Claims

[Claim 1]

A ground thermal energy system comprising:

a ~~pumping~~first well;

a ~~water injection~~second well;

a pipe extending from the ~~pumping~~first well to the ~~water injection~~second well;

a heat exchanger provided to the pipe;

a pressure sensor configured to detect a pressure inside the ~~water injection~~second well;

an opening/closing valve configured to open/close the ~~water injection~~second well with respect to atmospheric air; and

a control device configured to control the opening/closing valve to open when the pressure detected is greater than a reference pressure~~.~~, wherein

the control device controls the opening/closing valve to open only in a state where water injection from the first well to the second well through the heat exchanger is performed.

[Claim 2]

The ground thermal energy system according to claim 1, further comprising

a well lid configured to close an opening at an upper part of the ~~water injection~~second well, wherein

the pressure sensor and the opening/closing valve are provided at the well lid.

[Claim 3]

The ground thermal energy system according to claim 1 or 2, wherein

in a state where water injection from the pipe to the ~~water injection~~second well is performed, the control device controls the opening/closing valve to open

when the pressure inside the ~~water injection~~second well detected by the pressure sensor is greater than the reference pressure.

[Claim 4]

The ground thermal energy system according to any one of claims 1 to 3, further comprising

a degassing valve configured to discharge, to an outside of the pipe, gas contained in ground water flowing inside the pipe.

[Claim 5]

The ground thermal energy system according to any one of claims 1 to 4, wherein

the control device is configured to not control the opening/closing valve to open in a state where the second well serves as a pumping well.

[Claim 6]

The ground thermal energy system according to any one of claims 1 to 5, wherein

the control device is configured to recognize whether or not water injection from the pipe to the second well is performed.

[Claim 7]

The ground thermal energy system according to any one of claims 1 to 6, wherein

the control device is configured to recognize whether or not water injection from the pipe to the second well is performed by the operation mode of the ground thermal energy system or the flow direction of the ground water inside the pipe.

[Claim 8]

A control device comprising:

a pressure data acquiring section configured to acquire a pressure inside a ~~water injection~~second well to which ground water pumped from a ~~pumping~~first well and passed through a heat exchanger is injected; ~~and~~

an opening/closing valve control section configured to control an opening/closing valve to allow an inside of the ~~water injection~~second well to communicate with atmospheric air when the pressure acquired is greater than a predetermined reference pressure~~.~~,

wherein the control device controls the opening/closing valve to open only in a state where water injection from the first well to the second well through the heat exchanger is performed.

[Claim ~~6~~9]

A control method comprising:

acquiring a pressure inside a ~~water injection~~second well to which ground water pumped from a ~~pumping~~first well and passed through a heat exchanger is injected; ~~and~~

controlling an opening/closing valve to allow an inside of the ~~water injection~~second well to communicate with atmospheric air when the pressure acquired is greater than a predetermined reference pressure~~.~~; and

controlling the opening/closing valve to open only in a state where water injection from the first well to the second well through the heat exchanger is performed.

[Claim ~~7~~10]

A program configured to cause a computer to perform a method, the method comprising:

acquiring a pressure inside a ~~water injection~~second well to which ground water pumped from a ~~pumping~~first well and passed through a heat exchanger is injected; ~~and~~

controlling an opening/closing valve to allow an inside of the ~~water injection~~second well to communicate with atmospheric air when the pressure acquired is greater than a predetermined reference pressure~~.~~; and

controlling the opening/closing valve to open only in a state where water injection from the first well to the second well through the heat exchanger the is performed.