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(54) Heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference

(57) The present invention relates to the heat absorbing or dissipating device with piping staggered and uniformly distributed from both sides toward the middle by the temperature difference of passed fluid, wherein the temperature difference fluid passes through the neighboring piping of the heat absorbing or dissipating device, and the synthetic temperature in the device is more uniform, so as to form a more uniform temperature distribution status on the passively heat dissipation or absorption receiving article or space.

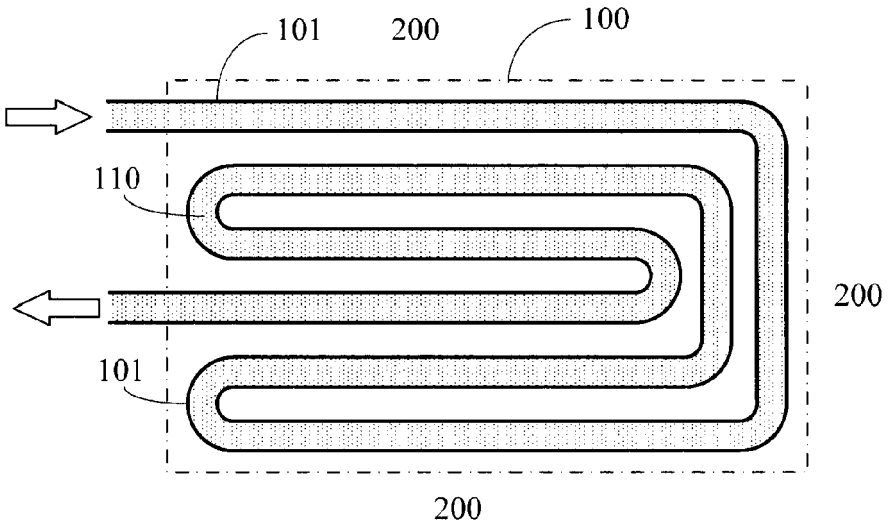

Fig. 4

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Description

BACKGROUND OF THE INVENTION

(a) Field of the Invention

[0001] The present invention relates to the heat absorbing or dissipating device with piping staggered and uniformly distributed from both sides toward the middle by temperature difference of passed fluid, wherein the temperature difference fluid passes through the neighboring piping of the heat absorbing or dissipating device, and the synthetic temperature in the device is more uniform, so as to produce heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article or space thereby forming a more uniform temperature distribution status on the passively heat dissipation or absorption receiving article or space. (b) Description of the Prior

[0002] For the conventional heat absorbing or dissipating devices by passing through thermal conductive fluid as the heat absorbing or dissipating body constituted by gaseous or liquid state fluid, gaseous to liquid state fluid, or liquid to gaseous state fluid such as engine cooling water radiators, heat absorbing cooling energy discharge devices utilizing thermal conductive fluid, or heat dissipating warming energy discharge devices utilizing thermal conductive fluid such as warming devices, heaters, or the warming energy transfer device, as the flow direction of the thermal conductive fluid is fixed, larger temperature difference is formed at each position on the heat absorbing or dissipating body of the thermal conductive fluid.

SUMMARY OF THE INVENTION

[0003] The present invention discloses that the conventional application device transmitting thermal conductive fluid to pass through the heat absorbing or dissipating body for heat absorption or dissipation is improved to be a heat absorbing or dissipating device with piping staggered and uniformly distributed from both sides toward the middle according to the temperature difference of passed fluid, causing the synthetic temperature of the fluid heat absorbing or dissipating device with temperature differene fluid for the neighboring piping passing through to become more uniform, so as to produce heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article or space thereby forming a more uniform temperature distribution status on the passively heat dissipation or absorption receiving article or space.

BRIEF DESCRIPTION OF THE DWAWINGS

[0004]

FIG 1 is a main structural schematic view of a heat absorbing or dissipating device for being passed through by thermal conductive fluid at fixed flow direction being constituted by conventional heat absorbing or dissipating gaseous or liquid state fluid or gaseous to liquid state fluid, or liquid to gaseous state fluid;

FIG. 2 is a temperature difference distribution diagram of FIG 1 being operated for the heat absorbing cooling energy discharge device function;

FIG. 3 is a temperature difference distribution diagram of FIG. 1 being operated for the heat dissipating warming energy discharge device function;

FIG. 4 is a main structural schematic view of an embodiment, according to the present invention;

FIG. 5 is a temperature difference distribution diagram formed on the structure shown in FIG. 4 being operated for heat absorbing cooling energy discharge device function;

FIG. 6 is a temperature difference distribution diagram formed on the structure shown in FIG. 4 being operated for heat dissipating warming energy discharge device function;

FIG. 7 is a main structural schematic view of another embodiment, according to the present invention;

FIG. 8 is a temperature difference distribution diagram formed on the structure shown in FIG. 7 being operated for heat absorbing cooling energy discharge device function;

FIG 9 is a temperature difference distribution diagram formed on the structure shown in FIG. 7 being operated for heat dissipating warming energy discharge device function;

FIG. 10 shows an practical appliation that the fluid piping 101 showen in FIG. 4 is through the heat absorbing or dissipating thermal energy transmission body 100 combining with the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', according to the present invention;

FIG. 11 shows another practical application that the fluid piping 101, first branching fluid piping 1011, and second branching fluid piping 1012 showen in FIG. 7 are through the heat absorbing or dissipating thermal energy transmission body 100 combining with the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', according to the present invention;

FIG. 12 shows an practical application that the fluid piping 101 showen in FIG. 4 is through the heat absorbing or dissipating thermal energy transmission body 100 combining with multiple sets of the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', according to the present invention;

FIG. 13 shows another practical application that the fluid piping 101, first branching fluid piping 1011, and second branching fluid piping 1012 showen in FIG. 7 are through the heat absorbing or dissipating ther-

mal energy transmission body 100 combining with multiple sets of the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', according to the present invention;

FIG. 14 is a structural schematic view of an embodiment, wherein the fluid piping 101 is additionally connected with independent thermal conductive plate 300, according to the present invention;

FIG. 15 is a sectional drawing of line A-A in FIG. 14;

FIG. 16 is a structural schematic view of an embodiment, wherein common thermal conductive plate 400 is installed between the fluid piping 101, according to the present invention;

FIG 17 is a sectional drawing of line B-B in FIG. 16;

FIG. 18 is a structural schematic view of an embodiment, wherein a thermal conductive plate 350 with temperature insulating slots is installed between the fluid piping 101, according to the present invention;

FIG. 19 is a sectional drawing of line C-C in FIG 18; and

FIG. 20 is an operation system schematic view, wherein thermal conductive fluid 110 is periodically bi-directionally pumped by a bi-directional fluid pump, according to the present invention.

DESCRIPTION OF MAIN COMPONENT SYMBOLS

[0005]

100 : Heat absorbing or dissipating thermal energy transmission body
100' : Piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid
101 : Fluid piping
102 : Fluid inlet
103 : Fluid outlet
110 : Thermal conductive fluid
200 : Passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space
300 : Independent thermal conductive plate
350 : Thermal conductive plate with temperature insulating slots
400 : Common thermal conductive plate
500 : Control device
600 : Bidirectional fluid pumping device
1011 : First branching fluid piping
1012 : Second branching fluid piping

DETAILED DESCRIPTION OF THE PREFERED EMBODIMENTS

[0006] FIG. 1 is a main structural schematic view of a conventional heat absorbing or dissipating device for being passed through by thermal conductive fluid at fixed flow direction being constituted by heat absorbing or dissipating gaseous or liquid state fluid or gaseous to liquid state fluid, or liquid to gaseous state fluid. As shown in FIG. 1, the heat absorbing or dissipating device assembly is conventionally composed by the thermal conductive fluid 110, which is constituted by gaseous or liquid state fluid, or gaseous to liquid state fluid, or liquid to gaseous state fluid, passing through the first fluid piping 101 to combine with the heat absorbing or dissipating thermal energy transmission body 100 for 1) passing through the thermal conductive fluid 110 in the fluid piping 101 to perform cooling or heating functions through the heat absorbing or dissipating thermal energy transmission body 100 onto passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200; or 2) passing through the thermal conductive fluid 110 in the fluid piping 101 to reversely receive the surrounding cooling or heating energy of the heat absorbing or dissipating thermal energy transmission body 100 to perform cooling or heating functions; wherein the item 1) is often applied in engine cooling water radiators, heat absorbing cooling energy discharge devices utilizing the thermal conductive fluid 110, or heat dissipating warming energy discharge devices utilizing the thermal conductive fluid 110 such as warming devices, heaters, evaporators, condensers, or the cooling or warming energy transfer device; the latter item 2) is often applied in cooling or warming energy transfer devices; and in the item 1) application, the thermal conductive fluid 110 is inputting via the inlet of the fluid piping 101 at one side end of the heat absorbing or dissipating thermal energy transmission body 100 and outputting via another side end thereby forming a larger temperature difference between the inlet and outlet of the thermal conductive fluid 110 of the fluid piping 101 of the heat absorbing or dissipating thermal energy transmission body 100, and similarly in the item 2) application, it will form a larger temperature difference between the inlet and outlet of the thermal conductive fluid 110 of the fluid piping 101 of the heat absorbing or dissipating thermal energy transmission body 100, which are the defects of the conventional heat absorbing or dissipating device.

