

**HEAT-DISSIPATING STRUCTURE HAVING SUSPENDED
EXTERNAL TUBE AND INTERNALLY RECYCLING
HEAT TRANSFER FLUID AND APPLICATION
APPARATUS**

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BACKGROUND OF THE INVENTION

(a) Field of the Invention

The present invention is to provide one or more than one of external tubes (101) suspendedly installed and capable of performing temperature
10 equalizing operation with an external gaseous environment or a liquid or solid environment which is manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body, the interior of the external tube (101) is provided with an inner tube (103), the inner diameter of the external tube (101) is larger than the outer diameter
15 of the inner tube (103), the space defined by the diameter differentiation is formed as a heat transfer fluid path, the distal end of the external tube (101) is sealed, the distal end of the inner tube (103) is shorter than the distal end of the external tube (101) or preformed with fluid holes, the distal ends of both tubes are formed with a flow returning segment
20 allowing the heat transfer fluid to be returned;

The front tube port of the external tube (101) and the front tube port of the inner tube (103) allow the heat transfer fluid passing an electric energy application device assembly (108) and/or a heat dissipater thereof to be transferred, wherein one of the tube ports allows the heat transfer
25 fluid to be transferred for passing the electric energy application device assembly (108) and/or the heat dissipater thereof, and the other tube port allows the heat transfer fluid which already passed the electric energy application device assembly (108) and/or the heat dissipater thereof to be returned;

30 When two or more than two of the external tubes (101) are installed

and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common electric energy application device assembly (108), or respectively leaded
5 to a corresponding electric energy application device assembly (108), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

One or more than one of fluid pumps (105) are serially installed on the closed recycling heat transfer fluid path, the flowing direction thereof
10 can be selected from one flowing direction or two flowing directions enabled to be switched or periodically changed;

The gaseous or liquid heat transfer fluid pumped by the fluid pump (105) passes the external tube (101) of the closed recycling heat transfer fluid path and the exposed portion of the relevant structure, thereby
15 enabling to perform temperature equalizing operation with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or
20 obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can
25 be further installed.

(b) Description of the Prior Art

A conventional electric energy application device assembly, e.g. an illumination device utilizing electric energy being converted into photo energy, an illumination device adopting LED, a photovoltaic, a wind
30 power generator, a transformer or a motor, generates thermal energy while

being operated, so over-heating prevention or anti-freezing for the mentioned assembly is very important.

SUMMARY OF THE INVENTION

5 The present invention is to provide one or more than one of external tubes (101) suspendedly installed and capable of performing temperature equalizing operation with an external gaseous environment or a liquid or solid environment which is manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body, the
10 interior of the external tube (101) is provided with an inner tube (103), the inner diameter of the external tube (101) is larger than the outer diameter of the inner tube (103), the space defined by the diameter differentiation is formed as a heat transfer fluid path, the distal end of the external tube (101) is sealed, the distal end of the inner tube (103) is shorter than the
15 distal end of the external tube (101) or preformed with fluid holes, the distal ends of both tubes are formed with a flow returning segment allowing the heat transfer fluid to be returned;

 The front tube port of the external tube (101) and the front tube port of the inner tube (103) allow the heat transfer fluid passing an electric
20 energy application device assembly (108) and/or a heat dissipater thereof to be transferred, wherein one of the tube ports allows the heat transfer fluid to be transferred for passing the electric energy application device assembly (108) and/or the heat dissipater thereof, and the other tube port allows the heat transfer fluid which already passed the electric energy
25 application device assembly (108) and/or the heat dissipater thereof to be returned;

 When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103)
30 thereof can be connected in serial or in parallel and leaded to a common

electric energy application device assembly (108), or respectively leaded to a corresponding electric energy application device assembly (108), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

- 5 One or more than one of fluid pumps (105) are serially installed on the closed recycling heat transfer fluid path, the flowing direction thereof can be selected from one flowing direction or two flowing directions enabled to be switched or periodically changed;

 The structure of the heat transfer fluid path formed between the
10 mentioned electric energy application device assembly (108) and/or the heat dissipater thereof and the external tube (101) and the inner tube (103) includes one or more than one of followings:

 (a) the interior of the electric energy application device assembly (108) is formed with one or more than one of heat transfer fluid
15 paths connected in serial or in parallel to pass through, the fluid inlet port and the fluid outlet port are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);

 (b) the heat dissipater installed in the electric energy application
20 device assembly (108) is formed with one or more than one of heat transfer fluid paths connected in parallel to pass through, the fluid inlet port and the fluid outlet port are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);

 (c) one or more than one of heat transfer fluid paths formed in the
25 interior of the electric energy application device assembly (108) are connected in serial or in parallel with the heat transfer fluid paths formed in the heat dissipater, the fluid inlet port and the fluid outlet port are respectively communicated with the tube
30 port of the external tube (101) and the tube port of the inner

tube (103);

- 5 (d) the electric energy application device assembly (108) is formed with two or more than two of heat transfer fluid paths connected through external tubes so as to form the fluid inlet port and the fluid outlet port respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103), or the interior thereof is bent to the U-like shape or L-like shape, and the fluid inlet port and the flow outlet port at the same or different sides are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);
- 10 (e) the exterior of the electric energy application device assembly (108) is installed with a sealed housing, thereby forming a space between the above two for allowing the heat transfer fluid to pass, the electric energy application device assembly (108) is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel, one end thereof is formed with a heat transfer fluid inlet/outlet port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108), and a heat transfer fluid connection port is formed on the sealed housing for being communicated with the tube port of the external tube (101);
- 15 20 (f) a sealed space allowing the heat transfer fluid to pass is formed between the electric energy application device assembly (108) and the heat dissipater thereof, and the exterior and the installed housing, the electric energy application device assembly (108) and/or the heat dissipater thereof is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel, one end thereof is formed with a heat transfer fluid
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inlet/outlet port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108) and/or the heat dissipater thereof, a heat transfer fluid inlet/outlet port is formed on the sealed housing for being communicated with the tube port of the external tube (101);

