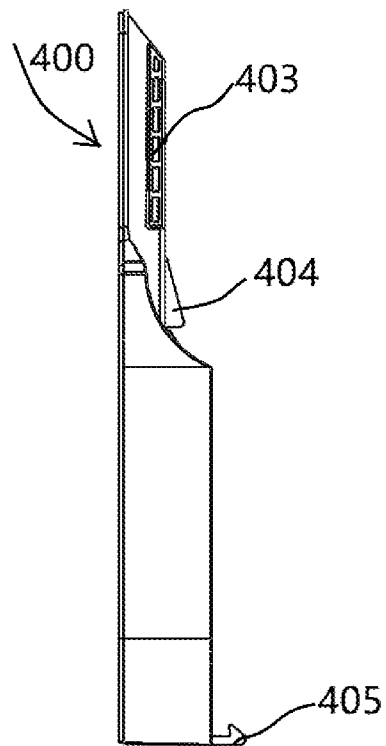


Figure 21

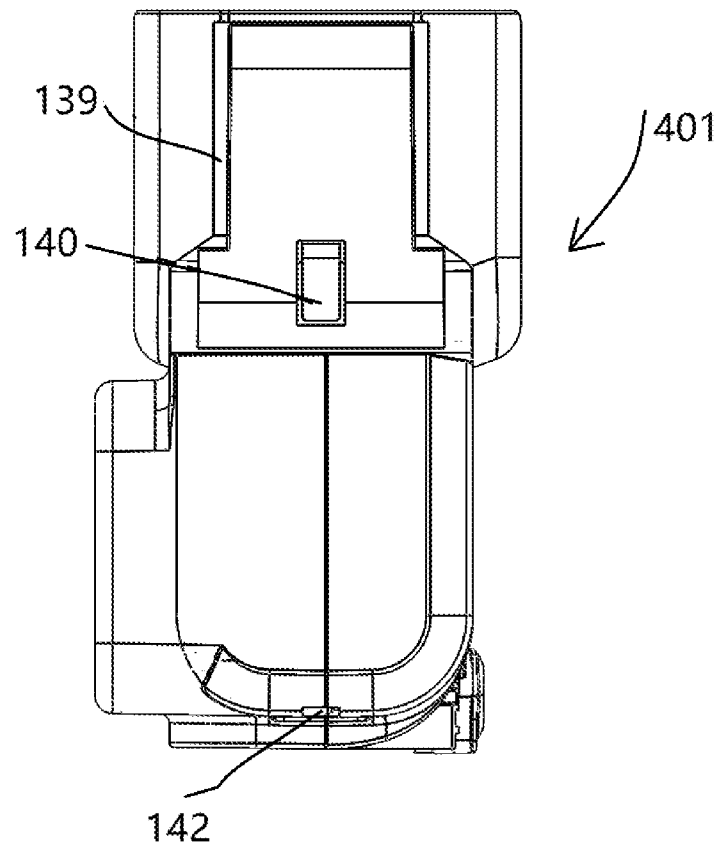


Figure 22

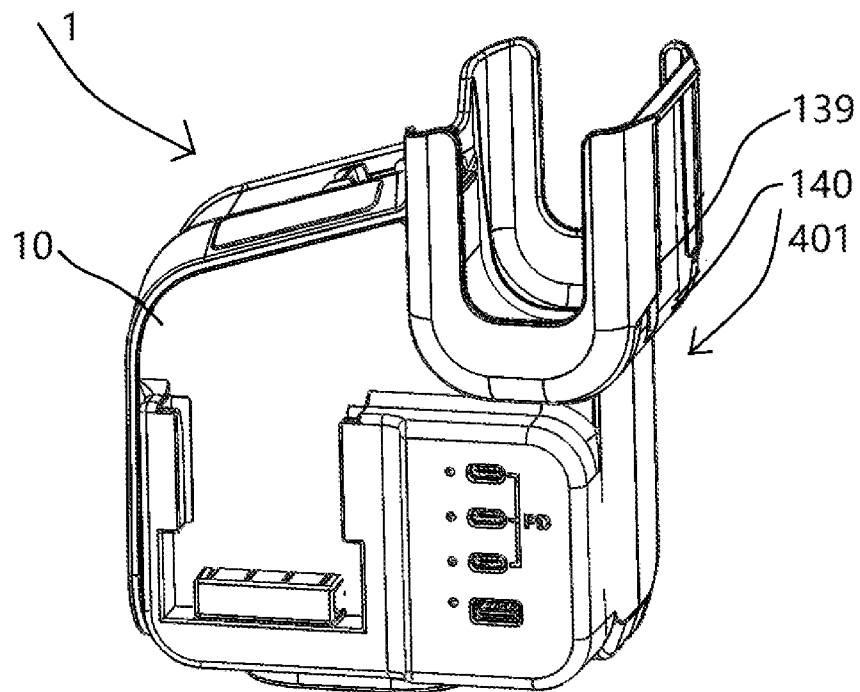


Figure 23

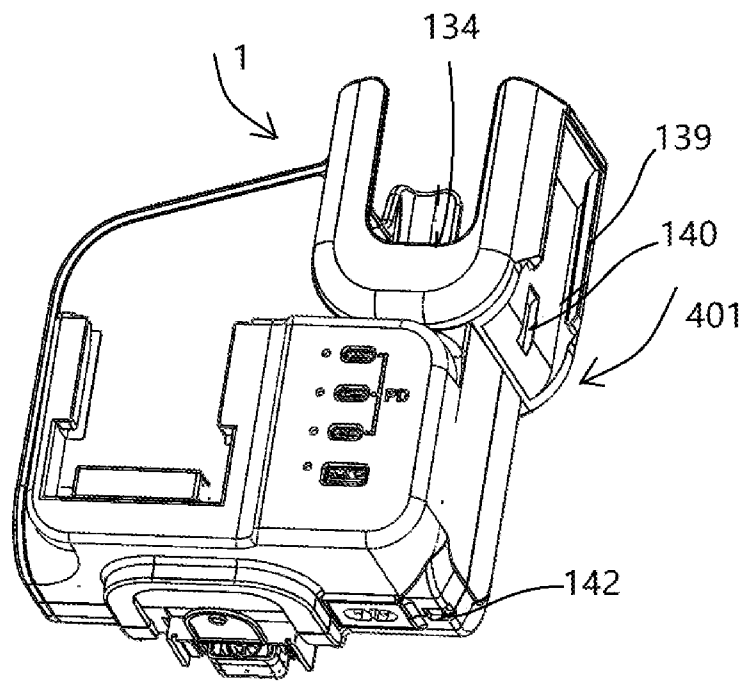


Figure 24

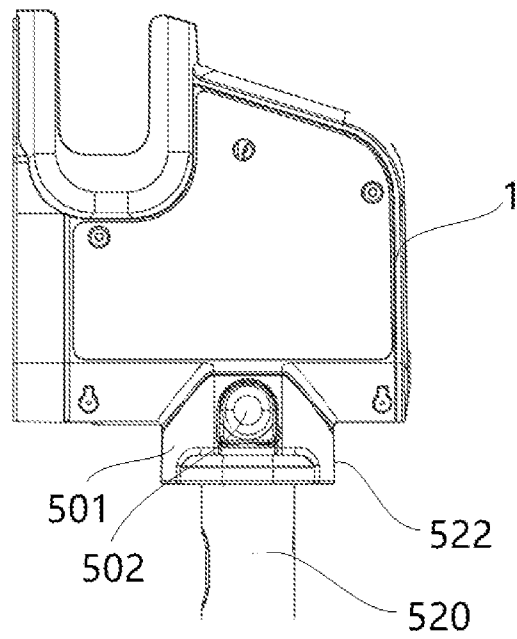


Figure 25

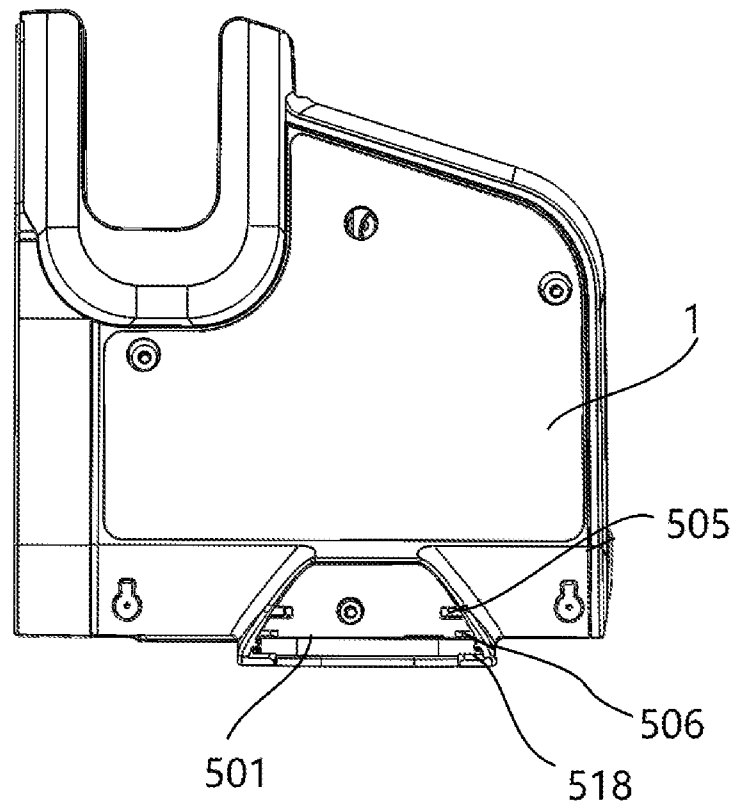


Figure 26

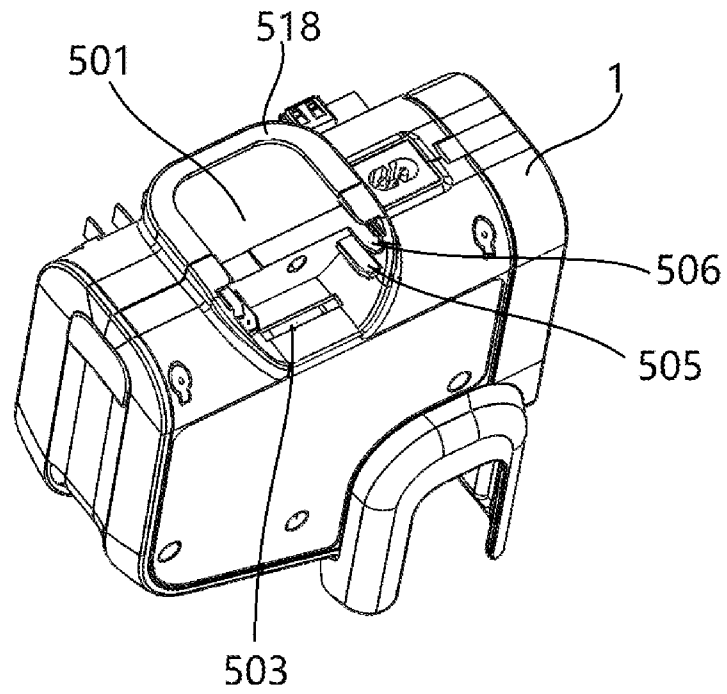


Figure 27

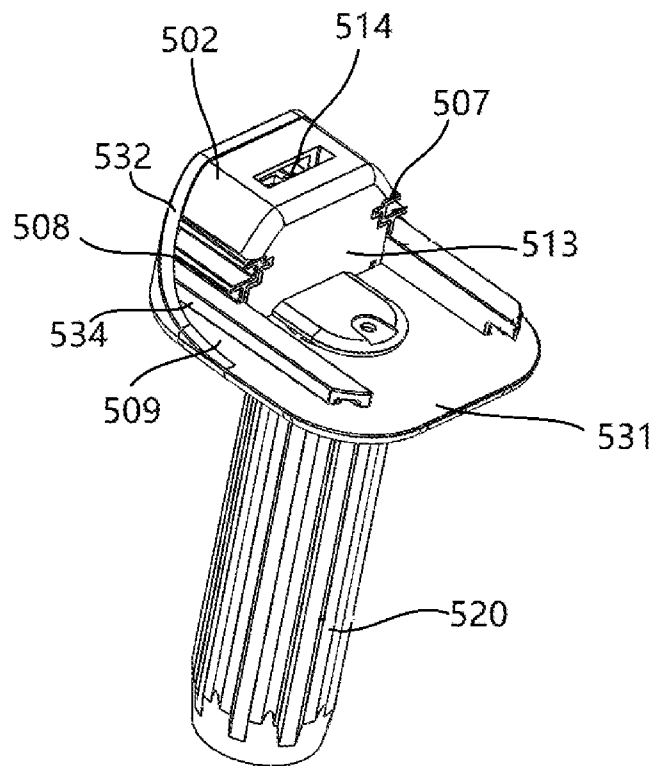


Figure 28

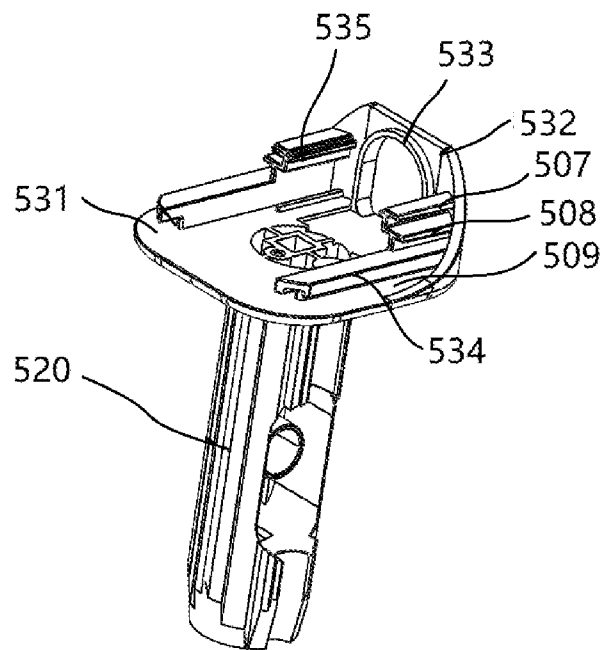


Figure 29

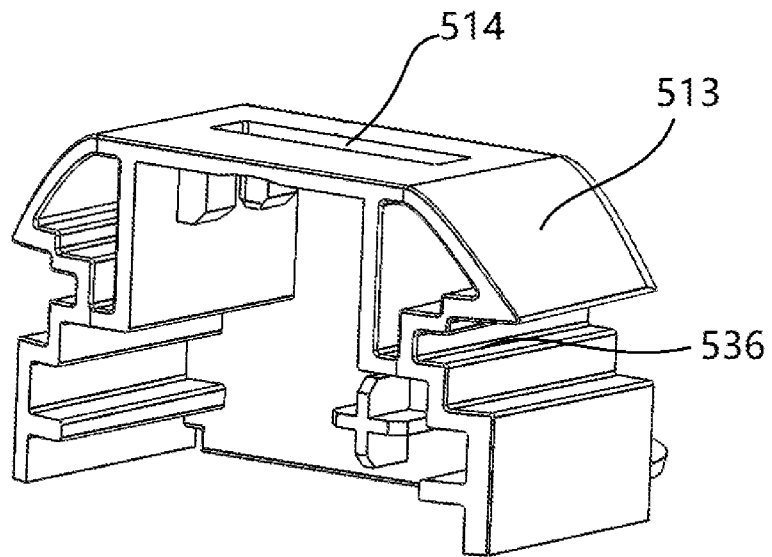


Figure 30

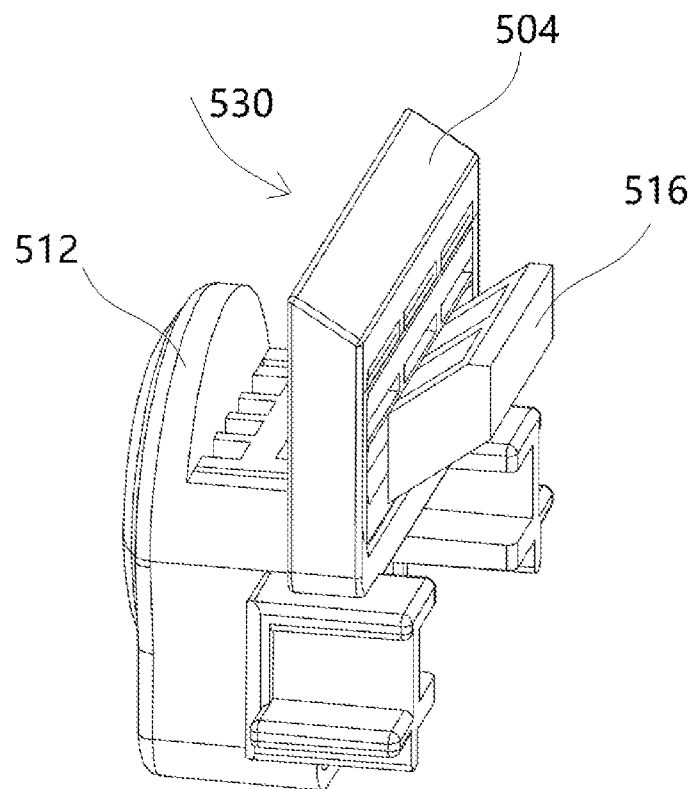


Figure 31

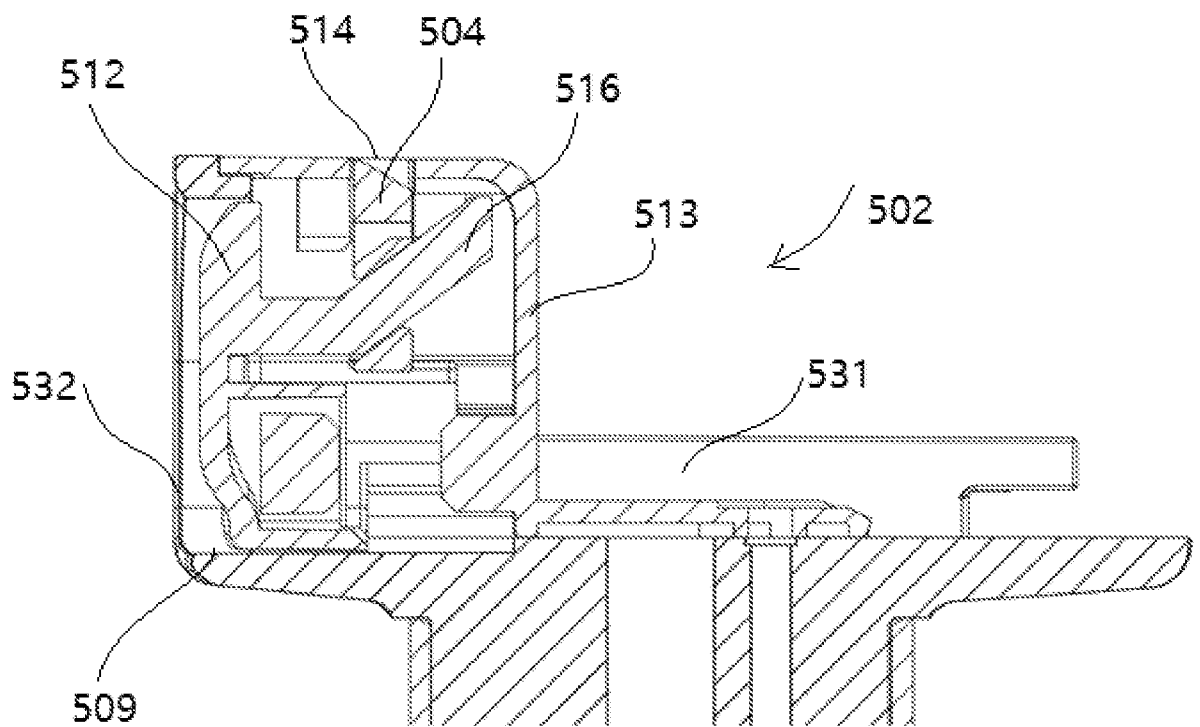


Figure 32