[0007] FIG. 2 is a temperature difference distribution diagram of FIG. 1 being operated for the heat absorbing cooling energy discharge device function. Fig 2 shows that the thermal conductive fluid 110 in unidiretional flow direction as shown in FIG. 1 being operated in the conventional heat dissipating warming energy discharge functions appears in unidirectional flow path distribution, wherein when the thermal conductive fluid 110 passes through the fluid piping 101, a larger temperature difference distribution status forms between the inlet and outlet of the thermal conductive fluid 110 of the heat absorbing or dissipating thermal energy transmission body 100.

[0008] FIG. 3 is a temperature difference distribution diagram of FIG. 1 being operated for the heat dissipating warming energy discharge device function. FIG. 3 shows that the thermal conductive fluid 110 in unidirectional flow direction as shown in FIG. 1 being operated in the con-

ventional heat absorbing cooling energy discharge function appears in unidirectional flow path distribution, wherein when the thermal conductive fluid 110 passes through the fluid piping 101, a larger temperature difference distribution status forms between the inlet and outlet of the thermal conductive fluid 110 of the heat absorbing or dissipating thermal energy transmission body 100.

[0009] Aiming to above phenomenon, the present invention innovatively discloses a device with fluid piping staggered and uniformly distributed from both sides toward the middle by temperature difference of passed fluid, wherein the temperature difference fluid passes through the neighboring piping of the heat absorbing or dissipating device, and the synthetic temperature in the device is more uniform, so as to produce heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article or space thereby forming a more uniform temperature distribution status on the passively heat dissipation or absorption receiving article or space.

[0010] FIG. 4 is a main structural schematic view of an embodiment, according to the present invention. As shown in FIG. 4, the assembly structure of the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference mainly comprises the following:

---Heat absorbing or dissipating thermal energy transmission body 100: made of thermal conductive material in solid, or colloid, or liquid, or gaseous state, wherein the number of the heat absorbing or dissipating bodies (100) can be one or more than one;
---Fluid piping 101: made of good thermal conductive material, wherein the piping staggered and uniformly distributed from both sides toward the middle by the temperature difference of passed fluid, the temperature difference fluid passes through the neighboring piping of the heat absorbing or dissipating device, and the synthetic temperature in the device is more uniform; and

the internal part of the fluid piping 101 is used for passing through the thermal conductive fluid 110 constituted by gaseous or liquid state fluid, or gaseous to liquid state fluid, or liquid to gaseous state fluid, and the thermal energy of the internal part of the fluid piping 101 directly or through the heat absorbing or dissipating thermal energy transmission body 100 performs heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200;
the fluid inlet 102 of the fluid piping 101 is used for receiving inflow of the thermal conductive fluid 110, and the fluid outlet 103 of the fluid piping 101 is used for outflow of the thermal conductive fluid 110; and
the fluid piping 101 is parallel or quasi-parallel distributed in a plane structure or three-dimensional structure in the heat absorbing or dissipating thermal energy transmission body 100 to allow the whole temperature difference of the heat absorbing or dissipating thermal energy transmission body 100 more uniformly distributed for performing heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200.

[0011] The structural relationships between the heat absorbing or dissipating thermal energy transmission body 100 and the fluid piping 101 as shown in Fig. 4 can be constituted by one or more relationships as following, including:

(1) the heat absorbing or dissipating thermal energy transmission body 100 is in an assembled structure with the fluid piping 101;
(2) the heat absorbing or dissipating thermal energy transmission body 100 is in an integral structure with the fluid piping 101;
(3) the function of the heat absorbing or dissipating thermal energy transmission body 100 is directly provided by the fluid piping 101;
(4) the function of the heat absorbing or dissipating thermal energy transmission body 100 is provided by the fluid piping 101 additionally installed with the independent thermal conductive plate 300;
(5) the function of the heat absorbing or dissipating thermal energy transmission body 100 is provided by the common thermal conductive plate 400 connected between the neighboring fluid piping 101; and
(6) the function of the heat absorbing or dissipating thermal energy transmission body 100 is provided by the thermal conductive plate 350 with temperature insulating slots connected between the neighboring fluid piping 101.

[0012] FIG. 5 is a temperature difference distribution diagram formed on the structure shown in FIG. 4 being operated for heat absorbing cooling energy discharge device function. As shown in FIG. 5, the fluid piping 101 is used for transmitting the thermal conductive fluids 110, wherien the inputting thermal conductive fluid 110 and the outputting thermal conductive fluid 110 has temperature difference between them, and the heat absorbing or dissipating thermal energy transmission body 100 demonstrates the middle temperature, which is more uniformly distributed, between the temperatures of the inputting thermal conductive fluid 110 and the outputting thermal conductive fluid 110, for performing the heat absorpting or dissipating function onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200 to prevent the local low temperature from being too low.

[0013] FIG. 6 is a temperature difference distribution diagram formed on the structure shown in FIG. 4 being operated for heat dissipating warming energy discharge

device function. As shown in FIG. 6, the fluid piping 101 is used for transmitting the thermal conductive fluids 110, wherein the inputting thermal conductive fluid 110 and the outputting thermal conductive fluid 110 has temperature difference between them, and the heat absorbing or dissipating thermal energy transmission body 100 demonstrates the middle temperature, which is more uniformly distributed, between the temperatures of the inputting thermal conductive fluid 110 and the outputting thermal conductive fluid 110, for performing the heat absorpting or dissipating function onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200 to prevent the local high temperature from being too high.

[0014] FIG. 7 shows another embodiment of the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference according to the present invention, wherein the fluid piping 101 is composed of two or more branching fluid piping, which are sequentially arranged from both sides toward the middle and gather together in the fluid piping 101. For the purpose of clear description, two branching fluid piping are exemplified in FIG.7, wherein the two branching fluid piping arranged from both sides toward the middle for transmitting the thermal conductive fluid 110 with temperature difference include first branching fluid piping 1011 and second branching fluid piping 1012, which are sequentially arranged from both sides toward the middle and gather together in the fluid piping 101, so as to directly or through the heat absorbing or dissipating thermal energy transmission body 100 transmit thermal energy to the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200, the further structure including:

---Fluid piping 101: made of good thermal conductive material, wherein the first branching fluid piping 1011 and the second branching fluid piping 1012, which are placed between the fluid inlet 102 and the fluid outlet 103 of the fluid piping 101, are sequentially arranged from both sides toward the middle and gather together in the fluid piping 101 for transmitting the thermal conductive fluid 110 constituted by gaseous or liquid state fluid, gaseous to liquid state fluid, or liquid to gaseous state fluid, so as to directly or through the heat absorbing or dissipating thermal energy transmission body 100 transmit thermal energy to the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200; and

the first branching fluid piping 1011 and the second branching fluid piping 1012 are parallel or quasi-parallel distributed in a plane structure or three-dimensional structure to constitute a common structural body, in which:

between the fluid inlet 102 and the fluid outlet 103 of the fluid piping 101 are placed with the first branching fluid piping 1011 and the second branching fluid piping 1012 or more than two piping, and the fluid inlet 102 and the fluid outlet 103 of the fluid piping 101 are respectively installed at the two sides of the heat absorbing or dissipating thermal energy transmission body 100;

the first branching fluid inlet of the first branching fluid piping 1011 and the second branching fluid inlet of the second branching fluid piping 1012 are parallel connected, and the first branching fluid outlet of the first branching fluid piping 1011 and the second branching fluid outlet of the second branching fluid piping 1012 are parallel connected, thereby for transmitting the thermal conductive fluid 110; and

the first branching fluid piping 1011 near the fluid inlet 102 and the second branching fluid piping 1012 near the fluid inlet 102 are placed at the upper side and the lower side of the common structural body respectively, and the first branching fluid outlet of the first branching fluid piping 1011 and the second branching fluid outlet of the second branching fluid piping 1012 are parallel placed at the middle of the common structural body, for respectively transmitting the thermal conductive fluid 110 to the first branching fluid piping 1011 and the second branching fluid piping placed at the common structural body 1012 during the operation, so as to have the whole temperature difference of the common structural body become more unifoemly distributed , thereby to directly or through the heat absorbing or dissipating thermal energy transmission body 100 perform heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200.

