WHAT IS CLAIMED IS:

1. A power distribution apparatus (1), comprising:

a base (100), a high-voltage connection part (110) and a low-voltage connection part (120) being fixed on the base;

a high-voltage loop (200), at least a portion of the high-voltage loop being arranged on the base, the high-voltage loop being electrically connected to the high-voltage connection part, the high-voltage loop having a module positive-electrode connection end (210) and a module negative-electrode connection end (220), and the high-voltage loop comprising a main disconnecting switch core (230) fixed on the base;

a circuit board (300), the circuit board being arranged on the base;

a low-voltage loop (400), the low-voltage loop being integrated into the circuit board and being electrically connected to the low-voltage connection part; and

a plurality of high-and-low-voltage tabs (500), a first end of each high-and-low-voltage tab being connected to the high-voltage loop for electrical connection, and a second end of the high-and-low-voltage tab being plugged into the circuit board for electrical connection with the low-voltage loop,

wherein the plurality of high-and-low-voltage tabs are parallel to each other and perpendicular to the circuit board.

2. The power distribution apparatus according to claim 1, wherein the high-voltage loop overlaps with the high-voltage connection part for electrical connection;

the low-voltage connection part is plugged into the circuit board for electrical connection with the low-voltage loop; and

components connected in the high-voltage loop overlap with each other for electrical connection.

3. The power distribution apparatus according to claim 1, wherein the high-voltage loop further comprises a circuit protector (240), the circuit protector is arranged on the base, and a first terminal of the circuit protector forms the module positive-electrode connection end;

the main disconnecting switch core comprises a plurality of main disconnecting switch cores, the plurality of main disconnecting switch cores comprise at least a main positive disconnecting switch core (231) and a main negative disconnecting switch core (232), a second terminal of the circuit protector is electrically connected to a first terminal of the main positive disconnecting switch core, and a second terminal of the main positive disconnecting switch core and a first terminal of the main negative disconnecting switch core are respectively electrically connected to the high-voltage connection part; and

the plurality of high-and-low-voltage tabs comprise a main positive low-voltage positive-electrode tab (510), a main positive low-voltage negative-electrode tab (520), a main negative low-voltage positive-electrode tab (530), and a main negative low-voltage negative-electrode tab (540), a first end of the main positive low-voltage positive-electrode tab and a first end of the main positive low-voltage negative-electrode tab are respectively connected to the main positive disconnecting switch core, a second end of the main positive low-voltage positive-electrode tab and a second end of the main positive low-voltage negative-electrode tab are respectively plugged into the circuit board and are electrically connected to the low-voltage loop, a first end of the main negative low-voltage positive-electrode tab and a first end of the main negative low-voltage negative-electrode tab are respectively connected to the main negative disconnecting switch core,

and a second end of the main negative low-voltage positive-electrode tab and a second end of the main negative low-voltage negative-electrode tab are respectively plugged into the circuit board for electrical connection with the low-voltage loop.

4. The power distribution apparatus according to claim 3, wherein the second terminal of the circuit protector overlaps with the first terminal of the main positive disconnecting switch core for electrical connection; and

the second terminal of the main positive disconnecting switch core and the first terminal of the main negative disconnecting switch core respectively overlap with the high-voltage connection part for electrical connection.

5. The power distribution apparatus according to claim 4, wherein the plurality of high-and-low-voltage tabs further comprise:

a positive-electrode voltage collection piece (550), a first end of the positive-electrode voltage collection piece being overlapped at an overlapping position between the second terminal of the main positive disconnecting switch core and the high-voltage connection part, and a second end of the positive-electrode voltage collection piece being plugged into the circuit board and being electrically connected to the low-voltage loop; and

a negative-electrode voltage collection piece (560), a first end of the negative-electrode voltage collection piece being overlapped at an overlapping position between the first terminal of the main negative disconnecting switch core and the high-voltage connection part, and a second end of the negative-electrode voltage collection piece being plugged into the circuit board and being electrically connected to the low-voltage loop.