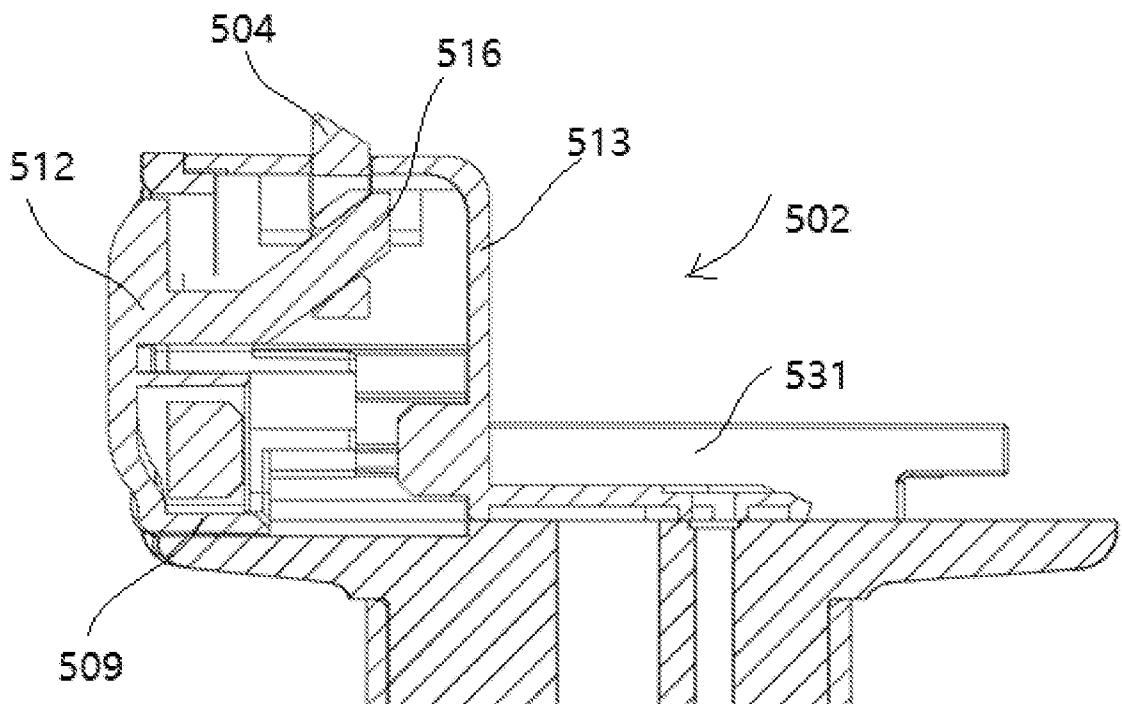


Figure 33

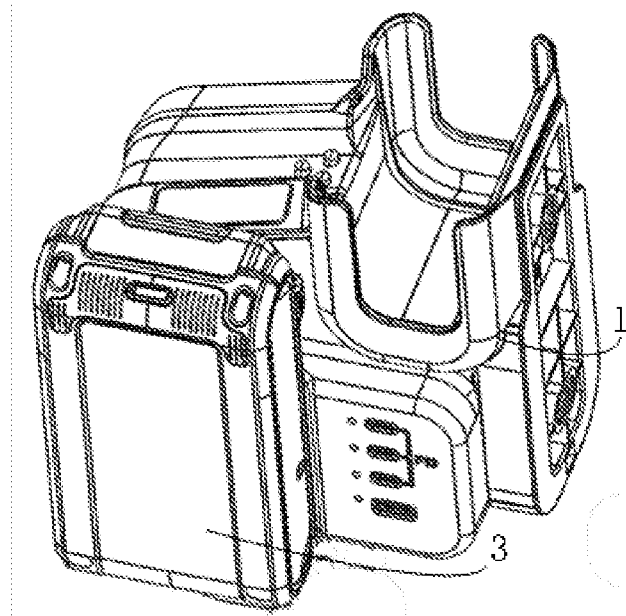


Figure 34

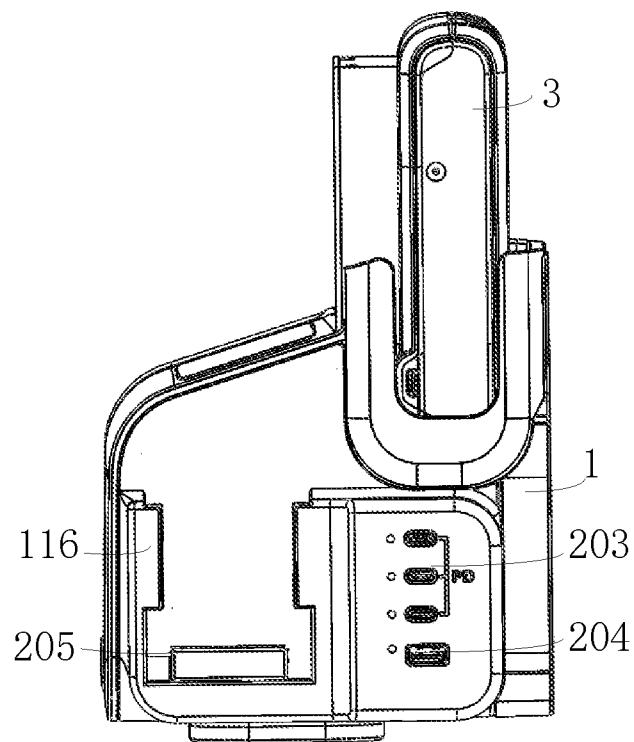


Figure 35

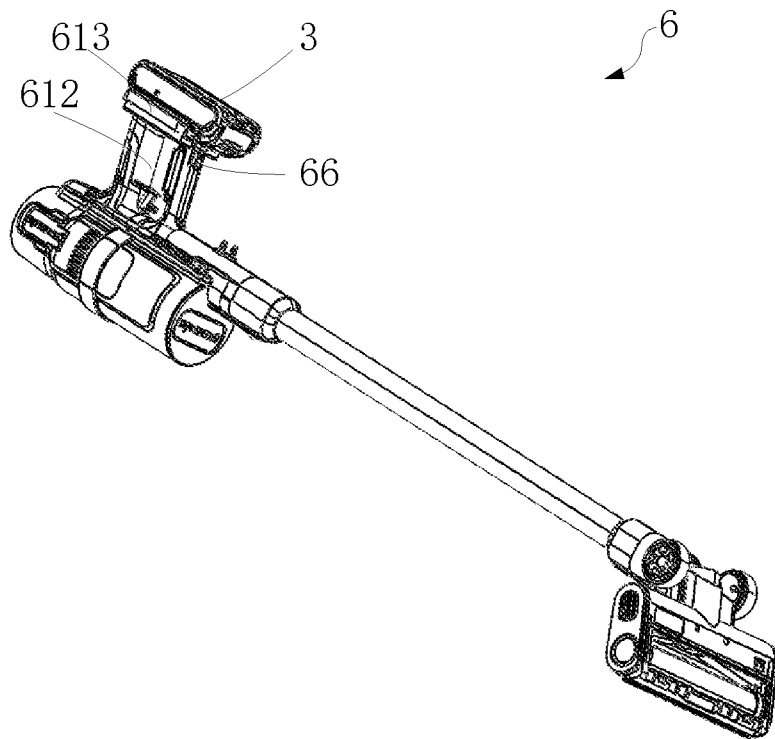


Figure 36

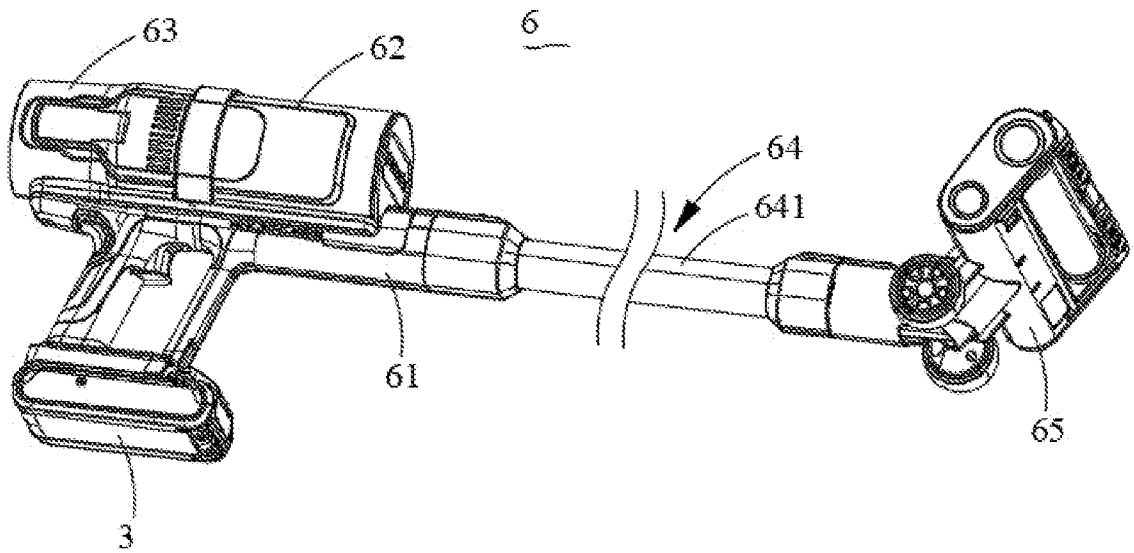


Figure 37

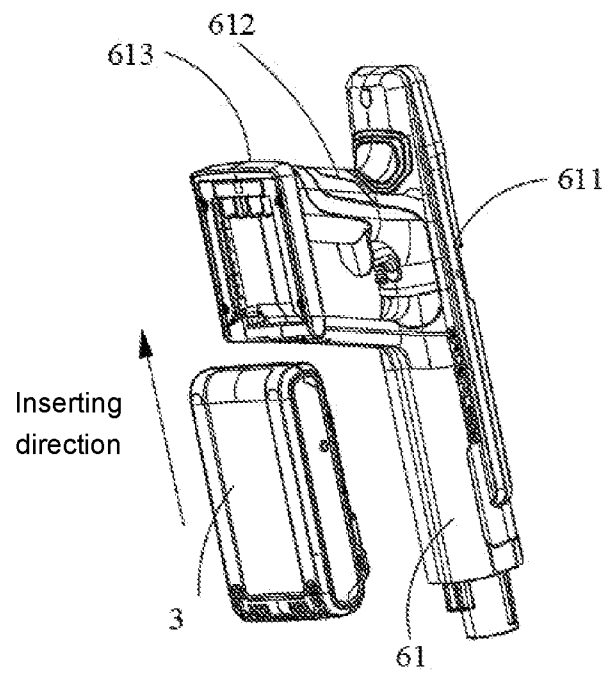


Figure 38

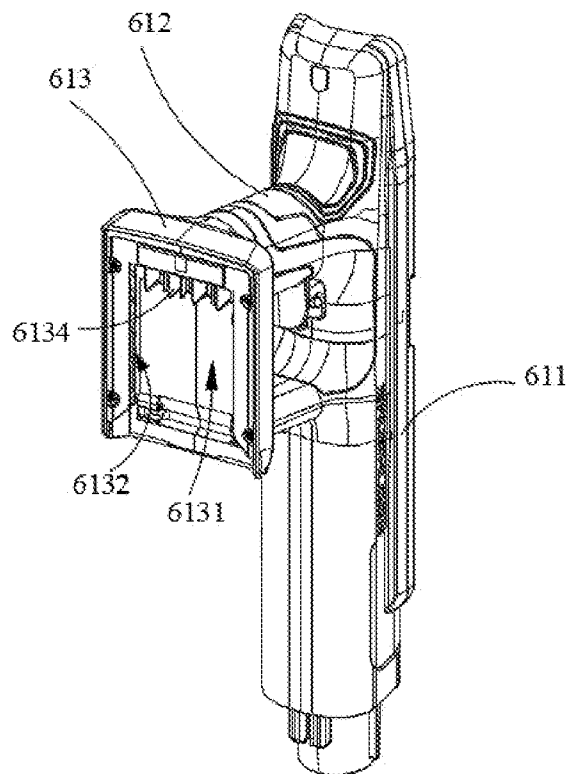


Figure 39

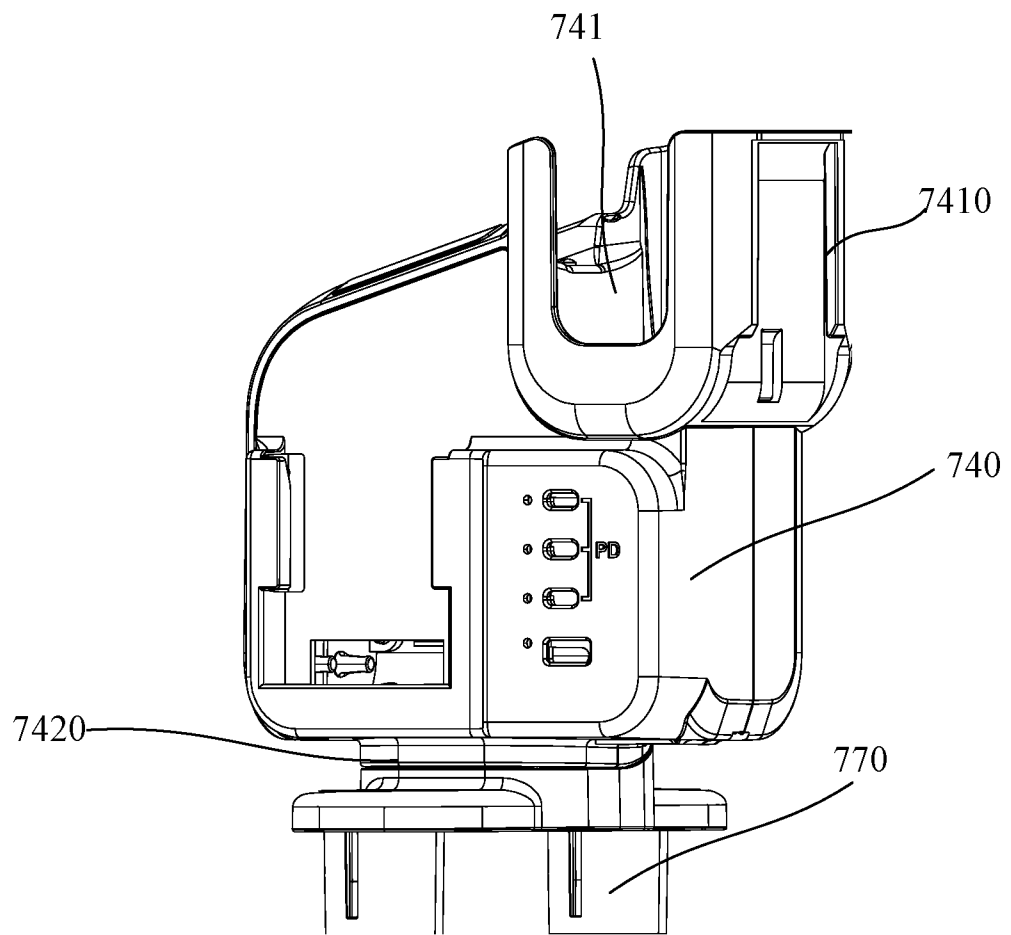


Figure 40

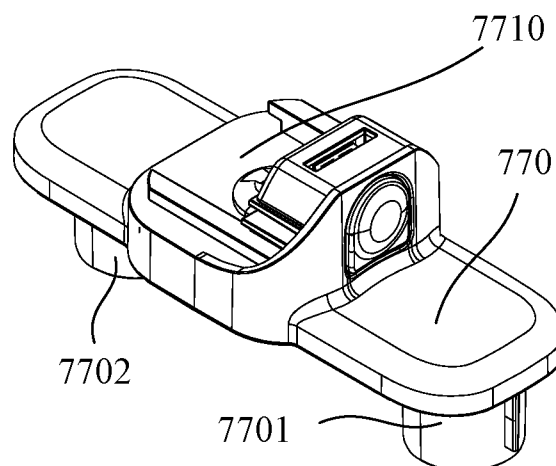


Figure 41

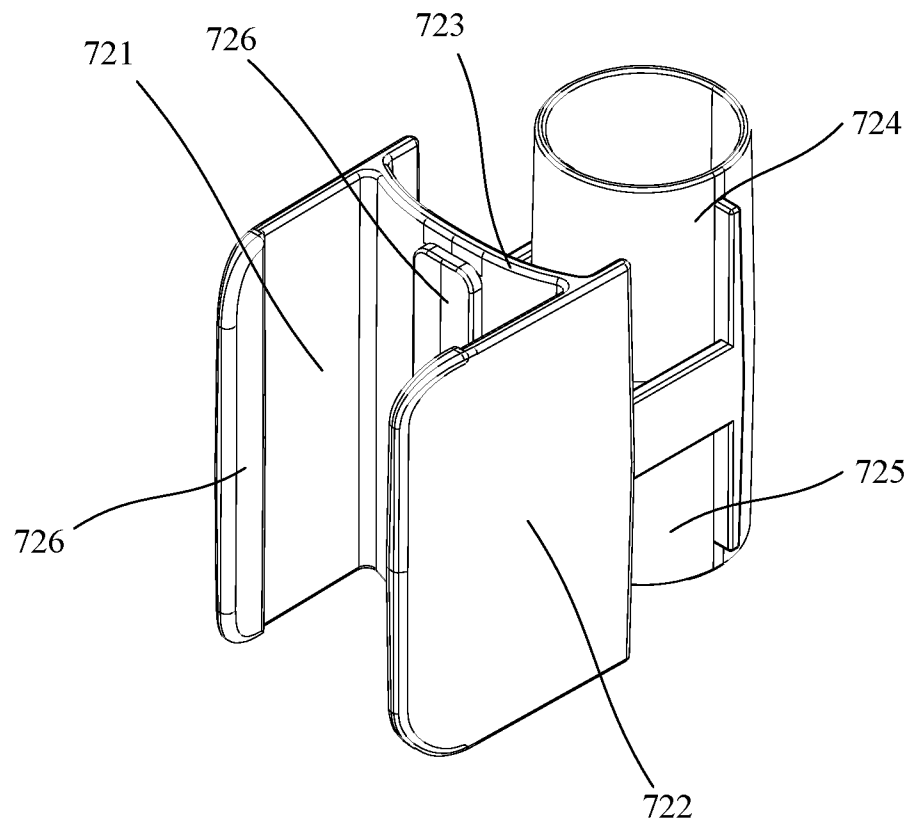


Figure 42

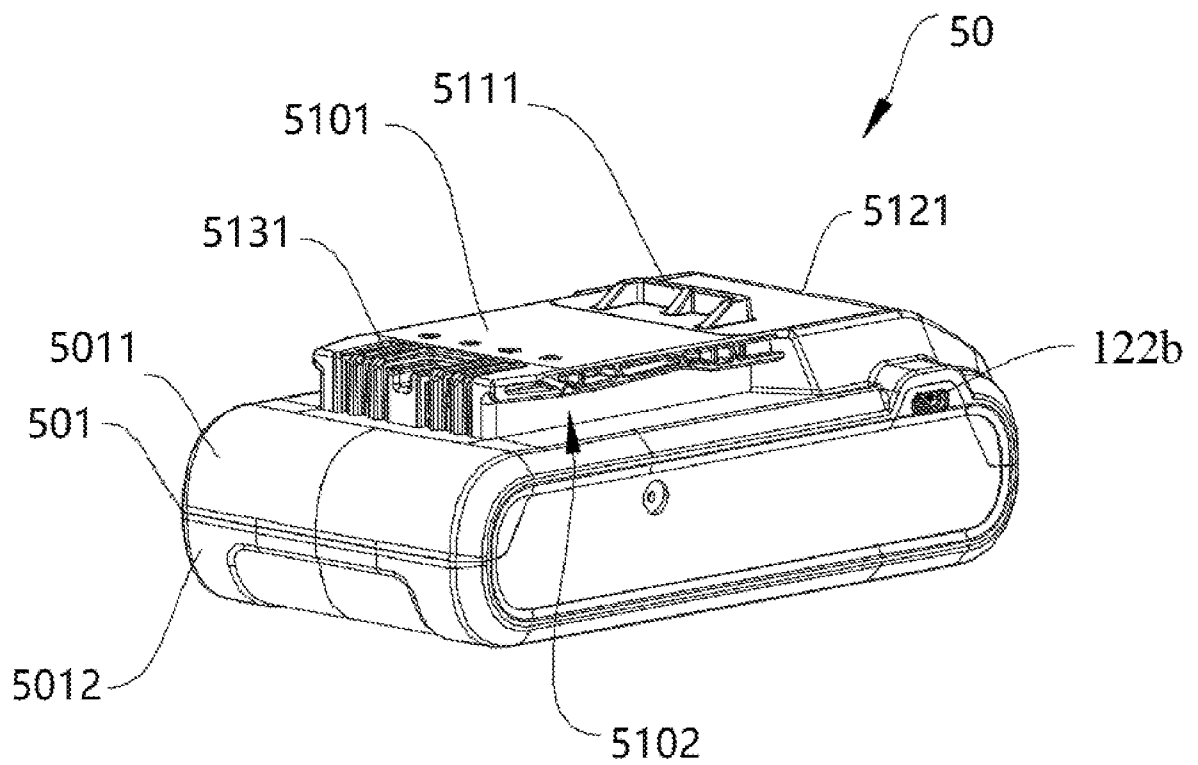


Figure 43

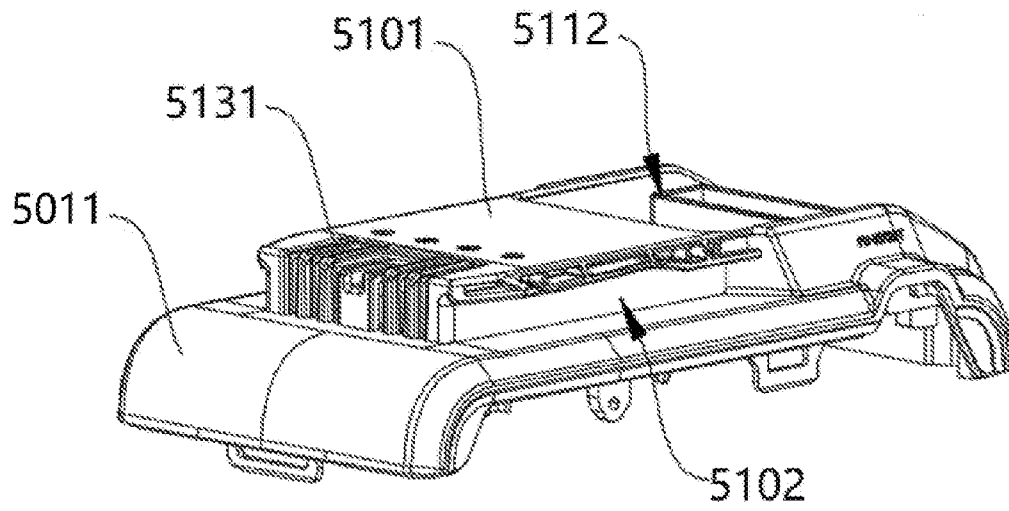


Figure 44

