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CA 2682420 C 2017/12/12

(11)(21) 2 682 420

(12) BREVET CANADIEN / CANADIAN PATENT

(13) C

(22) Date de dépôt/Filing Date: 2009/10/13

(41) Mise à la disp. pub./Open to Public Insp.: 2010/04/15

(45) Date de délivrance/Issue Date: 2017/12/12

(30) Priorité/Priority: 2008/10/15 (US12/285,862)

(51) Cl.Int./Int.Cl. *F28D 1/047* (2006.01), *F28F 1/00* (2006.01)

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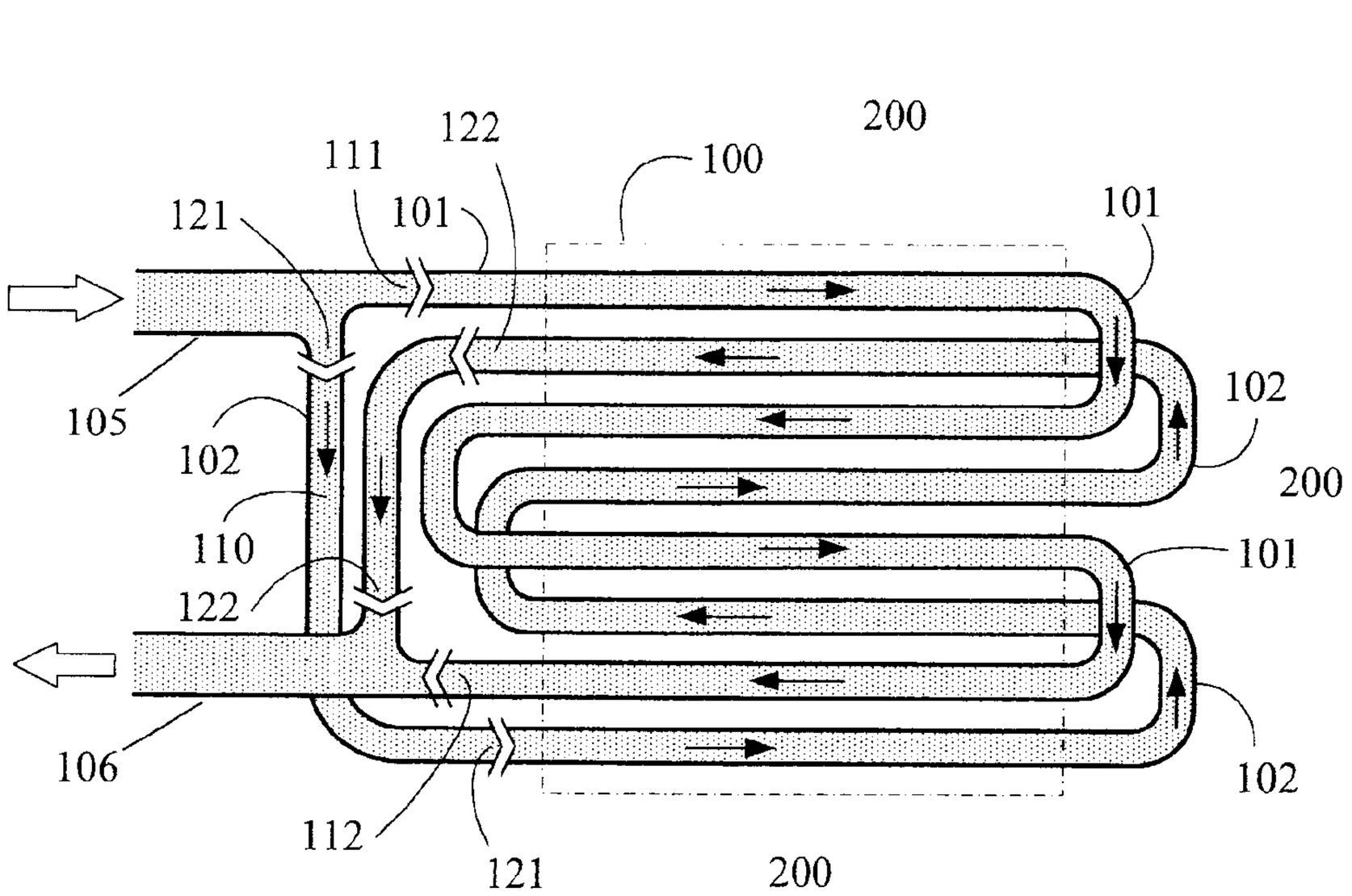
(54) Titre : ABSORBEUR OU DISSIPATEUR THERMIQUE MULTITUBULAIRE AVEC FLUIDES A ECART DE TEMPERATURE A TRANSPORT INVERSE

(54) Title: HEAT ABSORBING OR DISSIPATING DEVICE WITH MULTI-PIPE REVERSELY TRANSPORTED TEMPERATURE DIFFERENCE FLUIDS



(57) Abrégé/Abstract:
The present invention relates to the thermal conductive fluids in temperature difference reversely transported by the first fluid piping and second fluid piping in parallel or quasi-parallel arrangement on the same end side to produce heat absorbing or dissipating

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(13) C

(57) Abrégé(suite)/Abstract(continued):
function onto the passively heat dissipation or absorption receiving article or space thereby forming a more uniform temperature distribution status on the heat absorbing or dissipating body (100) or the passively heat dissipation or absorption receiving article or space (200).

ABSTRACT

The present invention relates to the thermal conductive fluids in temperature difference reversely transported by the first fluid piping and second fluid piping in parallel or quasi-parallel arrangement on the same end side 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 heat absorbing or dissipating body (100) or the passively heat dissipation or absorption receiving article or space (200).

TITLE: HEAT ABSORBING OR DISSIPATING DEVICE WITH MULTI-PIPE REVERSELY TRANSPORTED TEMPERATURE DIFFERENCE FLUIDS

BACKGROUND OF THE INVENTION

(a) Field of the invention

The present invention discloses a device by using multi-pipe to pass the thermal conductive fluids in reverse directions as the heat absorbing or dissipating body, more specifically it is disposed with at least one passage of the first fluid piping and at least one passage of the second fluid piping in parallel or quasi-parallel arrangement, wherein the first fluid piping and the second fluid piping is arranged for transporting the thermal conductive fluids constituted by gaseous or liquid state fluid, gaseous to liquid state fluid or liquid to gaseous state fluid in temperature difference to the passively heat dissipation or absorption receiving article or space in mutually reverse directions, 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 Art

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 such as warming devices, heaters, or the warming energy transfer device, etc., 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

The present invention discloses that the conventional application device using thermal conductive fluid in fixed flow direction as the heat absorbing or dissipating body for heat absorption or dissipation is improved to be constituted by a first fluid piping and a second fluid piping in parallel or quasi-parallel arrangement, wherein the first fluid piping and the second fluid piping is arranged for transporting the thermal conductive fluids constituted by gaseous or liquid state fluid, gaseous to liquid state fluid or liquid to gaseous state fluid in temperature difference to the passively heat dissipation or absorption receiving article or space in mutually reverse directions thereby when transporting thermal conductive fluids to perform heat absorbing or dissipating function the passively heat dissipation or absorption receiving article or space can form a more uniform temperature distribution.

SUMMARY

In accordance with an aspect of the present application there is provided a heat absorbing or dissipating device comprising: a passive heat dissipation or absorption receiving article or space having at least one heat absorbing or dissipating body having a first side, wherein the heat absorbing or dissipating body has an inlet manifold having a first inlet manifold outlet and second inlet manifold outlet feeding to opposite ends of the first side and an outlet manifold having a first outlet manifold inlet and second outlet manifold inlet receiving from opposite ends of the first side of the heat absorbing or dissipating body; at least one first fluid piping coupled to the first inlet manifold outlet of the inlet manifold and to the first outlet manifold inlet of the outlet manifold to form at least one first circuit within the heat absorbing or dissipating body; at least one second fluid piping coupled to the second inlet manifold outlet of the inlet manifold and to the second outlet manifold inlet of the outlet manifold to form at least one second circuit within the heat absorbing or dissipating body, wherein the at least one first and second circuits are configured in a way such that any thermal conductive fluid is flowable in the heat absorbing or dissipating body such that the flow through the at least one first circuit is in one direction and the flow

in the at least one second circuit is in a parallel and opposite direction to the one direction.

BRIEF DESCRIPTION OF THE DRAWINGS

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, etc.

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 the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids of 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 the structure shown in Fig. 4 showing that the first fluid piping and the second fluid piping for directly reversely transporting thermal conductive fluids in temperature difference by multi-pipe directly constitute the common structural body and directly transfer thermal energy onto the passively heat dissipation or absorption receiving article or space.

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 is an embodiment schematic view of the structure shown in Fig. 4 showing that the fluid inlets and the fluid outlets of the first fluid piping and the second fluid piping for reversely transporting thermal conductive fluids in temperature difference by multi-pipe are installed at two sides of the piping respectively.

Fig. 11 is a schematic view of the embodiment shown in Fig. 4 showing that heat absorbing or dissipating body (100) combines with thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100').

Fig. 12 is a schematic view of the embodiment shown in Fig. 4 showing that the heat absorbing or dissipating body (100) combines with a number of the thermal conductive fluid passed and passively receiving

heat absorbing or dissipating tubular structure body (100').

Fig. 13 is a schematic view of the embodiment shown in Fig. 10 showing that the heat absorbing or dissipating body (100) combines with the thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100').

Fig. 14 is a schematic view of the embodiment shown in Fig. 10 showing that the heat absorbing or dissipating body (100) combines with a number of the thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100').

Fig. 15 is a structural schematic view of an embodiment, wherein the multiple pipes of the first fluid piping (101) and the second fluid piping (102), which are countercurrent to each other, are sequentially staggered for parallel reversely transmitting thermal conductive fluid (110), according to the present invention.

Fig. 16 is a structural schematic view of an embodiment, wherein the first fluid piping (101) and/or the second fluid piping (102) are additionally installed with independent thermal conductive plates, according to the present invention.

Fig. 17 is a sectional drawing of line A-A in Fig. 16.

Fig. 18 is a structural schematic view of an embodiment, wherein a common thermal conductive plate is additionally installed between the neighboring fluid piping and the first fluid piping and/or the second fluid piping, according to the present invention.

Fig. 19 is a sectional drawing of line B-B in Fig. 18.

Fig. 20 is a structural schematic view of an embodiment, wherein a thermal conductive plate with temperature insulating slots is additionally installed between the neighboring fluid piping and the first fluid piping and/or the second fluid piping, according to the present invention.

Fig. 21 is a sectional drawing of line C-C in Fig. 20.

Fig. 22 is a structural schematic view of the embodiment shown in

Fig. 15 showing that the first fluid piping and/or the second fluid piping are additionally installed with independent thermal conductive plates.

Fig. 23 is a sectional drawing of line A-A in Fig. 22.

Fig. 24 is a structural schematic view of the embodiment shown in Fig. 15 showing that a common thermal conductive plate is additionally installed between the neighboring fluid piping and the first fluid piping and/or the second fluid piping.

Fig. 25 is a sectional drawing of line B-B in Fig. 24.

Fig. 26 is a structural schematic view of the embodiment shown in Fig. 15 showing that a thermal conductive plate with temperature insulating slots is additionally installed between the neighboring fluid piping and the first fluid piping and/or the second fluid piping.

Fig. 27 is a sectional drawing of line C-C in Fig. 26.

Fig. 28 is a block diagram of a periodic forward/reverse pumping system, according to the present invention.

DESCRIPTION OF MAIN COMPONENT SYMBOLS

100: Heat absorbing or dissipating body

100': Thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body

101: First fluid piping

102: Second fluid piping

105: Inlet manifold

106: Outlet manifold

110: Thermal conductive fluid

111: First fluid outlet

112: First fluid inlet

121: Second fluid outlet

122: Second fluid inlet

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: Two-way movement of fluid pumping device

DETAILED DESCRIPTION OF THE PREFERED EMBODIMENTS

Fig. 1 is a main structural schematic view of a heat absorbing or dissipating device for being passed through by thermal conductive fluids 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, etc., wherein the thermal conductive fluid (110) constituted by gaseous or liquid state fluid, or gaseous to liquid state fluid, or liquid to gaseous state fluid, etc conventionally is passed through the first fluid piping (101) to combine with the heat absorbing or dissipating assembly constituted by the heat absorbing or dissipating body (100) for **1)** passing through the thermal conductive fluid (110) in the first fluid piping (101) to perform cooling or heating functions through the heat absorbing or dissipating body (100) onto the passively heat dissipation or absorption receiving solid, or colloid, or liquid, or gaseous state article or space (200); or **2)** passing through the thermal conductive fluid (110) in the first fluid piping (101) to reversely receive the surrounding cooling or heating energy of the heat absorbing or dissipating body (100); the item **1)** is often applied in engine cooling water radiators, heat absorbing cooling energy discharge devices utilizing thermal conductive fluid (110), or heat dissipating warming energy discharge devices such as warming devices, heaters, evaporators, condensers, or the cooling or warming energy transfer device, etc. wherein the latter item **2)** is often applied in cooling or warming energy transfer devices; in the item **1)** application, thermal conductive fluid (110) is inputting via the inlet of first fluid piping (101) at one side end of the heat absorbing or dissipating body (100) and outputting via another side end thereby forming a larger temperature

difference between the inlet and outlet of the thermal conductive fluids (110) of the first fluid piping (101) of the heat absorbing or dissipating 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 fluids (110) of the first fluid piping (101) of the heat absorbing or dissipating body (100), which are the defects of the conventional heat absorbing or dissipating device.

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 fixed 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 first fluid piping (101) a larger temperature difference distribution status forms between the inlet and outlet of the thermal conductive fluids (110) of the heat absorbing or dissipating body (100).

Fig. 3 is a temperature difference distribution diagram of Fig. 1 being operated for the heat dissipating warming energy discharge device function, wherein Fig. 3 shows that the thermal conductive fluid (110) in fixed flow direction as shown in Fig. 1 being operated in the conventional heat absorbing cooling energy discharge function appears in unidirectional flow path distribution, wherein when the thermal conductive fluid (110) passes through the first 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 body (100).

Aiming to above the phenomenon, the present invention innovatively discloses a device by passing thermal conductive fluids for heat absorption or dissipation which uses a method by respectively pumping the multi-pipe temperature difference fluids in reverse directions to produce heat absorbing or dissipating function onto the passively heat

dissipation or absorption receiving article or space thereby allowing the heat absorbing or dissipating thermal conductive fluid to appear the more uniform temperature distribution status.