[0015] The structural relationships between the heat absorbing or dissipating thermal energy transmission body 100 and the first branching fluid piping 1011 and/or the second branching fluid piping 1012 as shown in Fig. 7 can be constituted by one or more relationships as following, including:

(1) the heat absorbing or dissipating thermal energy transmission body 100 is in an assembled structure with the first branching fluid piping 1011 and/or the second branching fluid piping 1012;

(2) the heat absorbing or dissipating thermal energy transmission body 100 is in an integral structure with the first branching fluid piping 1011 and/or the second branching fluid piping 1012;

(3) the function of the heat absorbing or dissipating thermal energy transmission body 100 is directly provided by the first branching fluid piping 1011 and/or the second branching fluid piping 1012;

(4) the function of the heat absorbing or dissipating thermal energy transmission body 100 is provided

by the first branching fluid piping 1011 and/or the second branching fluid piping 1012 additionally installed with the independent thermal conductive plate 300 disconnected with the neighboring piping;
(5) the function of the heat absorbing or dissipating thermal energy transmission body 100 is provided by the common thermal conductive plate 400 connected between the neighboring fluid piping of the neighboring first branching fluid piping 1011 and/or second branching fluid piping 1012; and
(6) the function of the heat absorbing or dissipating thermal energy transmission body 100 is provided by the thermal conductive plate 350 with temperature insulating slots connected between the neighboring fluid piping of the neighboring first branching fluid piping 1011 and/or second branching fluid piping 1012.

[0016] FIG. 8 is a temperature difference distribution diagram formed on the structure shown in FIG. 7 being operated for heat absorbing cooling energy discharge device function.

[0017] FIG. 9 is a temperature difference distribution diagram formed on the structure shown in FIG. 7 being operated for heat dissipating warming energy discharge device function.

[0018] The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference can be a common structural body directly constituted by the fluid piping 101, and/or thr first branching fluid piping 1011, and the second branching fluid piping 1012, and the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200.

[0019] As the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the fluid piping also can be parallel or quasi-parallel distributed in a plane structure or three-dimensional structure to construct the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100' in place of the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200, and by means of the fluid piping 101 transmitting the thermal conductive fluid 110 constituted by gaseous or liquid state fluid, gaseous to liquid state fluid, or liquid to gaseous state fluid, thereby through the heat absorbing or dissipating thermal energy transmission body 100 transmits thermal energy to the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100'.

[0020] FIG 10 shows an practical appliation that the fluid piping 101 showen in FIG. 4 is through the heat absorbing or dissipating thermal energy transmission body 100 combining with the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', according to the present invention.

[0021] FIG. 11 shows another practical applicationthat the fluid piping 101, first branching fluid piping 1011, and second branching fluid piping 1012 showen in FIG.7 are through the heat absorbing or dissipating thermal energy transmission body 100 combining with the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', according to the present invention.

[0022] FIG. 12 shows an practical application that the fluid piping 101 showen in FIG. 4 is through the heat absorbing or dissipating thermal energy transmission body 100 combining with multiple sets of the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', according to the present invention.

[0023] FIG. 13 shows another practical application that the fluid piping 101, first branching fluid piping 1011, and second branching fluid piping 1012 showen in FIG.7 are through the heat absorbing or dissipating thermal energy transmission body 100 combining with multiple sets of the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', according to the present invention.

[0024] As the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, for further improving effects of heat absorption or dissipation, the independent thermal conductive plate 300 is additionally installed at the fluid piping 101 and/or the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', so as to improve effects of heat absorption or dissipation.

[0025] FIG. 14 is a structural schematic view of an embodiment, wherein the fluid piping 10 is additionally connected with independent thermal conductive plate 300, according to the present invention.

[0026] FIG. 15 is a sectional drawing of line A-A in FIG. 14.

[0027] As the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, for further improving effects of heat absorption or dissipation, the common thermal conductive plate 400 is installed between the fluid piping 101 and/or the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', so as to improve effects of heat absorption or dissipation.

[0028] FIG. 16 is a structural schematic view of an embodiment, wherein a common thermal conductive plate is installed between the fluid piping 101, according to the present invention.

[0029] FIG 17 is a sectional drawing of line B-B in FIG. 16.

[0030] As the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, for further improving effects of heat absorption or dissipation, the thermal conductive plate 350 with temperature insulating slots is installed between the

fluid piping 101 and/or the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100', so as to improve effects of heat absorption or dissipation.

[0031] FIG. 18 is a structural schematic view of an embodiment, wherein a thermal conductive plate with temperature insulating slots is installed between the fluid piping 101, according to the present invention.

[0032] FIG. 19 is a sectional drawing of line C-C in FIG. 18.

[0033] For the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the fluid passing through the fluid piping 101 and/or the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid 100' can be controlled by the control device 500 to drive the bidirectional fluid pumping device 600 for periodic forward/reverse pumping operation, to periodically forward/reverse pump the thermal conductive fluid 110 bidirectionally, so as to improve effects of uniform temperature.

[0034] The bidirectional fluid pumping device 600 is used for periodic forward/reverse pumping under the control of control device 500 constituted by the electromechanical device, electronic device, or microcomputer and related software.

[0035] FIG. 20 is an operation system schematic view, wherein thermal conductive fluid 110 is periodically bidirectionally pumped by a bi-directional fluid pump, according to the present invention.

[0036] For applications of the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, one or more methods based afore the operating principles according to application structural needs and cost considerations can be used to make the following designs, including:

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the fluid piping for the thermal conductive fluid 110 passing through and the heat absorbing or dissipating thermal energy transmission body 100 can be constituted by an integral type structure;

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the fluid piping for the thermal conductive fluid 110 passing through and the heat absorbing or dissipating thermal energy transmission body 100 can be constituted by an assembled structure;

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the fluid piping for the thermal conductive fluid 110 passing through can be constituted by the structural unit of the single structural body in plate, block, or multi-fins shape, or the structural unit assembled by fins, and can be constituted by at least one structural unit;

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, which can be composed by one or more than one unit, and among the respectively belonged fluid pipings for passing through the thermal conductive fluid 110 are in serial, parallel, or serial-parallel connetion, and can be made of various geometric shapes;

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the thermal conductive fluid 110 passing through the related fluid piping can be transported by pumping, and/or evaporation, and/or heat-cold natural circulation;

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the warming or cooling energy is discharged to the liquid state passively heat dissipation or absorption receiving article or space 200 through using the cold-heat natural convection of fluid in temperature difference, and/or forced fluid pumping to generate thermal transfer function of convection, and/or radiation, and/or conduction; or the warming or cooling energy is discharged to the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space 200 through conduction;

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the thermal conductive fluid 110 passing through related fluid piping is closed-loop circulated or open-loop released;

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, the fluid inlets and the fluid outlets of the various fluid piping can be installed with same or different pointing direction within three-dimensional space; and

---for the heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, there are various installation modes of the fluid piping, including that the fluid piping is composed of tubular structure, and/or the fluid piping is composed of plate sheet structure for fluid flow, and/or the pore-like fluid piping is composed of blocky structure for fluid flow.

