CLAIMS

[Claim 1]

A refrigerator comprising:

a freezing chamber and at least one storage chamber different from the freezing chamber;

a refrigeration cycle including a compressor, a condenser, an expansion mechanism, and an evaporator;

an air passage communicating to the freezing chamber and the storage chamber different from the freezing chamber, the evaporator being arranged at the air passage;

an internal fan provided at the air passage and configured to supply air cooled by the evaporator to the freezing chamber and the storage chamber different from the freezing chamber;

a damper provided at a supply port of the storage chamber different from the freezing chamber in the air passage and configured to open and close the supply port; and

a controller configured to control, based on an internal load, at least the damper,

the controller including

an internal load recognizing unit configured to recognize the internal load,

an opening time acquisition unit configured to acquire an opening time during which the supply port is opened within a specified time serving as a control interval for the damper in a case where the internal load is less than or equal to a specified value,

a determination unit configured to determine whether or not a load of the freezing chamber and a load of the storage chamber different from the freezing chamber are greater than the specified value, and

a damper control unit configured to

control, in a case where the internal load is less than or equal to the specified value, the damper to open the supply port for the opening time within the specified time, and

control, in a case where the internal load is greater than the specified value and the internal load is the load of the freezing chamber, the damper to fully close the supply port for the specified time, and in a case where the internal load is greater than the specified value and the internal load is the load of the storage chamber different from the freezing chamber, the damper to fully open the supply port for the specified time.

[Claim 2]

The refrigerator of claim 1,

wherein the specified time is a time for which an entire input of the refrigerator is minimum.

[Claim 3]

The refrigerator of claim 1 or 2, wherein

the storage chamber different from the freezing chamber includes a plurality of storage chambers, and the damper includes a plurality of dampers,

the storage chambers different from the freezing chamber include a refrigerating chamber and at least one storage chamber different from the refrigerating chamber, and

the damper control unit is configured to start control for the damper provided at the supply port of the refrigerating chamber and then start control for the damper provided at the supply port of the storage chamber different from the refrigerating chamber.

[Claim 4]

The refrigerator of claim 3, wherein

the storage chamber different from the refrigerating chamber incudes a plurality of storage chambers, and

in controlling the damper provided at the supply port of each of the storage chambers different from the refrigerating chamber, the damper control unit is configured to start control in order from the damper corresponding to a storage chamber having a high setting temperature.

[Claim 5]

The refrigerator of claim 1 or 2, wherein

the storage chamber different from the freezing chamber includes a plurality of storage chambers, and the damper includes a plurality of dampers, and

the damper control unit is configured to start control in order from the damper provided at the supply port of a storage chamber having a high setting temperature.

[Claim 6]

The refrigerator of any one of claims 1 to 5, further comprising:

a temperature sensor configured to detect a temperature of the storage chamber different from the freezing chamber,

wherein the determination unit is configured to

compare, in a state in which the internal load is greater than the specified value, the temperature detected by the temperature sensor with a specified value,

determine, in a case where the temperature detected by the temperature sensor is less than or equal to the specified value, that the load of the freezing chamber is greater than the specified value, and

determine, in a case where the temperature detected by the temperature sensor is greater than the specified value, that the load of the storage chamber different from the freezing chamber is greater than the specified value.

[Claim 7]

The refrigerator of any one of claims 1 to 6, wherein the internal load recognizing unit is configured to recognize the internal load, based on a rotation speed of the compressor or input power of the compressor.

[Claim 8]

The refrigerator of any one of claims 1 to 6, further comprising:

a temperature sensor configured to measure a temperature of refrigerant on an outlet side of the evaporator; and

a temperature senor configured to measure a temperature of refrigerant on the outlet side of the evaporator,

wherein the internal load recognizing unit is configured to recognize the internal load, based on a difference in the temperature between the refrigerant on the outlet side of the evaporator and the refrigerant on the inlet side of the evaporator.

[Claim 9]

The refrigerator of any one of claims 1 to 6, further comprising:

a door opening and closing sensor configured to detect an opening and closing state of a door of the storage chamber,

wherein the internal load recognizing unit is configured to recognize the internal load, based on a number of times of opening and closing the door per unit time.

[Claim 10]

The refrigerator of any one of claims 1 to 6, further comprising:

a door opening and closing sensor configured to detect an opening and closing state of a door of the storage chamber,

wherein the internal load recognizing unit is configured to recognize the internal load, based on a cumulative opening time of the door per unit time.

[Claim 11]

The refrigerator of any one of claims 1 to 6, further comprising:

a temperature sensor configured to detect a temperature of the storage chamber different from the freezing chamber,

wherein the internal load recognizing unit is configured to recognize the internal load, based on the temperature of the storage chamber.

[Claim 12]

The refrigerator of any one of claims 1 to 6, further comprising:

a freezing chamber temperature sensor configured to detect a temperature of the freezing chamber,

wherein the internal load recognizing unit is configured to recognize the internal load, based on an amount of reduction in the temperature of the freezing chamber per unit time.

[Claim 13]

The refrigerator of any one of claims 1 to 12, wherein in a case where the internal load is greater than the specified value, the controller is configured to increase a rotation speed of at least one of the compressor and the internal fan.