Fig. 4 is a main structural schematic view of the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids of the present invention, wherein the assembly structure of the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids mainly comprises the following:

-----Heat absorbing or dissipating body (100): made of thermal conductive material in solid, or colloid, or liquid, or gaseous state for receiving the thermal energy of the thermal conductive fluid (110) constituted by gaseous or liquid state fluid, gascous to liquid state fluid, or liquid to gaseous state fluid inside the combined first fluid piping (101) and the second fluid piping (102) so as to perform heat absorbing cooling energy discharge operating function or heat dissipating warming energy discharge operating function onto the passively heat dissipation or absorption receiving solid, or colloid, or liquid, or gaseous state article or space (200), wherein the number of the heat absorbing or dissipating bodies (100) can be one or more than one;

----First fluid piping (101), Second fluid piping (102): made of good thermal conductive material for reversely passing the thermal conductive fluid (110) constituted by gaseous or liquid state liquid, gaseous to liquid state fluid, or liquid to gaseous state fluid for transferring thermal energy to the heat absorbing or dissipating body (100) made of good thermal conductive material in solid, or colloid, or liquid, or gaseous state, wherein the first fluid piping (101) and the second fluid piping (102) can be respectively constituted by one or more than one passage;

An inlet manifold 105 having a first fluid outlet (111) is connected to the first fluid piping (101) in parallel with a second fluid outlet (121) of the inlet manifold connected to the second fluid piping (102) to receive

the inflow of the thermal conductive fluid (110) and the first fluid inlet (112) of an outlet manifold 106 is connected to the first fluid piping (101) in parallel with the second fluid inlet (122) of the outlet manifold connected to the second fluid piping (102) to receive the outflow of the thermal conductive fluid (110);

The first fluid piping (101) and the second fluid piping (102) are arranged to form a first and second circuit within the heat absorbing or dissipating device in a parallel or quasi-parallel configuration having a planar structure or three-dimensional structure in the heat absorbing or dissipating body (100). This structure is characterized as having the first fluid outlet (111) and the second fluid inlet (122) installed at adjacent locations to the heat absorbing or dissipating body (100), while the first fluid inlet (112) and the second fluid outlet (121) are installed at another adjacent location on the heat absorbing or dissipating body (100). In other words, the first fluid outlet is arranged on an opposite end of a first side of the heat absorbing or dissipating body than the second fluid outlet of the inlet manifold and the first fluid inlet is arranged on an opposite side of the first side of the heat absorbing or dissipating body than the second fluid inlet of the outlet manifold. This configuration allows the thermal conductive fluids (110) to flow in two circuits inside the first fluid piping (101) and the second fluid piping (102) installed on the heat absorbing or dissipating body (100) to transport the fluids in reverse directions to commonly allow a more uniform temperature distribution in the heat absorbing or dissipating body (100) for performing the heat absorbing or dissipating function to the passive heat dissipation or absorption receiving solid, or colloid, or liquid, or gaseous state article or space (200). In other words, the flow of the thermal conductive fluid through the first and second circuits is arranged so that the thermal conductive fluid is flowable in the heat absorbing or dissipating body such that the flow through the at least one first circuit is in one direction and the flow in the at least one

second circuit is in a parallel and opposite direction to the one direction.

The structural relationships between the heat absorbing or dissipating body (100), the first fluid piping (101), and the second fluid piping (102) as shown in Fig. 4 can be constituted by one or more than one relationships as following, include:

(1) The heat absorbing or dissipating body (100) is in a assembled structure with at least one of the first fluid piping (101) and the second fluid piping (102);

(2) The heat absorbing or dissipating body (100) is in an integral structure with at least one of the first fluid piping (101) and the second fluid piping (102);

(3) The function of the heat absorbing or dissipating body (100) is directly provided by at least one of the first fluid piping (101) and the second fluid piping (102);

(4) The first fluid piping (101) and/or the second fluid piping (102) is additionally installed with independent thermal conductive plate (300) which does not connect with the neighboring fluid piping;

(5) Common thermal conductive plate (400) connects between the neighboring fluid piping and the first fluid piping (101) and/or the second fluid piping (102); and

(6) Thermal conductive plate with temperature insulating slots connects between the neighboring fluid piping and the first fluid piping (101) and/or the second fluid piping (102).

Fig. 5 is a temperature difference distribution diagram of the structure shown in Fig. 4 where the thermal conductive fluid absorbs warming energy from the heat absorbing or dissipating body (100) or the passive heat dissipation or absorption receiving article or space (200). As shown in Fig. 5, in the heat absorbing or dissipating body (100), the first fluid outlet (111) of the inlet manifold 105 and the second fluid inlet (122) of the outlet manifold 106 are installed in adjacent first positions.

While the first fluid inlet (112) of the outlet manifold 106 and the second fluid outlet (121) of the inlet manifold 105 are installed in adjacent second positions at another location. These configurations allow the transporting of the thermal conductive fluids (110) in the two circuits in reverse directions, wherein the input flow of the thermal conductive fluid (110) has a lower temperature, while the output flow of the thermal conductive fluid (110) has a higher temperature, and the heat absorbing or dissipating body (100) has an intermediate temperature above the temperatures of the input and output flows of the thermal conductive fluid (110). However, the heat absorbing or dissipating body (100) has a more uniformly distributed temperature distribution resulting from absorbing or dissipating the heating and cooling energy into the passive heat dissipation or absorption receiving article or space (200) to avoid localized low temperatures.

Fig. 6 is a temperature difference distribution diagram of the structure shown in Fig. 4 configured in a way to allow for heat dissipation of the warming energy. As shown in Fig. 6, in the heat absorbing or dissipating body (100), the first fluid outlet (111) of the inlet manifold 105 and the second fluid inlet (122) of the outlet manifold 106 are installed in adjacent first position, while the first fluid inlet (112) of the outlet manifold 106 and the second fluid outlet (121) of the inlet manifold are installed in adjacent second positions at another location. These configurations allow the transportation of the thermal conductive fluid (100) in the two circuits in reverse directions. The input flow of the thermal conductive fluid (110) has a higher temperature, while the output flow of the thermal conductive fluid (110) has a lower temperature, and the heat absorbing or dissipating body (100) has an intermediate temperature below the temperatures of the input and output flows of the thermal conductive fluid (110). However, the heat absorbing or dissipating body (100) has a more uniformly distributed temperature

distribution resulting from the heat dissipating and absorbing of warming energy onto the passive heat dissipation or absorption receiving article or space (200) to avoid localized high temperatures.

For the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, beside of transferring thermal energy via the heat absorbing or dissipating body (100), the first fluid piping (101) and the second fluid piping (102) can be parallel or quasi-parallel distributed in a plane structure or three-dimensional structure to directly constitute structural body, thereby the first fluid piping (101) and the second fluid piping (102) is arranged to directly reversely transport the thermal conductive fluid (110) constituted by gaseous or liquid state fluid, gaseous to liquid state fluid, or liquid to gaseous state fluid in temperature difference from the same end side thereby allowing the first fluid piping (101) and the second fluid piping (102) to directly perform heat dissipating warming energy discharge or heat absorbing cooling energy discharge on the passively heat dissipating or absorption receiving article or space.

Fig. 7 is a main structural schematic view of the structure shown in Fig. 4 showing that the first fluid piping and the second fluid piping for directly reversely transporting thermal conductive fluids in temperature difference by multi-pipe directly constitute the common structural body and directly transfer thermal energy onto the passively heat dissipation or absorption receiving article or space; wherein the structure of Fig. 7 is further constituted, including:

A first fluid piping (101) and the second fluid piping (102) made of thermal conductive material that form the common structural body for transferring thermal energy through the thermal conductive fluid (110), wherein the first fluid piping (101) and the second fluid piping (102) can have one or more flow circuits. The first fluid outlet (111) of the inlet manifold 105 is connected in parallel with the second fluid outlet (121) of

the inlet manifold 105 to receive inflow of the thermal conductive fluid (110), and the first fluid outlet inlet (112) of the outlet manifold 106 is connected in parallel with the second fluid outlet inlet (122) outlet manifold 106 to receive outflow of the thermal conductive fluid (110). The first fluid piping (101) and the second fluid piping (102) are configured so that they have a parallel or quasi-parallel distribution in a planar structure or three-dimensional structure to form the common structural body. The first fluid outlet (111) and the second fluid outlet inlet (122) are installed at an adjacent first location that is common to their position in the structural body, while the first fluid inlet (112) and the second fluid outlet (121) are installed on a second adjacent location at another location that is common to their position in the structural body. The first fluid piping (101) and the second fluid piping (102) of the multiple piping structure forming the common structural body is configured in a way so that the two circuits transport the thermal conductive fluid (110) in reverse directions to more uniformly distribute the temperature in the passive heat dissipation or absorption receiving article or space (200) when absorbing the heating energy or dissipating the heating energy onto the passive heat dissipation or absorption receiving article or space (200).

For the heat absorbing or dissipating device having the multi-pipe structure for reversely transporting temperature difference fluids of the present invention, the structural relationships between the passive heat dissipation or absorption receiving article or space (200), the first fluid piping (101) and the second fluid piping (102) include the following features: the function of the heat absorbing or dissipating body (100) is provided by at least one of the first fluid piping (101) and the second fluid piping (102) to perform the heat absorption or dissipation onto the passive heat dissipation or absorption receiving article or space (200), or the first fluid piping and the second fluid piping forming the multi-pipe structure

configured in a way to allow the reverse flow of the thermal conductive fluids to form the common structural body and directly transfer thermal energy onto the passive heat dissipation or absorption receiving article or space (200).

Fig. 8 is a temperature difference distribution diagram of the structure shown in Fig. 7 where the thermal conductive fluid absorbs warming energy from the heat absorbing or dissipating body (100) or the passive heat dissipation or absorption receiving article or space. As shown in Fig. 8, in the structural body as shown in the structure of Fig. 7, the first fluid outlet (111) of thc inlet manifold 105 and the second fluid inlet (122) of the outlet manifold 106 are installed in adjacent first positions, while the first fluid inlet (112) of the outlet manifold 106 and the second fluid outlet (121) of the inlet manifold 105 are installed in adjacent second positions at another location for transporting the thermal conductive fluid (110) in the two circuits in reverse directions, wherein the input flow of the thermal conductive fluid (110) has a lower temperature, while the output flow of the thermal conductive fluid (110) has a higher temperature, and the common structural body has an intermediate temperature above the temperatures of the input and output flows of the thermal conductive fluids (110). This configuration has a more uniformly distributed temperature distribution in the passive heat dissipation or absorption receiving article or space (200) to perform heat absorbing and cooling energy transfer onto the passive heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200) thereby avoiding localized low temperatures.

Fig. 9 is a temperature difference distribution diagram of the structure shown in Fig. 7 being operated for heat dissipating warming energy discharge device function; as shown in Fig. 9, in the common structural body as shown in the structure of Fig. 7, the first fluid inlet (111) of the first fluid piping (101) and the second fluid outlet (122) of the

second fluid piping (102) are installed in adjacency, while the first fluid outlet (112) of the first fluid piping (101) and the second fluid inlet (121)

of the second fluid piping (102) are installed in adjacency at another location for respectively transporting the two circuits of the thermal conductive fluid flows (110) in reverse directions, wherein the input flow of the thermal conductive fluid (110) appears at higher temperature status, while the output flow of the thermal conductive fluid (110) appears at lower temperature status, and the common structural body appears at an intermediate temperature between the ones of input and output flows of thermal conductive fluids (110) and appears more uniformly distributed in the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200) to perform heat dissipating and warming energy discharge onto the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200) thereby avoiding localized over-high temperatures.

The heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids further can be installed with the fluid inlets and the fluid outlets of the first fluid piping and the second fluid piping for reversely transporting thermal conductive fluids in temperature difference by multi-pipe at two sides of the piping, with same height or different height, respectively.

Fig. 10 is an embodiment schematic view of the structure shown in Fig. 4 showing that the fluid inlets and the fluid outlets of the first fluid piping and the second fluid piping for reversely transporting thermal conductive fluids in temperature difference by multi-pipe are installed at two sides of the piping respectively.

The heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids further can be installed with thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100'), which is composed of one or more fluid piping or the structure similar the heat absorbing or dissipating

body (100), in place of the passively heat dissipation or absorption receiving article in solid, or colloid, or liquid, or gaseous state or space (200).

Fig. 11 is a schematic view of the embodiment shown in Fig. 4 showing that the heat absorbing or dissipating body (100) combines with the thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100').

Fig. 12 is a schematic view of the embodiment shown in Fig. 4 showing that the heat absorbing or dissipating body (100) combines with a number of the thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100').

Fig. 13 is a schematic view of the embodiment shown in Fig. 10 showing that the heat absorbing or dissipating body (100) combines with the thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100').

Fig. 14 is a schematic view of the embodiment shown in Fig. 10 showing that the heat absorbing or dissipating body (100) combines with a number of the thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100').

The heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids also can be formed by the multiple pipes of the first fluid piping (101) and the second fluid piping (102), which are countercurrent to each other, sequentially staggered for parallel reversely transmitting the thermal conductive fluid (110).

Fig. 15 is a structural schematic view of an embodiment, wherein the multiple pipes of the first fluid piping (101) and the second fluid piping (102), which are countercurrent to each other, are sequentially staggered for parallel reversely transmitting the thermal conductive fluid (110).

As shown in Fig. 15, by the multiple pipes of the first fluid piping (101) and the second fluid piping (102), which are countercurrent to each

other, being sequentially staggered for forming the heat absorbing or dissipating body (100), when the thermal conductive fluid (110) passes through the first fluid piping (101) with forward current and the second fluid piping (102) with reverse current, which are sequentially staggered, more uniform temperature distribution will be produced at two sides of the heat absorbing or dissipating body (100); the above first fluid piping (101) and/or second fluid piping (102) are straight pipes each with single segment or curved pipes each with at least one bending, and every bending segment of the first fluid piping (101) and the second fluid piping (102) are staggered in the order of mutual countercurrent.

The piping in the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids can be additionally installed with an independent thermal conductive plate (300), and/or a common thermal conductive plate (400), and/or a thermal conductive plate (350) with temperature insulating slots to improve effects of heat absorption or dissipation, wherein:

for further improving effects of heat absorption or dissipation, the first fluid piping (101) and/or the second fluid piping (102) can be additionally installed with an independent thermal conductive plate to increase heat absorption or dissipation area to improve effects of heat absorption or dissipation.

Fig. 16 is a structural schematic view of an embodiment, wherein the first fluid piping (101) and/or the second fluid piping (102) are additionally installed with independent thermal conductive plates, according to the present invention.

Fig. 17 is a sectional drawing of line A-A in Fig. 16.

For further increasing heat absorption or dissipation area and enhancing structure stability, common thermal conductive plate (400) is additionally installed between the neighboring fluid piping and the first fluid piping (101) and/or the second fluid piping (102) to improve effects

of heat absorption or dissipation.

Fig. 18 is a structural schematic view of an embodiment, wherein a common thermal conductive plate is additionally installed between the neighboring fluid piping and the first fluid piping and/or the second fluid piping, according to the present invention.

Fig. 19 is a sectional drawing of line B-B in Fig. 18.

For increasing heat absorption or dissipation area and enhancing structure stability, thermal conductive plate (350) with temperature insulating slots further can be additionally installed between the neighboring fluid piping and the first fluid piping (101) and/or the second fluid piping (102) to improve effects of heat absorption or dissipation.

Fig. 20 is a structural schematic view of an embodiment, wherein a thermal conductive plate with temperature insulating slots is additionally installed between the neighboring fluid piping and the first fluid piping and/or the second fluid piping, according to the present invention.

Fig. 21 is a sectional drawing of line C-C in Fig. 20.

As the embodiment of the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids shown in Fig.15, by the multiple pipes of the first fluid piping (101) and the second fluid piping (102) being sequentially staggered for forming the heat absorbing or dissipating body (100), when the thermal conductive fluid (110) passes through the first fluid piping (101) and the second fluid piping (102), which are sequentially staggered, more uniform temperature distribution will be produced at two sides of the heat absorbing or dissipating body (100); for further improving effects of heat absorption or dissipation, the first fluid piping (101) and/or the second fluid piping (102) can be additionally installed with the independent thermal conductive plate (300) to increase heat absorption or dissipation area to improve effects of heat absorption or dissipation.

Fig. 22 is a structural schematic view of the embodiment shown in

Fig. 15 showing that the first fluid piping and/or the second fluid piping are additionally installed with independent thermal conductive plates.

Fig. 23 is a sectional drawing of line A-A in Fig. 22.

As the embodiment of the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids shown in Fig.15, for further improving effects of heat absorption or dissipation, the common thermal conductive plate (400) is additionally installed between the neighboring fluid piping and the first fluid piping (101) and/or the second fluid piping (102) to improve effects of increasing heat absorption or dissipation area and enhancing structure stability.

