

[0011]

A refrigerant intermediary device according to an embodiment of the present disclosure includes a refrigerant container configured to contain refrigerant; a first inlet, provided for an outer periphery of the refrigerant container, through which a vapor-phase refrigerant and a first liquid-phase refrigerant flowing in; a first outlet, provided for the outer periphery of the refrigerant container, through which the vapor-phase refrigerant flowing out; a second inlet, provided for the outer periphery of the refrigerant container, through which a second liquid-phase refrigerant flowing in; and a second outlet, provided for the outer periphery of the refrigerant container, through which the first liquid-phase refrigerant and the second liquid-phase refrigerant flowing; wherein the first inlet includes a plurality of inlets, the first outlet includes a single outlet, the second inlet includes a single inlet, and the second outlet includes a plurality of outlets; wherein the plurality of inlets of the first inlet are located in positions such that lines along inflowing directions of the vapor-phase refrigerant and the first liquid-phase refrigerant do not intersect one another.

[0011A]

In an aspect, there is provided a cooling device including a refrigerant intermediary device comprising, the refrigerant intermediary device including:

- a refrigerant container configured to contain refrigerant;
- a first inlet, provided for an outer periphery of the refrigerant container, through which a vapor-phase refrigerant and a first liquid-phase refrigerant flowing in;
- a first outlet, provided for the outer periphery of the refrigerant container, through which the vapor-phase refrigerant flowing out;

a second inlet, provided for the outer periphery of the refrigerant container, through which a second liquid-phase refrigerant flowing in; and

a second outlet, provided for the outer periphery of the refrigerant container, through which the first liquid-phase refrigerant and the second

5 liquid-phase refrigerant flowing; wherein

the first inlet includes a plurality of inlets,

the first outlet includes a single outlet,

the second inlet includes a single inlet,

and the second outlet includes a plurality of outlets; wherein

10 the plurality of inlets of the first inlet are located in positions such that lines along inflowing directions of the vapor-phase refrigerant and the first liquid-phase refrigerant do not intersect one another; a plurality of heat receiving units, each of which is configured to contain refrigerant for receiving heat from a heat source;

15 a condensing unit configured to condense and liquefy the vapor-phase refrigerant that is a vapor-state refrigerant evaporated in the plurality of heat receiving units, and generate the second liquid-phase refrigerant;

a primary vapor tube connecting the condensing unit with the first outlet;

20 a primary liquid tube connecting the condensing unit with the second inlet;

a plurality of secondary vapor tubes connecting the plurality of heat receiving units with a plurality of the first inlets; and

a plurality of secondary liquid tubes connecting the plurality of heat receiving units with a plurality of the second outlets.

25 [0012]

A cooling device including a refrigerant intermediary device according to an embodiment of the present disclosure includes a heat receiving unit configured to contain refrigerant for receiving heat from a

30 heat source; a condensing unit configured to

condense and liquefy the vapor-phase refrigerant that is a vapor-state refrigerant evaporated in the heat receiving unit, and generate the second liquid-phase refrigerant; a primary vapor tube connecting the condensing unit with the first outlet; a primary liquid tube connecting the condensing
5 unit with the second inlet; a secondary vapor tube connecting the heat receiving unit with the first inlet; and a secondary liquid tube connecting the heat receiving unit with the second outlet; and a refrigerant intermediary device respectively connected with the heat receiving unit and the condensing unit, wherein the
10 refrigerant intermediary device is located above the heat receiving unit and includes a refrigerant container configured to contain refrigerant; a first inlet, provided for an outer periphery of the refrigerant container, through which a vapor-phase refrigerant and a first liquid-phase refrigerant flowing in; a first outlet, provided for the outer periphery of the refrigerant
15 container, through which the vapor-phase refrigerant flowing out; a second inlet, provided for the outer periphery of the refrigerant container, through which a second liquid-phase refrigerant flowing in; and a second outlet,

CLAIMS:

1. A cooling device including a refrigerant intermediary device comprising, the refrigerant intermediary device including:
 - a refrigerant container configured to contain refrigerant;
 - a first inlet, provided for an outer periphery of the refrigerant container, through which a vapor-phase refrigerant and a first liquid-phase refrigerant flowing in;
 - a first outlet, provided for the outer periphery of the refrigerant container, through which the vapor-phase refrigerant flowing out;
 - a second inlet, provided for the outer periphery of the refrigerant container, through which a second liquid-phase refrigerant flowing in; and
 - a second outlet, provided for the outer periphery of the refrigerant container, through which the first liquid-phase refrigerant and the second liquid-phase refrigerant flowing; wherein
 - the first inlet includes a plurality of inlets,
 - the first outlet includes a single outlet,
 - the second inlet includes a single inlet,
 - and the second outlet includes a plurality of outlets; wherein the plurality of inlets of the first inlet are located in positions such that lines along inflowing directions of the vapor-phase refrigerant and the first liquid-phase refrigerant do not intersect one another; a plurality of heat receiving units, each of which is configured to contain refrigerant for receiving heat from a heat source;
 - a condensing unit configured to condense and liquefy the vapor-phase refrigerant that is a vapor-state refrigerant evaporated in the plurality of heat receiving units, and generate the second liquid-phase refrigerant;
 - a primary vapor tube connecting the condensing unit with the first outlet;
 - a primary liquid tube connecting the condensing unit with the second inlet;
 - a plurality of secondary vapor tubes connecting the plurality of heat receiving units with a plurality of the first inlets; and
 - a plurality of secondary liquid tubes connecting the plurality of heat receiving units with a plurality of the second outlets.
2. The cooling device according to claim 1,
 - wherein the first inlet and the first outlet are located on the outer periphery of the refrigerant container away from the second inlet and the second outlet.

3. The cooling device according to claim 1 or 2,
wherein the refrigerant container is composed of a rectangular parallelepiped shaped container,
the first inlet is located on an upper part of a side surface of the container,
the first outlet is located on an upper surface of the container,
the second inlet is located on a lower part of a side surface of the container,
and
the second outlet is located on at least on one of a lower part of a side surface of the container and an undersurface of the container.
4. The cooling device according to claim 1 or 2,
wherein the refrigerant container is composed of a cylindrical tube.
5. The cooling device according to any one of claims 1, 2, 3, and 4, further comprising a partition with a plurality of open holes inside the refrigerant container.