WHAT IS CLAIMED IS:

1. A battery charging and discharging device, comprising:

a power conversion unit, configured to convert AC power into DC power and convert DC power into AC or DC power;

a connecting end of an energy storage battery pack, configured to connect the energy storage battery pack;

a connecting end of charging and discharging, configured to connect a charging power supply or a device to be charged or a load;

a charging switch, comprising a first charging switch and a second charging switch, wherein the first charging switch is arranged in a connection line between the connecting end of charging and discharging and an input of the power conversion unit, and the second charging switch is arranged in a connection line between an output of the power conversion unit and the connecting end of the energy storage battery pack, wherein the connected power storage battery pack may be charged when the first charging switch and the second charging switch are closed; and

a discharging switch, comprising a first discharging switch and a second discharging switch, wherein the first discharging switch is arranged in a connection line between the connecting end of the energy storage battery pack and the input of the power conversion unit, and the second discharging switch is arranged in a connection line between the output of the power conversion unit and the connecting end of charging and discharging, wherein the connected power storage battery pack may be discharged when the first discharging switch and the second discharging switch are closed.

2. The device according to claim 1, further comprising a controller configured to perform the following actions:

closing the first charging switch and the second charging switch when a charging signal indicating that the charge operation should be performed is received; and

closing the first discharging switch and the second discharging switch when a discharging signal indicating that the discharge operation should be performed is received.

3. The device according to claim 1, wherein each of the first charging switch, the second charging switch, the first discharge switch and the second discharge switch comprises at least one switch.

4. The device according to claim 1, wherein the first charging switch, the second charging switch, the first discharge switch and the second discharge switch are selected from the groups including the following: contactor, circuit breaker, relay, and semiconductor switch.

5. The device according to claim 1, wherein the connecting ends have at least four cores, three of which are used as fire wire input of three-phase AC, and the other one of which is used as protective ground; two of the three cores of fire wire input of three-phase AC may be connected to the positive and negative poles of the DC power supply, to receive the DC input; and two of the three cores of fire wire input of three-phase AC may also be used as the positive and negative pole of the DC output to charge DC loads; or

the connecting ends have three cores, two of which are used as single-phase AC input and the other one of which is used as a protective ground; the two cores as single-phase AC input may be connected to the positive and negative poles of DC power supply, to receive DC input; and the two cores as single-phase AC input may also be used as positive and negative poles of DC output to charge DC loads; or

the connecting ends have at least has five cores, three of which are used as fire wire input of three-phase AC, one of which is used as zero-line, and the other one of which is used as protective ground; any two of the three cores of fire wire input of three-phase AC and zero-line may be connected to the positive and negative poles of DC power supply, to accept DC input; and any two of the three cores of fire wire input of three-phase AC and zero-line may also be used as positive and negative poles of DC output to charge DC loads.

6. The device according to claim 1, wherein the connecting end of charging and discharging comprises a three-hole socket for AC and a two-hole socket for DC.

7. The device according to claim 1, wherein each of the first charging switch, the second charging switch, the first discharge switch and the second discharge switch comprises

at least one contact, the number of the contact corresponding to the number of charging/discharging terminals of the connecting end of charging and discharging.

8. The device according to claim 1, comprising:

an interlock logic between the first charging switch and the second discharging switch, so that the first charging switch and the second discharging switch cannot be closed at the same time; and/or

an interlock logic between the first discharging switch and the second charging switch, so that the first discharging switch and the second charging switch cannot be closed at the same time.

9. A rechargeable power supply, comprising:

a power conversion unit, configured to convert AC power into DC power and convert DC power into AC or DC power;

an energy storage battery pack, configured to be charged in a charged state and discharged in a discharged state;

a connecting end of charging and discharging, configured to connect a charging power supply or a device to be charged or a load;

a charging switch, comprising a first charging switch and a second charging switch, wherein the first charging switch is arranged in a connection line between the connecting end of charging and discharging and an input of the power conversion unit, and the second charging switch is arranged in a connection line between an output of the power conversion unit and the energy storage battery pack, wherein the connected power storage battery pack may be discharged when the first charging switch and the second charging switch are closed; and

a discharging switch, comprising a first discharging switch and a second discharging switch, wherein the first discharging switch is arranged in a connection line between the energy storage battery pack and the input of the power conversion unit, and the second discharging switch is arranged in a connection line between the output of the power conversion unit and the connecting end of charging and discharging, wherein the connected power storage battery pack may be discharged when the first discharging switch and the second discharging switch are closed.

10. The rechargeable power supply according to claim 9, wherein the energy storage battery pack comprises multiple rechargeable batteries connected in series or parallel.

11. The rechargeable power supply according to claim 9, wherein the charging power supply or the device to be charged is one of the following: power grid, storage battery, and electric vehicle.

12. A charging vehicle, comprising the rechargeable power supply according to one of claims 9 to 11, wherein the charging vehicle may move in order to charge an electric vehicle or other loads.