[0037] The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference of the present invention can be applied for various heat absorbing, or heat dissipating, or cooling heat conducting application devices, such as the cooling water radiators of the engine, or cooling energy discharge device using thermal conductive fluid for heat absorbing, or warming energy discharge device using thermal conductive fluid for heat dissipating, such as thermal energy transfer for warming equipments, heater or thermal en-

ergy transfer devices, or heating or cooling for ceilings, walls or floors of the buildings, or cooling of photovoltaic panels, or heating or cooling for electrical machine or power machineries, or heat absorption and dissipation of various machine casings, heat pipe structures, structure casings, various chips or semiconductor components, ventilation devices, or the heat absorption, heat dissipation or thermal energy transfer for information, audio, image devices, various lamp or LED devices, or the heat absorption of the evaporator or heat dissipation or thermal energy transfer of condensers of air conditioning devices, or thermal energy transfer of mechanical devices, or heat dissipation of frictional heat loss, or heat dissipation or thermal energy transfer of electric heater or other electric heating home appliances or cooking devices, or heat absorption or thermal energy transfer of flame heating stoves or cooking devices, or heat absorption, heat dissipation or thermal energy transfer of earth layer or water thermal energy, plant or housing building or building material or building structure devices, heat absorbing or dissipation of water tower, or heat absorption, heat dissipation or thermal energy transfer of batteries or fuel cells; and

applied for thermal energy transfer in home appliances, industrial products, electronic products, electrical machines or mechanical devices, power generation equipments, buildings, air conditioning devices, industrial equipments or industrial manufacturing process.

Claims

1. A heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference, wherein the fluid piping staggered and uniformly distributed from both sides toward the middle by the temperature difference of passed fluid, threby to make the synthetic temperature of the fluid heat absorbing or dissipating device with temperature differene fluid for the neighboring piping passing through to become more uniform, so as to produce heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article or space thereby forming a more uniform temperature distribution status on the passively heat dissipation or absorption receiving article or space, the main components including:

---Heat absorbing or dissipating thermal energy transmission body (100): made of thermal conductive material in solid, or colloid, or liquid, or gaseous state, wherein the number of the heat absorbing or dissipating body (100) is one or more than one;

---Fluid piping (101): made of good thermal conductive material, wherein the piping staggered and uniformly distributed from both sides toward the middle by the temperature difference of passed fluid, the temperature difference fluid passes through the neighboring piping of the heat absorbing or dissipating device, and the synthetic temperature in the device is more uniform; and

the internal part of the fluid piping (101) is used for passing through the thermal conductive fluid (110) constituted by gaseous or liquid state fluid, or gaseous to liquid state fluid, or liquid to gaseous state fluid, and the thermal energy of the internal part of the fluid piping (101) directly or through the heat absorbing or dissipating thermal energy transmission body (100) performs heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200);

the fluid inlet (102) of the fluid piping (101) is used for receiving inflow of the thermal conductive fluid (110), and the fluid outlet (103) of the fluid piping (101) is used for outflow of the thermal conductive fluid (110); and

the fluid piping (101) is parallel or quasi-parallel distributed in a plane structure or

three-dimensional structure in the heat absorbing or dissipating thermal energy transmission body (100) to allow the whole temperature difference of the heat absorbing or dissipating thermal energy transmission body (100) more uniformly distributed for performing heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200).

2. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in Claim 1, wherein the structural relationships between the heat absorbing or dissipating thermal energy transmission body (100) and the fluid piping (101) are constituted by one or more relationships as following, including:

1) the heat absorbing or dissipating thermal energy transmission body (100) is in an assembled structure with the fluid piping (101);

2) the heat absorbing or dissipating thermal energy transmission body (100) is in an integral structure with the fluid piping (101);

3) the function of the heat absorbing or dissipating thermal energy transmission body (100) is directly provided by the fluid piping (101);

4) the function of the heat absorbing or dissipating thermal energy transmission body (100) is provided by the fluid piping (101) additionally installed with independent thermal conductive plate (300);

5) the function of the heat absorbing or dissipating thermal energy transmission body (100) is

provided by common thermal conductive plate (400) connected between the neighboring fluid piping (101); and

6) the function of the heat absorbing or dissipating thermal energy transmission body (100) is provided by thermal conductive plate (350) with temperature insulating slots connected between the neighboring fluid piping (101).

3. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in Claim 1 or 2, wherein the fluid piping (101) is composed of two or more branching fluid piping, which are sequentially arranged from both sides toward the middle and gather together in the fluid piping (101).

4. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in Claim 3, wherein the two branching fluid piping arranged from both sides toward the middle for transmitting the thermal conductive fluid (110) with temperature difference include first branching fluid piping (1011) and second branching fluid piping (1012), which are sequentially arranged from both sides toward the middle and gather together in the fluid piping (101), so as to directly or through the heat absorbing or dissipating thermal energy transmission body (100) transmit thermal energy to the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200), the further structure including:

---Fluid piping (101): made of good thermal conductive material, wherein the first branching fluid piping (1011) and the second branching fluid piping (1012), which are placed between the fluid inlet (102) and the fluid outlet (103) of the fluid piping (101), are sequentially arranged from both sides toward the middle and gather together in the fluid piping (101) for transmitting the thermal conductive fluid (110) constituted by gaseous or liquid state fluid, gaseous to liquid state fluid, or liquid to gaseous state fluid, so as to directly or through the heat absorbing or dissipating thermal energy transmission body (100) transmit thermal energy to the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200); and

the first branching fluid piping (1011) and the second branching fluid piping (1012) are parallel or quasi-parallel distributed in a plane structure or three-dimensional structure to constitute a common structural body, in which:

between the fluid inlet (102) and the fluid outlet (103) of the fluid piping (101) are placed with the first branching fluid piping (1011) and the second branching fluid piping (1012) or more than two piping, and the fluid inlet (102) and the fluid outlet (103) of the fluid piping (101) are respectively installed at the two sides of the heat absorbing or dissipating thermal energy transmission body (100);

the first branching fluid inlet of the first branching fluid piping (1011) and the second branching fluid inlet of the second branching fluid piping (1012) are parallel connected,

and the first branching fluid outlet of the first branching fluid piping (1011) and the second branching fluid outlet of the second branching fluid piping (1012) are parallel connected, thereby for transmitting the thermal conductive fluid (110); and

the first branching fluid piping (1011) near the fluid inlet (102) and the second branching fluid piping (1012) near the fluid inlet (102) are placed at the upper side and

the lower side of the common structural body respectively, and the first branching fluid outlet of the first branching fluid piping (1011) and the second branching fluid outlet of the second branching fluid piping (1012) are parallel placed at the middle of the common structural body, for respectively transmitting the thermal conductive fluid (110) to the first branching fluid piping (1011) and the second branching fluid piping placed at the common structural body (1012) during the operation, so as to have the whole temperature difference of the common structural body become more unifoemly distributed , thereby to directly or through the heat absorbing or dissipating thermal energy transmission body (100) perform heat absorbing or dissipating function onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid,

or gaseous state or space (200).

5. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the fluid piping is parallel or quasi-parallel distributed in a plane structure or three-dimensional structure to construct the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid (100') in place of the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200), and by means of the fluid piping (101) transmitting the thermal conductive fluid (110) constituted by gaseous or liquid state fluid, gaseous to liquid state fluid, or liquid to gaseous state

fluid, thereby through the heat absorbing or dissipating thermal energy transmission body (100) transmits thermal energy to the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid (100').

6. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the independent thermal conductive plate (300), and/or the common thermal conductive plate (400), and/or the thermal conductive plate (350) with temperature insulating slots are additionally installed at the fluid piping (101) and/or the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid (100'), so as to improve effects of heat absorption or dissipation.

7. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the fluid passing through the fluid piping (101) and/or the piping structural body transmitting the passively receiving heat absorbing or dissipating thermal conductive fluid (100') can be controlled by the control device (500) to drive the bidirectional fluid pumping device (600) for periodic forward/reverse pumping operation, to periodically forward/reverse pump the thermal conductive fluid (110) bidiretionally, so as to improve effects of uniform temperature; and
the bidirectional fluid pumping device (600) is used for periodic forward/reverse pumping under the control of control device (500) constituted by the electromechanical device, electronic device, or microcomputer and related software.

8. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the fluid piping for the thermal conductive fluid (110) passing through and the heat absorbing or dissipating thermal energy transmission body (100) can be constituted by an integral type structure.

9. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of claims 1 to 7, wherein the fluid piping for the thermal conductive fluid (110) passing through and the heat absorbing or dissipating thermal energy transmission body (100) can be constituted by an assembled structure.

10. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the fluid piping for the thermal conductive fluid (110) passing through is constituted by the structural unit of the single structural body in plate, block, or multi-fins shape, or the structural unit assembled by fins, and is constituted by at least one structural unit.

11. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the device can be composed by one or more than one unit, and among the respectively belonged fluid pipings for passing through the thermal conductive fluid 110 are in serial, parallel, or serial-parallel connection, and can be made of various geometric shapes.

12. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the thermal conductive fluid (110) passing through the related fluid piping is transported by pumping, and/or vaporation, and/or heat-cold natural circulation.

13. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the warming or cooling energy is discharged to the liquid state passively heat dissipation or absorption receiving article or space (200) through using the cold-heat natural convection of fluid in temperature difference, and/or forced fluid pumping to generate thermal transfer function of convection, and/or radiation, and/or conduction; or the warming or cooling energy is discharged to the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200) through conduction.

14. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the thermal conductive fluid (110) passing through the related fluid piping is closed-loop circulated or open-loop released.

15. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the fluid inlets and the fluid outlets of the various fluid piping are installed with same or different pointing direction within three-dimensional space.

16. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding

claims, wherein there are various installation modes of the fluid piping, including that the fluid piping is composed of tubular structure, and/or the fluid piping is composed of plate sheet structure for fluid flow, and/or the pore-like fluid piping is composed of blocky structure for fluid flow.

17. The heat absorbing or dissipating device with piping staggered and uniformly distributed by temperature difference as claimed in any one of the preceding claims, wherein the device is applied for various heat absorbing, or heat dissipating, or cooling heat conducting application devices, such as the cooling water radiators of the engine, or cooling energy discharge device using thermal conductive fluid for heat absorbing, or warming energy discharge device using thermal conductive fluid for heat dissipating, such as thermal energy transfer for warming equipments, heater or thermal energy transfer devices, or heating or cooling for ceilings, walls or floors of the buildings, or cooling of photovoltaic panels, or heating or cooling for electrical machine or power machineries, or heat absorption and dissipation of various machine casings, heat pipe structures, structure casings, various chips or semiconductor components, ventilation devices, or the heat absorption, heat dissipation or thermal energy transfer for information, audio, image devices, various lamp or LED devices, or the heat absorption of the evaporator or heat dissipation or thermal energy transfer of condensers of air conditioning devices, or thermal energy transfer of mechanical devices, or heat dissipation of frictional heat loss, or heat dissipation or thermal energy transfer of electric heater or other electric heating home appliances or cooking devices, or heat absorption or thermal energy transfer of flame heating stoves or cooking devices, or heat absorption, heat dissipation or thermal energy transfer of earth layer or water thermal energy, plant or housing building or building material or building structure devices, heat absorbing or dissipation of water tower, or heat absorption, heat dissipation or thermal energy transfer of batteries or fuel cells; and
applied for thermal energy transfer in home appliances, industrial products, electronic products, electrical machines or mechanical devices, power generation equipments, buildings, air conditioning devices, industrial equipments or industrial manufacturing process.

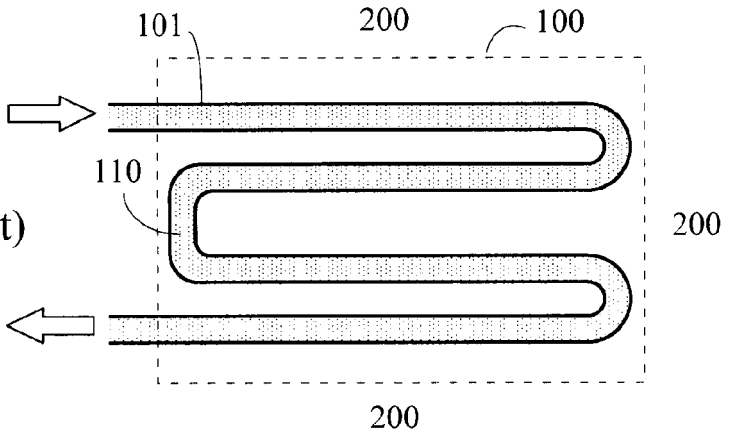


Fig. 1 (Prior Art)

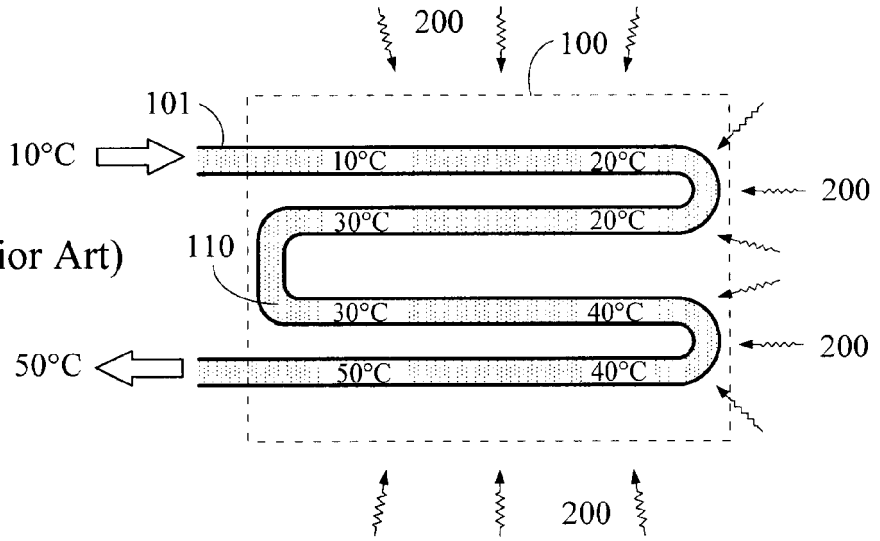


Fig. 2 (Prior Art)

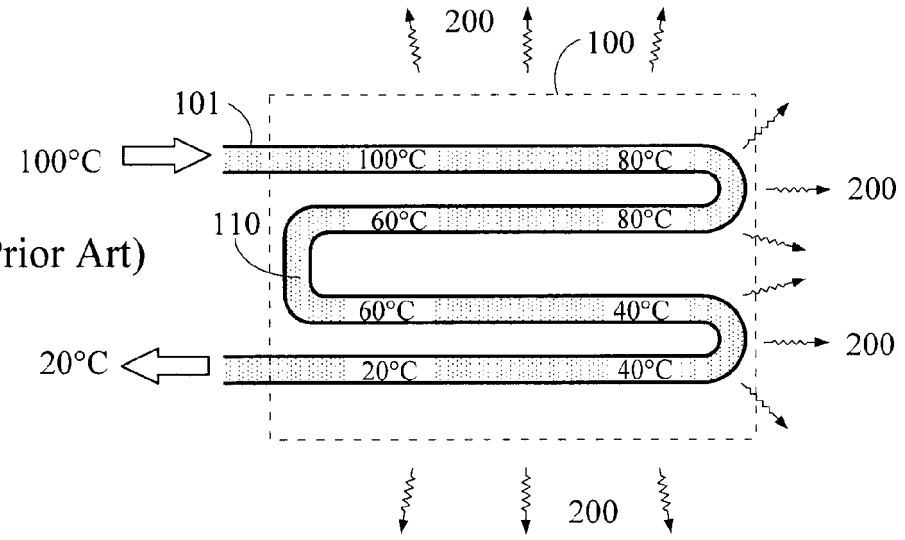


Fig. 3 (Prior Art)