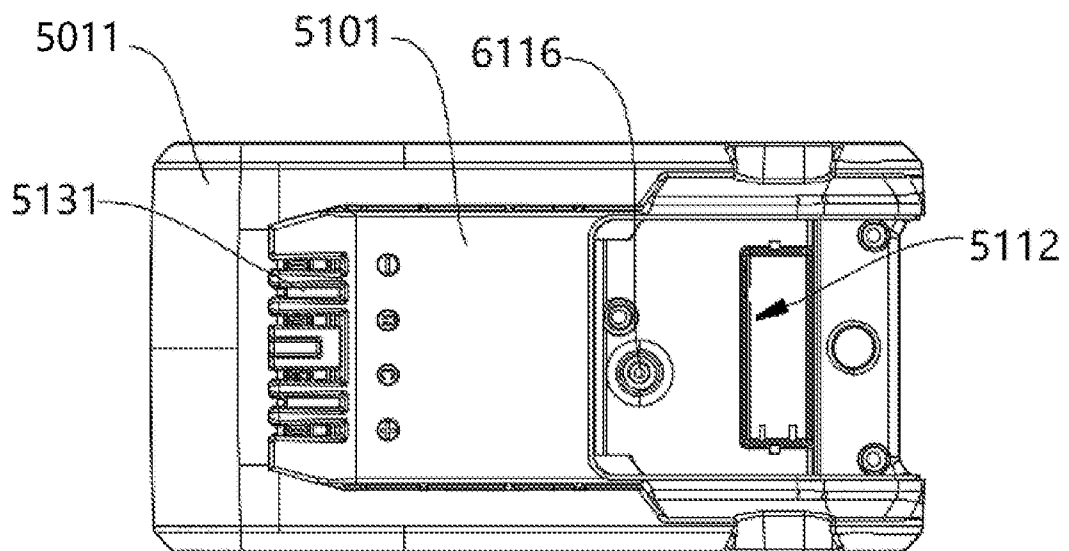


Figure 45

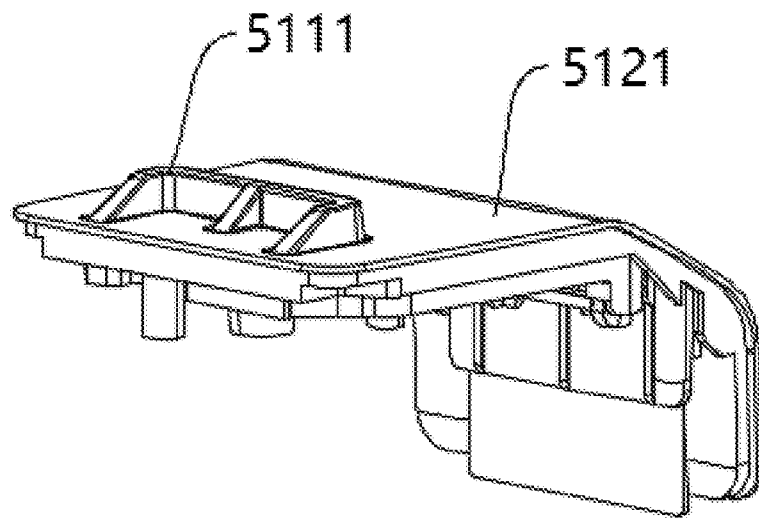


Figure 46

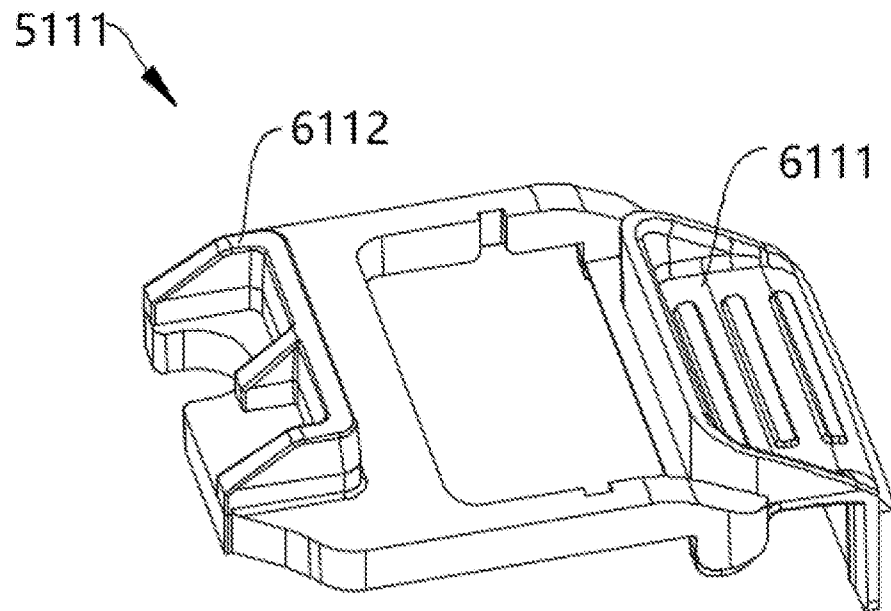


Figure 47

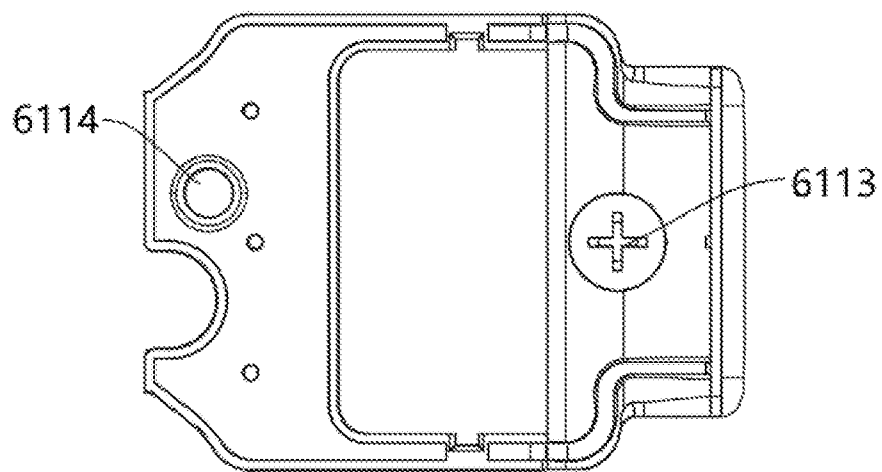


Figure 48

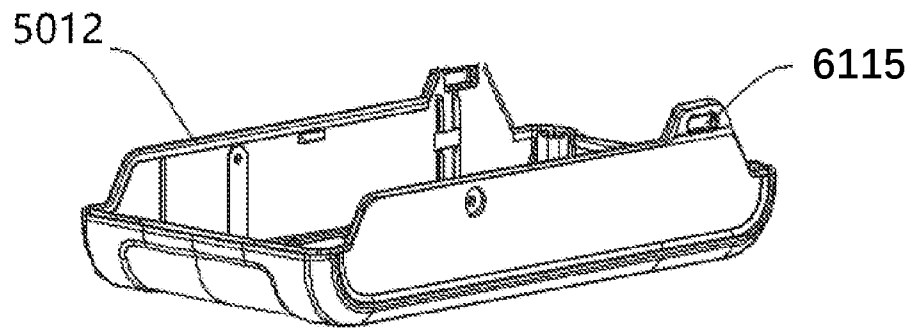


Figure 49

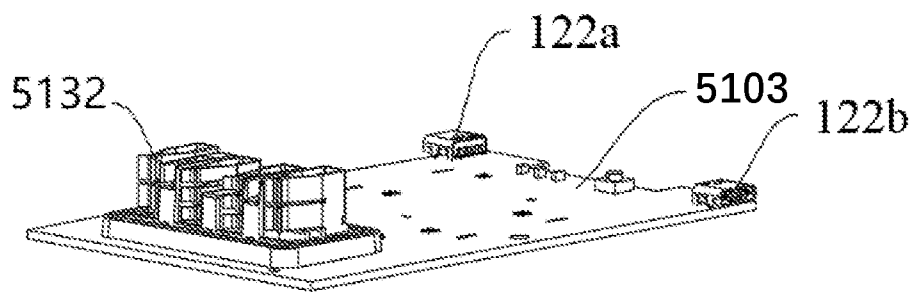


Figure 50

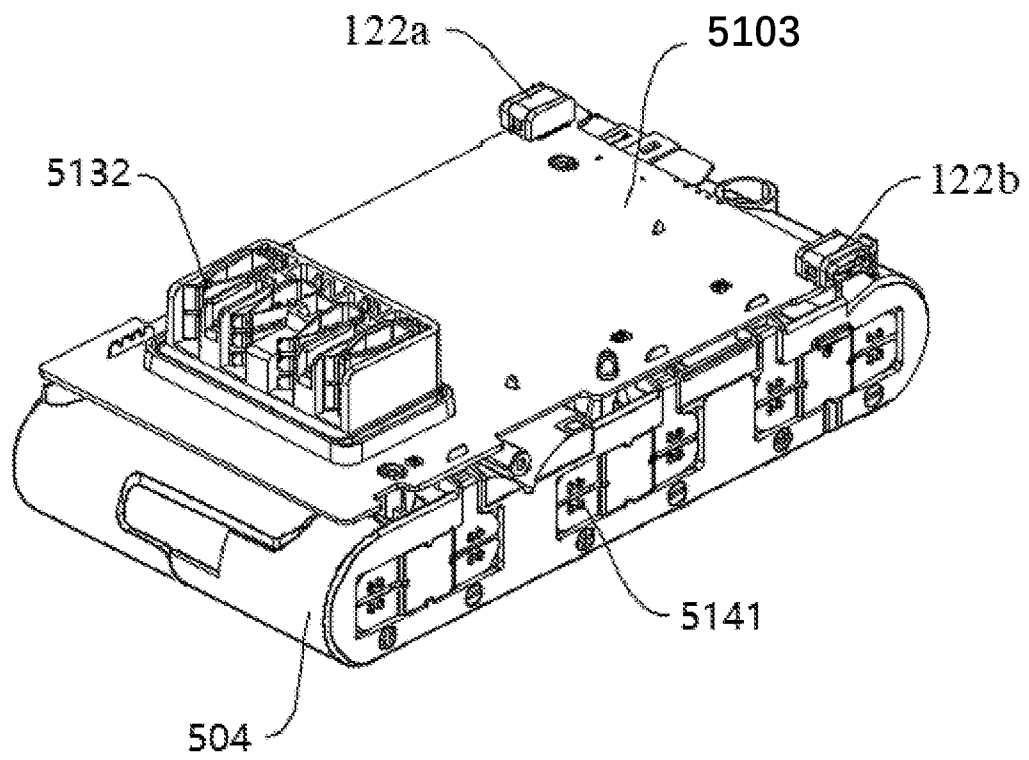


Figure 51

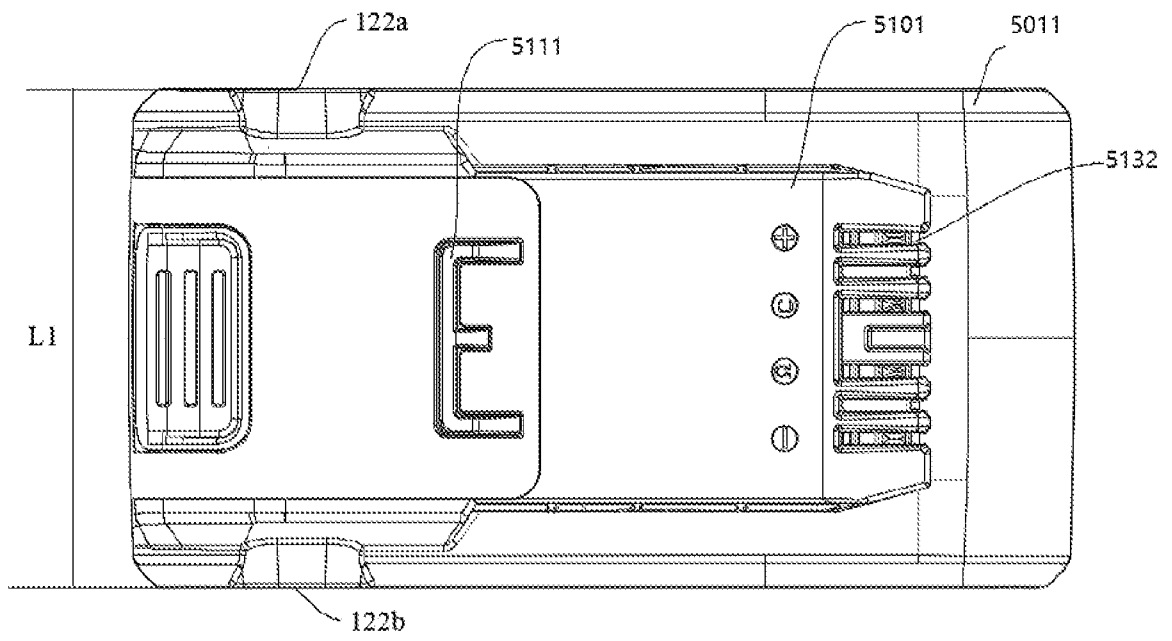


Figure 52

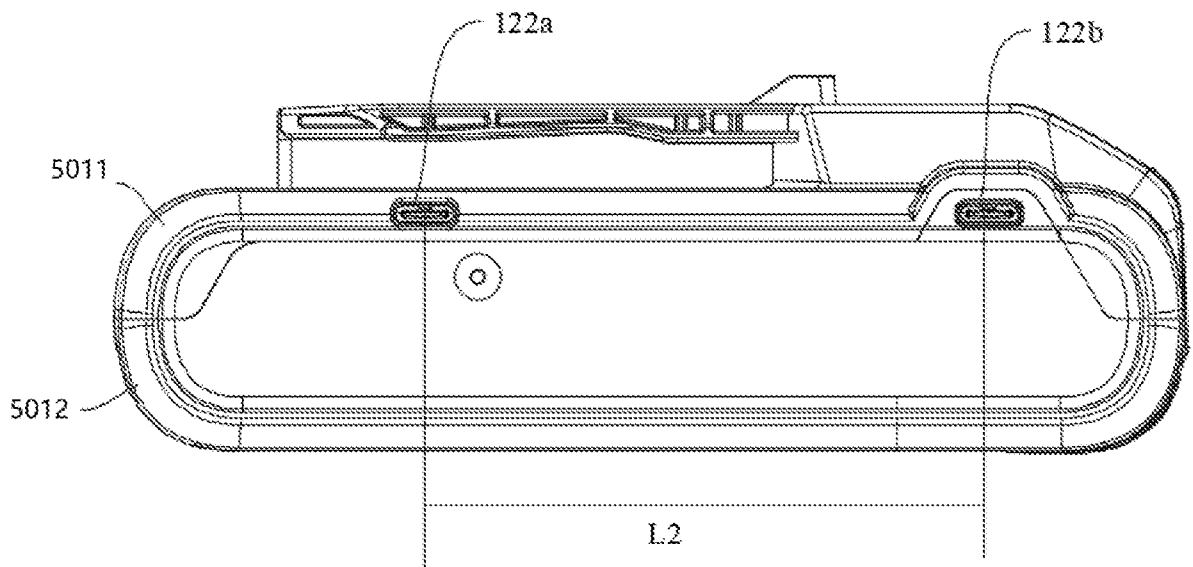


Figure 53

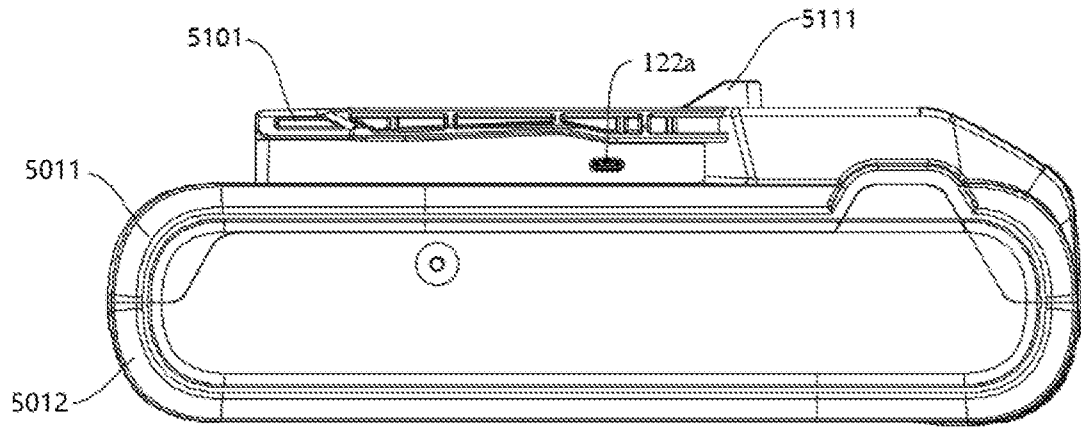


Figure 54

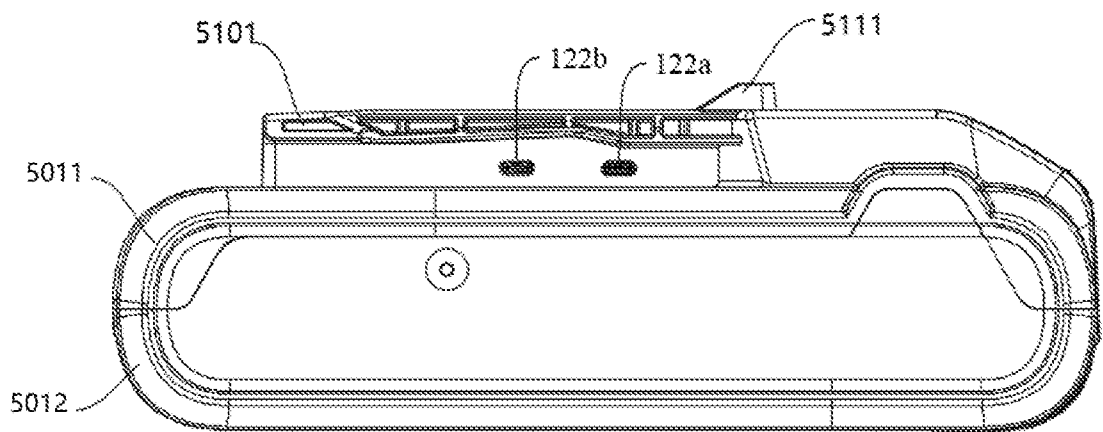


Figure 55

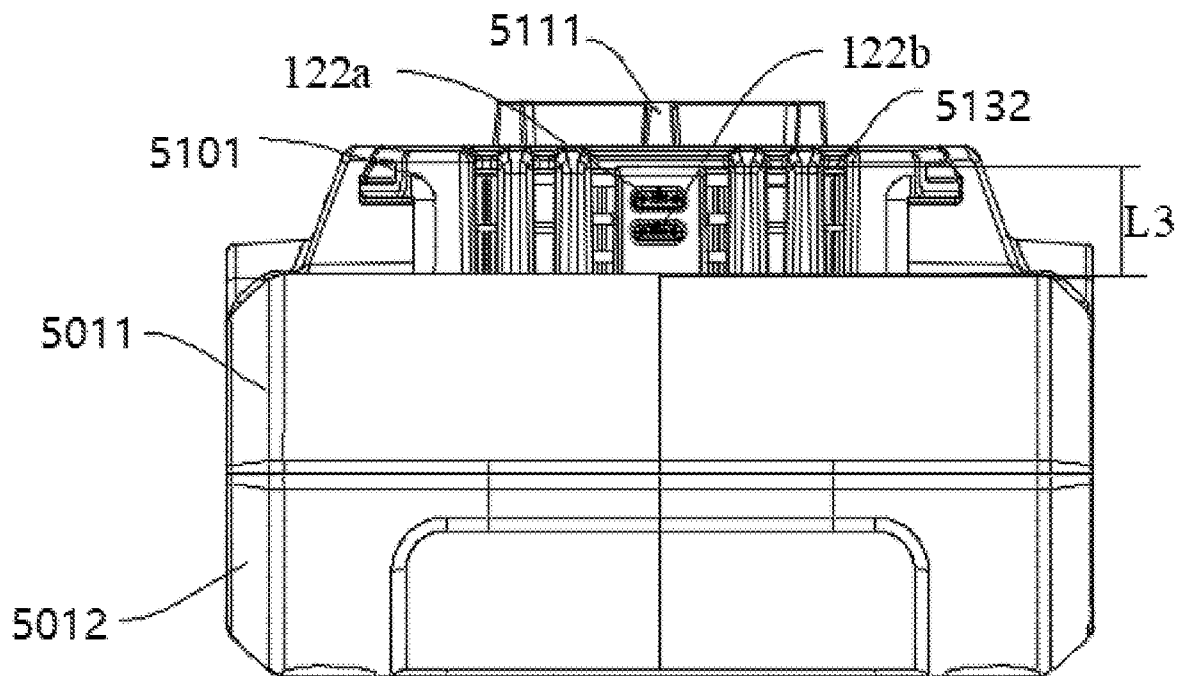


Figure 56

