Claims

[Claim 1]

A refrigerator, comprising:

a refrigerator compartment;

a freezer compartment;

a cooling device compartment comprising a cooling device configured to cool refrigerator compartment air sent from the refrigerator compartment and freezer compartment air sent from the freezer compartment; and

a circulation fan configured to send cooled air cooled by the cooling device to the refrigerator compartment and the freezer compartment,

wherein, in the cooling device compartment, the freezer compartment air and the refrigerator compartment air flow from a lower side to an upper side of the cooling device compartment,

the cooling device compartment further comprising:

a pre-cooling device arranged on an upstream side of the cooling device and configured to perform dehumidification;

a defrost heater configured to heat the pre-cooling device and arranged at a position at which the defrost heater is shifted from the pre-cooling device in a horizontal direction in the cooling device compartment, a heater roof being arranged above the defrost heater;

a freezer compartment return port formed at a position at which the freezer compartment air sent from the freezer compartment to the cooling device compartment directly flows toward the cooling device; and

a refrigerator compartment return port formed at a position at which the refrigerator compartment air sent from the refrigerator compartment to

the cooling device compartment flows toward the pre-cooling device,

wherein the heater roof is located closer to the freezer compartment return port with respect to the pre-cooling device 10, and is located below the freezer compartment return port,

wherein the freezer compartment return port is inclined so that the cooling device side of the freezer compartment return port is lower, and

wherein the freezer compartment air is discharged above the heater roof through the freezer compartment return port.

[Claim 2]

The refrigerator according to claim 1, wherein the pre-cooling device is arranged at the same height as the defrost heater in a horizontal direction, and is arranged on a back surface side of the cooling device compartment with respect to the defrost heater.

[Claim 3]

The refrigerator according to claim 1 or 2,

wherein a lower end of the freezer compartment return port is arranged above a lower end of the cooling device, and

wherein the refrigerator compartment return port is arranged below the lower end of the freezer compartment return port.

[Claim 4]

The refrigerator according to any one of claims 1 to 3, wherein the freezer compartment air and the refrigerator compartment air flow into the cooling device from the same direction.

[Claim 5]

The refrigerator according to any one of claims 1 to 4, wherein an air flow

of the freezer compartment air sent through the freezer compartment return port to the cooling device compartment is larger than an air flow of the refrigerator compartment air sent through the refrigerator compartment return port to the cooling device compartment.

[Claim 6]

The refrigerator according to any one of claims 1 to 5,

wherein the cooling device compartment comprises, above the freezer compartment return port, an outlet port for allowing the cooled air to be blown out, and

wherein the refrigerator further comprises an airflow control rib, which is arranged between an upper portion of the freezer compartment return port on the freezer compartment side and a lower portion of the outlet port, and is configured to block at least a part of flow of the cooled air blown out through the outlet port.

[Claim 7]

The refrigerator according to any one of claims 1 to 6, wherein the freezer compartment air discharged through the freezer compartment return port flows downward and then flows upward.

[Claim 8]

The refrigerator according to any one of claims 1 to 7, wherein the refrigerator compartment return port and the pre-cooling device have equivalent widths.

[Claim 9]

The refrigerator according to any one of claims 1 to 8,

wherein the freezer compartment return port is arranged on a front surface side of the cooling device compartment, and

wherein the refrigerator compartment return port is arranged on a lateral surface side of the cooling device compartment.

[Claim 10]

The refrigerator according to any one of claims 1 to 9,

wherein the defrost heater comprises a radiant heater, and

wherein the heater roof has a flat shape that is placed below the freezer compartment return port, and is inclined so that the freezer compartment return port side of the heater roof is lower.

[Claim 11]

The refrigerator according to any one of claims 1 to 10, wherein a vertical dimension of the freezer compartment return port is equal to or less than 100 mm.

[Claim 12]

The refrigerator according to any one of claims 1 to 11,

wherein the refrigerator compartment return port comprises an air pathway, which is formed below the defrost heater, and comes close to the pre-cooling device.

[Claim 13]

The refrigerator according to any one of claims 1 to 12,

wherein the cooling device comprises stacked fins and side plates located on outer sides in a stacking direction of the stacked fins, and

wherein the refrigerator further comprises a lateral-portion airflow control rib configured to block air flowing through a lateral surface bypass air pathway formed between each of the side plates and a wall surface of the cooling device compartment.