(g) a sealed housing is jointly formed through the exterior of the electric energy application device assembly (108) and/or the heat dissipater thereof and the matched housing, the interior of the electric energy application device assembly (108) and/or the heat dissipater thereof and the matched housing is formed with a space allowing the heat transfer fluid to pass and leaded to the tube port of the external tube (101), the electric energy application device assembly (108) and/or the heat dissipater thereof is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel, one end thereof is formed with a heat transfer fluid connection port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108) and/or the heat dissipater thereof, a heat transfer fluid connection port is formed on the sealed housing for being communicated with the tube port of the external tube (101);

The gaseous or liquid heat transfer fluid pumped by the fluid pump (105) passes the external tube (101) of the closed recycling heat transfer fluid path and the exposed portion of the relevant structure, thereby enabling to perform temperature equalizing operation with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural

thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow
5 the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

The mentioned electric energy application device assembly (108)
10 includes an illumination device utilizing electric energy being converted into photo energy, e.g. an illumination device adopting LED and/or a photovoltaic, e.g. a solar panel and/or a wind power generator and/or a transformer and/or an electric driven motor, and/or a heat discharging device used for discharging heat to the exterior or an electric heater or air
15 warmer or heat pump having the heat discharging device, and/or a cold discharging device used for discharging cold to the exterior or an air conditioner having the cold discharging device, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual
20 needs for assisting the operation of the electric energy application device assembly (108).

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view showing the main structure of the present
25 invention.

FIG. 2 is a cross section view of FIG. 1 taken along X-X.

FIG. 3 is a schematic structural view illustrating the mechanical structure between the external tube (101) and the electric energy application device assembly (108) being formed in a bending structure
30 with vertical angle or certain non-vertical angle.

FIG. 4 is a schematic structural view illustrating the mechanical structure between the external tube (101) and the electric energy application device assembly (108) being formed in a U-shaped structure.

FIG. 5 is a schematic structural view illustrating the mechanical structure between the external tube (101) and the electric energy application device assembly (108) being formed in a swirl structure with one or more loops.

FIG. 6 is a schematic structural view illustrating the mechanical structure between the external tube (101) and the electric energy application device assembly (108) being formed in a spiral structure.

FIG. 7 is a schematic structural view illustrating the mechanical structure between the external tube (101) and the electric energy application device assembly (108) being formed in a wavelike bending structure oriented towards up/down or left/right.

FIG. 8 is a schematic structural view showing the FIG. 1 being provided with a housing.

FIG. 9 is a cross section view of FIG. 8 taken along X-X.

FIG. 10 is a schematic structural view of the present invention illustrating the electric illuminating device (109) being adopted as the electric energy application device assembly (108) and/or the heat dissipater (104) thereof.

FIG. 11 is a cross sectional view of FIG. 10 taken along X-X.

FIG. 12 is a schematic structural view of the present invention illustrating the photovoltaic (110) being adopted as the electric energy application device assembly (108).

FIG. 13 is a cross sectional view of FIG. 12 taken along X-X.

FIG. 14 is a schematic structural view of the present invention illustrating the wind power generating device (111) being adopted as the electric energy application device assembly (108).

FIG. 15 is a schematic structural view of the present invention

illustrating the transformer (444) being adopted as the electric energy application device assembly (108).

FIG. 16 is a schematic structural view of the present invention illustrating the motor (333) driven by electric energy being adopted as the
5 electric energy application device assembly (108).

FIG. 17 is a schematic structural view of the present invention showing the front portion of the external tube (101) being formed with a manifold structure for being installed with plural electric energy application device assemblies (108) which sharing the mid tube body and
10 the distal tube body of the external tube (101).

FIG. 18 is a first schematic view showing the tube structure of the present invention.

FIG. 19 is a cross sectional view of FIG. 18 taken along X-X.

FIG. 20 is a second schematic view showing the tube structure of the
15 present invention.

FIG. 21 is a cross sectional view of FIG. 20 taken along X-X.

FIG. 22 is the third schematic view showing the tube structure of the present invention.

FIG. 23 is a cross sectional view of FIG. 22 taken along X-X.

FIG. 24 is a fourth schematic view showing the tube structure of the
20 present invention.

FIG. 25 is a cross sectional view of FIG. 24 taken along X-X.

FIG. 26 is a fifth schematic view showing the tube structure of the present invention.

FIG. 27 is a cross sectional view of FIG. 26 taken along X-X.
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FIG. 28 is a schematic structural view of the present invention showing a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass being formed through the space defined by the heat dissipater (104) of the electric energy application device assembly (108)
30 and the housing (106) and the heat transfer fluid path (1041) of the heat

dissipater (104).

FIG. 29 is a schematic structural view of the present invention showing a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass being formed through at least two heat transfer fluid paths (1041) of the heat dissipater (104) installed in the electric energy application device assembly (108) being serially connected with a U-shaped connection tube (1042).

FIG. 30 is a schematic structural view of the present invention showing a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass being formed through the space defined by the electric energy application device assembly (108) and the housing (106) and the heat transfer fluid path (1081) provided by the electric energy application device assembly (108).

FIG. 31 is a schematic structural view of the present invention showing a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass being formed through at least two heat transfer fluid paths (1081) of the electric energy application device assembly (108) being serially connected with a U-shaped connection tube (1042).

FIG. 32 is a schematic structural view of the present invention showing a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass being formed through a U-shaped connection tube (1042) being connected between at least one heat transfer fluid path (1081) of the electric energy application device assembly (108) and at least one heat transfer fluid path (1041) of the heat dissipater (104) thereof.

FIG. 33 is a schematic view showing the main structure being vertically installed according to one embodiment of the present invention.

FIG. 34 is a cross sectional view of FIG. 33 taken along X-X.

FIG. 35 is a schematic structural diagram of one embodiment showing the present invention being horizontally and penetratingly installed on a wall.

FIG. 36 is a schematic structural diagram showing single electric energy application device assembly (108) being vertically installed with plural heat-dissipating structures having internally recycling heat transfer fluid flowing in tubes.

5 FIG. 37 is a schematic structural view of one embodiment showing single electric energy application device assembly (108) being installed with plural heat-dissipating structures having internally recycling heat transfer fluid flowing in tubes for being horizontally and penetratingly installed on a wall.

10 FIG. 38 is a schematic structural view of the first embodiment showing the heat dissipater of the present application being installed with a conical flow guiding body (1040) having thermal conductivity and being installed in a downward configuration.

15 FIG. 39 is a schematic structural view of the second embodiment showing the heat dissipater of the present application being installed with a conical flow guiding body (1040) having thermal conductivity and being installed in a downward configuration.

