Claims

[Claim 1]

A charging device comprising:

a charger which charges a secondary battery of a vehicle;

a resistor which is connected in parallel with the charger;

a ground-side switch which connects the charger and the resistor in an openable/closable manner; and

a determination device which acquires information indicating that the ground-side switch is closed and information indicating that a vehicle-side switch connecting the secondary battery and the charger in an openable/closable manner is open, and then determines that the vehicle-side switch is short-circuited when a physical quantity relating to electricity of the resistor does not decrease.

[Claim 2]

The charging device according to claim 1,

wherein the charger includes

a voltage conversion circuit which converts an AC voltage to a DC voltage, and

a capacitor which smoothes the DC voltage converted by the voltage conversion circuit.

[Claim 3]

The charging device according to claim 1,

wherein the charger includes

a voltage conversion circuit which converts a DC voltage to a DC voltage different from this DC voltage, and

a capacitor which smoothes the DC voltage converted by the voltage conversion circuit.

[Claim 4]

The charging device according to any one of claims 1 to 3,

wherein the determination device outputs a command signal for separating a contact intermediating the connection of the charger and the secondary battery from the secondary battery when it is determined that the vehicle-side switch is short-circuited.

[Claim 5]

A vehicle comprising:

a control device which performs control for separating the secondary battery of the vehicle when a determination device of an external charging device determines that a vehicle-side switch of the vehicle is short-circuited.

[Claim 6]

The vehicle according to claim 5, further

comprising:

a communication unit which performs communication with a communication unit of the charging device;

a battery management unit which manages the secondary battery; and

a host controller which outputs a control signal to the battery management unit based on a command signal received by the communication unit.

[Claim 7]

A vehicle charging system comprising:

a charging device including

a charger which charges a secondary battery of the vehicle,

a resistor which is connected in parallel with the charger,

a ground-side switch which connects the charger and the resistor in an openable/closable manner, and

a determination device which acquires information indicating that the ground-side switch is closed and information indicating that a vehicle-side switch connecting the secondary battery and the charger in an openable/closable manner is open, and then determines that the vehicle-side switch is short-circuited when a physical quantity relating to electricity of the resistor does not decrease; and

a vehicle including a control device which performs control for separating the secondary battery of the vehicle when the determination device determines that the vehicle-side switch of the vehicle is short-circuited.

[Claim 8]

A charging method for a charging device,

wherein the charging device includes

a charger which charges a secondary battery of a vehicle,

a resistor which is connected in parallel with the charger, and

a ground-side switch which connects the charger and the resistor in an openable/closable manner, and

the charging method comprises:

acquiring information indicating that the ground-side switch is closed and information indicating that a vehicle-side switch connecting the secondary battery and the charger in an openable/closable manner is open, and then determining that the vehicle-side switch is short-circuited when a physical quantity relating to electricity of the resistor does not decrease.

[Claim 9]

A program which causes a computer of a charging device to function as:

determination means for acquiring information

indicating that a ground-side switch connecting a charger for charging a secondary battery of a vehicle and a resistor connected in parallel with the charger in an openable/closable manner is closed and a vehicle-side switch connecting the secondary battery and the charger in an openable/closable manner is open, and determining that the vehicle-side switch is short-circuited when a physical quantity relating to electricity of the resistor does not decrease.

Claims

[Claim 1]

A charging device comprising:

a charger which charges a secondary battery of a vehicle;

a resistor which is connected in parallel with the charger;

a ground-side switch which connects the charger and the resistor in an openable/closable manner; and

a determination device which acquires information indicating that the ground-side switch is closed and information indicating that a vehicle-side switch connecting the secondary battery and the charger in an openable/closable manner is open, and then determines that the vehicle-side switch is short-circuited when a physical quantity relating to electricity of the resistor does not decrease.

[Claim 2]

The charging device according to claim 1,

wherein the charger includes

a voltage conversion circuit which converts an AC voltage to a DC voltage, and

a capacitor which smoothes the DC voltage converted by the voltage conversion circuit.

[Claim 3]

The charging device according to claim 1,

wherein the charger includes

a voltage conversion circuit which converts a DC voltage to a DC voltage different from this DC voltage, and

a capacitor which smoothes the DC voltage converted by the voltage conversion circuit.

[Claim 4]

The charging device according to any one of claims 1 to 3,

wherein the determination device outputs a command signal for separating a contact intermediating the connection of the charger and the secondary battery from the secondary battery when it is determined that the vehicle-side switch is short-circuited.

[Claim 5]

A vehicle charging system comprising:

a charging device including

a charger which charges a secondary battery of the vehicle,

a resistor which is connected in parallel with the charger,

a ground-side switch which connects the charger and the resistor in an openable/closable manner, and

a determination device which acquires information indicating that the ground-side switch is closed and information indicating that a vehicle-side switch connecting the secondary battery and the charger in an openable/closable manner is open, and then determines

that the vehicle-side switch is short-circuited when a physical quantity relating to electricity of the resistor does not decrease; and

a vehicle including a control device which performs control for separating the secondary battery of the vehicle when the determination device determines that the vehicle-side switch of the vehicle is short-circuited.

[Claim 6]

A charging method for a charging device,

wherein the charging device includes

a charger which charges a secondary battery of a vehicle,

a resistor which is connected in parallel with the charger, and

a ground-side switch which connects the charger and the resistor in an openable/closable manner, and

the charging method comprises:

acquiring information indicating that the ground-side switch is closed and information indicating that a vehicle-side switch connecting the secondary battery and the charger in an openable/closable manner is open, and then determining that the vehicle-side switch is short-circuited when a physical quantity relating to electricity of the resistor does not decrease.

[Claim 7]

A program which causes a computer of a charging device to function as:

determination means for acquiring information indicating that a ground-side switch connecting a charger for charging a secondary battery of a vehicle and a resistor connected in parallel with the charger in an openable/closable manner is closed and a vehicle-side switch connecting the secondary battery and the charger in an openable/closable manner is open, and determining that the vehicle-side switch is short-circuited when a physical quantity relating to electricity of the resistor does not decrease.