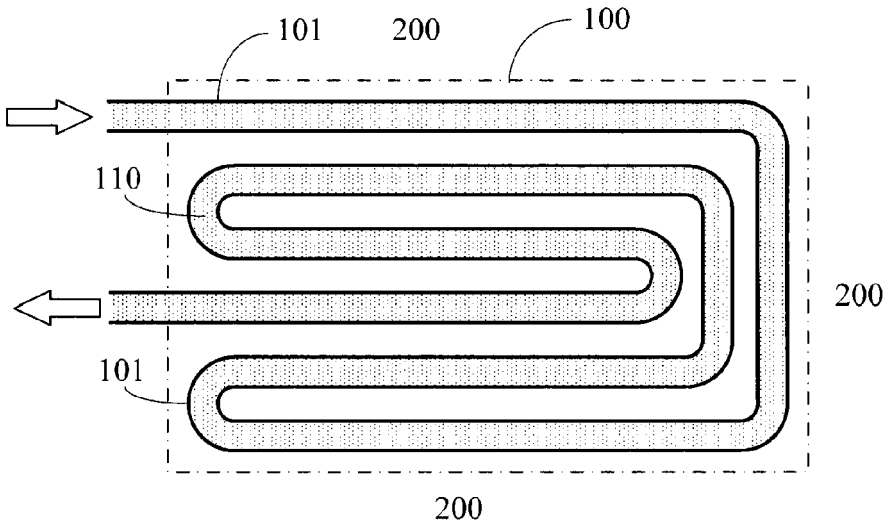


Fig. 4

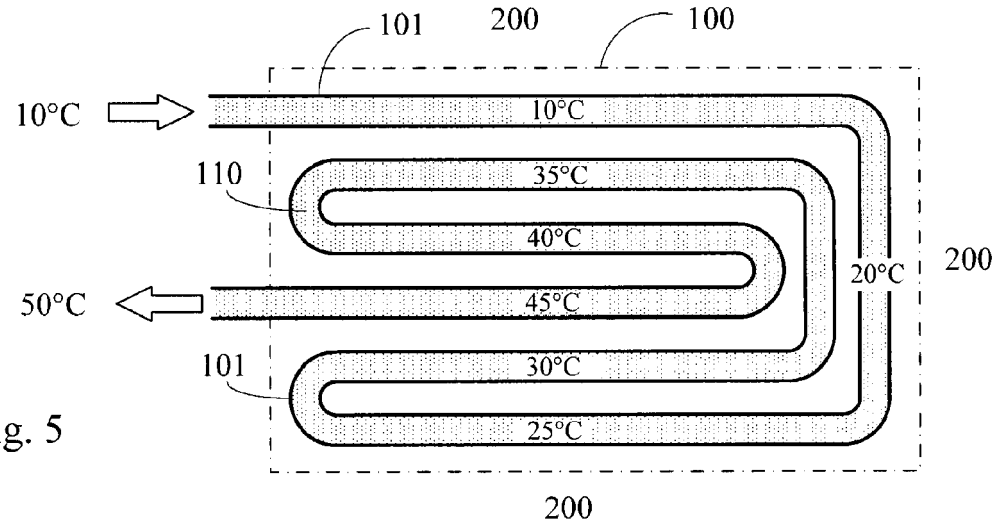


Fig. 5

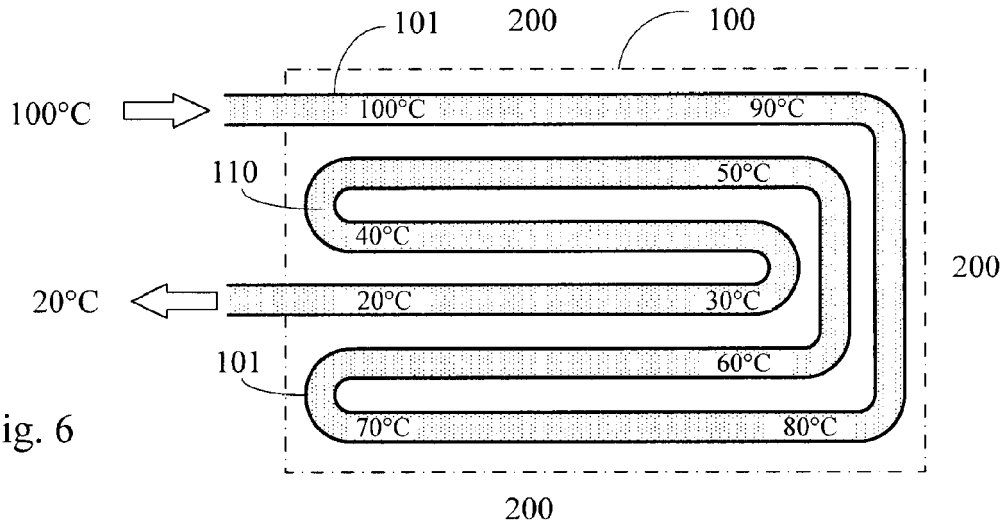


Fig. 6

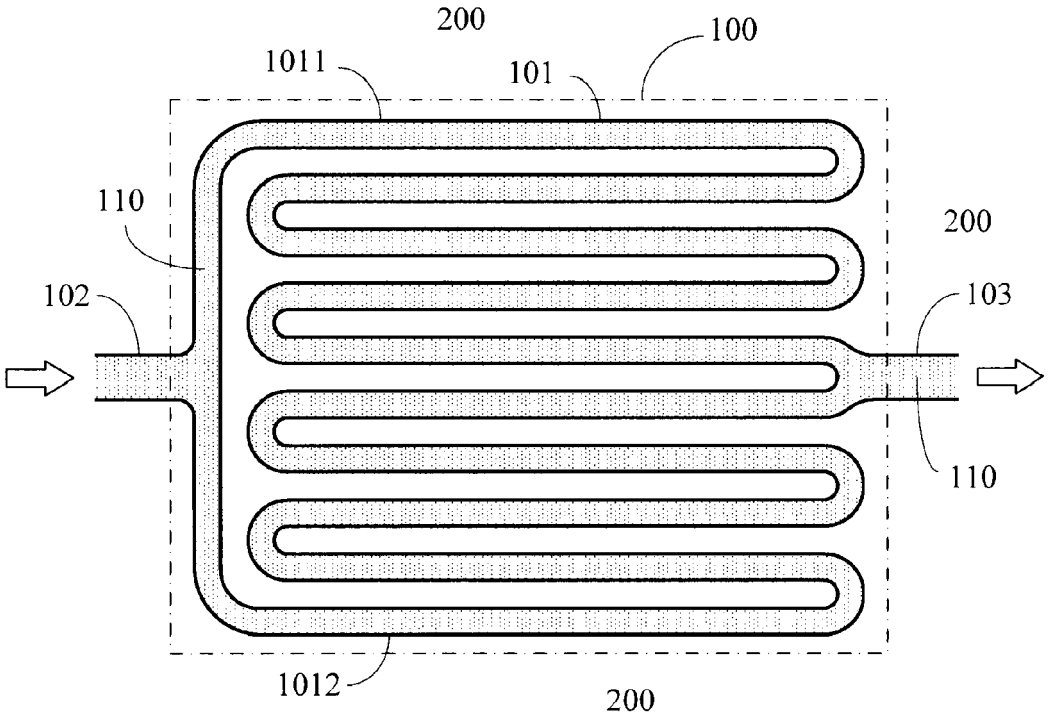
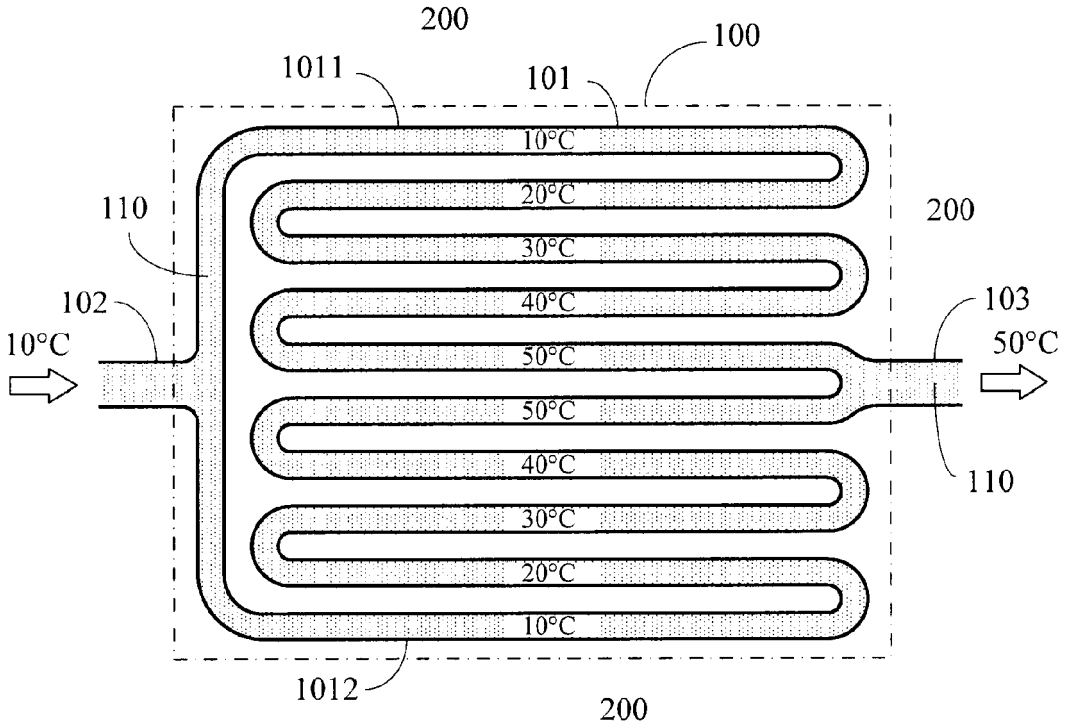