6. The power distribution apparatus according to claim 5, wherein the high-voltage connection part comprises:

a high-voltage positive-electrode lead-out piece (111), the high-voltage positive-electrode lead-out piece overlapping with the second terminal of the main positive disconnecting switch core and an end of the positive-electrode voltage collection piece for electrical connection; and

a high-voltage negative-electrode lead-out piece (112), the high-voltage negative-electrode lead-out piece overlapping with the first terminal of the main negative disconnecting switch core and an end of the negative-electrode voltage collection piece for electrical connection.

7. The power distribution apparatus according to claim 6, wherein the second terminal of the main positive disconnecting switch core, the high-voltage positive-electrode lead-out piece, and the end of the positive-electrode voltage collection piece overlap with each other in sequence, one of the high-voltage positive-electrode lead-out piece and the positive-electrode voltage collection piece is provided with a positive-electrode anti-rotation positioning groove, and the other one of the high-voltage positive-electrode lead-out piece and the positive-electrode voltage collection piece mates with the positive-electrode anti-rotation positioning groove; and

the first terminal of the main negative disconnecting switch core, the high-voltage negative-electrode lead-out piece, and the end of the negative-electrode voltage collection piece overlap with each other in sequence, one of the high-voltage negative-electrode lead-out piece and the negative-electrode voltage collection piece is provided with a negative-electrode anti-rotation positioning groove, and the other one of the high-voltage negative-electrode lead-out piece and the negative-electrode voltage collection piece mates with the negative-electrode anti-rotation

positioning groove.

8. The power distribution apparatus according to claim 6, wherein the base comprises a first positioning separation rib (130) and a second positioning separation rib (140);

the first positioning separation rib is located between the circuit protector and the high-voltage positive-electrode lead-out piece and between the circuit protector and the positive-electrode voltage collection piece; and

the second positioning separation rib is located between the high-voltage positive-electrode lead-out piece and the high-voltage negative-electrode lead-out piece and between the positive-electrode voltage collection piece and the negative-electrode voltage collection piece.

9. The power distribution apparatus according to claim 3, wherein the high-voltage loop further comprises a current sensor (150), a first terminal of the current sensor forming the module negative-electrode connection end, and a second terminal of the current sensor being electrically connected to a second terminal of the main negative disconnecting switch core; and

the plurality of high-and-low-voltage tabs further comprise a current collection pin (570), a first end of the current collection pin is connected to the current sensor, and a second end of the current collection pin is plugged into the circuit board and is electrically connected to the low-voltage loop.

10. The power distribution apparatus according to claim 9, wherein the second terminal of the current sensor overlaps with the second terminal of the main negative disconnecting switch core for electrical connection.

11. The power distribution apparatus according to claim 9, wherein the base is configured with a third positioning separation rib (160), and the third positioning separation rib is located between the current sensor and the high-voltage connection part.

12. The power distribution apparatus according to claim 9, wherein the circuit protector, the main positive disconnecting switch core, the main negative disconnecting switch core and the current sensor are arranged in sequence along a length direction of the base; and

the low-voltage connection part and the current sensor are arranged along a width direction of the base.

13. The power distribution apparatus according to claim 3, wherein the high-voltage loop further comprises a precharge loop (170), a portion of the precharge loop is integrated into the circuit board, the precharge loop comprises a precharge resistor (180) and a precharge disconnecting switch (190), the precharge resistor and the precharge disconnecting switch are arranged on the base and plugged into the circuit board, and the precharge resistor and the precharge disconnecting switch are connected in series to each other and in parallel with a corresponding main disconnecting switch core; and

the plurality of high-and-low-voltage tabs further comprise a precharge low-voltage positive-electrode tab (580) and a precharge low-voltage negative-electrode tab (590), a first end of the precharge low-voltage positive-electrode tab and a first end of the precharge low-voltage negative-electrode tab are respectively connected to the precharge disconnecting switch, and a second end of the precharge low-voltage positive-electrode tab and a second end of the precharge low-voltage

negative-electrode tab are respectively plugged into the circuit board for electrical connection with the low-voltage loop.