20 FIG. 40 is a schematic structural view of the third embodiment showing the heat dissipater of the present application being installed with a conical flow guiding body (1040) having thermal conductivity and being installed in a downward configuration.

FIG. 41 is a bottom side view of FIG. 38, FIG. 39 and FIG. 40.

FIG. 42 is a cross sectional view of FIG. 38, FIG. 39 and FIG. 40 taken along A-A.

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DESCRIPTION OF MAIN COMPONENT SYMBOLS

100: Fastening and supporting structural member

101: External tube

102: Temperature protecting device

30 103: Inner tube

- 1031: Transversal hole
- 1032: Notch
- 1033: Supporter
- 104: Heat dissipater
- 5 1040: Conical flow guiding body
- 1041: Heat transfer fluid path of heat dissipater
- 1042: U-shaped connection tube
- 105: Fluid pump
- 106: Housing
- 10 1061: Light-pervious member
- 107: Heat transfer fluid path
- 108: Electric energy application device assembly
- 1081: Heat transfer fluid path
- 109: Electric illuminating device
- 15 110: Photovoltaic
- 111: Wind power generating device
- 112: Drive control circuit device
- 201: External heat guiding plate
- 203: Inner heat guiding plate
- 20 222: Wind power generator
- 2001: Heat transfer fin
- 2003: Spiral flow guiding structure
- 333: Motor
- 334: Motor driving load
- 25 444: Transformer
- 445: Transformer support rack
- 555: Fixed holder

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

- 30 A conventional electric energy application device assembly, e.g. an

illumination device utilizing electric energy being converted into photo energy, an illumination device adopting LED, a photovoltaic, a wind power generator, a transformer or a motor, generates thermal energy while being operated, so over-heating prevention or anti-freezing for the
5 mentioned assembly is very important;

The present invention is to provide one or more than one of external tubes (101) suspendedly installed and capable of performing temperature equalizing operation with an external gaseous environment or a liquid or solid environment which is manually installed but not disposed in the
10 stratum or liquid of the shallow ground natural thermal energy body, the interior of the external tube (101) is provided with an inner tube (103), the inner diameter of the external tube (101) is larger than the outer diameter of the inner tube (103), the space defined by the diameter differentiation is formed as a heat transfer fluid path, the distal end of the external tube
15 (101) is sealed, the distal end of the inner tube (103) is shorter than the distal end of the external tube (101) or preformed with fluid holes, the distal ends of both tubes are formed with a flow returning segment allowing the heat transfer fluid to be returned;

The front tube port of the external tube (101) and the front tube port
20 of the inner tube (103) allow the heat transfer fluid passing an electric energy application device assembly (108) and/or a heat dissipater thereof to be transferred, wherein one of the tube ports allows the heat transfer fluid to be transferred for passing the electric energy application device assembly (108) and/or the heat dissipater thereof, and the other tube port
25 allows the heat transfer fluid which already passed the electric energy application device assembly (108) and/or the heat dissipater thereof to be returned;

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths
30 formed by the individual external tube (101) and the inner tube (103)

thereof can be connected in serial or in parallel and led to a common electric energy application device assembly (108), or respectively led to a corresponding electric energy application device assembly (108), and can be designed to share a common fluid pump (105) or respectively
5 installed with a fluid pump (105);

One or more than one of fluid pumps (105) are serially installed on the closed recycling heat transfer fluid path, the flowing direction thereof can be selected from one flowing direction or two flowing directions enabled to be switched or periodically changed;

10 The structure of the heat transfer fluid path formed between the mentioned electric energy application device assembly (108) and/or the heat dissipater thereof and the external tube (101) and the inner tube (103) includes one or more than one of followings:

(a) the interior of the electric energy application device assembly
15 (108) is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel to pass through, the fluid inlet port and the fluid outlet port are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);

20 (b) the heat dissipater installed in the electric energy application device assembly (108) is formed with one or more than one of heat transfer fluid paths connected in parallel to pass through, the fluid inlet port and the fluid outlet port are respectively communicated with the tube port of the external tube (101) and
25 the tube port of the inner tube (103);

(c) one or more than one of heat transfer fluid paths formed in the interior of the electric energy application device assembly (108) are connected in serial or in parallel with the heat transfer fluid paths formed in the heat dissipater, the fluid inlet port and the
30 fluid outlet port are respectively communicated with the tube

port of the external tube (101) and the tube port of the inner tube (103);

5 (d) the electric energy application device assembly (108) is formed with two or more than two of heat transfer fluid paths connected through external tubes so as to form the fluid inlet port and the fluid outlet port respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103), or the interior thereof is bent to the U-like shape or L-like shape, and the fluid inlet port and the flow outlet port at the same or different sides are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);

10 (e) the exterior of the electric energy application device assembly (108) is installed with a sealed housing, thereby forming a space between the above two for allowing the heat transfer fluid to pass, the electric energy application device assembly (108) is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel, one end thereof is formed with a heat transfer fluid inlet/outlet port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108), and a heat transfer fluid connection port is formed on the sealed housing for being communicated with the tube port of the external tube (101);

20 (f) a sealed space allowing the heat transfer fluid to pass is formed between the electric energy application device assembly (108) and the heat dissipater thereof, and the exterior and the installed housing, the electric energy application device assembly (108) and/or the heat dissipater thereof is formed with one or more than one of heat transfer fluid paths connected in serial or in

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parallel, one end thereof is formed with a heat transfer fluid inlet/outlet port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108) and/or the heat dissipater thereof, a heat transfer fluid inlet/outlet port is formed on the sealed housing for being communicated with the tube port of the external tube (101);

(g) a sealed housing is jointly formed through the exterior of the electric energy application device assembly (108) and/or the heat dissipater thereof and the matched housing, the interior of the electric energy application device assembly (108) and/or the heat dissipater thereof and the matched housing is formed with a space allowing the heat transfer fluid to pass and leaded to the tube port of the external tube (101), the electric energy application device assembly (108) and/or the heat dissipater thereof is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel, one end thereof is formed with a heat transfer fluid connection port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108) and/or the heat dissipater thereof, a heat transfer fluid connection port is formed on the sealed housing for being communicated with the tube port of the external tube (101);

The gaseous or liquid heat transfer fluid pumped by the fluid pump (105) passes the external tube (101) of the closed recycling heat transfer fluid path and the exposed portion of the relevant structure, thereby enabling to perform temperature equalizing operation with the external gaseous environment or the liquid or solid environment manually installed

but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

The mentioned electric energy application device assembly (108) includes an illumination device utilizing electric energy being converted into photo energy, e.g. an illumination device adopting LED and/or a photovoltaic, e.g. a solar panel and/or a wind power generator and/or a transformer and/or an electric driven motor, and/or a heat discharging device used for discharging heat to the exterior or an electric heater or air warmer or heat pump having the heat discharging device, and/or a cold discharging device used for discharging cold to the exterior or an air conditioner having the cold discharging device, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric energy application device assembly (108);

Main components of the heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus are illustrated by following embodiment:

FIG. 1 is a schematic view showing the main structure of the present invention.