Fig. 24 is a structural schematic view of the embodiment shown in Fig. 15 showing that a common thermal conductive plate is additionally installed between the neighboring fluid piping and the first fluid piping and/or the second fluid piping.

Fig. 25 is a sectional drawing of line B-B in Fig. 24.

As the embodiment of the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids shown in Fig.15, in order to give consideration to structure stability, process, and the need for functionality of independent temperature guiding, the thermal conductive plate (350) with temperature insulating slots further can be additionally installed between the neighboring fluid piping and the first fluid piping (101) and/or the second fluid piping (102) to increase heat absorption or dissipation area and enhance structure stability.

Fig. 26 is a structural schematic view of the embodiment shown in Fig. 15 showing that a thermal conductive plate with temperature insulating slots is additionally installed between the neighboring fluid piping and the first fluid piping and/or the second fluid piping.

Fig. 27 is a sectional drawing of line C-C in Fig. 26.

As the embodiment of the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, the fluid

passing through the first fluid piping (101) and/or the thermal conductive fluid passed and passively receiving heat absorbing or dissipating tubular structure body (100') can be controlled by control device (500) to drive two-way movement of fluid pumping device (600) for periodic forward/reverse pumping operation, to periodically forward/reverse pump the thermal conductive fluid (110), and to improve effects of uniform temperature.

The above two-way movement of fluid pumping device (600) is used for periodic forward/reverse pumping under the control of control device composed of electromechanical device, electronic device, or microcomputer and related software.

Fig. 28 is a block diagram of a periodic forward/reverse pumping system, according to the present invention.

For applications of the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, one or more than one 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 multi-pipe reversely transported temperature difference fluids, the first fluid piping (101) and the second fluid piping (102) can be constituted by an integral type structure of the piping made directly using the structure of the heat absorbing or dissipating body (100);

--For the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, the three of first fluid piping (101), second fluid piping (102) and heat absorbing or dissipating body (100) can be constituted by an assembled structure;

--For the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, the heat absorbing or dissipating body (100) for combination with the first fluid piping (101) and the

second fluid piping (102) 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 multi-pipe reversely transported temperature difference fluids, the three of the heat absorbing or dissipating body (100) constituted by solid, or colloid, or liquid, or gaseous state thermal conductive material, the first fluid piping (101) and the second fluid piping (102) can be partly or all made to various geometric shapes while without changing the principles;

--For the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, the thermal conductive fluid (110) passing through the first fluid piping (101) and the second fluid piping (102) can be transported by pumping, evaporation, or heat-cold natural circulation;

--For the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, 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 circulation of fluid in temperature difference or forced fluid pumping to generate thermal transfer function of heat convention, radiation or conduction; or the warming or cooling energy is discharged to the solid or colloidal or liquid or gaseous state passively heat dissipation or absorption receiving article or space (200) through conduction;

--For the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, the thermal conductive fluid (110) passing through the first fluid piping (101) and the second fluid piping (102) is closed-loop circulated or open-loop released;

--For the heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids, 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 multi-pipe reversely transported temperature difference fluids, 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.

The heat absorbing or dissipating device with multi-pipe reversely transported temperature difference fluids of the present invention can be applied for various heat absorbing, or dissipating, or cooling heat conducting application devices, such as the cooling water radiators of the engine, heat absorbing cooling energy discharge device using thermal conductive fluid, or heat dissipating warming energy discharge device using thermal conductive fluid such as thermal energy, heater or thermal energy transfer devices for warming equipments, 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 of information, audio or image devices, or heat dissipation of 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 of fuel cells, etc.;

As well as 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 comprising:

a passive heat dissipation or absorption receiving article or space having at least one heat absorbing or dissipating body (100) having a first side, wherein the heat absorbing or dissipating body (100) has an inlet manifold (105) having a first inlet manifold outlet (111) and second inlet manifold outlet (121) feeding to opposite ends of the first side and an outlet manifold (106) having a first outlet manifold inlet (112) and second outlet manifold inlet (122) receiving from opposite ends of the first side of the heat absorbing or dissipating body;

at least one first fluid piping (101) coupled to the first inlet manifold outlet (111) of the inlet manifold (105) and to the first outlet manifold inlet (112) of the outlet manifold (106) to form at least one first circuit within the heat absorbing or dissipating body (100);

at least one second fluid piping (102) coupled to the second inlet manifold outlet (121) of the inlet manifold (105) and to the second outlet manifold inlet (122) of the outlet manifold (106) to form at least one second circuit within the heat absorbing or dissipating body (100),

wherein the at least one first and second circuits are configured in a way such that any thermal conductive fluid is flowable in the heat absorbing or dissipating body such that the flow through the at least one first circuit is in one direction and the flow in the at least one second circuit is in a parallel and opposite direction to the one direction.

2. The heat absorbing or dissipating device as claimed in claim 1, wherein the first inlet manifold outlet (111) of the inlet manifold (105) is configured in a way such that the first inlet manifold outlet (111) is located in a first position adjacent to the second outlet manifold inlet (122) of the outlet manifold (106) and the second inlet manifold outlet (121) of the inlet manifold (105) is configured in a way such that the second input manifold outlet (121) is located in a second position adjacent to the first outlet manifold inlet (112) of the outlet manifold (106).

3. The heat absorbing or dissipating device as claimed in claim 1, wherein the at

least one first fluid piping and the at least one second fluid piping can be integrally formed with the heat absorbing or dissipating body.

4. The heat absorbing or dissipating device as claimed in claim 1, wherein the at least one first fluid piping and the at least one second fluid piping can be formed with the heat absorbing or dissipating body as an assembled structure.

5. The heat absorbing or dissipating device as claimed in claim 1, wherein the heat absorbing or dissipating body can be formed from at least one single structural body selected from the group consisting of a plate, a block, multi-fin structure, and a structural unit assembled with fins.

6. The heat absorbing or dissipating device as claimed in claim 1, wherein the at least one first fluid piping, the at least one second fluid piping, or the heat absorbing or dissipating body, or combinations thereof can be formed into various geometric shapes.

7. The heat absorbing or dissipating device as claimed in claim 1, wherein the thermal conductive fluid is a gaseous or liquid state fluid, or changes phases from a gas to a liquid fluid, or liquid fluid to gas.

8. The heat absorbing or dissipating device as claimed in claim 1, wherein the thermal conductive fluid flows through the at least one first fluid piping and the at least one second fluid piping by pumping, evaporation, or heat-cold natural circulation.

9. The heat absorbing or dissipating device as claimed in claim 1, wherein the heat transference to the passively heat dissipation or absorption receiving article or space is through cold-heat natural circulation of the thermal conductive fluid having a temperature difference or forced fluid pumping to generate thermal transference of heat by heat convention, radiation or conduction.

10. The heat absorbing or dissipating device as claimed in claim 1, wherein the

thermal conductive fluid passing through the at least one first fluid piping and the at least one second fluid piping flows in a closed-loop or open-loop system.

11. The heat absorbing or dissipating device according to claim 1, wherein the heat absorbing or dissipating device is configured to transfer heat to the thermal conductive fluids from the passive heat dissipating or absorption receiving article so that a more uniform temperature distribution occurs within the passive heat dissipation or absorption receiving article or space.

12. The heat absorbing or dissipating device as recited in claim 1, wherein the flow through the at least one first circuit and flow through the at least one second circuit is parallel and opposite in immediately adjacent sections in the at least one first circuit and the at least one second circuit.

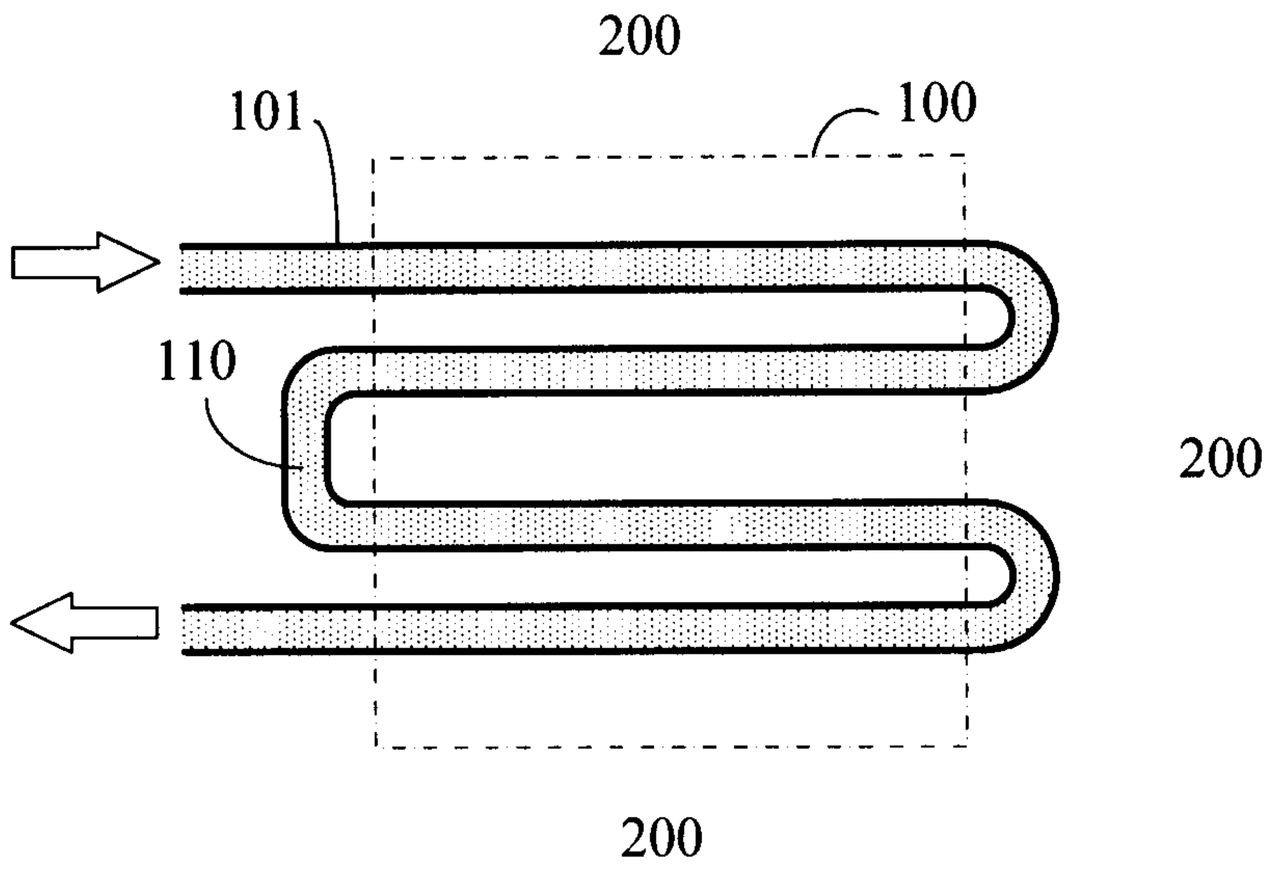

Fig. 1 (Prior Art)

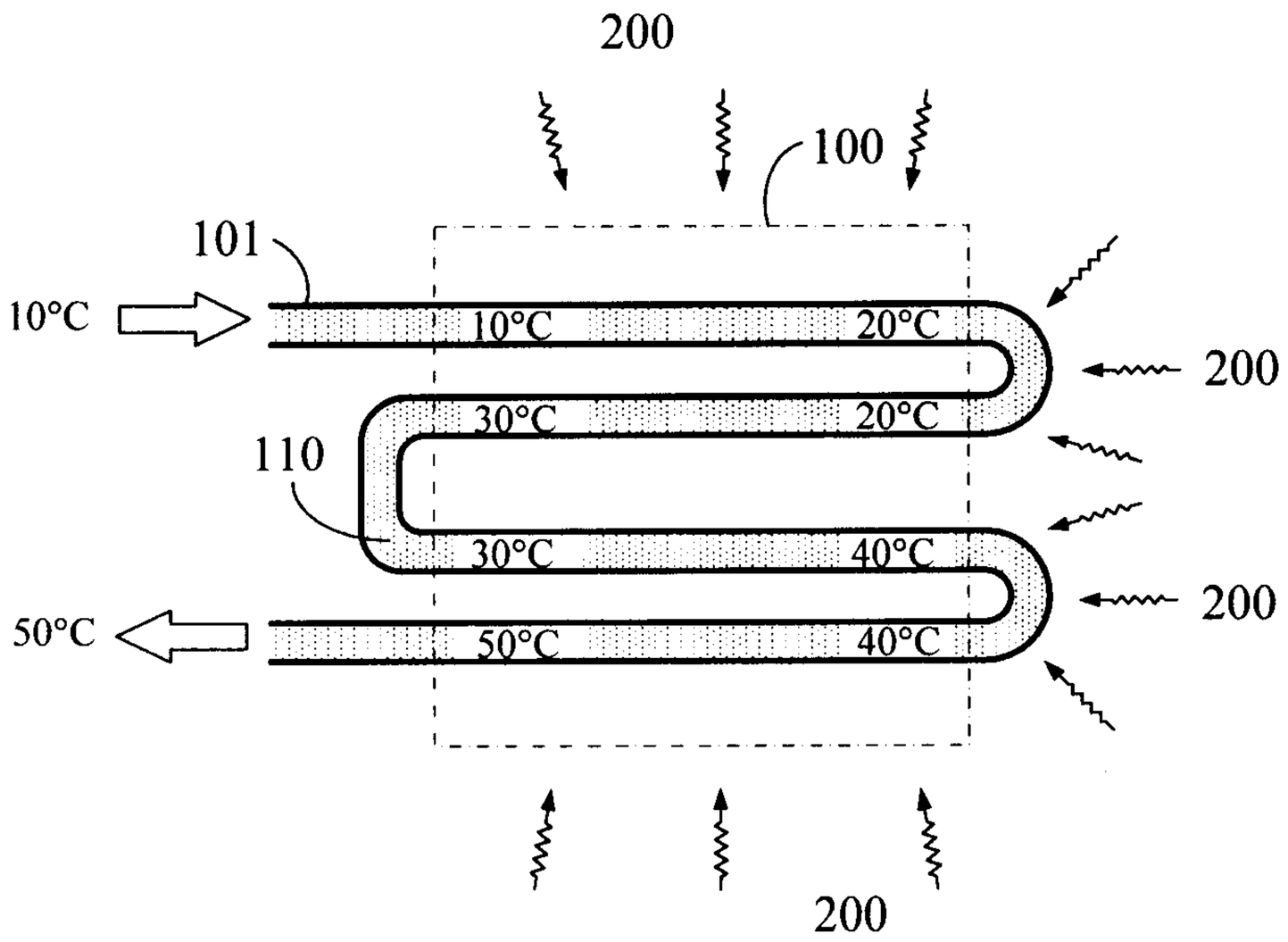

Fig. 2 (Prior Art)