14. The power distribution apparatus according to claim 13, wherein the precharge disconnecting switch has a precharge high-voltage positive-electrode tab (191) and a precharge high-voltage negative-electrode tab (192), the precharge resistor has a resistor high-voltage tab (181), the circuit protector and the precharge resistor are electrically connected to each other through contact, and the precharge high-voltage positive-electrode tab, the precharge high-voltage negative-electrode tab, and the resistor high-voltage tab are plugged into the circuit board for electrical connection with a portion of the precharge loop integrated on the circuit board; or

the precharge disconnecting switch has the precharge high-voltage positive-electrode tab and the precharge high-voltage negative-electrode tab, the precharge resistor has a resistor high-voltage positive-electrode tab (182) and a resistor high-voltage negative-electrode tab (183), and the precharge high-voltage positive-electrode tab, the precharge high-voltage negative-electrode tab, the resistor high-voltage positive-electrode tab, and the resistor high-voltage negative-electrode tab are plugged into the circuit board for electrical connection with the portion of the precharge loop integrated on the circuit board.

15. The power distribution apparatus according to claim 13, wherein the precharge loop further comprises:

a precharge tab (171), the second terminal of the circuit protector overlapping with the first terminal of the main positive disconnecting switch core for electrical connection, a first end of the precharge tab being overlapped at an overlapping position between the second terminal of the

circuit protector and the first terminal of the main positive disconnecting switch core, and a second end of the precharge tab being plugged into the circuit board and electrically connected to a portion of the precharge loop integrated on the circuit board.

16. The power distribution apparatus according to claim 15, wherein the precharge tab is integrally formed with the second terminal of the circuit protector.

17. The power distribution apparatus according to claim 13, wherein the precharge disconnecting switch, the precharge resistor, the main positive disconnecting switch core, the main negative disconnecting switch core, and the low-voltage connection part are arranged in sequence along a length direction of the base; and

the precharge disconnecting switch, the precharge resistor and the circuit protector are arranged along a width direction of the base.

18. The power distribution apparatus according to claim 13, wherein the base comprises a main positive disconnecting switch core installation groove (101), a main negative disconnecting switch core installation groove (102), a precharge disconnecting switch installation groove (103), and a precharge resistor installation groove (104);

the main positive disconnecting switch core is fixed to the main positive disconnecting switch core installation groove through thermal conductive potting of smidahk;

the main negative disconnecting switch core is fixed to the main negative disconnecting switch core installation groove through thermal conductive potting of smidahk;

the precharge disconnecting switch is clamped in the precharge disconnecting switch

installation groove or fixed to the precharge disconnecting switch installation groove through thermal conductive potting of smidahk; and

the precharge resistor is clamped in the precharge resistor installation groove.

19. The power distribution apparatus according to any one of claims 1 to 18, wherein the base comprises:

a base body (105), at least a portion of the high-voltage loop being arranged on the base body, and the circuit board being arranged on the base body; and

a panel (106), the panel being connected to the base body, and the high-voltage connection part and the low-voltage connection part being fixed on the panel.

20. The power distribution apparatus according to claim 19, wherein the base body and the panel are one piece or separate pieces.

21. A battery pack (2), comprising:

a housing (800);

the power distribution apparatus (1) according to any one of claims 1 to 20, the power distribution apparatus being arranged in the housing, and the high-voltage connection part (110) and the low-voltage connection part (120) being exposed from the housing; and

a battery module (700), the battery module being located in the housing and electrically connected to the module positive-electrode connection end (210) and the module negative-electrode connection end (220) respectively.

22. A vehicle (3), comprising the battery pack (2) according to claim 21 and a load (900) electrically connected to the battery pack.