FIG. 2 is a cross section view of FIG. 1 taken along X-X.

As shown in FIG. 1 and FIG. 2, mainly consists:

-- external tube (101): constituted by one or more than one of hollow tube

members with materials having mechanical strength, the tube body is divided into a front tube body, a mid tube body and a distal tube body, wherein:

The front tube body is mainly served to be installed with the electric
5 energy application device assembly (108);

The mid tube body is served to provide a support function and to transfer the thermal energy between the interior and the exterior of the tube;

The distal tube body is served to perform temperature equalizing
10 operation with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

The external tube (101) includes being formed in round shape or other geometric shapes, and being made of a material having mechanical
15 strength and better heat conductivity or a material having heat insulation property; the mentioned external tube (101) can be optionally installed with heat transfer fins (2001) at the exterior thereof according to actual needs;

The mentioned mechanical structure between the external tube (101)
20 and the electric energy application device assembly (108) includes one or more than one of geometrically extended structures in one dimension or two dimensions or three dimensions; as followings

- (a) formed in the linear structure (as shown in FIG. 1);
- (b) formed in the bending structure with vertical angle or certain
25 non-vertical angle (as shown in FIG. 3);
- (c) formed in the U-shaped structure (as shown in FIG. 4);
- (d) formed in the swirl structure with one or more loops (as shown in FIG. 5);
- (e) formed in the spiral structure (as shown in FIG. 6);
- 30 (f) formed in the wavelike bending structure oriented towards

up/down or left/right (as shown in FIG. 7);

-- inner tube (103): constituted by a tube member having an outer diameter smaller than the inner diameter of the external tube (101) and made of a hard material, e.g. metal material, or a flexible material or a soft material, e.g. plastic, or a fabric or other materials having similar properties, the inner tube (103) is formed in a linear or bended or curved shaped or can be freely deformed if being made of the flexible material or the soft material thereby being enabled to be installed in the external tube (101) without affecting the smoothness of the heat transfer fluid path, the front portion thereof is leaded to the heat transfer fluid path of the electric energy application device assembly (108) or the heat dissipater thereof installed at the front portion of the external tube (101), the distal portion thereof is leaded to the mid portion or extended to the distal portion of the external tube (101), a diameter differentiation is formed between the outer diameter of the inner tube (103) and the inner diameter of the external tube (101) thereby forming a reversed space which can be served as the heat transfer fluid path, so the fluid path allowing the heat transfer fluid to pass is formed through the inner tube and two tube ports at two ends of the inner tube and the reserved space formed between the outer diameter of the inner tube and the inner diameter of the outer tube, and selected locations defined on the mentioned fluid path can be serially installed with one or more than one of fluid pumps (105), the space defined between the front portion of the inner tube (103) and the front portion of the external tube (101) is served to allow the electric energy application device assembly (108) to be installed;

The inner tube (103) includes being formed in round shape or other geometric shapes, and being made of (a) a hard material or flexible material or soft material having heat insulation property, or (b) a hard material or flexible material or soft material having better heat conductivity, and the exterior of the tube member is provided with a heat

insulation material, or (c) a hard material or flexible material or soft material having better heat conductivity, and the interior of the tube member is provided with a heat insulation material, or (d) a hard material or flexible material or soft material having better heat conductivity;

5 When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common electric energy application device assembly (108), or respectively leaded
10 to a corresponding electric energy application device assembly (108), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

-- fluid pump (105): constituted by a pump driven by an electric motor, and used to pump the gaseous or liquid heat transfer fluid according to the
15 controlled flowing direction and flowing rate;

-- electric energy application device assembly (108): served to be disposed on a fastening and supporting structural member (100) and constituted by an illumination device driven by electric energy, and/or a power generator driven by the kinetic power provided by external gaseous or liquid fluid,
20 and/or a device driven by photo energy for generating electric energy and also generating thermal loss, and/or a transformer and/or an electric driven motor, and/or a heat discharging device used for discharging heat to the exterior or an electric heater or air warmer or heat pump having the heat discharging device, and/or a cold discharging device used for discharging
25 cold to the exterior or an air conditioner having the cold discharging device, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric energy application device assembly (108).

30 According to the heat-dissipating structure having suspended external

tube and internally recycling heat transfer fluid and application apparatus, with the pumping operation provided by the fluid pump (105), the gaseous or liquid heat transfer fluid is allowed to pass the heat transfer fluid outlet port at the front portion of the inner tube (103), then pass the heat transfer fluid path formed on the surface or the interior of the electric energy application device assembly (108) which generates thermal loss during operation and the heat dissipater thereof, then pass the heat transfer fluid path formed by the separated space defined between the interior of the external tube (101) and the inner tube (103) thereby being leaded to the distal tube body of the external tube (101) then returned from the heat transfer fluid inlet port at the distal end of the inner tube (103), thereby forming a closed recycling heat transfer fluid loop, or the heat transfer fluid pumped by the fluid pump (105) can pass the mentioned paths in a reverse order and in the reverse flowing direction thereby forming a closed recycling heat transfer fluid loop having reverse order and reverse flowing direction, so through the heat transfer fluid passing the outer surface of the electric energy application device assembly (108) and the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body.

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed.

According to the heat-dissipating structure having suspended external

tube and internally recycling heat transfer fluid and application apparatus, the front tube body of the external tube (101) which allows the electric energy application device assembly (108) to be installed can be further installed with a housing (106) for protecting the electric energy application device assembly (108), and the space formed through the surface of the electric energy application device assembly (108) or the surface of the heat dissipater thereof can be served as a heat transfer fluid path (107) for transferring the heat transfer fluid;

FIG. 8 is a schematic structural view showing the FIG. 1 being provided with a housing.