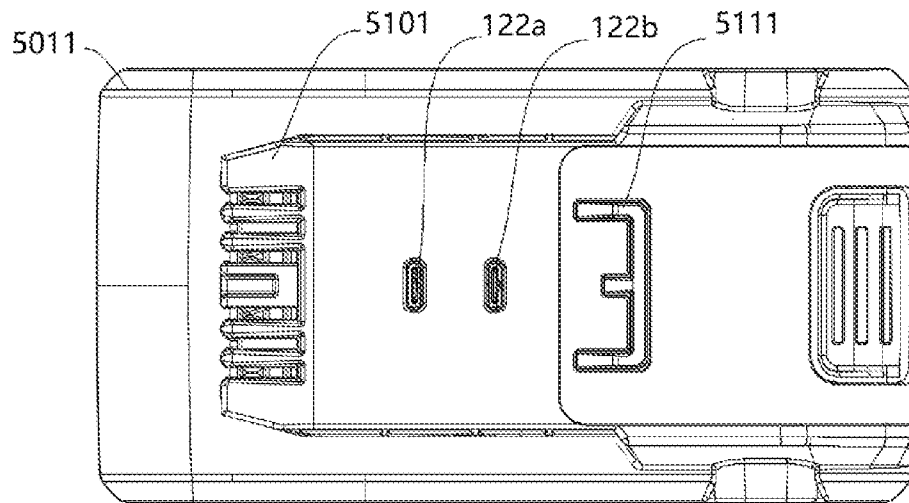


Figure 57

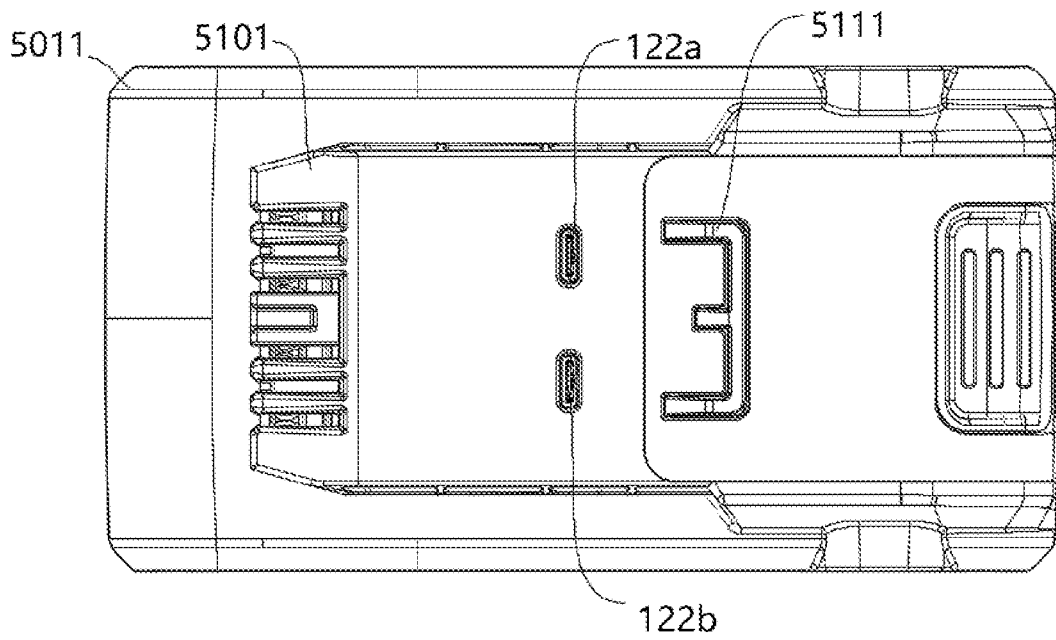


Figure 58

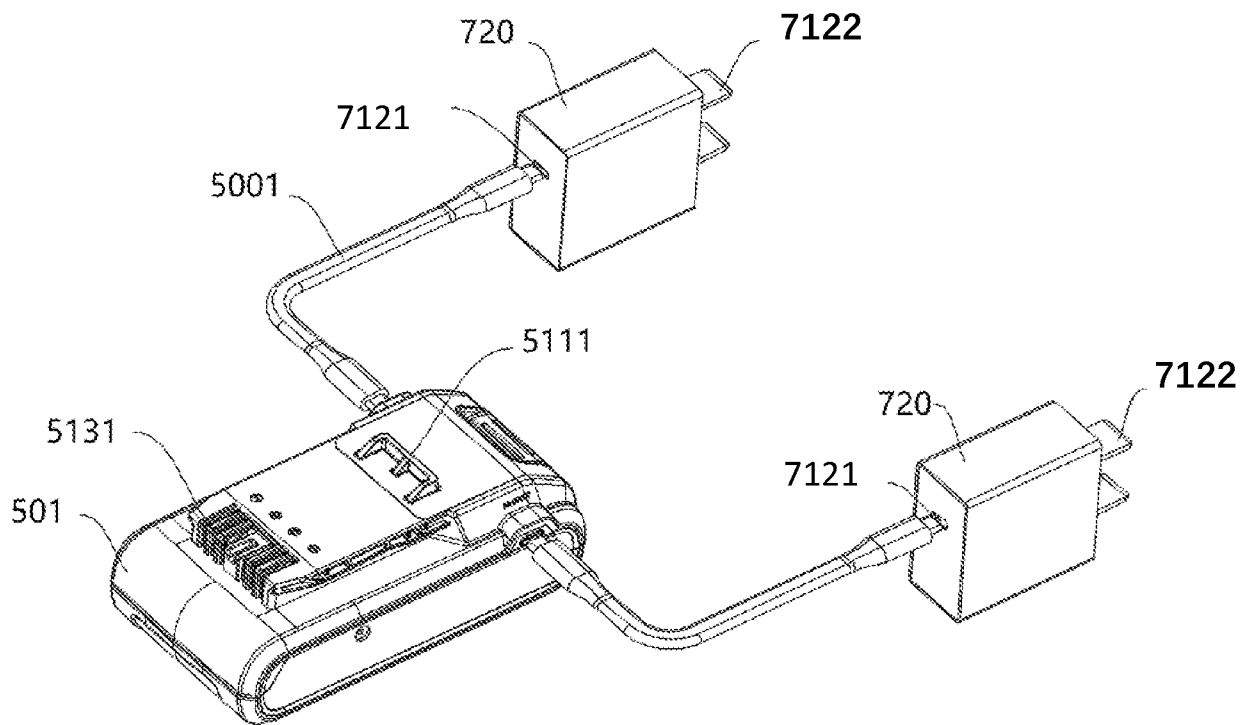


Figure 59

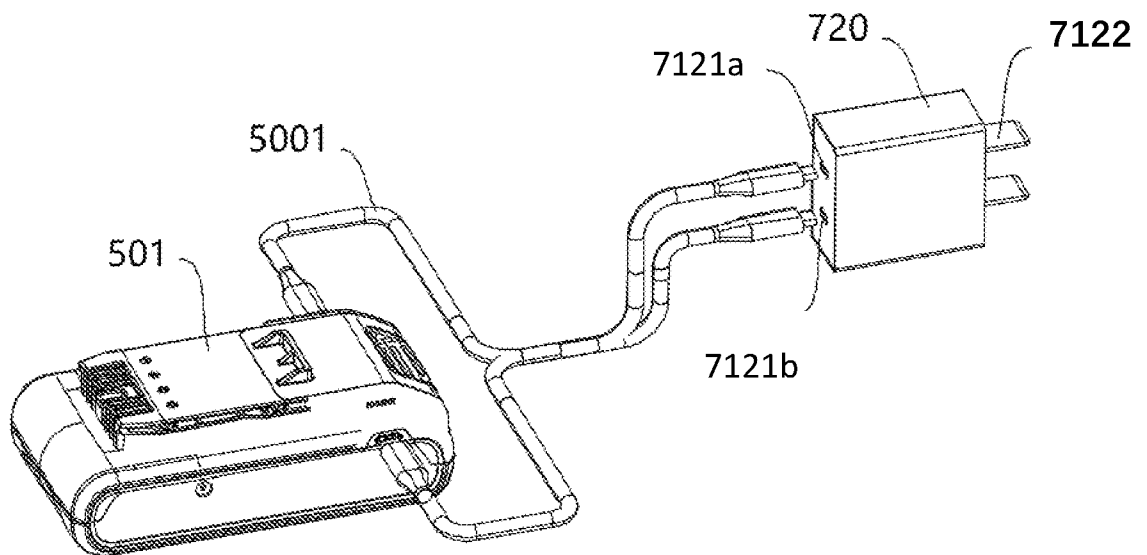


Figure 60

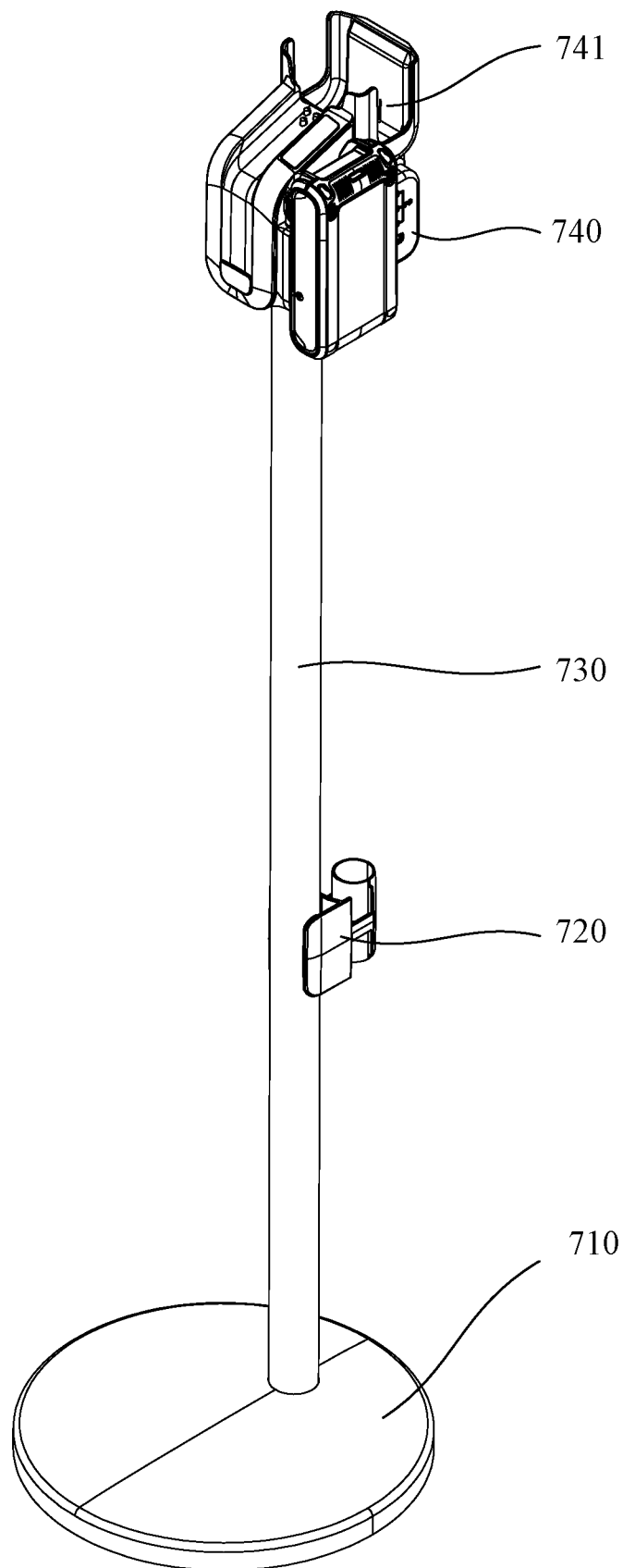


Figure 61

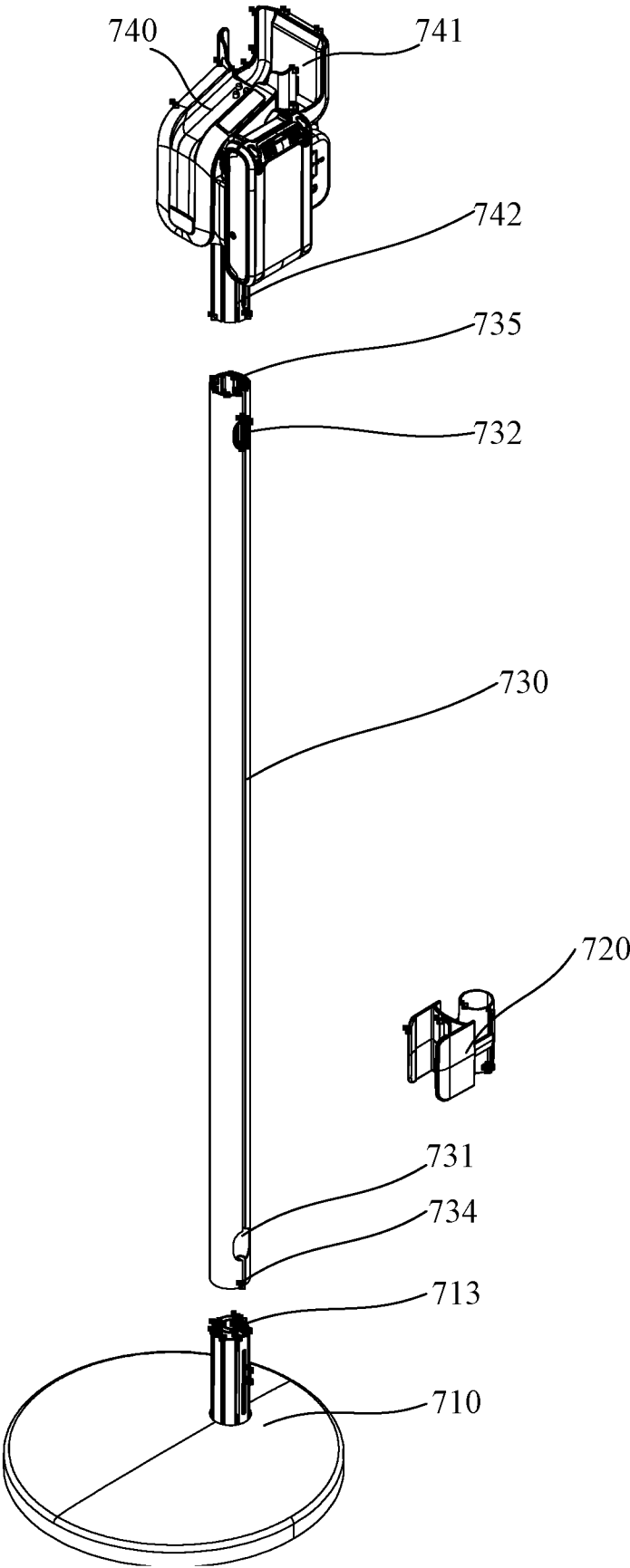


Figure 62

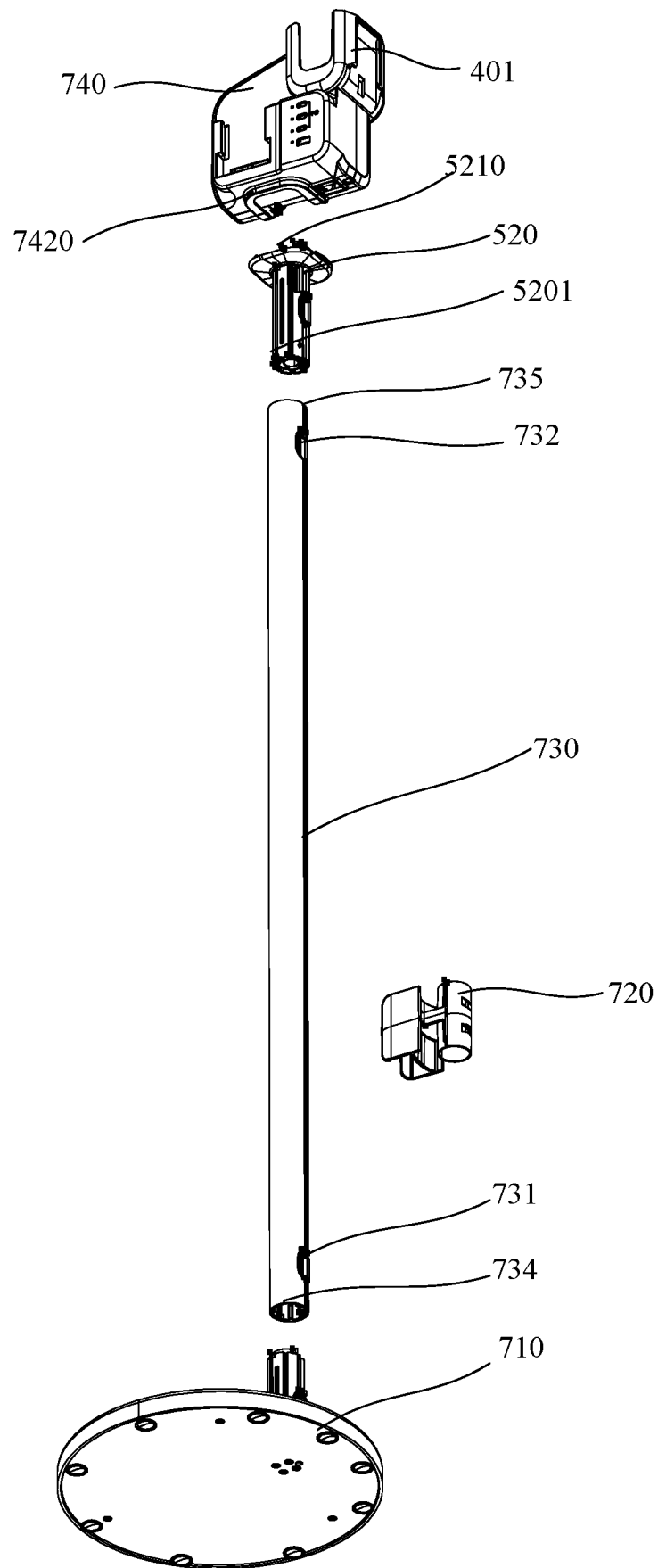


Figure 63

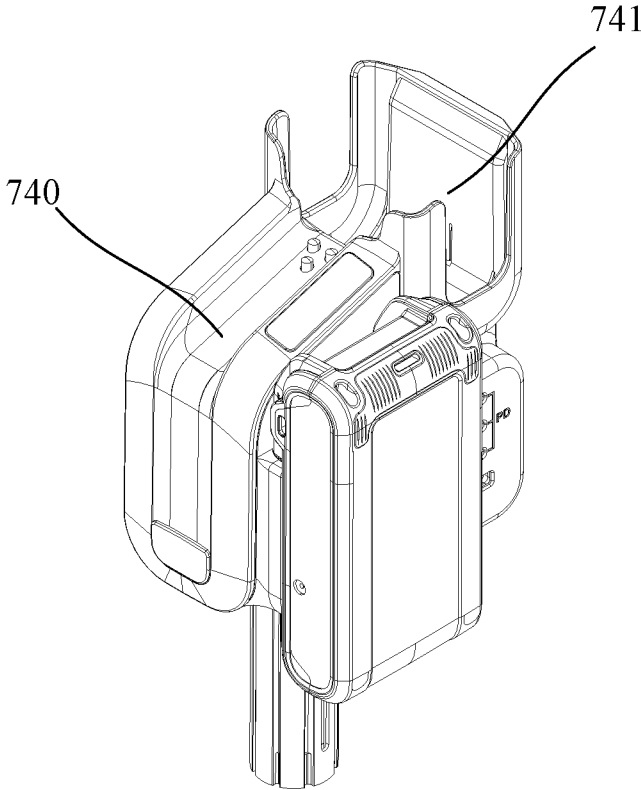


Figure 64

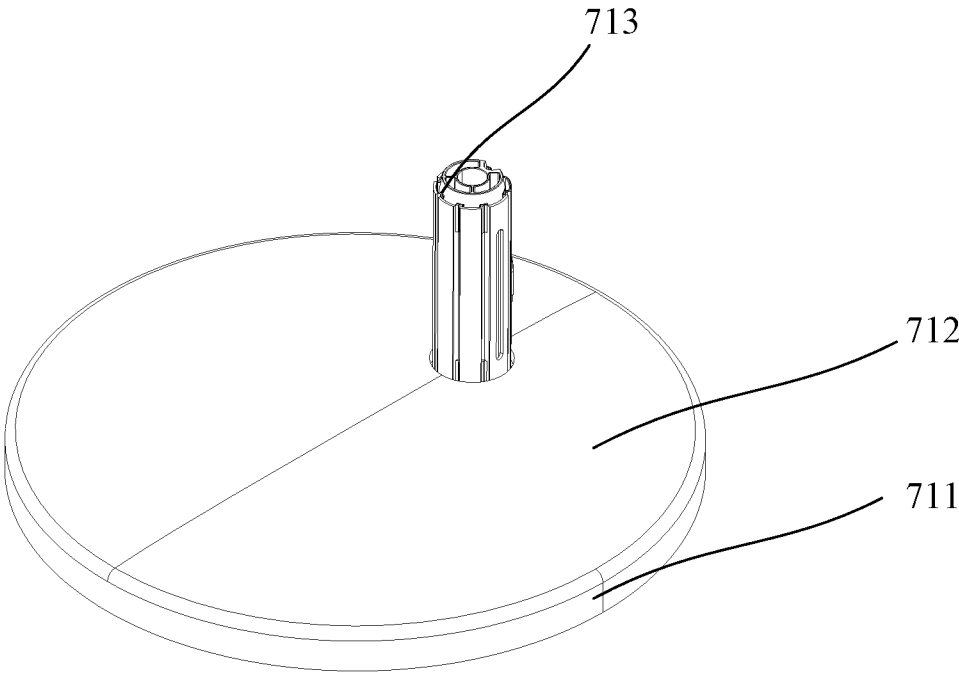


Figure 65

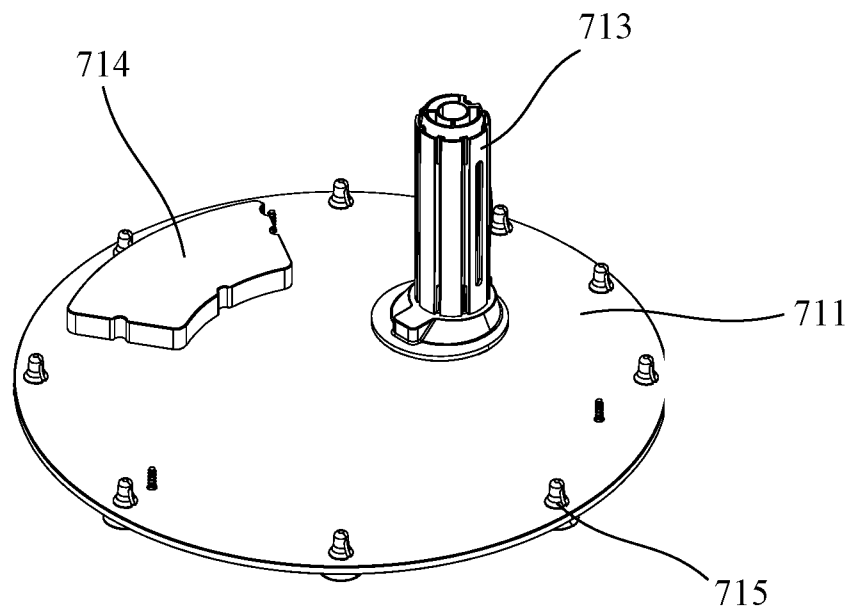


Figure 66

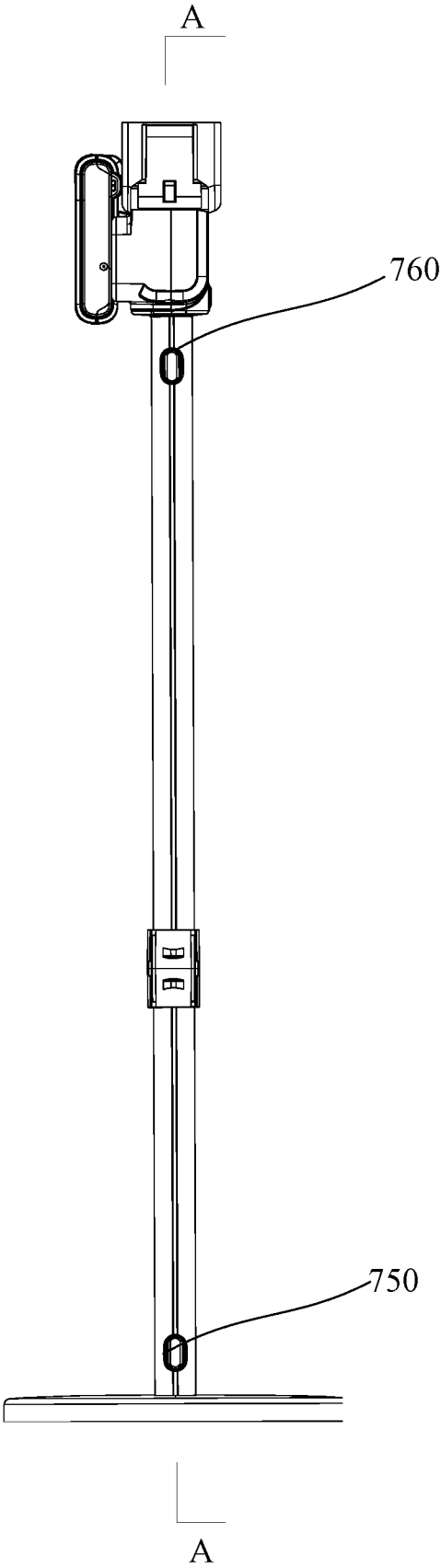


Figure 67

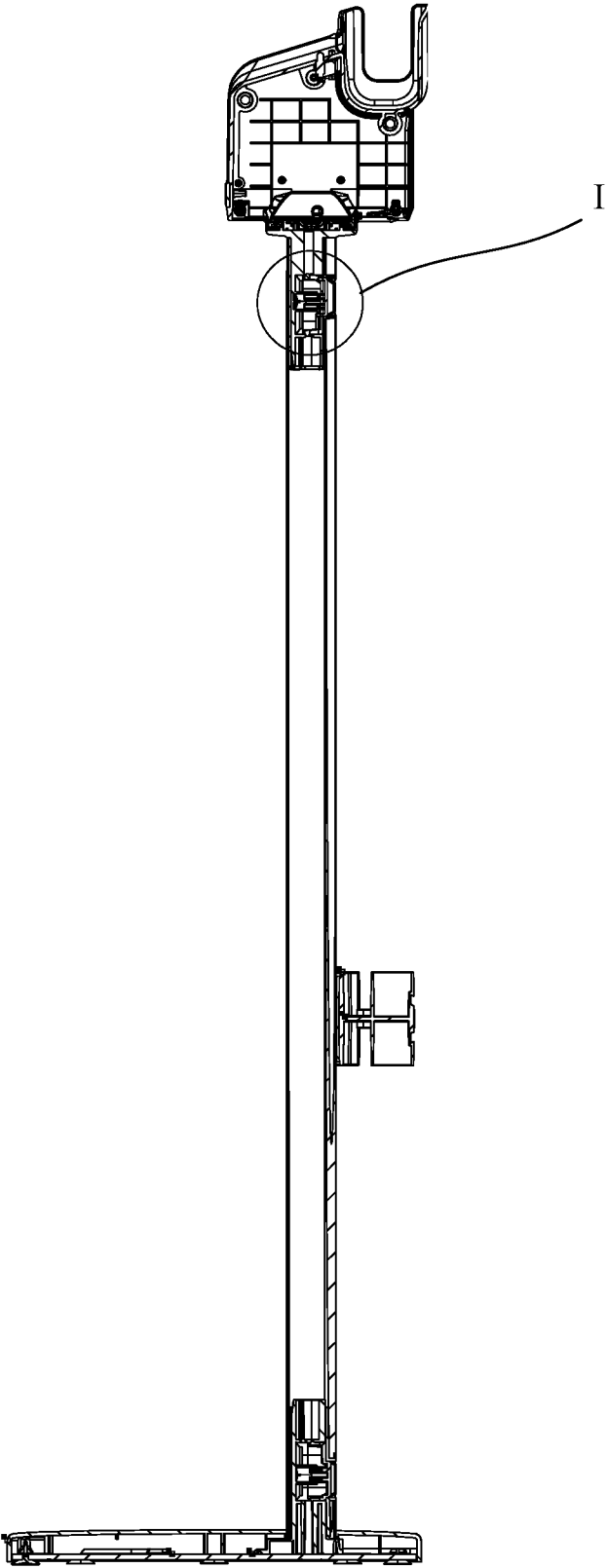


Figure 68

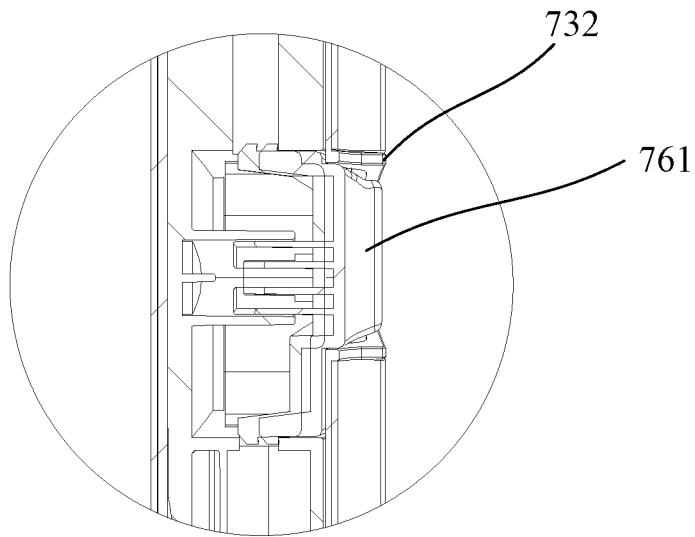