200
1011
101
100
110
200
102
103
110
1012
200

Fig. 7


200
1011
101
100
10°C
20°C
30°C
40°C
50°C
50°C
40°C
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20°C
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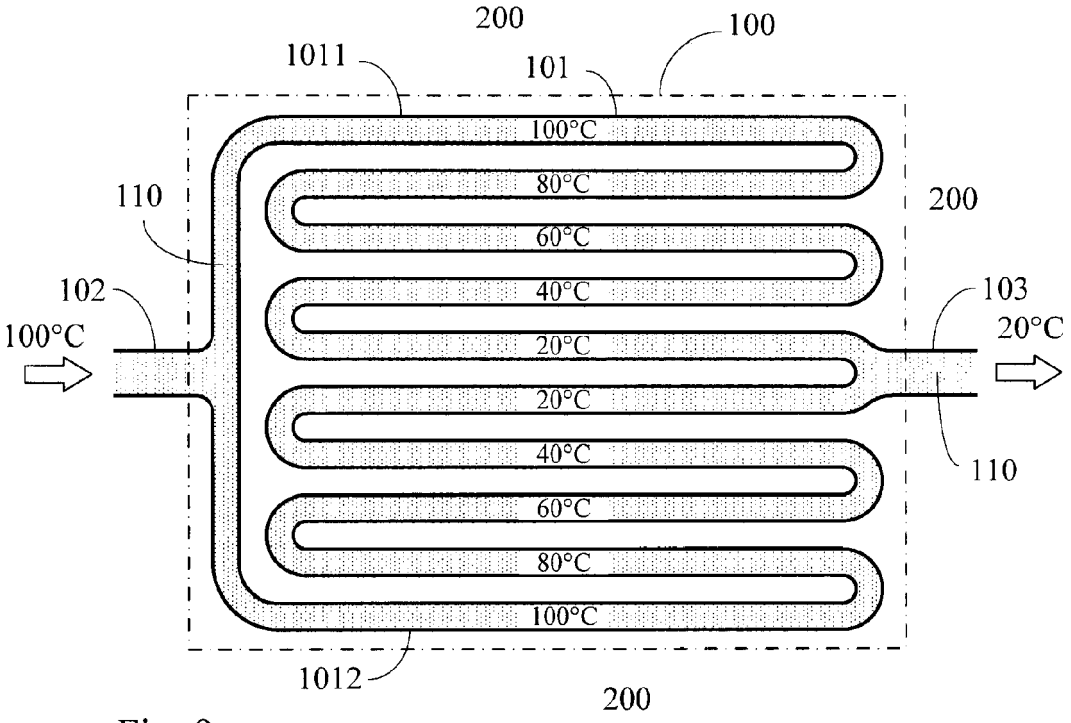
103
10°C
50°C
110
1012
200

Fig. 8


200
100
1011
101
100°C
80°C
60°C
40°C
20°C
20°C
40°C
60°C
80°C
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110
200
102
103
100°C
20°C
110
1012
200