FIG. 9 is a cross section view of FIG. 8 taken along X-X.

As shown in FIG. 8 and FIG. 9, mainly consists:

-- external tube (101): constituted by one or more than one of hollow tube members with materials having mechanical strength, the tube body is divided into a front tube body, a mid tube body and a distal tube body, wherein:

The front tube body is mainly served to be installed with the electric energy application device assembly (108) and the housing (106);

The mid tube body is served to provide a support function and to transfer the thermal energy between the interior and the exterior of the tube;

The distal tube body is served to perform temperature equalizing operation with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

The external tube (101) includes being formed in round shape or other geometric shapes, and being made of a material having mechanical strength and better heat conductivity or a material having heat insulation property; the mentioned external tube (101) can be optionally installed with heat transfer fins (2001) at the exterior thereof according to actual

needs;

-- inner tube (103): constituted by a tube member having an outer diameter smaller than the inner diameter of the external tube (101) and made of a hard material, e.g. metal material, or a flexible material or a soft material, e.g. plastic, or a fabric or other materials having similar properties, the inner tube (103) is formed in a linear or bended or curved shaped or can be freely deformed if being made of the flexible material or the soft material thereby being enabled to be installed in the external tube (101) without affecting the smoothness of the heat transfer fluid path, the front portion thereof is leaded to the heat transfer fluid path of the electric energy application device assembly (108) or the heat dissipater thereof installed at the front portion of the external tube (101), the distal portion thereof is leaded to the mid portion or extended to the distal portion of the external tube (101), a diameter differentiation is formed between the outer diameter of the inner tube (103) and the inner diameter of the external tube (101) thereby forming a reversed space which can be served as the heat transfer fluid path, so the fluid path allowing the heat transfer fluid to pass is formed through the inner tube and two tube ports at two ends of the inner tube and the reserved space formed between the outer diameter of the inner tube and the inner diameter of the outer tube, and selected locations defined on the mentioned fluid path can be serially installed with one or more than one of fluid pumps (105), the space defined between the front portion of the inner tube (103) and the front portion of the external tube (101) is served to allow the electric energy application device assembly (108) to be installed;

The inner tube (103) includes being formed in round shape or other geometric shapes, and being made of (a) a hard material or flexible material or soft material having heat insulation property, or (b) a hard material or flexible material or soft material having better heat conductivity, and the exterior of the tube member is provided with a heat

insulation material, or (c) a hard material or flexible material or soft material having better heat conductivity, and the interior of the tube member is provided with a heat insulation material, or (d) a hard material or flexible material or soft material having better heat conductivity;

5 When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common electric energy application device assembly (108), or respectively leaded

10 to a corresponding electric energy application device assembly (108), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

 -- fluid pump (105): constituted by a pump driven by an electric motor, and served for being used to pump the gaseous or liquid heat transfer fluid

15 according to the controlled flowing direction and flowing rate;

 -- housing (106): made of a material having heat conductive or heat insulation property and used for covering the exterior of the electric energy application device assembly (108) so as to be sealed relative to the exterior, the heat transfer fluid is pumped by the fluid pump (105) for

20 flowing from the heat transfer fluid outlet port at the front portion of the inner tube (103) to the space formed by the housing (106) and the electric energy application device assembly (108), then passing the heat transfer fluid path formed by the partitioned space defined by the inner diameter of the external tube (101) and the outer diameter of the inner tube (103) to

25 be leaded towards the distal end of the external tube (101), then returning via the heat transfer fluid inlet port at the distal end of the inner tube (103), thereby forming a closed recycling heat transfer fluid loop, or forming a closed recycling heat transfer fluid loop having opposite flowing direction through changing the fluid flowing direction in which the fluid pump (105)

30 is pumping;

-- electric energy application device assembly (108): served to be disposed on a fastening and supporting structural member (100) and constituted by an illumination device driven by electric energy, and/or a power generator driven by the kinetic power provided by external gaseous or liquid fluid, and/or a device driven by photo energy for generating electric energy and also generating thermal loss, and/or a transformer and/or an electric driven motor, and/or a heat discharging device used for discharging heat to the exterior or an electric heater or air warmer or heat pump having the heat discharging device, and/or a cold discharging device used for discharging cold to the exterior or an air conditioner having the cold discharging device, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric energy application device assembly (108);

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation software; the drive control circuit device (112) is optionally installed;

-- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the load is overheated, the operation of electric energy application device assembly (108) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the temperature protecting device (102) is optionally installed.

According to the heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus, with the pumping operation provided by the fluid pump (105), the gaseous or liquid heat transfer fluid is allowed to pass the heat transfer fluid outlet port at the front portion of the inner tube (103), then pass the heat transfer fluid path formed on the surface or the interior of the electric energy

application device assembly (108) which generates thermal loss during operation and the heat dissipater (104) thereof, then pass the heat transfer fluid path formed between the interior of the external tube (101) and the inner tube (103) thereby being leaded to the distal end of the external tube (101) then returned from the heat transfer fluid inlet port at the distal end of the inner tube (103), thereby forming a closed recycling heat transfer fluid loop, or the heat transfer fluid pumped by the fluid pump (105) can pass the mentioned paths in a reverse order and in the reverse flowing direction thereby forming a closed recycling heat transfer fluid loop having reverse order and reverse flowing direction, so through the heat transfer fluid passing the outer surface of the electric energy application device assembly (108) and the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body.

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed.

According to the heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus, the electric energy application device assembly (108) can be combined and applied in many fields under the same theory and structure, including an electric illuminating device (109) e.g. an illumination device adopting LED, and/or a photovoltaic (110) e.g. a solar panel, and/or a wind power generating device (111), and/or a transformer (444), and/or a motor (333)

driven by electric energy, and/or a heat discharging device used for discharging heat to the exterior or an electric heater or air warmer or heat pump having the heat discharging device, and/or a cold discharging device used for discharging cold to the exterior or an air conditioner
5 having the cold discharging device, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric energy application device assembly (108); what shall be addressed is that the applicable fields are numerous
10 and following embodiments are provided for illustrating some applied structures and installation means:

FIG. 10 is a schematic structural view of the present invention illustrating the electric illuminating device (109) being adopted as the electric energy application device assembly (108) and/or the heat
15 dissipater (104) thereof.