Figure 69

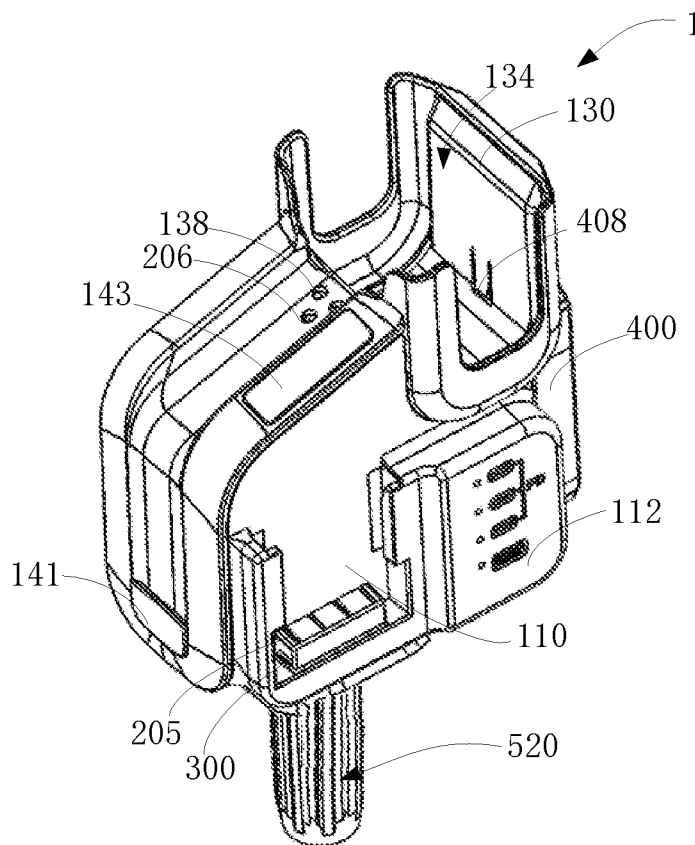


Figure 70

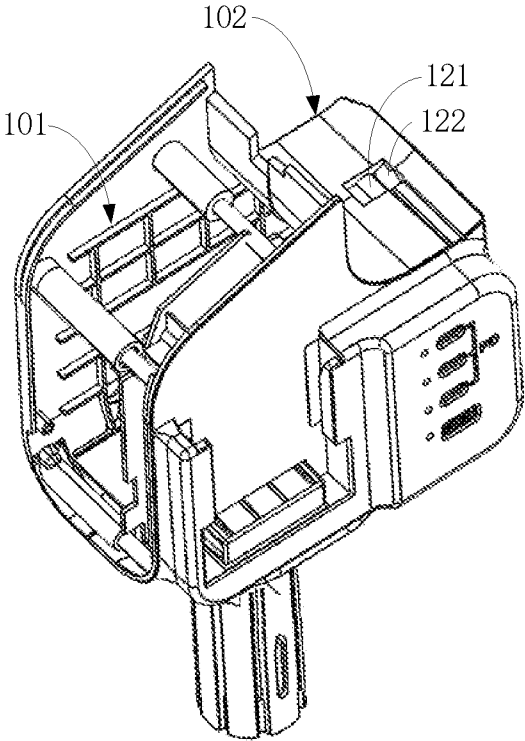


Figure 71

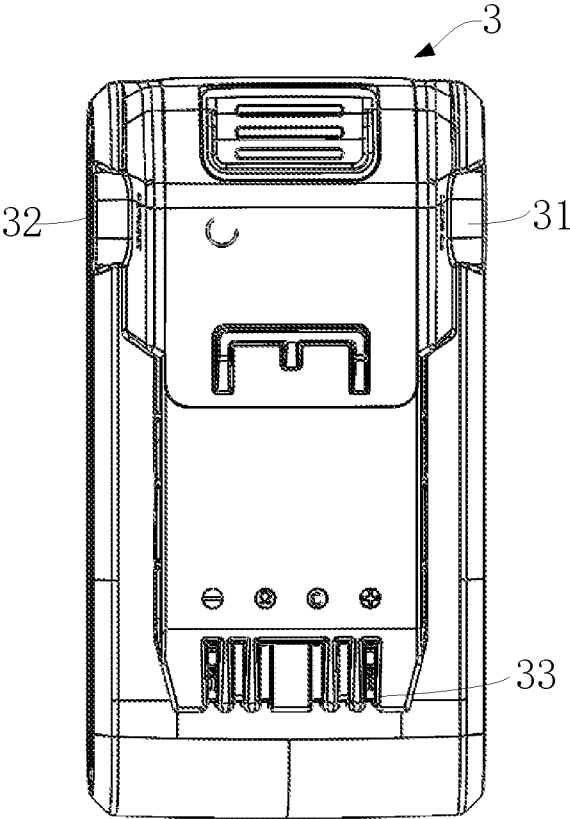


Figure 72

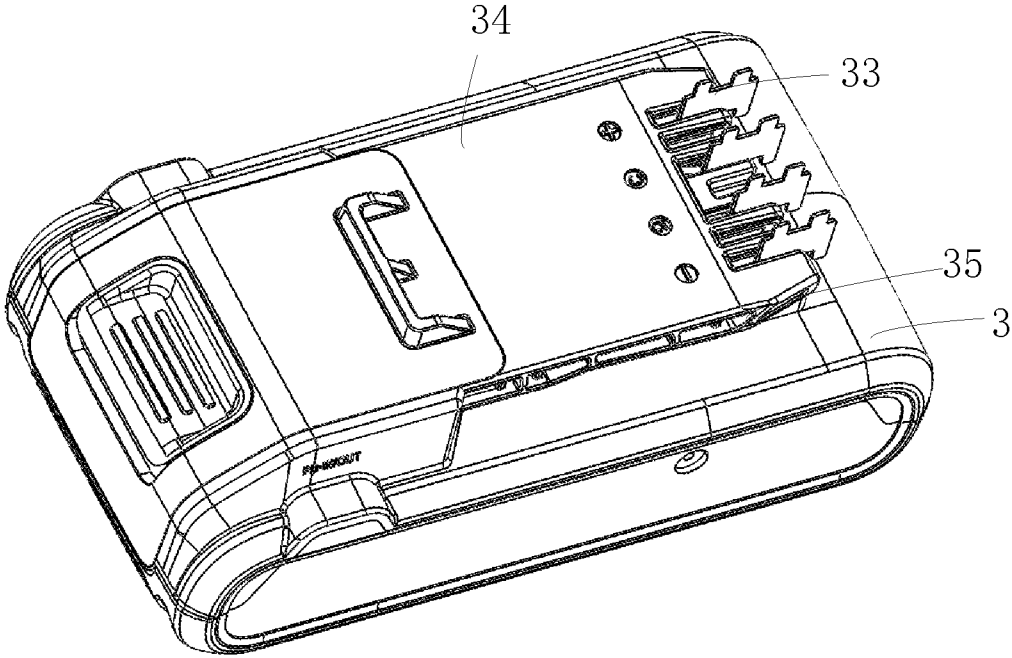


Figure 73

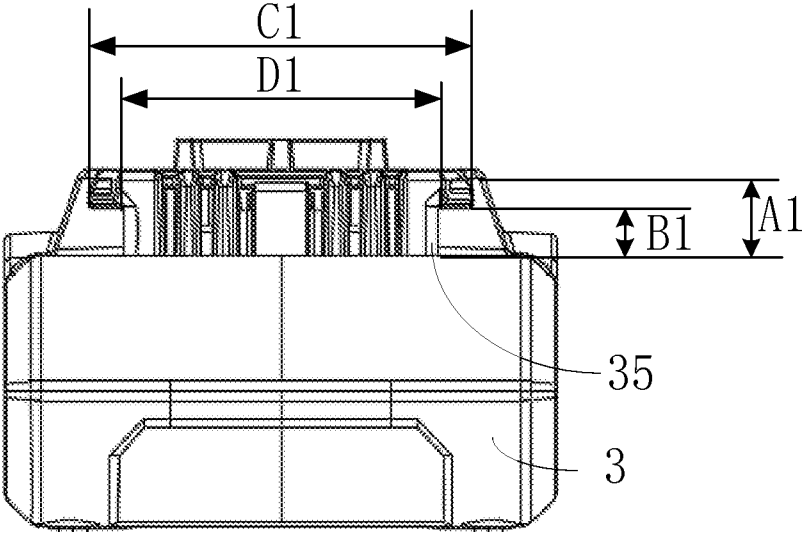


Figure 74

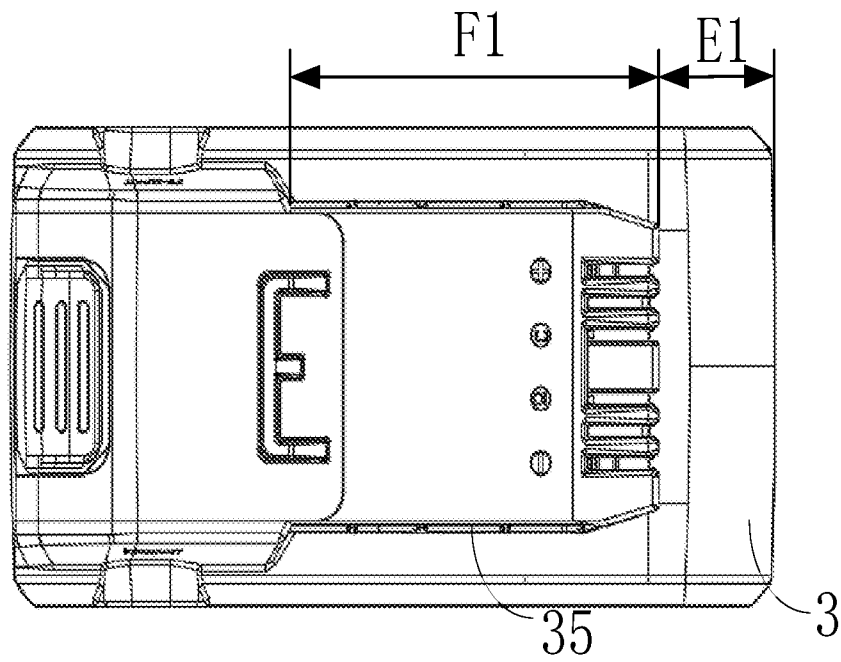


Figure 75

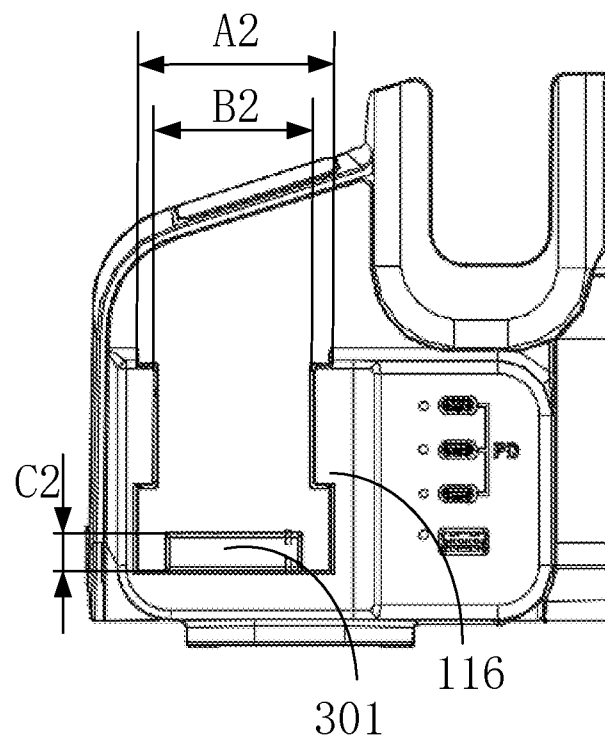


Figure 76

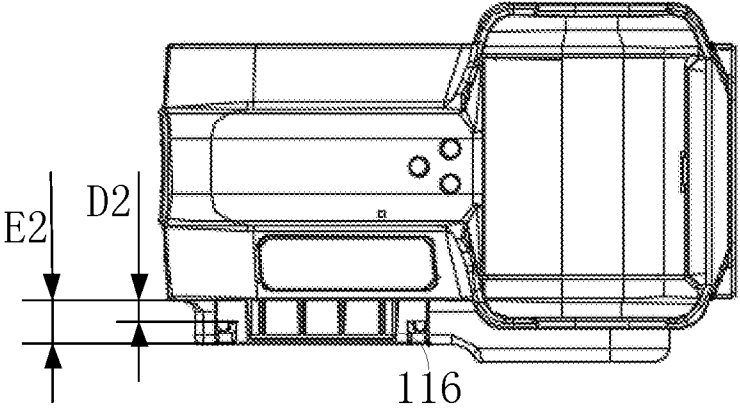


Figure 77

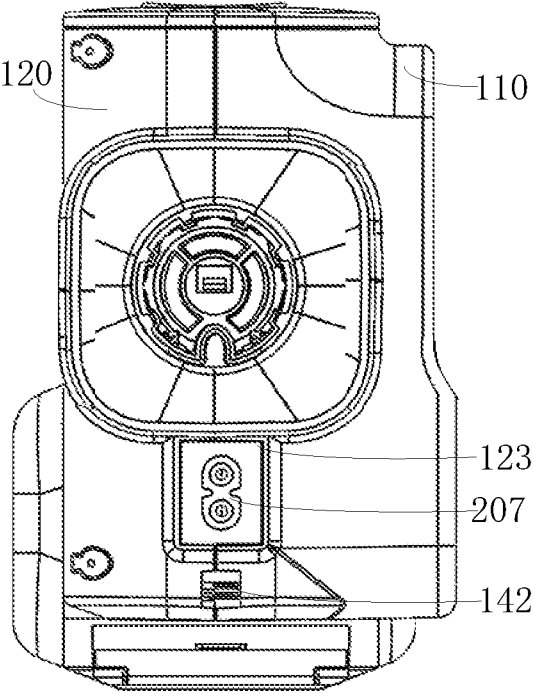


Figure 78

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/093995