Fig. 9

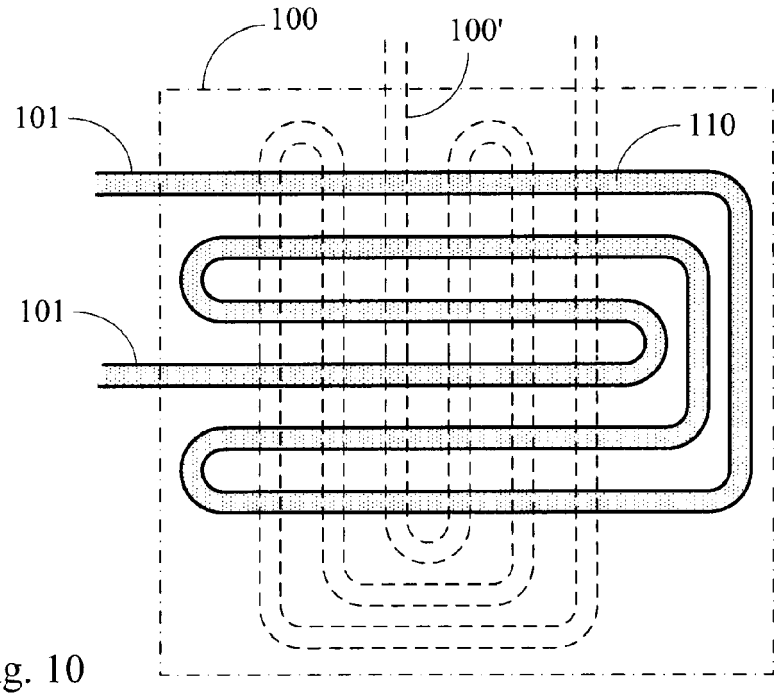
100
100'
101
110
101

Fig. 10

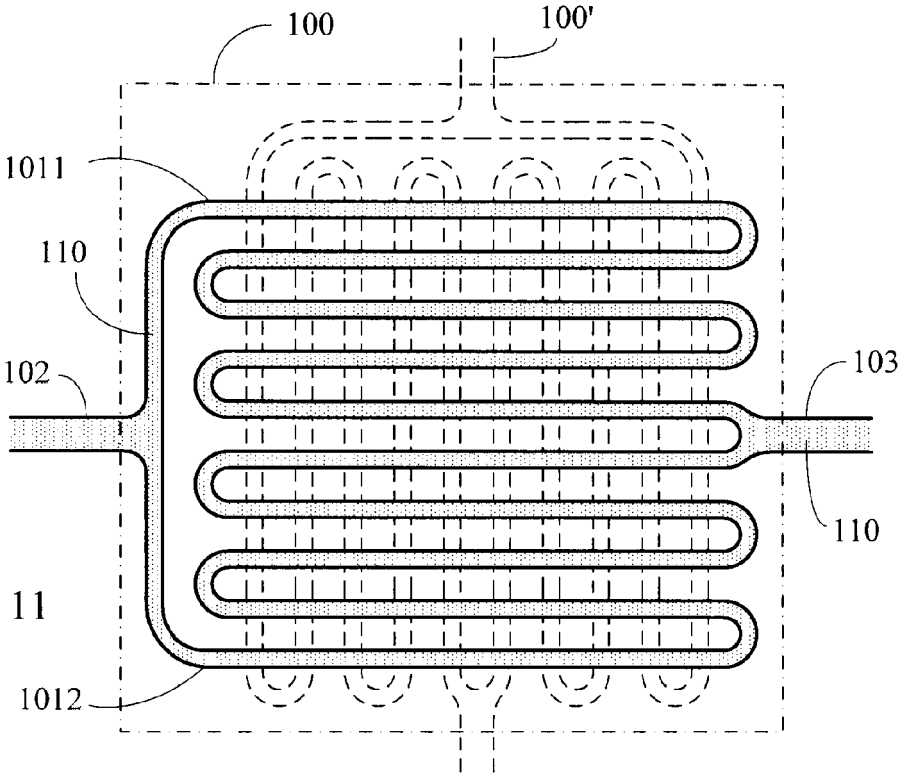
100
100'
1011
110
102
103
110
1012

Fig. 11

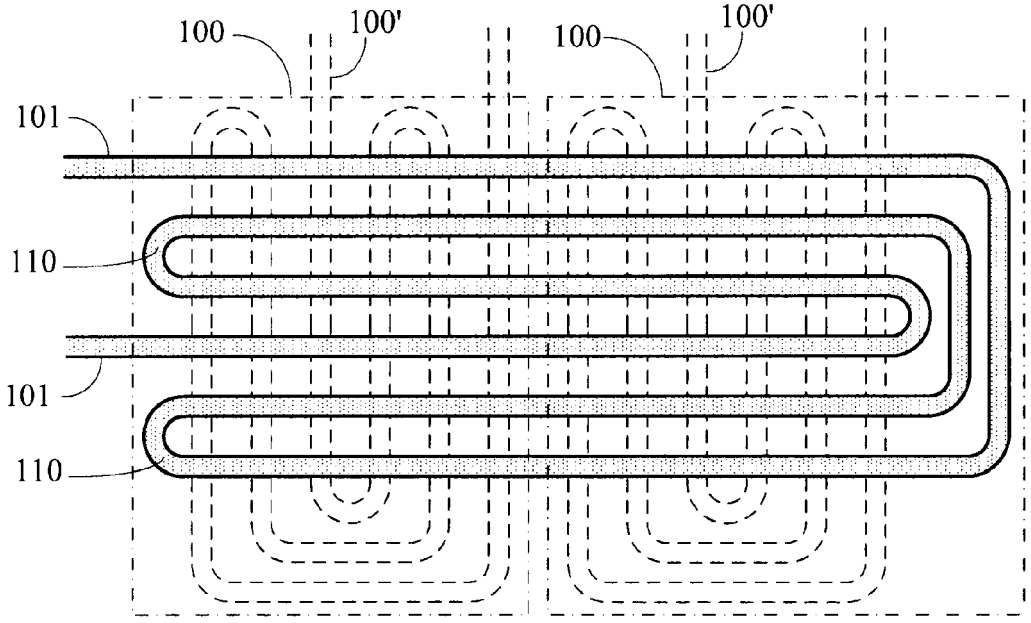
100
100'
100
100'
101
110
101
110

Fig. 12

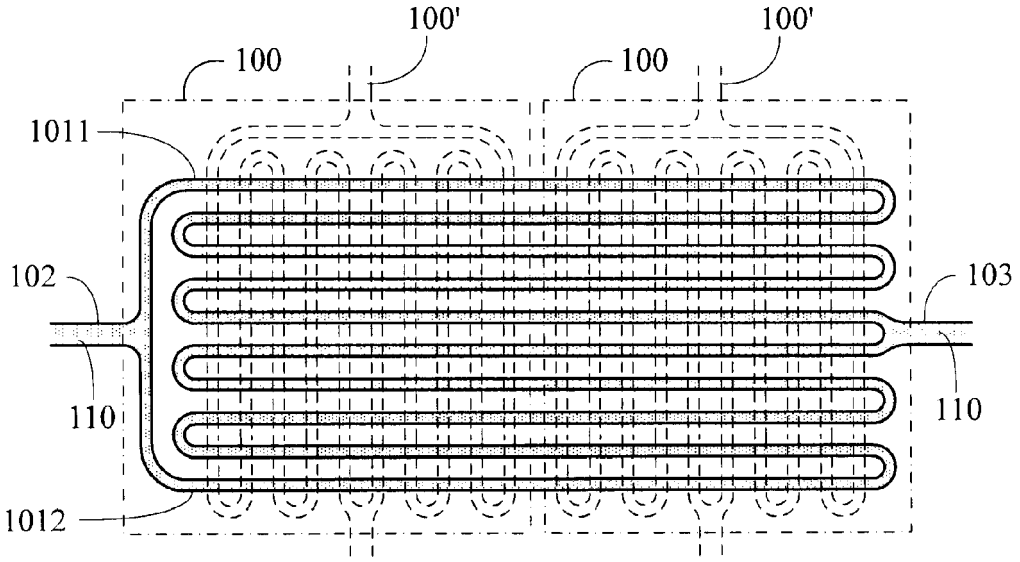

Fig. 13

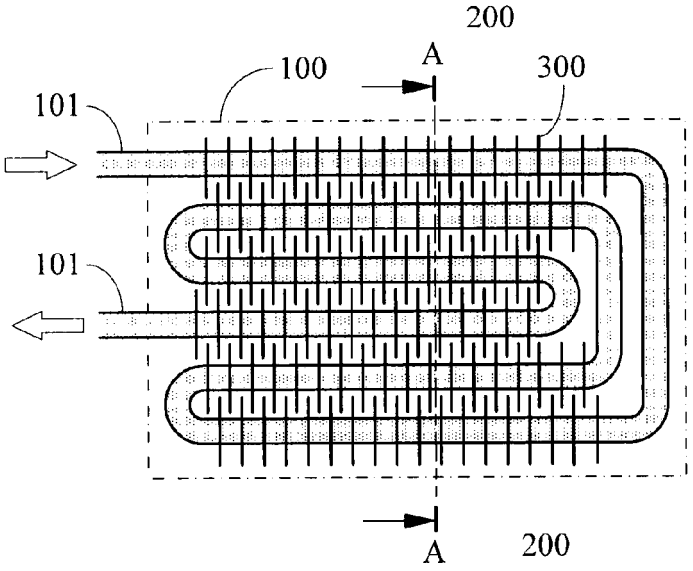

Fig. 14

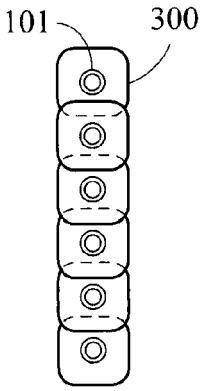

Fig. 15

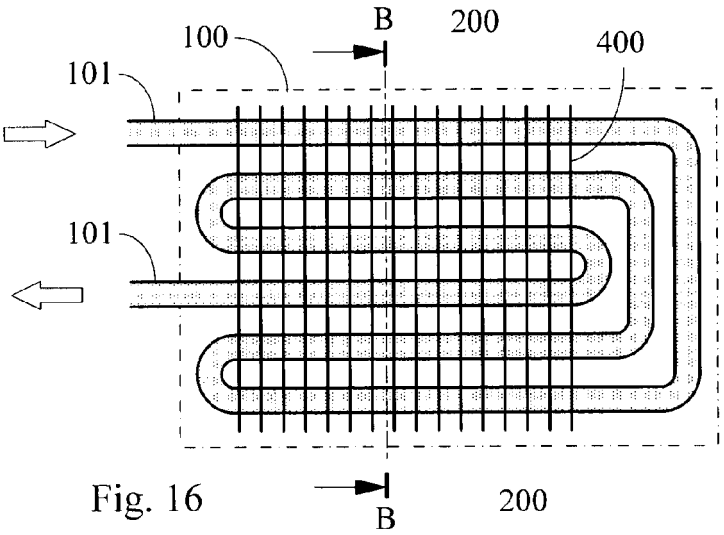

Fig. 16

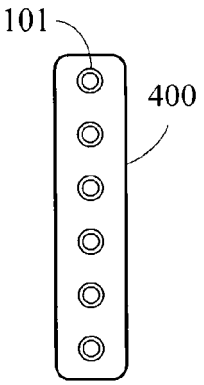

Fig. 17

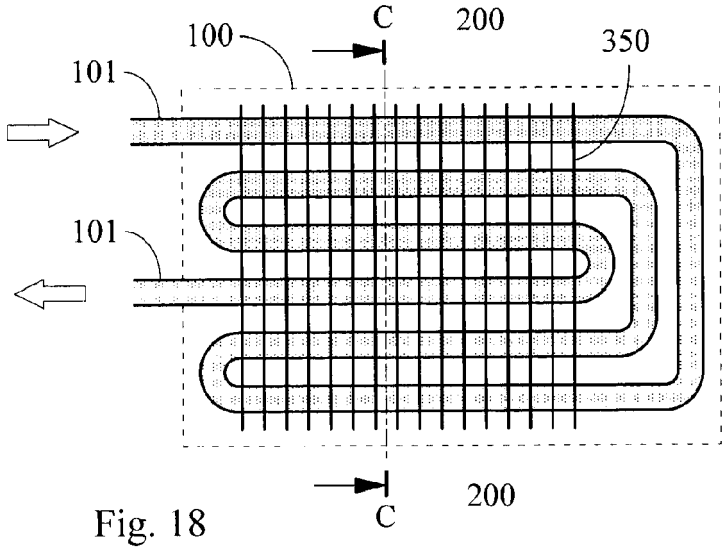

Fig. 18

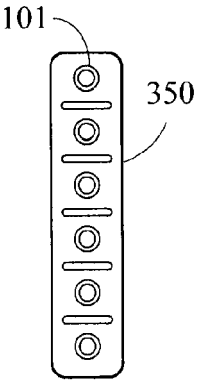

Fig. 19

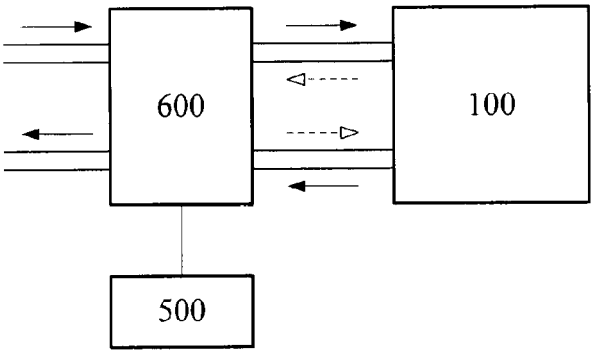

Fig. 20