FIG. 11 is a cross sectional view of FIG. 10 taken along X-X.

As shown in FIG. 10 and FIG. 11, the main configuration includes one or more than one of the external tube (101), the inner tube (103), the fluid pump (105), and the electric energy application device assembly
20 (108) is designed to adopt the electric illuminating device (109) which generates thermal loss e.g. the illumination device adopting LED, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric
25 illuminating device (109);

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common
30 electric illuminating device (109), or respectively leaded to a

corresponding electric illuminating device (109), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105)
5 passes the heat transfer fluid path (1041) in the interior of the electric illuminating device (109) or the heat dissipater (104) thereof, and passes the heat transfer fluid path (107) formed between the interior of the external tube (101) and the inner tube (103), so through the heat transfer fluid passing the outer surface of the electric illuminating device (109)
10 and/or the heat dissipater (104) thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

15 When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external
20 tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

-- electric illuminating device (109): related to a moveable lamp such as a desk lamp, standing lamp, working lamp, illumination lamp or a lamp installed inside or outside of a building, constituted by an illuminating
25 device utilizing electric energy being converted into photo energy which is composed of various gaseous lamps, solid-state LED or OLED, and other peripheral devices e.g. a light-pervious member (1061) shall be provided according to actual needs, and further including a display screen, a billboard, a signal or a warning sign operated through the photo energy
30 of the electric illuminating device (109);

-- fluid pump (105): constituted by a pump driven by an electric motor, and served for being used to pump the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation software; the drive control circuit device (112) is served to provide the input voltage, the current and the working temperature to the electric illuminating device (109) and to control the operation timing of the fluid pump (105);

-- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, installed in the electric illuminating device (109) or the heat dissipater (104) thereof, so when the temperature is abnormal, the operation of electric illuminating device (109) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the temperature protecting device (102) is optionally installed.

FIG. 12 is a schematic structural view of the present invention illustrating the photovoltaic (110) being adopted as the electric energy application device assembly (108).

FIG. 13 is a cross sectional view of FIG. 12 taken along X-X.

As shown in FIG. 12 and FIG. 13, the main configuration includes one or more than one of the external tube (101), the inner tube (103), the fluid pump (105), and the electric energy application device assembly (108) is designed to adopt the photovoltaic (110) capable of converting photo energy into electric energy and generating thermal loss, and drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the photovoltaic (110);

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths

formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common photovoltaic (110), or respectively leaded to a corresponding photovoltaic (110), and can be designed to share a common fluid pump (105) or
5 respectively installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105) passes the heat transfer fluid path (107) on the surface or the interior of the backside substrate of the photovoltaic (110) and/or the heat dissipater (104) thereof, and passes the interior of the external tube (101), so through
10 the heat transfer fluid passing the outer surface of the photovoltaic (110) and/or the heat dissipater (104) thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid
15 of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the
20 fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

-- photovoltaic (110): constituted by various types of photovoltaic which receives lights for generating and outputting electric energy, e.g. a solar
25 panel, and other relevant peripheral devices;

-- fluid pump (105): constituted by a pump driven by an electric motor, and served for being used to pump the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- drive control circuit device (112): constituted by solid-state or
30 electromechanical components, or chips and relevant operation software;,

the drive control circuit device (112) is served to control the input voltage, the current and the working temperature of the photovoltaic (110) and to control the operation timing of the fluid pump (105);

-- temperature protecting device (102): constituted by the

5 electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the temperature of the photovoltaic (110) is abnormal, the operation of photovoltaic (110) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the

10 temperature protecting device (102) is optionally installed.

FIG. 14 is a schematic structural view of the present invention illustrating the wind power generating device (111) being adopted as the electric energy application device assembly (108).

As shown in FIG. 14, the main configuration includes one or more

15 than one of the external tube (101), the inner tube (103) and the fluid pump (105), and the electric energy application device assembly (108) is designed to adopt a wind power generator (222) of the wind power generating device (111), and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection

20 devices are optionally installed according to actual needs for assisting the operation of the wind power generating device (111);

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103)

25 thereof can be connected in serial or in parallel and leaded to a common wind power generator (222), or respectively leaded to a corresponding wind power generator (222), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105)

30 passes the heat transfer fluid path in the interior of the wind power

generator (222) of the wind power generating device (111) and/or the heat dissipater thereof, or further including the heat transfer fluid path in the drive control circuit device (112) and/or the heat dissipater thereof, and the closed heat transfer fluid path is jointly defined by the inner tube (103) and the partitioned space formed between the inner tube (103) and the interior of the external tube (101) thereby allowing the heat transfer fluid to flow therein, and the temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body through the exposed portion of the external tube (101);

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

-- wind power generating device (111): constituted by wind turbine blades and the wind power generator (222) driven thereby and/or the drive control circuit device (112) and other relevant peripheral devices, wherein the wind power generator (222) and/or the drive control circuit device (112) are the main components receiving the heat dissipating operation;

-- fluid pump (105): constituted by a pump driven by a wind power driven rotating shaft or driven by electric energy, used for pumping the gaseous or liquid heat transfer fluid with respect to the controlled flowing direction and flowing rate of the fluid to be pumped;

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation software, used for controlling the operation of the system in the wind power

generating device (111), including the output voltage, the current and the working temperature of the wind power generator (222), AC and DC converting, parallel controlling of AC output electric energy and public electricity system, and controlling the operation timing of the fluid pump
5 (105);

-- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the temperature of the wind power generating device (111)
10 is abnormal, the system operation of the wind power generator (222) and/or the wind power generating device (111) can be controlled directly or through the drive control circuit device (112), and controlling the fluid pump (105); the temperature protecting device (102) is optionally installed.

15 FIG. 15 is a schematic structural view of the present invention illustrating the transformer (444) being adopted as the electric energy application device assembly (108).

