CLAIMS

[Claim 1]

A refrigeration apparatus (100) comprising a refrigerant circuit (10) in which a first compressor (21), a second compressor (22), a first heat exchanger (23), an expansion mechanism (25a, 25b), and a second heat exchanger (31) are sequentially connected, wherein

the first heat exchanger functions as a radiator of a refrigerant compressed by the first compressor or the second compressor,

the second heat exchanger functions as a heat absorber of a refrigerant decompressed by the expansion mechanism,

the refrigerant circuit includes

a gas-liquid separator (26) or a third heat exchanger (127),

a first channel (56) that connects the gas-liquid separator or the third heat exchanger to a suction side of the second compressor,

a second channel (52) that connects a discharge side of the first compressor to the suction side of the second compressor, and

a third channel (59) that connects the discharge side of the first compressor to a discharge side of the second compressor,

the gas-liquid separator separates a refrigerant in a gas-liquid two-phase state decompressed by the expansion mechanism into a liquid refrigerant and a gas refrigerant,

the third heat exchanger exchanges heat between a refrigerant decompressed by a decompression mechanism (141) after radiating heat in the first heat exchanger and a refrigerant after radiating heat in the first heat exchanger and before being decompressed by the expansion mechanism,

the first channel guides the gas refrigerant in the gas-liquid separator or the refrigerant decompressed by the decompression mechanism and heat-exchanged in the third heat exchanger to the suction side of the second compressor,

the second channel guides a refrigerant discharged from the first compressor to the suction side of the second compressor, and

the third channel guides the refrigerant discharged from the first compressor to the discharge side of the second compressor in a state where the refrigerant discharged from the first compressor does not flow through the second channel,

the refrigeration apparatus further comprising a control unit (70) that switches the refrigerant circuit between a first state and a second state, wherein

in the first state, the refrigerant discharged from the first compressor flows through the second channel, merges with the gas refrigerant flowing through the first channel, and is suctioned into the second compressor,

in the second state, the refrigerant discharged from the first compressor flows through the third channel without flowing through the second channel and merges with a refrigerant discharged from the second compressor that has suctioned a refrigerant flowing through the first channel.

[Claim 2]

The refrigeration apparatus according to claim 1, wherein

the refrigerant circuit further includes a first valve (43) provided in the second channel and a second valve (44) which is a check valve provided in the third channel, and

the control unit opens the first valve in the first state and closes the first valve in the second state.

[Claim 3]

The refrigeration apparatus according to claim 2, wherein when the refrigerant circuit is in the second state, the control unit switches the refrigerant circuit from the second state to the first state in a case where a temperature of the refrigerant suctioned into the first compressor decreases to a first value and a temperature of the refrigerant discharged from the first compressor increases to a second value.

[Claim 4]

The refrigeration apparatus according to claim 2 or 3, wherein when the refrigerant circuit is in the first state, the control unit switches the refrigerant circuit from the first state to the second state in a case where a temperature of the refrigerant suctioned into the first

compressor increases to a third value, or in a case where a number of rotations of the first compressor falls below a number of rotations of the second compressor.

[Claim 5]

The refrigeration apparatus according to any one of claims 2 to 4, wherein

the control unit switches the refrigerant circuit among the first state, the second state, and a third state,

in the third state, the refrigerant is not suctioned into the second compressor, and the refrigerant discharged from the first compressor flows through the third channel without flowing through the second channel,

the refrigerant circuit further includes a third valve (41) provided in the first channel, and

the control unit opens the third valve in the first state or the second state and closes the third valve in the third state.

[Claim 6]

The refrigeration apparatus according to claim 5, wherein the control unit switches the refrigerant circuit to the third state, the second state, and the first state in this order when the first compressor and the second compressor are activated.

[Claim 7]

The refrigeration apparatus according to any one of claims 1 to 6, wherein

the refrigerant circuit includes the gas-liquid separator and further includes a fourth channel (57) that connects the gas-liquid separator to the first channel, and

the fourth channel guides refrigerating machine oil in the gas-liquid separator to the suction side of the second compressor via the first channel together with the liquid refrigerant in the gas-liquid separator.

[Claim 8]

The refrigeration apparatus according to any one of claims 1 to 7, wherein

the refrigerant circuit further includes a fifth channel (58) that connects the discharge side of the second compressor to the suction side of the second compressor, and

the fifth channel guides refrigerating machine oil discharged from the second compressor to the suction side of the second compressor, and

the fifth channel is provided with an oil separator (60) that separates the refrigerating machine oil from a mixture of the refrigerant and the refrigerating machine oil.

[Claim 9]

The refrigeration apparatus according to any one of claims 1 to 8, wherein the refrigerant circuit includes the gas-liquid separator and further includes a fourth heat exchanger (27) that heats the gas refrigerant in the gas-liquid separator by exchanging heat with a refrigerant after radiating heat in the first heat exchanger and before being decompressed by the expansion mechanism.