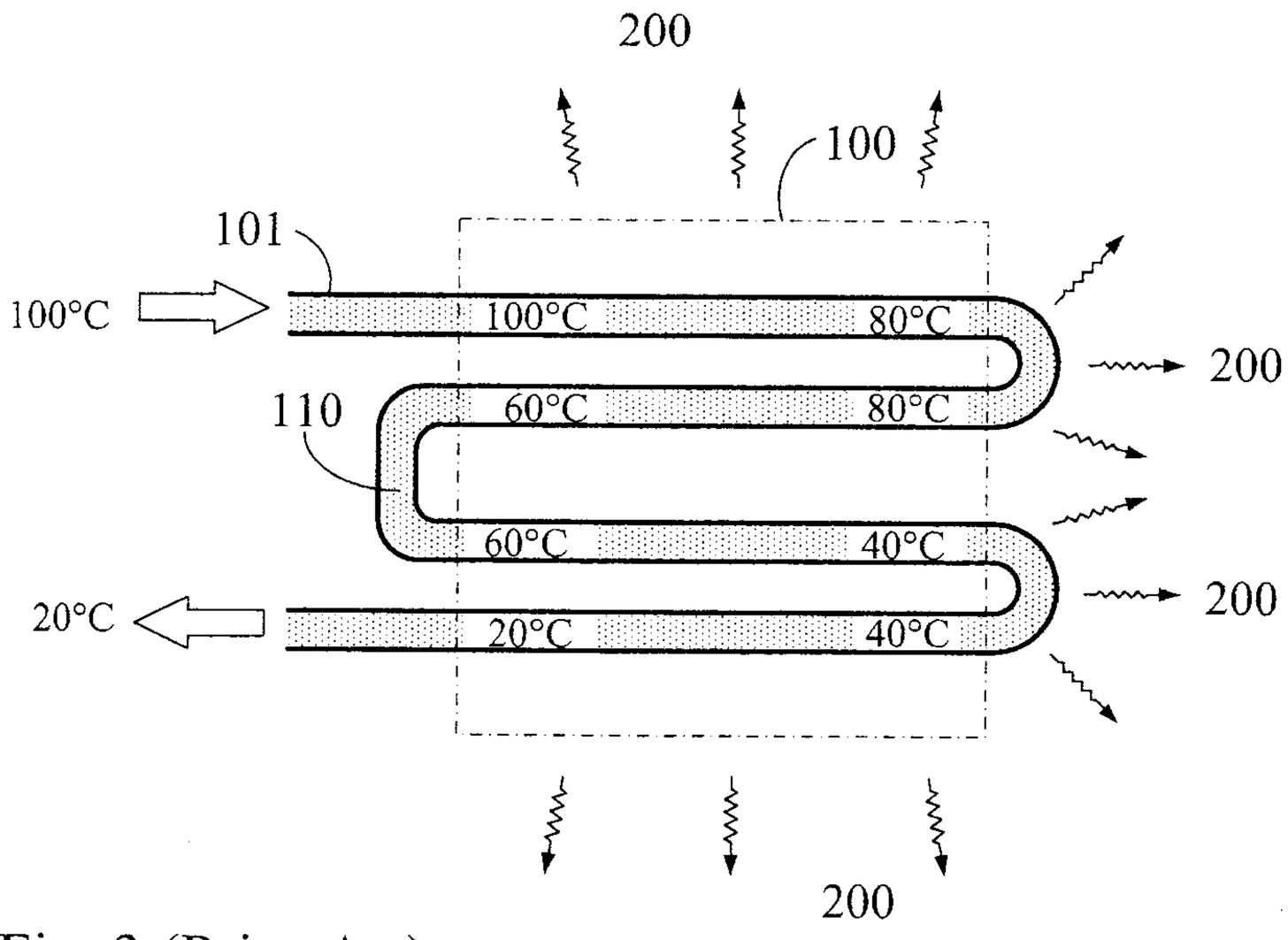

Fig. 3 (Prior Art)

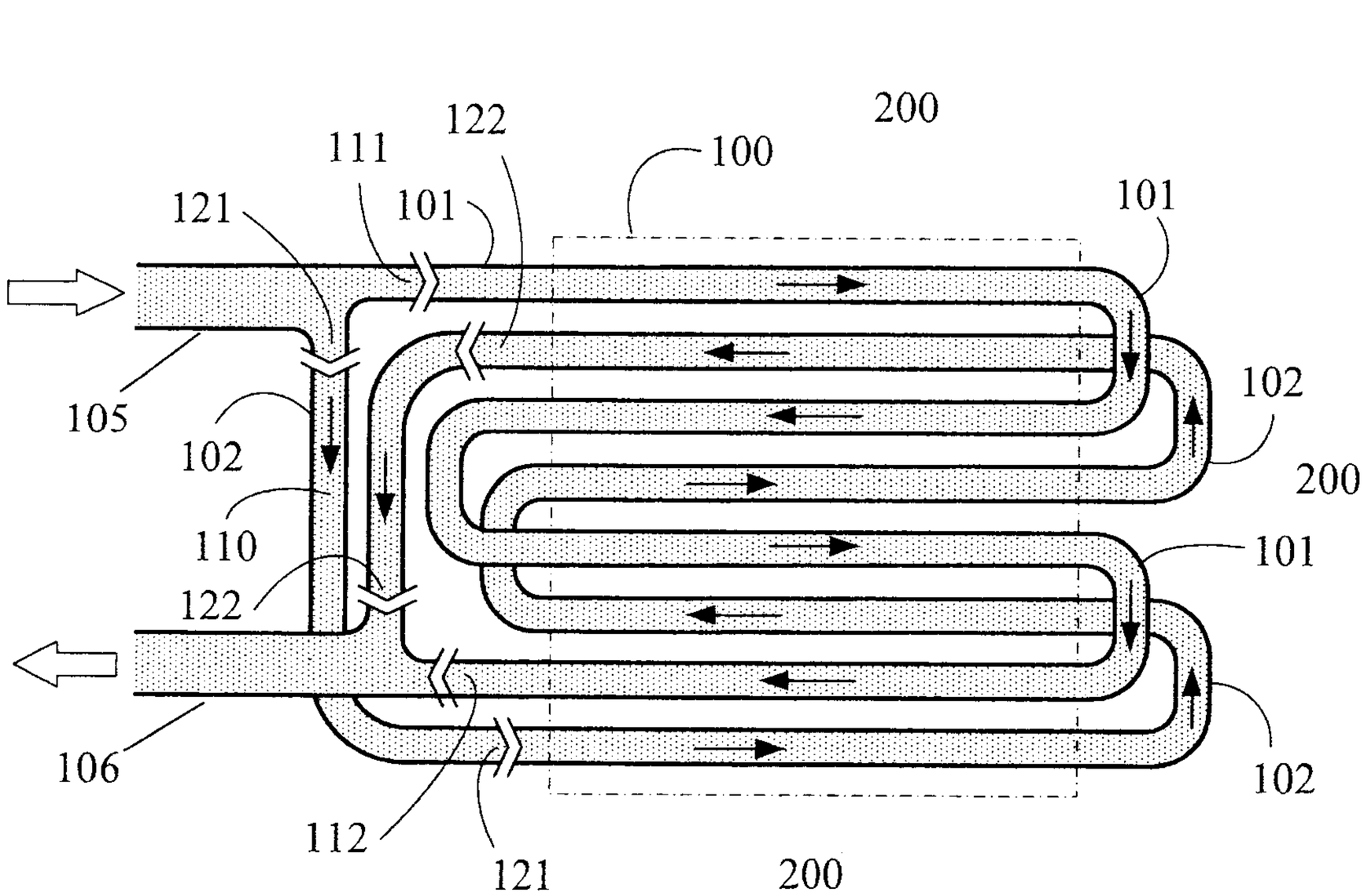

Fig. 4

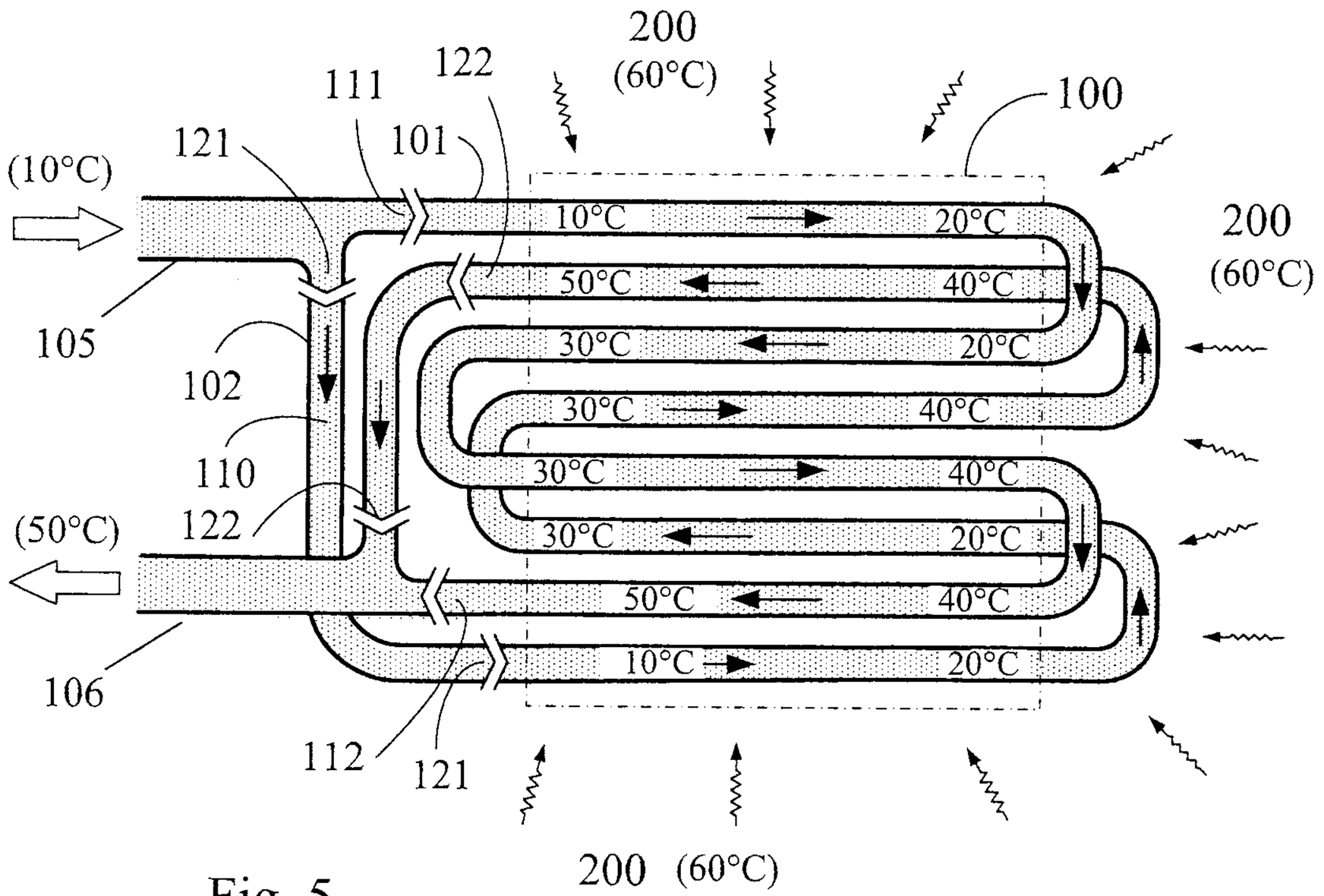
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Fig. 5

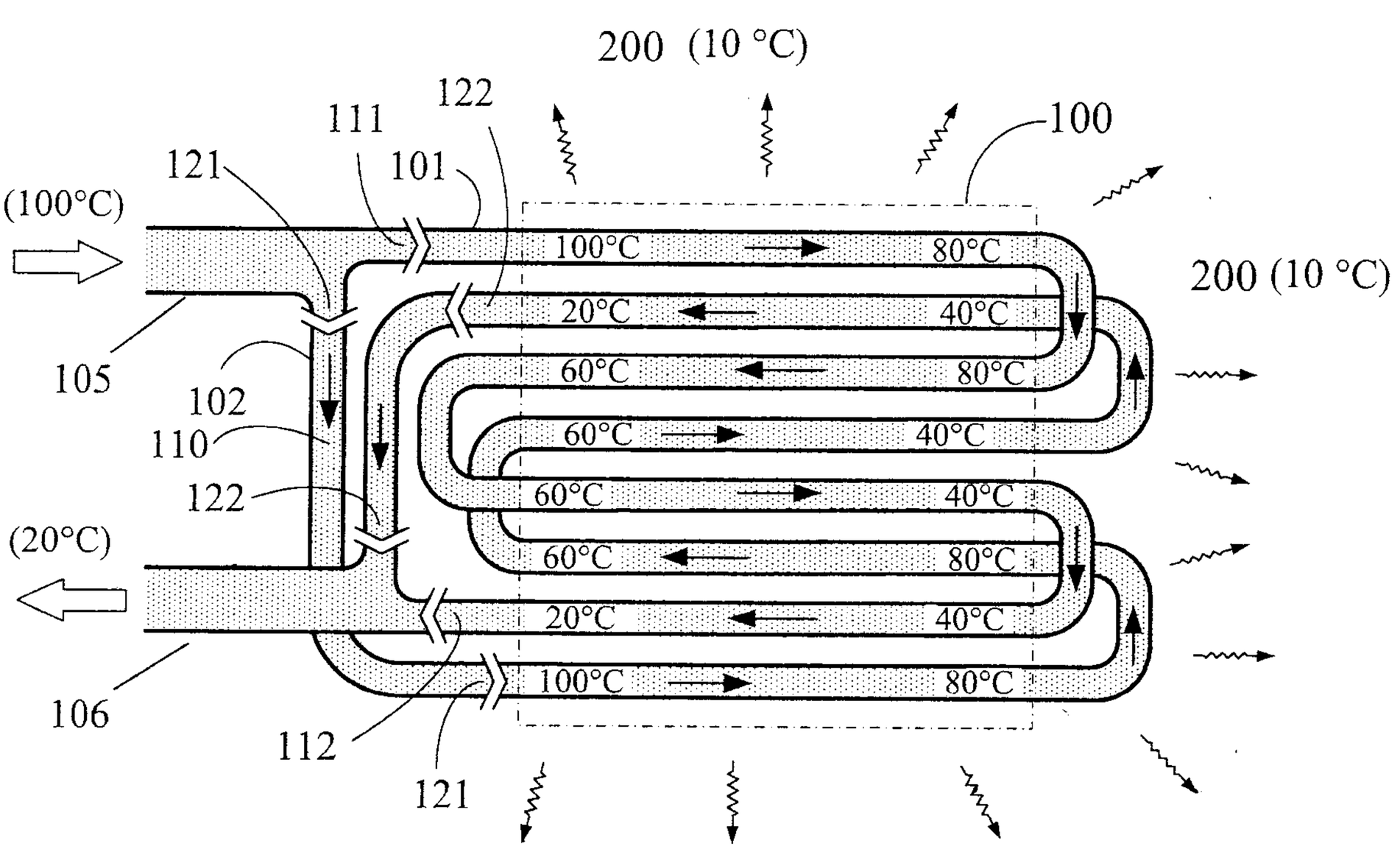
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Fig. 6