As shown in FIG. 15, the main configuration includes one or more than one of the external tube (101), the inner tube (103) and the fluid
20 pump (105), and the electric energy application device assembly (108) is designed to adopt a transformer (444), and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the transformer (444);

25 When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and lead to a common transformer (444), or respectively lead to a corresponding transformer
30 (444), and can be designed to share a common fluid pump (105) or

respectively installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105) passes the heat transfer fluid path (107) in the interior of the transformer (444) or the heat dissipater thereof, and passes the interior of the external tube (101), so through the heat transfer fluid passing the outer surface of the transformer (444) and/or the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

-- transformer (444): provided with winding sets, magnetic conductive wirings and an enclosure, used for outputting and inputting single-phase or three-phase (including multiple-phase) AC electric energy, or inputting and outputting pulse electric energy; the transformer includes the self-coupled or separated-winding transformer having a dry structure containing gas or wet structure containing cooling fluid, the surface or the exterior of the transformer is formed with a pipeline heat dissipating structure allowing the fluid to pass, or formed with a fluid inlet/outlet port allowing the fluid to flow in or out the internal space of the transformer; the transformer is combined on the fastening and supporting structural member (100) through a transformer support rack (445);

-- fluid pump (105): constituted by a pump driven by electric energy, and

used for pumping the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- drive control circuit device (112): constituted by solid-state, or electromechanical components, or chips and relevant operation software;

5 the drive control circuit device (112) is used for controlling the output voltage, the current and the working temperature of the transformer (444), and controlling the operation timing of the fluid pump (105);

-- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or

10 solid-state temperature detecting unit or solid-state temperature switch unit, so when the temperature of the transformer (444) is abnormal, the operation of transformer (444) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the temperature protecting device (102) is optionally installed.

15 FIG. 16 is a schematic structural view of the present invention illustrating the motor (333) driven by electric energy being adopted as the electric energy application device assembly (108).

As shown in FIG. 16, the main configuration includes one or more than one of the external tube (101), the inner tube (103) and the fluid

20 pump (105), and the electric energy application device assembly (108) is designed to adopt an electric driven motor (333), and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the motor (333);

25 When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common motor (333), or respectively leaded to a corresponding motor (333), and

30 can be designed to share a common fluid pump (105) or respectively

installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105) passes the heat transfer fluid path in the interior of the electric driven motor (333) or the heat dissipater thereof, and passes the interior of the external tube (101), so through the heat transfer fluid passing the outer surface of the motor (333) and/or the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

-- motor (333): constituted by a revolving electromechanical device driven by AC or DC electric energy for outputting rotational kinetic energy thereby driving the motor driven load (334);

-- fluid pump (105): constituted by a pump driven by the electric motor, used for pumping the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation software; the drive control circuit device (112) is used for controlling the input voltage, the current and the working temperature of the electric driven motor (333), and controlling the operation timing of the fluid pump (105);

-- temperature protecting device (102): constituted by the

electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the temperature of the electric driven motor (333) is abnormal, the operation of motor (333) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the temperature protecting device (102) is optionally installed.

According to the heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus, the front portion of the external tube (101) and the inner tube (103) can be further formed with a manifold structure for being installed with plural the same or different electric energy application device assemblies (108) which can share the mid tube body and the distal tube body;

FIG. 17 is a schematic structural view of the present invention showing the front portion of the external tube (101) being formed with a manifold structure for being installed with plural electric energy application device assemblies (108) which sharing the mid tube body and the distal tube body of the external tube (101).

As shown in FIG. 17, the main configuration includes the mentioned external tube (101), the inner tube (103), the fluid pump (105), wherein the front portion of the external tube (101) is formed with a manifold structure allowing plural electric energy application device assemblies (108) to be installed thereon, and formed with a common mid tube body and distal tube body of the external tube (101), and same or different electric energy application device assemblies (108) are respectively installed on the manifold formed on the front portion of the external tube (101), and correspondingly installed with an inner tube (103) in the external tube (101);

Wherein: the heat transfer fluid pumped by the fluid pump (105) passes the heat transfer fluid path on the surface or in the interior of the individual electric energy application device assembly (108) or the heat

dissipater (104) thereof, and passes the interior of the external tube (101), so through the heat transfer fluid passing the outer surface of the electric energy application device assembly (108) or the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature
5 equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body.

According to the heat-dissipating structure having suspended external
10 tube and internally recycling heat transfer fluid and application apparatus, there are many ways to form the heat transfer fluid path through the distal portion of the external tube (101) and the inner tube (103), followings are examples for illustration and shall not be seen as a limitation to the present invention, structures having the same functional operations are all
15 within the scope of the present invention: wherein the structure formed through the external tube (101) and the inner tube (103) includes one or more than one of followings:

FIG. 18 is a first schematic view showing the tube structure of the present invention.

20 FIG. 19 is a cross sectional view of FIG. 18 taken along X-X.

As shown in FIG. 18 and FIG. 19, the main configuration is that the external tube (101) and the inner tube (103) are arranged in coaxial or in a substantially parallel manner, the space defined by the periphery of the inner tube (103) and between the external tube (101) and the inner tube
25 (103) is served to allow the heat transfer fluid to pass, the inner tube (103) installed in the external tube (101) is shorter than the external tube (101), a length differentiation is formed between the distal end thereof and the sealed part at the distal portion of the external tube (101) and a supporter (1033) is provided for fastening, thereby forming the space allowing the
30 heat transfer fluid to pass.

FIG. 20 is a second schematic view showing the tube structure of the present invention.

FIG. 21 is a cross sectional view of FIG. 20 taken along X-X.

As shown in FIG. 20 and FIG. 21, the main configuration is that the
5 external tube (101) and the inner tube (103) are installed in parallel, the
distal end of the inner tube (103) inside the external tube (101) is
combined with the sealed part at the bottom of distal portion of the
external tube (101), and the distal end of the inner tube (103) or a
transversal hole (1031) or a notch (1032) penetrating the inner tube at the
10 distal portion of the inner tube (103) are forming the space allowing the
heat transfer fluid to pass.

FIG. 22 is the third schematic view showing the tube structure of the present invention.

FIG. 23 is a cross sectional view of FIG. 22 taken along X-X.

15 As shown in FIG. 22 and FIG. 23, the main configuration is that the
external tube (101) and the inner tube (103) are eccentrically arranged, the
distal end of the inner tube (103) installed inside the external tube (101) is
shorter, a length differentiation is formed between the distal end thereof
and the sealed part at the bottom of the distal portion of the external tube
20 (101) thereby forming a space allowing the heat transfer fluid to pass.