CLAIMS

[Claim 1]

A refrigerator comprising:

a freezing chamber and at least one storage chamber different from the freezing chamber;

a refrigeration cycle including a compressor, a condenser, an expansion mechanism, and an evaporator;

an air passage communicating to the freezing chamber and the storage chamber different from the freezing chamber, the evaporator being arranged at the air passage;

an internal fan provided at the air passage and configured to supply air cooled by the evaporator to the freezing chamber and the storage chamber different from the freezing chamber;

a damper provided at a supply port of the storage chamber different from the freezing chamber in the air passage and configured to open and close the supply port; and

a controller configured to control, based on an internal load, at least the damper,

the controller including

an internal load recognizing unit configured to recognize the internal load,

an opening time acquisition unit configured to acquire an opening time during which the supply port is opened within a specified time serving as a control interval for the damper in a case where the internal load is less than or equal to a specified value,

a determination unit configured to determine whether or not a load of the freezing chamber and a load of the storage chamber different from the freezing chamber are greater than the specified value, and

a damper control unit configured to

control, in a case where the internal load is less than or equal to the specified value, the damper to open the supply port for the opening time within the specified time, and

control, in a case where the internal load is greater than the specified value and the internal load is the load of the freezing chamber, the damper to fully close the supply port for the specified time, and in a case where the internal load is greater than the specified value and the internal load is the load of the storage chamber different from the freezing chamber, the damper to fully open the supply port for the specified time.

[Claim 2]

The refrigerator of claim 1,

wherein the specified time is a time for which an entire input of the refrigerator is minimum.

[Claim 3]

The refrigerator of claim 1 or 2, wherein

the storage chamber different from the freezing chamber includes a plurality of storage chambers, and the damper includes a plurality of dampers,

the storage chambers different from the freezing chamber include a refrigerating chamber and at least one storage chamber different from the refrigerating chamber, and

the damper control unit is configured to start control for the damper provided at the supply port of the refrigerating chamber and then start control for the damper provided at the supply port of the storage chamber different from the refrigerating chamber.

[Claim 4]

The refrigerator of claim 3, wherein

the storage chamber different from the refrigerating chamber incudes a plurality of storage chambers, and

in controlling the damper provided at the supply port of each of the storage chambers different from the refrigerating chamber, the damper control unit is configured to start control in order from the damper corresponding to a storage chamber having a high setting temperature.

[Claim 5]

The refrigerator of claim 1 or 2, wherein

the storage chamber different from the freezing chamber includes a plurality of storage chambers, and the damper includes a plurality of dampers, and

the damper control unit is configured to start control in order from the damper provided at the supply port of a storage chamber having a high setting temperature.

[Claim 6]

The refrigerator of any one of claims 1 to 5, further comprising:

a temperature sensor configured to detect a temperature of the storage chamber different from the freezing chamber,

wherein the determination unit is configured to

compare, in a state in which the internal load is greater than the specified value, the temperature detected by the temperature sensor with a specified value,

determine, in a case where the temperature detected by the temperature sensor is less than or equal to the specified value, that the load of the freezing chamber is greater than the specified value, and

determine, in a case where the temperature detected by the temperature sensor is greater than the specified value, that the load of the storage chamber different from the freezing chamber is greater than the specified value.

[Claim 7]

The refrigerator of any one of claims 1 to 6, wherein the internal load recognizing unit is configured to recognize the internal load, based on a rotation speed of the compressor or input power of the compressor.

[Claim 8]

The refrigerator of any one of claims 1 to 6, further comprising:

a temperature sensor configured to measure a temperature of refrigerant on an inlet side of the evaporator; and

a temperature senor configured to measure a temperature of refrigerant on an outlet side of the evaporator,

wherein the internal load recognizing unit is configured to recognize the internal load, based on a difference in the temperature between the refrigerant on the outlet side of the evaporator and the refrigerant on the inlet side of the evaporator.

[Claim 9]

The refrigerator of any one of claims 1 to 6, further comprising:

a door opening and closing sensor configured to detect an opening and closing state of a door of the storage chamber,

wherein the internal load recognizing unit is configured to recognize the internal load, based on a number of times of opening and closing the door per unit time.

[Claim 10]

The refrigerator of any one of claims 1 to 6, further comprising:

a door opening and closing sensor configured to detect an opening and closing state of a door of the storage chamber,

wherein the internal load recognizing unit is configured to recognize the internal load, based on a cumulative opening time of the door per unit time.

[Claim 11]

The refrigerator of any one of claims 1 to 6, further comprising:

a temperature sensor configured to detect a temperature of the storage chamber different from the freezing chamber,

wherein the internal load recognizing unit is configured to recognize the internal load, based on the temperature of the storage chamber.

[Claim 12]

The refrigerator of any one of claims 1 to 6, further comprising:

a freezing chamber temperature sensor configured to detect a temperature of the freezing chamber,

wherein the internal load recognizing unit is configured to recognize the internal load, based on an amount of reduction in the temperature of the freezing chamber per unit time.

[Claim 13]

The refrigerator of any one of claims 1 to 12, wherein in a case where the internal load is greater than the specified value, the controller is configured to increase a rotation speed of at least one of the compressor and the internal fan.

[Claim 14]

A refrigerator comprising:

a freezing chamber and at least one storage chamber different from the freezing chamber;

a refrigeration cycle including a compressor, a condenser, an expansion mechanism, and an evaporator;

an air passage communicating to the freezing chamber and the storage chamber different from the freezing chamber, the evaporator being arranged at the air passage;

an internal fan provided at the air passage and configured to supply air cooled by the evaporator to the freezing chamber and the storage chamber different from the freezing chamber;

a damper provided at a supply port of the storage chamber different from the freezing chamber in the air passage and configured to adjust an opening ratio of the supply port; and

a controller configured to control, based on an internal load, at least the damper,

the controller being configured to

control, in a case where the internal load is less than or equal to a specified value, the damper not to fully close or fully open the supply port to control, a temperature of the storage chamber different from the freezing chamber toward the setting temperature, and

control, in a case where the internal load is greater than the specified value and the internal load is the load of the freezing chamber, the damper to fully close the supply port, and in a case where the internal load is greater than the specified value and the internal load is the load of the storage chamber different from the freezing chamber, the damper to fully open the supply port.