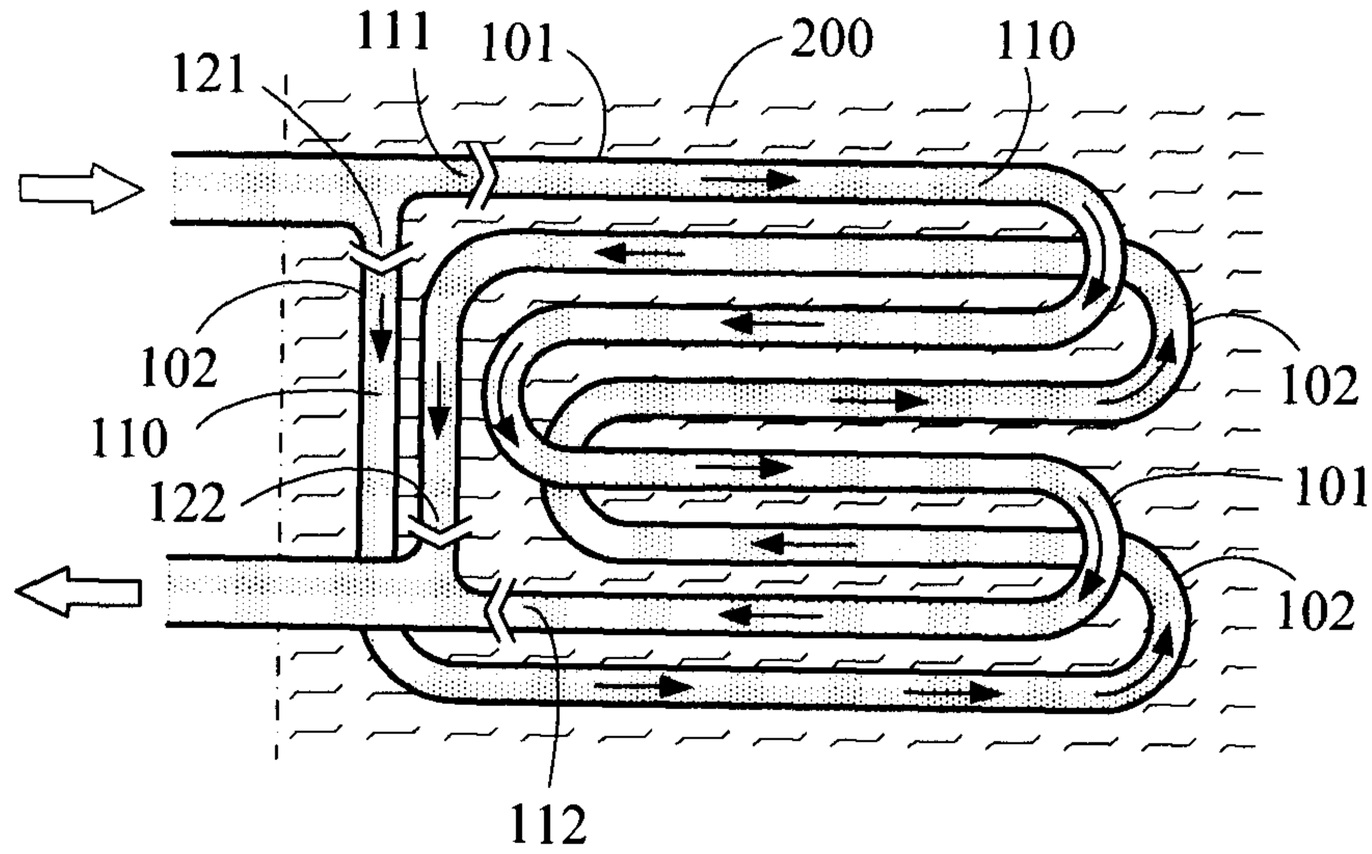


Fig. 7

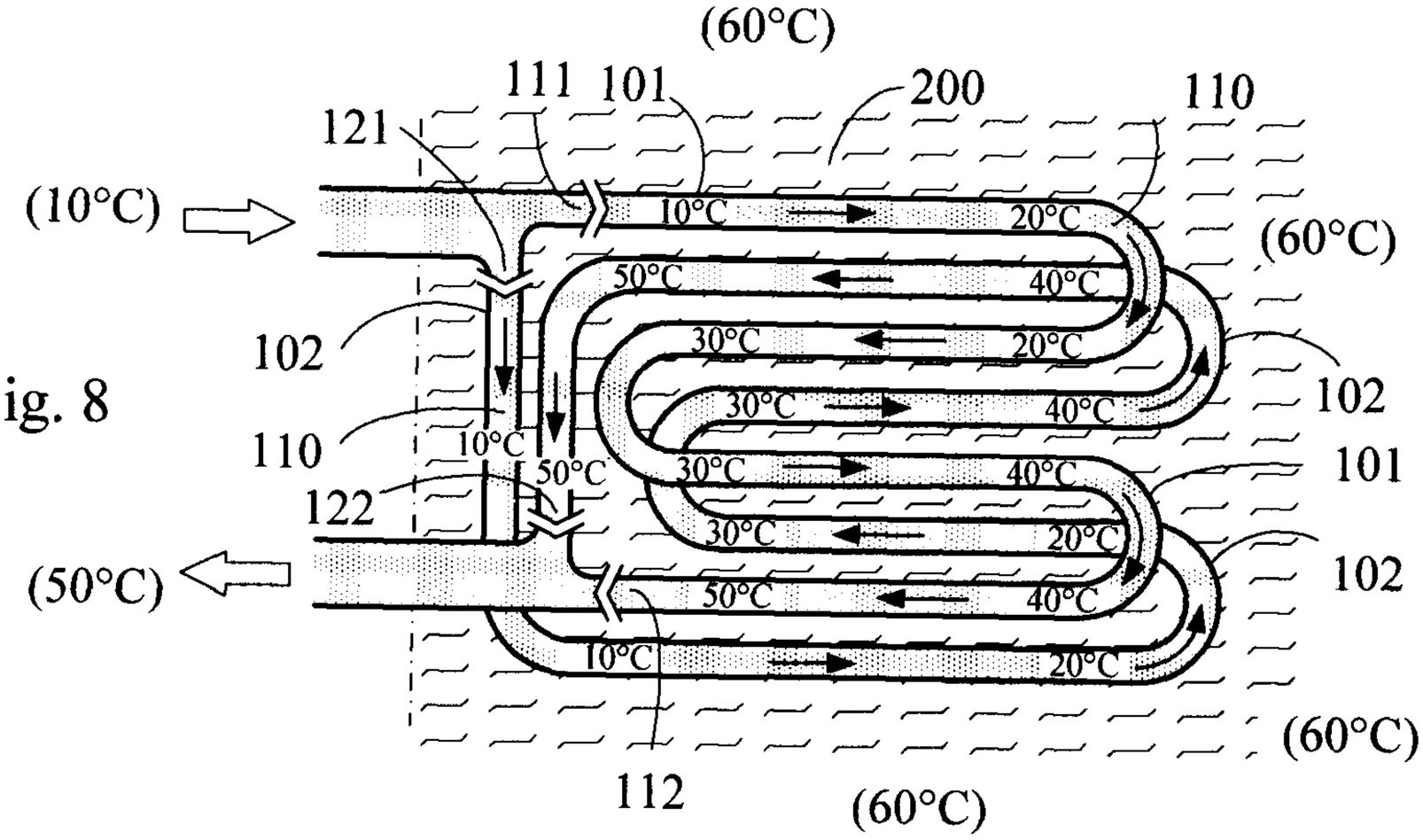


Fig. 8

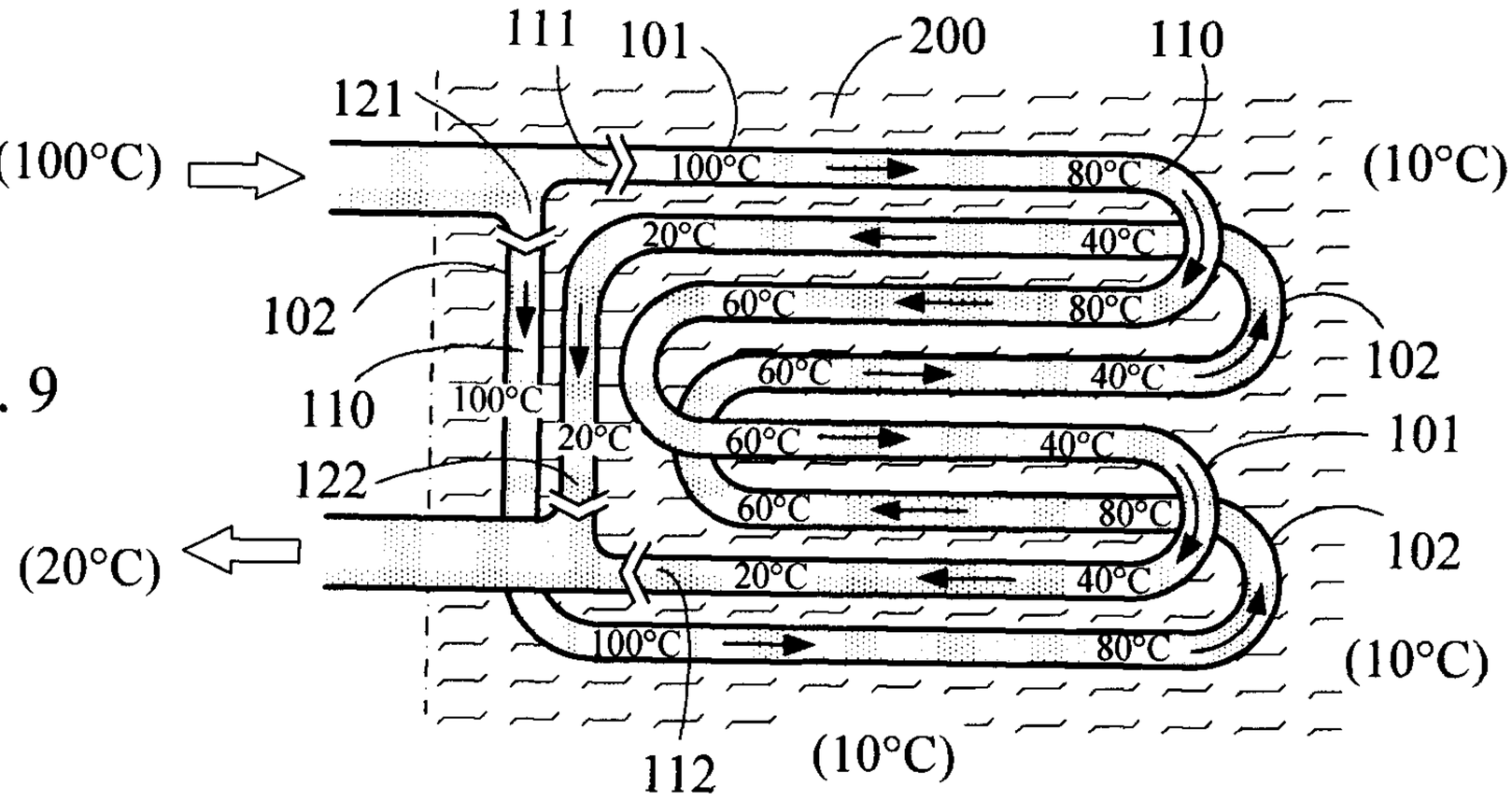


Fig. 9

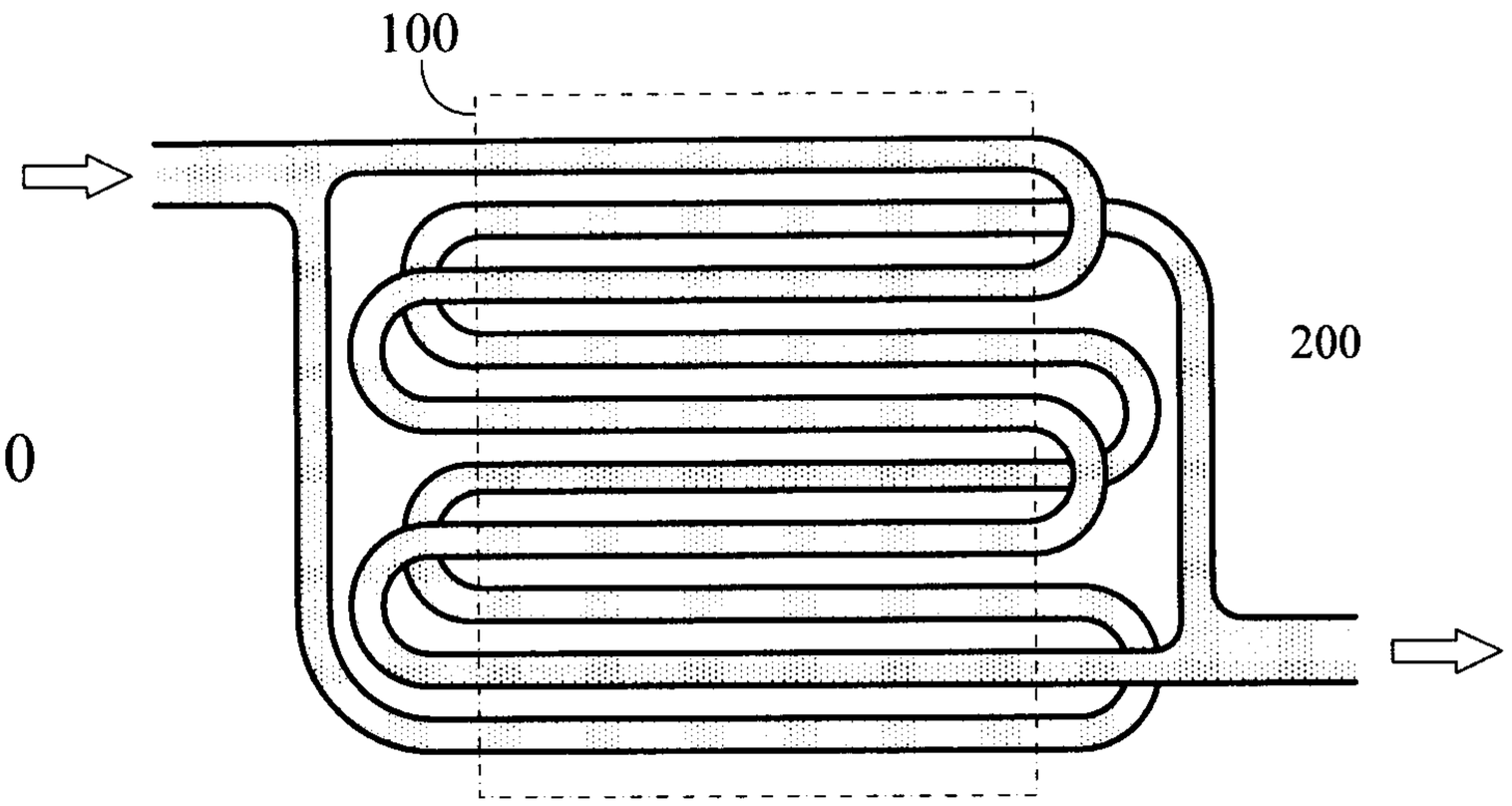


Fig. 10

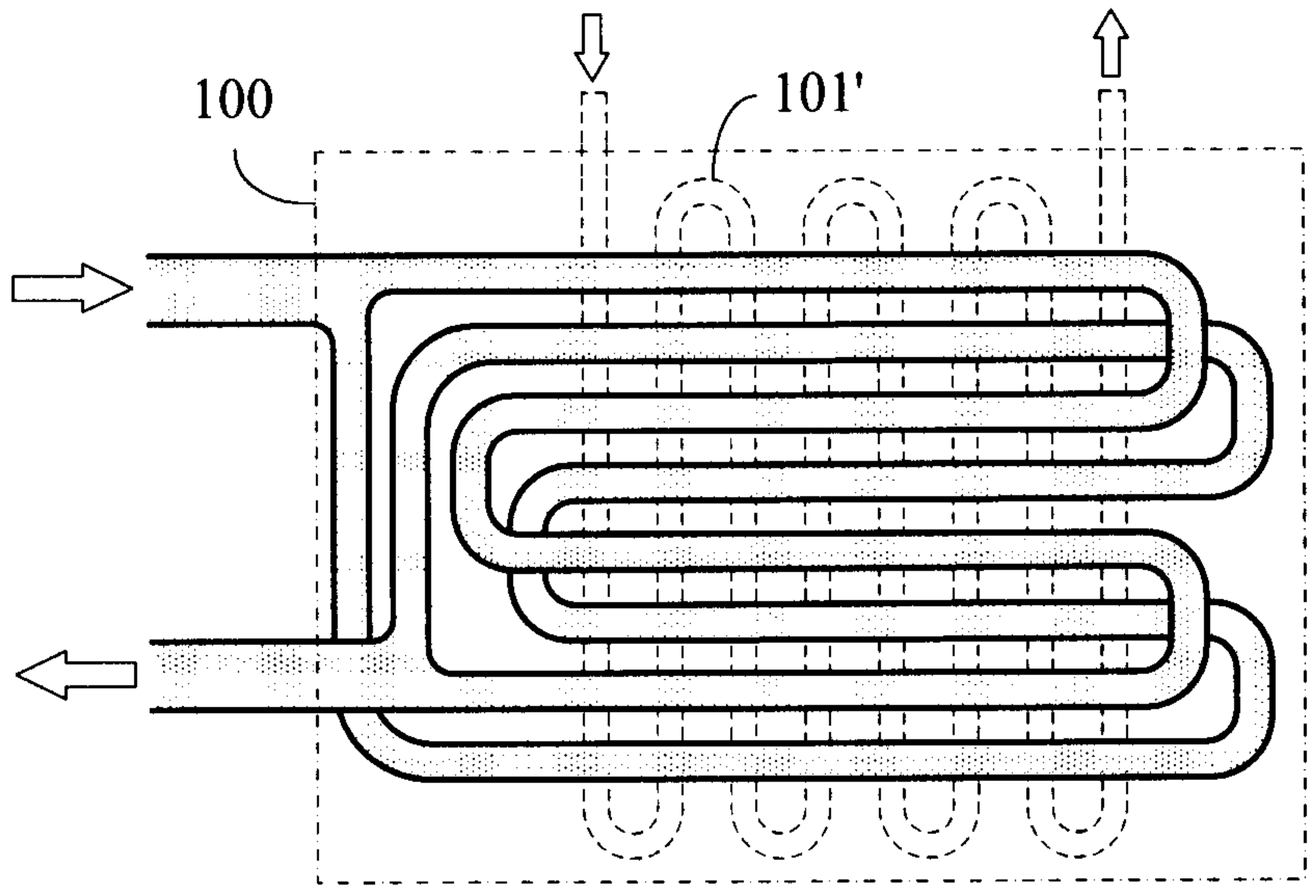


Fig. 11

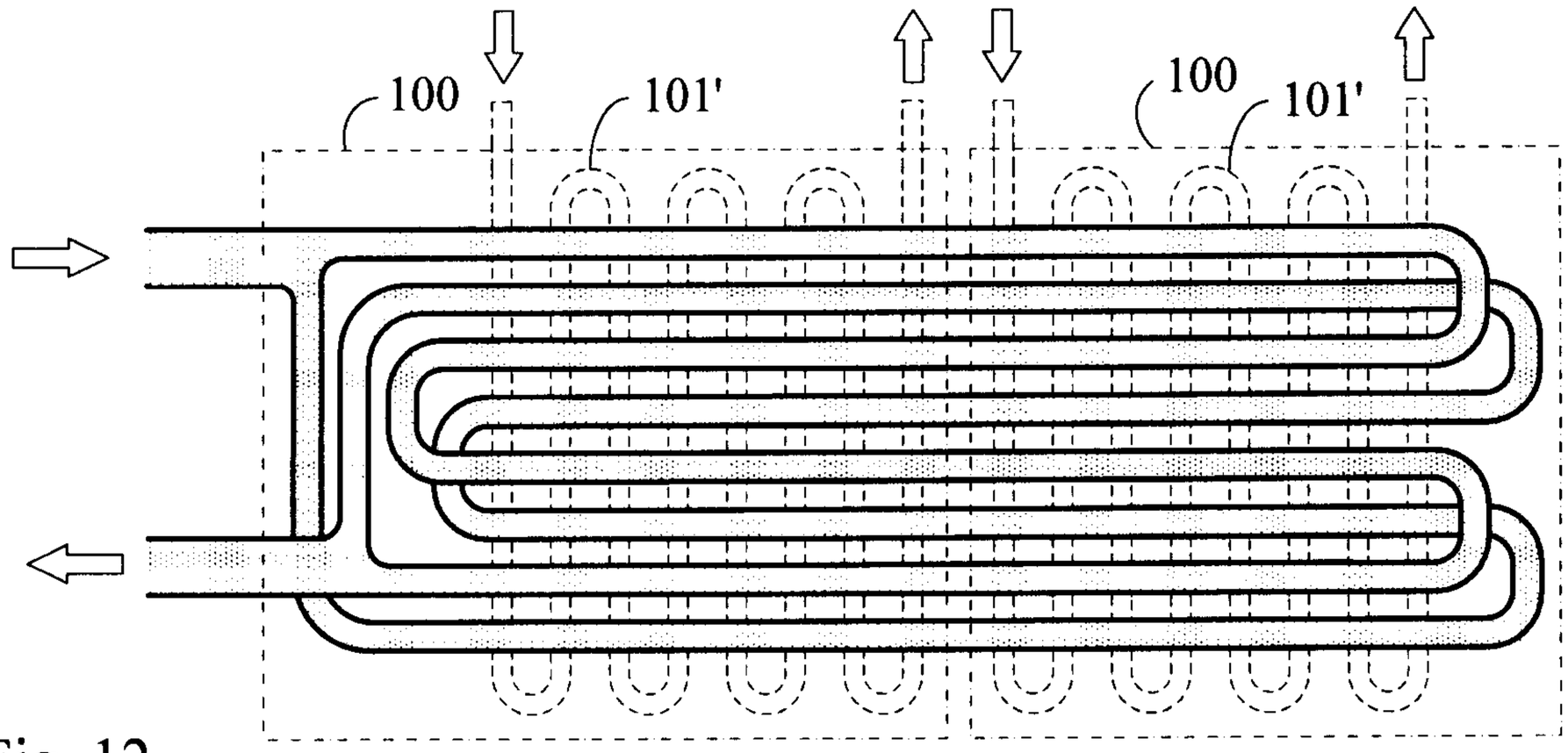


