Claims

1. A wind power generation apparatus, comprising:

an acquisition unit, a wind turbine, a generator, an electric power storage unit, and a controller, wherein the acquisition unit is configured to acquire a wind power value;

the controller is configured to control, according to the wind power value, the wind turbine to drive the generator to generate power and/or to drive the electric power storage unit to charge, comprising:

if the wind power value is between a first wind power threshold value and a second wind power threshold value, the wind turbine only drives the generator to generate power;

if the wind power value is greater than the second wind power threshold value, the wind turbine simultaneously drives the generator and the electric power storage unit to charge;

if the wind power value is less than the first wind power threshold value, the wind turbine only drives the electric power storage unit to charge or drives the electric power storage unit to output induced electric energy to the outside,

wherein the first wind power threshold value is less than the second wind power threshold value;

the electric power storage unit comprises a magnetic circuit and at least one group of battery;

driving the electric power storage unit to charge by the wind turbine comprises: driving relative rotation between the magnetic circuit and the battery by the wind turbine to form a rotating magnetic field applied to the battery, and generating an induced current under the rotating magnetic field by the battery for charging the electric power storage unit; and

the electric power storage unit is further configured to output the induced electric energy to grid through an inverter.

2. The wind power generation apparatus according to claim 1, wherein,

the magnetic circuit is a rotatable magnetic circuit configured to generate a magnetic field surrounding the battery; and

driving the electric power storage unit to charge by the wind turbine further comprises: driving the rotatable magnetic circuit and/or the battery to rotate to generate the rotating magnetic field by the wind turbine.

3. The wind power generation apparatus according to claim 1 or 2, wherein,

the battery is annular, or a plurality of batteries form an annular shape.

4. The wind power generation apparatus according to any one of the claims 1-3, wherein,

the magnetic circuit comprises a rotating shaft and at least one pair of pole shoes;

each pair of pole shoes comprises two pole shoes disposed above and below or right and left of the battery for generating the magnetic field surrounding the battery; and

the rotating shaft is configured to drive the battery or the pole shoes such that the battery generates an induced current in the magnetic field, the induced current being used for charging the battery.

5. The wind power generation apparatus according to claim 4, wherein,

the magnetic circuit generated by the pole shoes passes through the battery, and the battery forms an induced potential and the induced current in the rotating magnetic field generated by the magnetic circuit.

6. The wind power generation apparatus according to claim 2, wherein,

magnetic-curve of the rotatable magnetic circuit are not parallel to a tangent direction of the rotation of the rotatable magnetic circuit, and the magnetic-curve of the rotatable magnetic circuit and the tangent direction of the rotation of the rotatable magnetic circuit are not perpendicular to an electrolyte diaphragm; and

the battery generates an induced potential under the rotating magnetic field, and the induced potential has a direction consistent with direction of positive and negative electrodes of the battery.

7. A wind power generation method, comprising:

acquiring a wind power value; and

controlling, according to the wind power value, a wind turbine to drive a generator to generate power and/or to drive an electric power storage unit to charge, comprising:

if the wind power value is between a first wind power threshold value and a second wind power threshold value, only driving the generator to generate power by the wind turbine;

if the wind power value is greater than the second wind power threshold value, simultaneously driving the generator and the electric power storage unit to charge by the wind turbine;

and if the wind power value is less than the first wind power threshold value, only driving the electric power storage unit to charge or driving the electric power storage unit to output induced electric energy to the outside by the wind turbine,

wherein the first wind power threshold value is less than the second wind power threshold value;

the electric power storage unit comprises a magnetic circuit and at least one group of a battery;

driving the electric power storage unit to charge by the wind turbine comprises: driving relative rotation between the magnetic circuit and the battery by the wind turbine to form a rotating magnetic field applied to the battery, and generating an induced current under the rotating magnetic field by the battery for charging the electric power storage unit; and

the electric power storage unit is further configured to output the induced electric energy to grid through an inverter.

8. The wind power generation method according to claim 7, wherein,

the first wind threshold is 2-5 m/s and the second wind threshold is 10-25 m/s.

9. The wind power generation method according to claim 7, further comprising:

regulating a speed at which the electric power storage unit is charged according to the wind power value.

10. The wind power generation method according to claim 7, wherein,

the magnetic circuit is a rotatable magnetic circuit configured to generat a magnetic field surrounding the battery; and

driving the electric power storage unit to charge by the wind turbine further comprises: driving the rotatable magnetic circuit and/or the battery to rotate to generate the rotating magnetic field by the wind turbine.

11. The wind power generation method according to claim 7 or 10, wherein,

the battery is annular, or a plurality of batteries form an annular shape.

12. The wind power generation method according to any one of the claims 7-11, wherein,

the magnetic circuit comprises a rotating shaft and at least one pair of pole shoes;

each pair of pole shoes comprises two pole shoes disposed above and below or right and left of the battery for generating the magnetic field surrounding the battery; and

the rotating shaft is configured to drive the battery or the pole shoes such that the battery generates an induced current in the magnetic field, the induced current being used for charging the battery.

13. The wind power generation method according to claim 12, wherein,

the magnetic circuit generated by the pole shoes passes through the battery, and the battery forms an induced potential and the induced current in the rotating magnetic field generated by the magnetic circuit.

14. The wind power generation method according to claim 10, wherein,

magnetic-curve of the rotatable magnetic circuit are not parallel to a tangent direction of the rotation of the rotatable magnetic circuit, and the magnetic-curve of the rotatable magnetic circuit and the tangent direction of the rotation of the rotatable magnetic circuit are not perpendicular to an electrolyte diaphragm; and the battery generates an induced potential under the rotating magnetic field, and the induced potential has a direction consistent with direction of positive and negative electrodes of the battery.