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/00(2006.01)i; A47L 9/10(2006.01)i; A47L 9/04(2006.01)i; A47L 9/28(2006.01)i; A47L 5/28(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)

A47L

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, ENTXT, ENTXTC, DWPI, CNKI, IEEE: vacuum, cleaner, charge, bracket, storage, wall, floor, mount, hang

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 214760878 U (GLOBE JIANGSU CO LTD) 19 November 2021 (2021-11-19) see claims 1-20, description, paragraphs 74 to 152, and figures 1-46	1-10
PX	CN 215687418 U (GLOBE JIANGSU CO LTD) 01 February 2022 (2022-02-01) see claims 1-12, description, paragraphs 38 to 65, and figures 1-6	1-10
PX	CN 214760864 U (GLOBE JIANGSU CO LTD) 19 November 2021 (2021-11-19) see claims 1-13, description, paragraphs 62 to 138, and figures 1-38	1-10
X	CN 207768302 U (LG ELECTRONICS INC) 28 August 2018 (2018-08-28) see description, paragraphs 24 to 69, and figures 1-10	1-10
X	CN 110974087 A (BEIJING ROBOROCK TECHNOLOGY CO LTD) 10 April 2020 (2020-04-10) see description, paragraphs 42 to 57, and figures 1-12	1-10
A	US 4573234 A (SCOTT & FETZER CO) 04 March 1986 (1986-03-04) the whole document	1-10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“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

22 July 2022

Date of mailing of the international search report

08 August 2022

Name and mailing address of the ISA/CN

National Intellectual Property Administration, PRC
6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing
100088, China

Facsimile No. (86-10)62019451

Authorized officer

LI, Lu

Telephone No. (86-10) 62411656

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/093995

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	214760878	U	19 November 2021	None			
CN	215687418	U	01 February 2022	None			
CN	214760864	U	19 November 2021	None			
CN	207768302	U	28 August 2018	None			
CN	110974087	A	10 April 2020	WO	2021135518	A1	08 July 2021
				CN	211796196	U	30 October 2020
US	4573234	A	04 March 1986	None			