Fig. 12

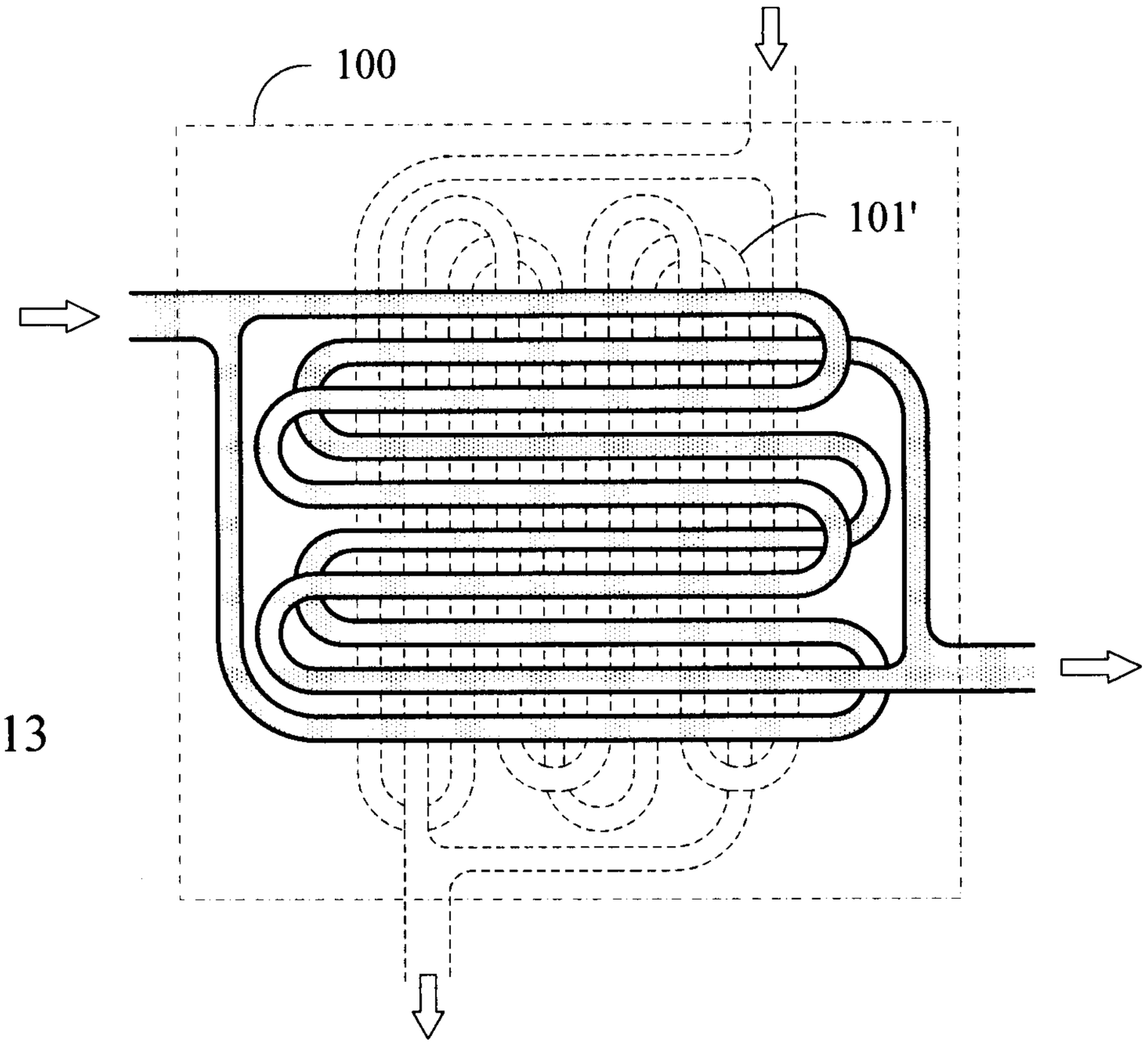


Fig. 13

Fig. 14

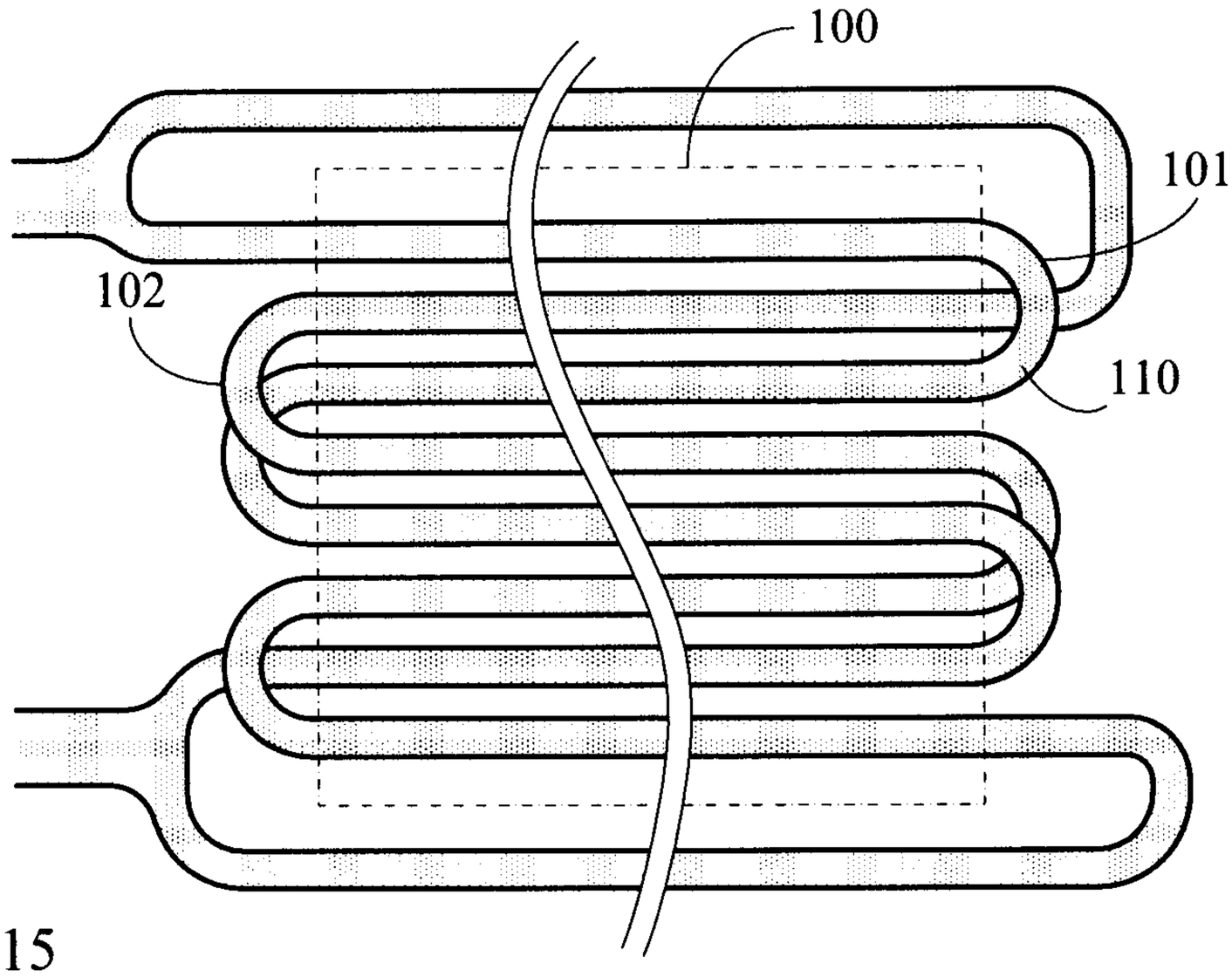


Fig. 15

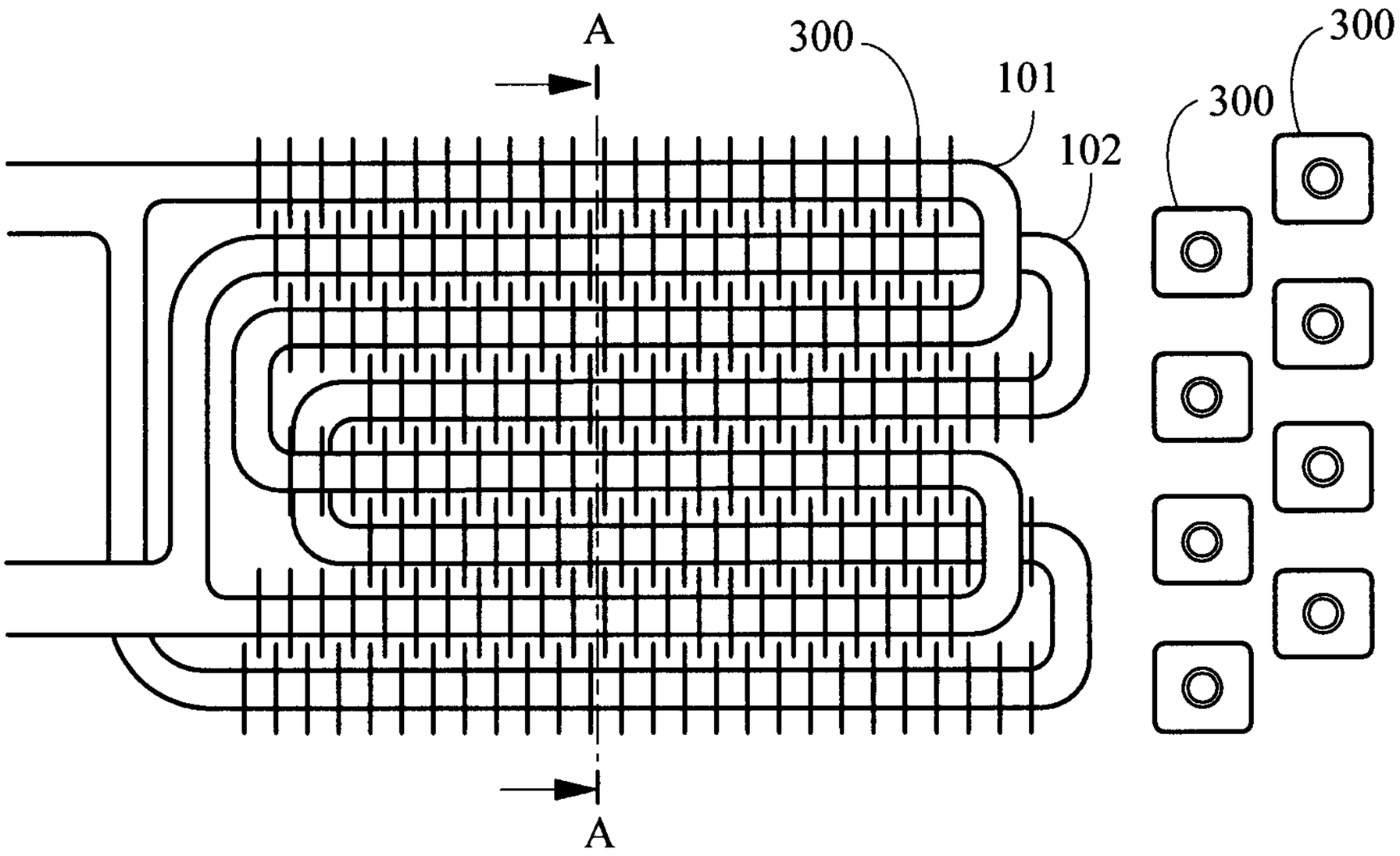


Fig. 16

Fig. 17

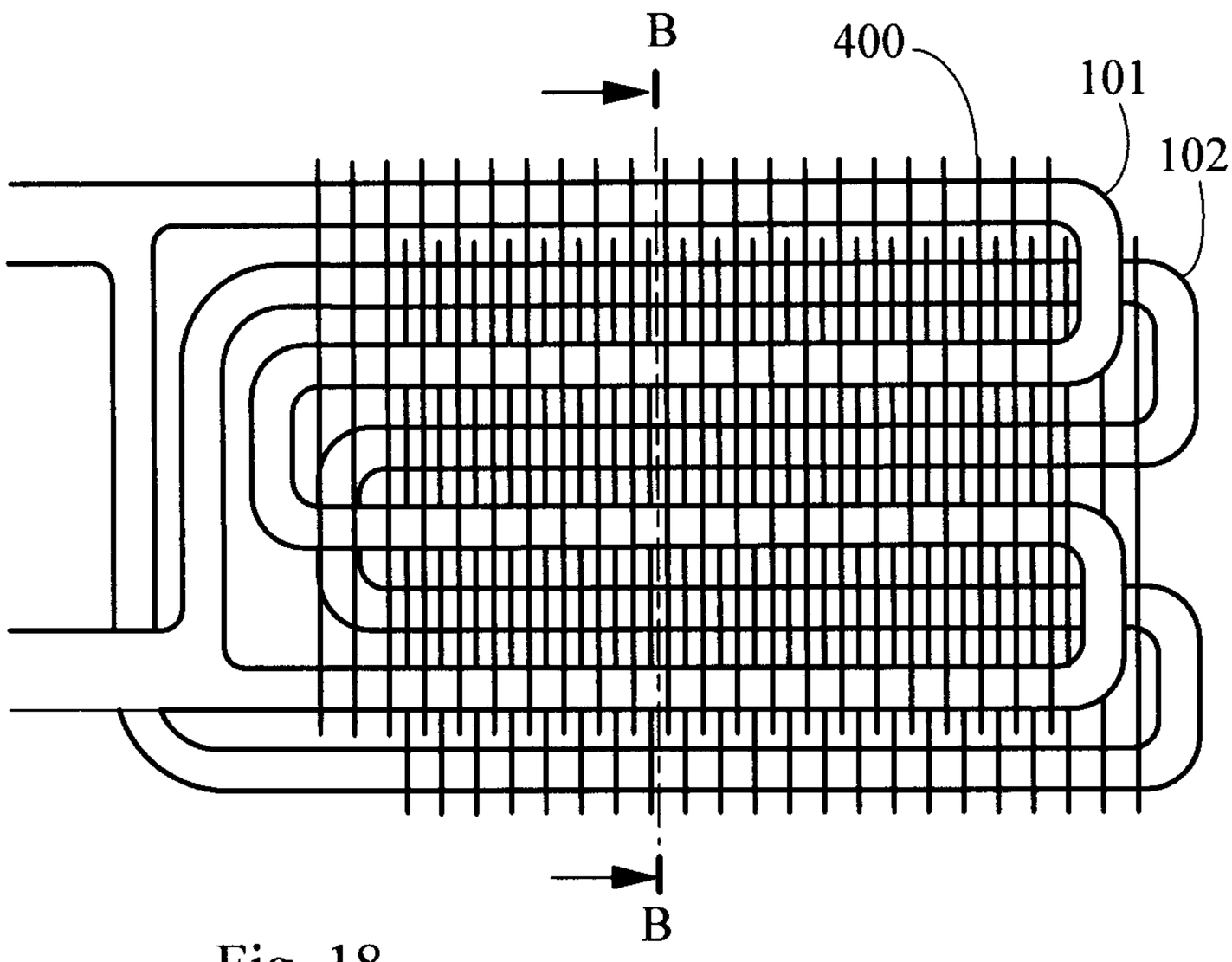


Fig. 18

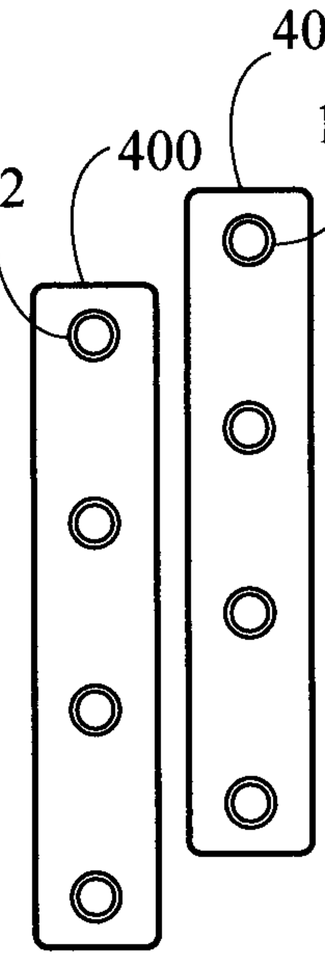


Fig. 19

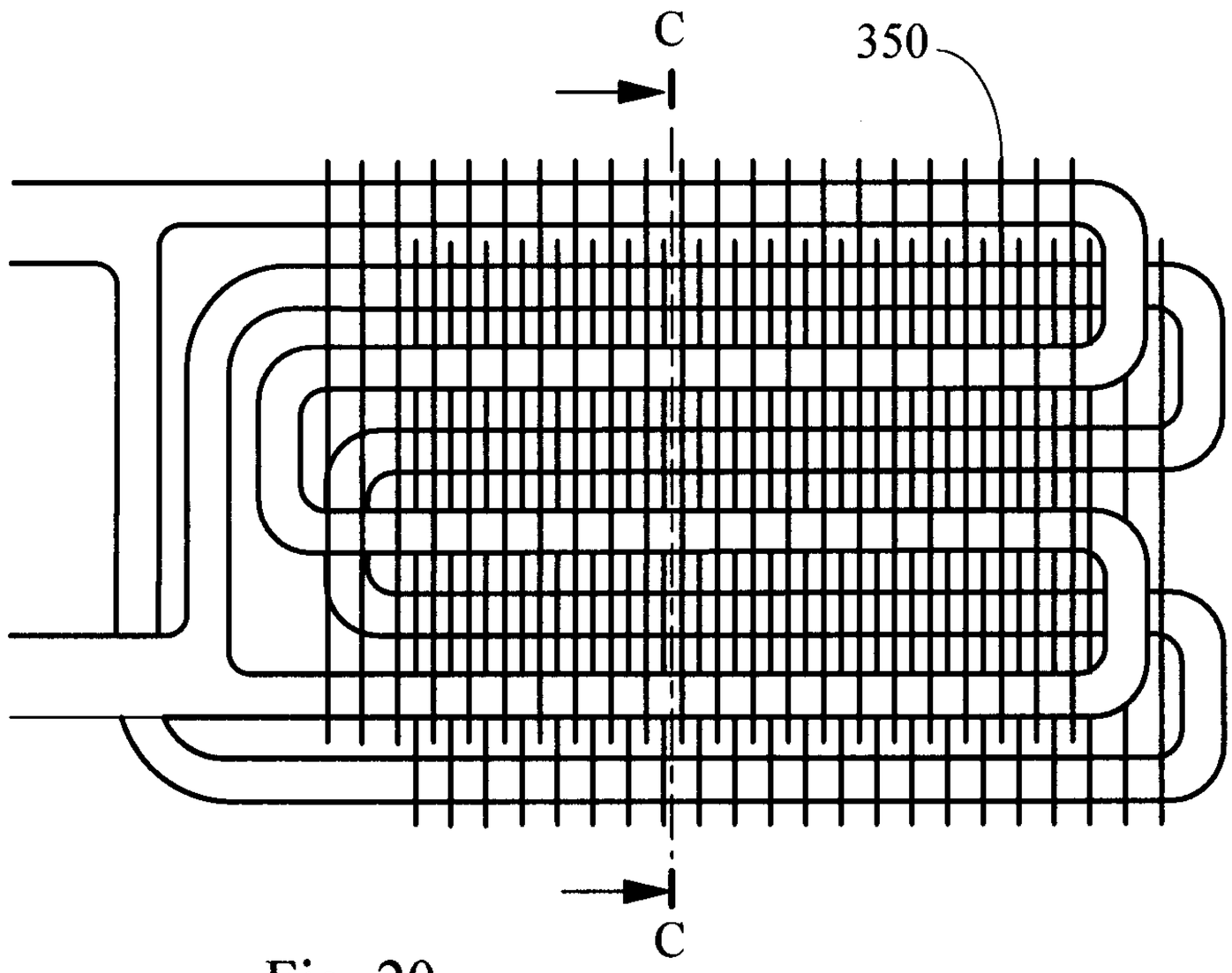


Fig. 20

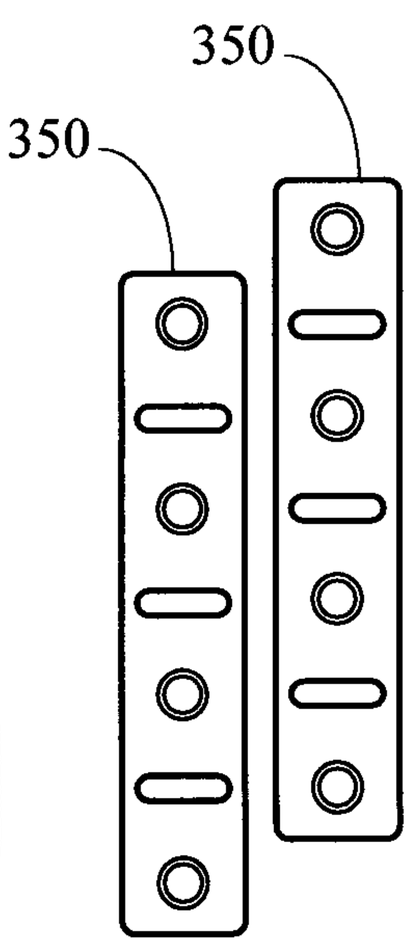


Fig. 21

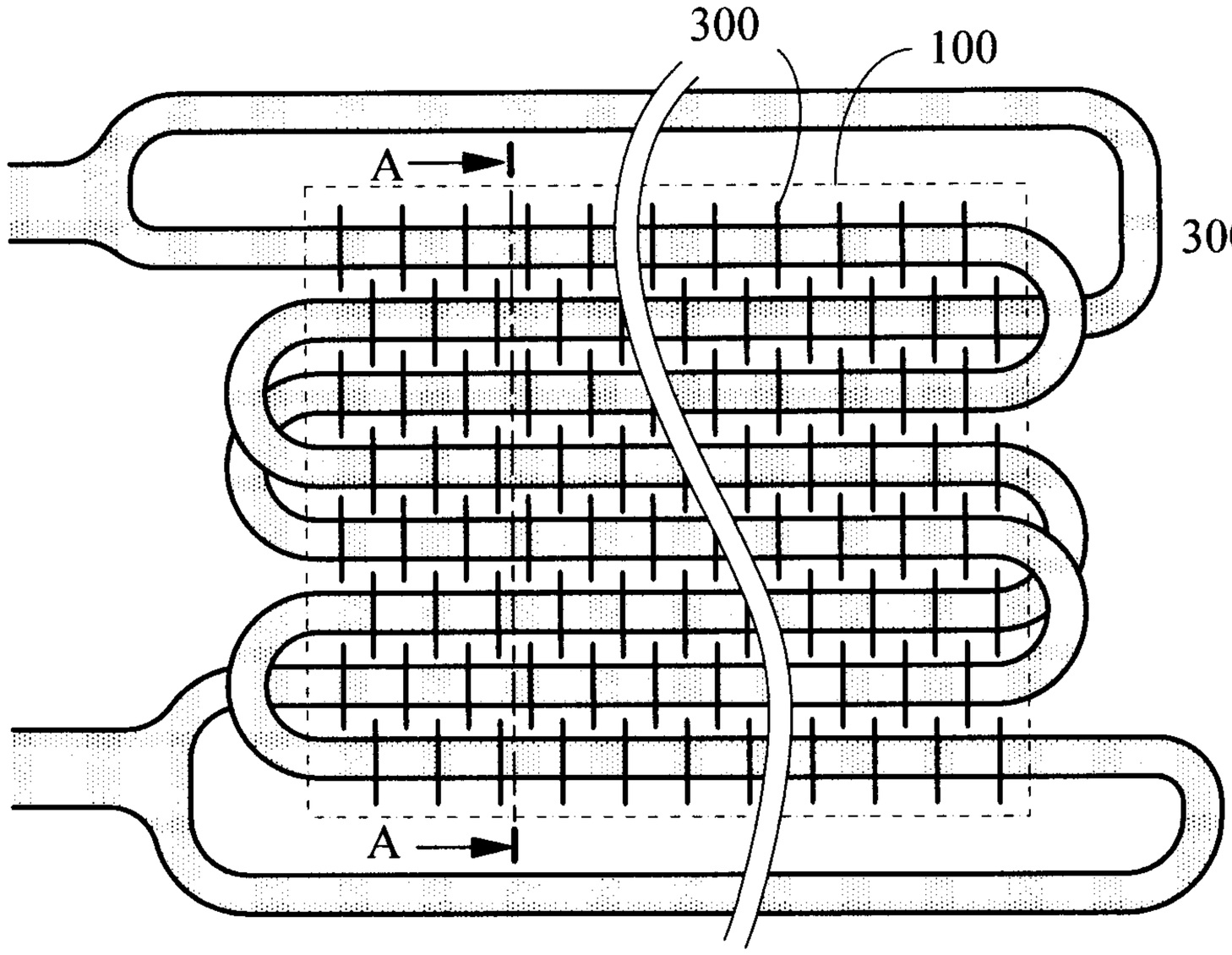


Fig. 22

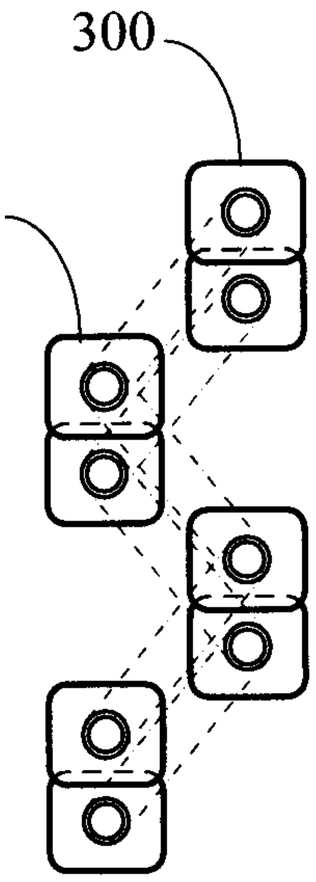


Fig. 23

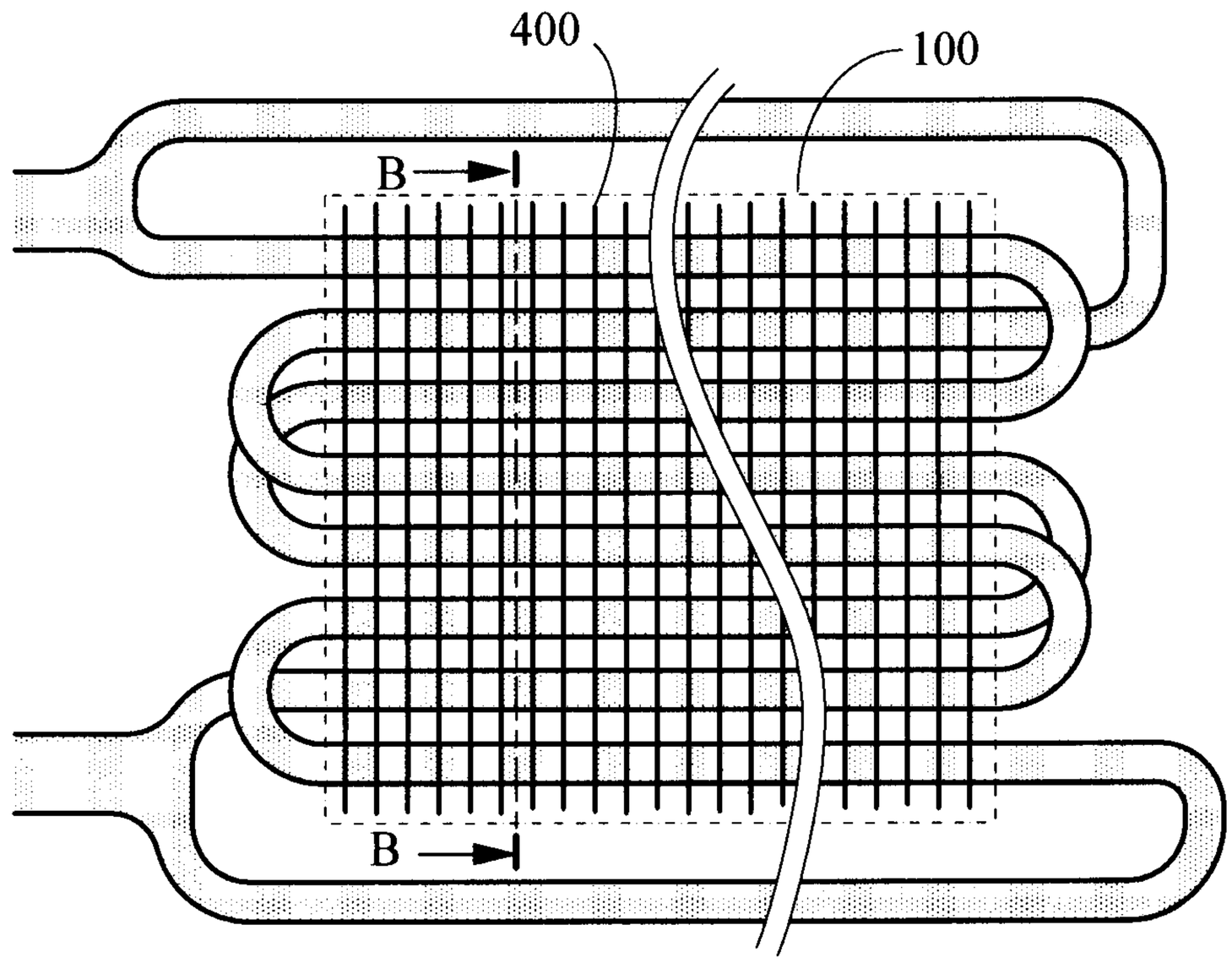


Fig. 24

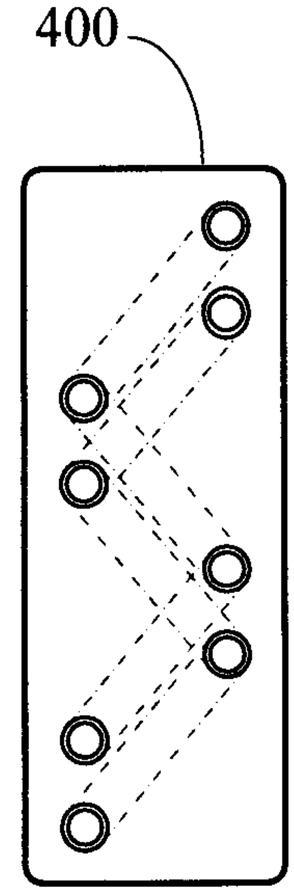


Fig. 25

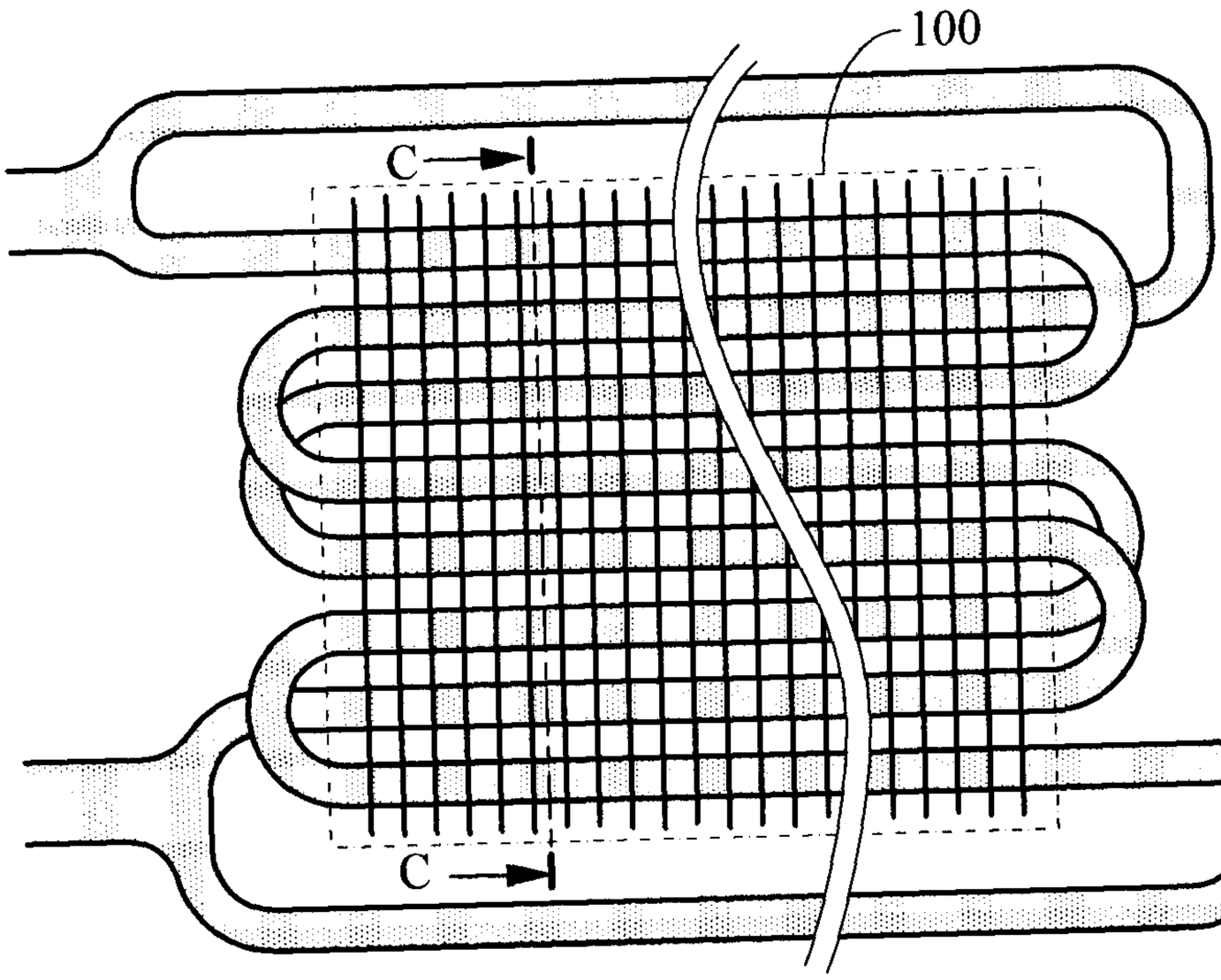


Fig. 26

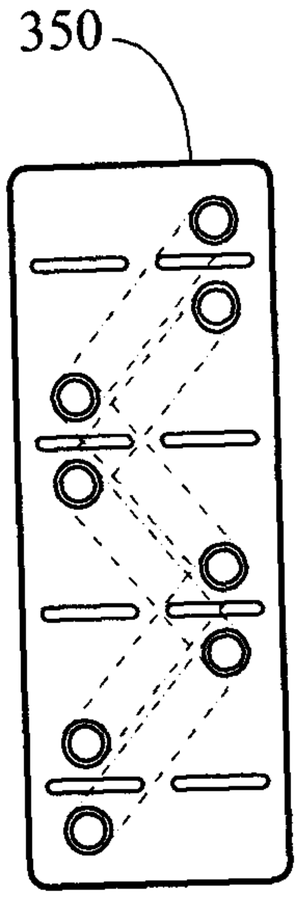


Fig. 27

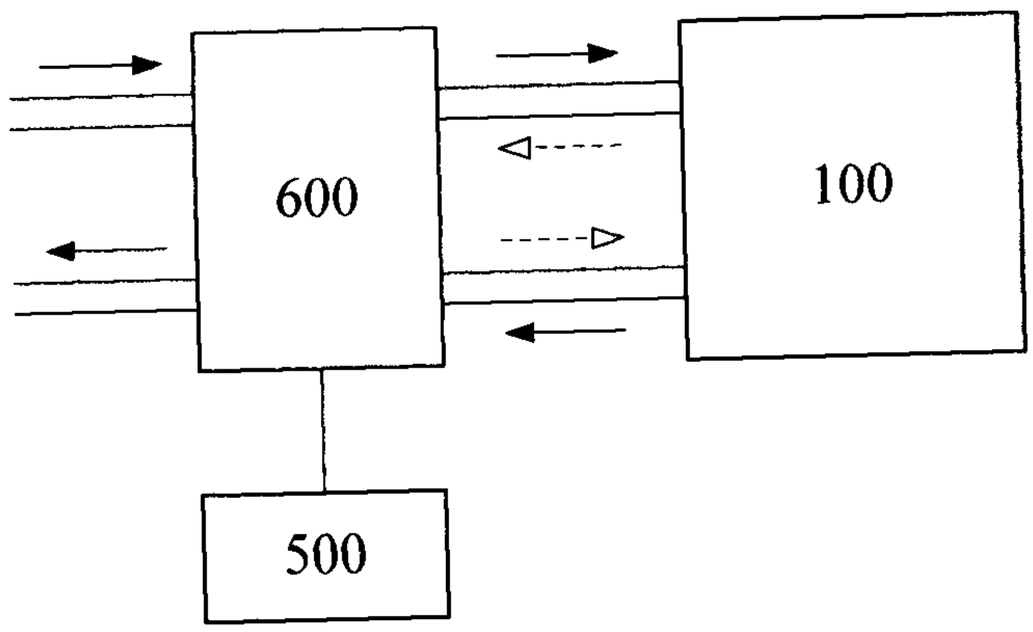
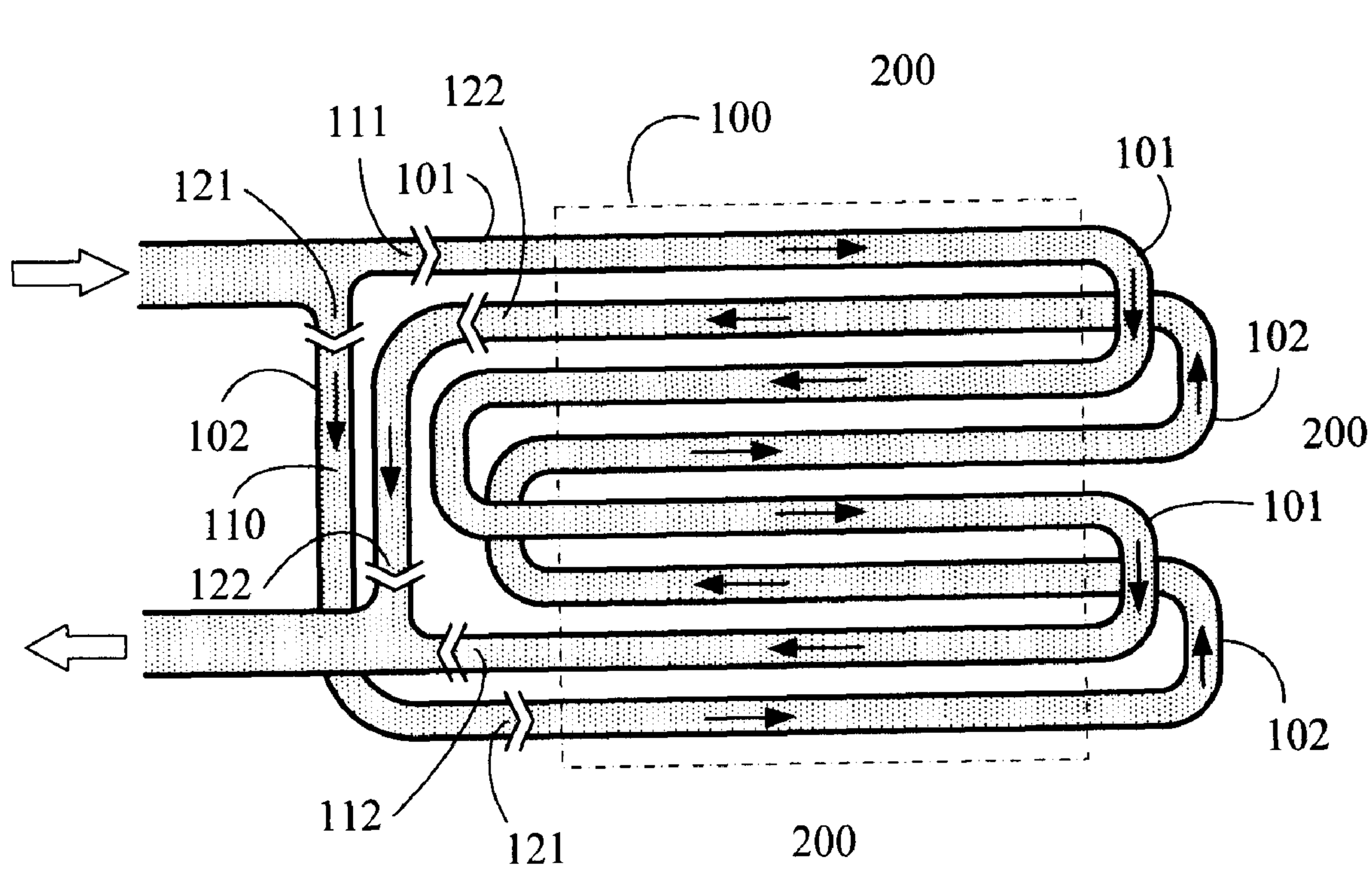


Fig. 28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