FIG. 24 is a fourth schematic view showing the tube structure of the present invention.

FIG. 25 is a cross sectional view of FIG. 24 taken along X-X.

As shown in FIG. 24 and FIG. 25, the main configuration is that the
25 external tube (101) and two or more than two of the inner tubes (103) are
installed in parallel, the distal portion of the inner tube (103) installed
inside the external tube (101) is shorter, a length differentiation is formed
between the distal portion thereof and the sealed part at the bottom of the
distal portion of the external tube (101) thereby forming a space allowing
30 the heat transfer fluid to pass.

FIG. 26 is a fifth schematic view showing the tube structure of the present invention.

FIG. 27 is a cross sectional view of FIG. 26 taken along X-X.

As shown in FIG. 26 and FIG. 27, the main configuration is that the
5 external tube (101) and the inner tube (103) are arranged in coaxial or in a
substantially parallel manner, the space defined by the periphery of the
inner tube (103) and between the external tube (101) and the inner tube
(103) is served to allow the heat transfer fluid to pass, the inner tube (103)
installed inside the external tube (101) is shorter than the external tube
10 (101), a length differentiation is formed between the distal portion thereof
and the sealed part at the bottom of the distal portion of the external tube
(101) thereby forming a space allowing the heat transfer fluid to pass, a
spiral flow guiding structure (2003) is further installed between the
external tube (101) and the inner tube (103) thereby increasing the length
15 of the heat transfer fluid path formed between the external tube (101) and
the inner tube (103).

FIG. 28 is a schematic structural view of the present invention
showing a heat transfer fluid path allowing the gaseous or liquid heat
transfer fluid to pass being formed through the space defined by the heat
20 dissipater (104) of the electric energy application device assembly (108)
and the housing (106) and the heat transfer fluid path (1041) of the heat
dissipater (104).

As shown in FIG. 28, the main configuration is that a heat transfer
fluid path allowing the gaseous or liquid heat transfer fluid to pass is
25 formed through the space defined by the heat dissipater (104) of the
electric energy application device assembly (108) and the housing (106)
and the heat transfer fluid path (1041) of the heat dissipater (104).

FIG. 29 is a schematic structural view of the present invention
showing a heat transfer fluid path allowing the gaseous or liquid heat
30 transfer fluid to pass being formed through at least two heat transfer fluid

paths (1041) of the heat dissipater (104) installed in the electric energy application device assembly (108) being serially connected with a U-shaped connection tube (1042).

As shown in FIG. 29, the main configuration is that at least two heat transfer fluid paths (1041) of the heat dissipater (104) installed in the electric energy application device assembly (108) are connected with a U-shaped connection tube (1042) in serial, so as to constitute a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass.

FIG. 30 is a schematic structural view of the present invention showing a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass being formed through the space defined by the electric energy application device assembly (108) and the housing (106) and the heat transfer fluid path (1081) provided by the electric energy application device assembly (108).

As shown in FIG. 30, the main configuration is that through the space defined by the electric energy application device assembly (108) and the housing (106) and the heat transfer fluid path (1081) provide by the electric energy application device assembly (108), a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass is formed.

FIG. 31 is a schematic structural view of the present invention showing a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass being formed through at least two heat transfer fluid paths (1081) of the electric energy application device assembly (108) being serially connected with a U-shaped connection tube (1042).

As shown in FIG. 31, the main configuration is that at least two of the heat transfer fluid paths (1081) provided by the electric energy application device assembly (108) are connected in serial with a U-shaped connection tube (1042), thereby to constitute a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass.

FIG. 32 is a schematic structural view of the present invention showing a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass being formed through a U-shaped connection tube (1042) being connected between at least one heat transfer fluid path (1081) of the electric energy application device assembly (108) and at least one heat transfer fluid path (1041) of the heat dissipater (104) thereof.

As shown FIG. 32, the main configuration is that at least one heat transfer fluid path (1081) provided by the electric energy application device assembly (108) and at least one heat transfer fluid path (1041) provided by the heat dissipater (104) thereof are connected in serial with a U-shaped connection tube (1042), thereby to constitute a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass.

The applicable fields of the heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus are very flexible, wherein the heat-dissipating structure having internally recycling heat transfer fluid flowing in tubes and installed in the electric energy application device assembly (108) can be one or more than one, the exposed portion of the external tube (101) enables the temperature equalizing operation to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body, the surface of the external tube (101) can be optionally installed with external heat guiding plates (201), the portion of the surface of the external tube (101) which is disposed in the interior of the electric energy application device assembly (108) can be optionally installed with inner heat guiding plates (203), and the installation and operating direction are not limited, illustrations are provided as followings:

FIG. 33 is a schematic view showing the main structure being vertically installed according to one embodiment of the present invention.

FIG. 34 is a cross sectional view of FIG. 33 taken along X-X.

As shown in FIG. 33 and FIG. 34, the main configuration is that the heat-dissipating structure having internally recycling heat transfer fluid flowing in tubes is combined and vertically installed in electric energy application device assembly (108), the fastening means can be the conventional means such as utilizing a support rod or chain or hook or a suspending hook device for fastening a standing lamp or ceiling lamp or a standing fan or ceiling fan, thereby being able to be vertically installed at the top of a building or the top of a structural unit having internal space or a moveable object.

The installation means disclosed in the embodiment shown in FIG. 33 and FIG. 34 includes one or more than one of following installation means:

FIG. 35 is a schematic structural diagram of one embodiment showing the present invention being horizontally and penetratingly installed on a wall.

As shown in FIG. 35, the main configuration is that the heat-dissipating structure having internally recycling heat transfer fluid flowing in tubes is combined and horizontally installed in the electric energy application device assembly (108), the fastening means can be the conventional means such as horizontally installing a window-type air conditioner on a wall or the window of a freezing cabinet of a transportation vehicle, thereby being able to be horizontally installed on the lateral side of a building or the lateral side of a structural unit or a moveable object.

FIG. 36 is a schematic structural diagram showing single electric energy application device assembly (108) being vertically installed with plural heat-dissipating structures having internally recycling heat transfer fluid flowing in tubes.

As shown in FIG. 36, the main configuration is that single electric

energy application device assembly (108) is vertically installed with two or more than two of the heat-dissipating structures having internally recycling heat transfer fluid flowing in tubes, the fastening means can be the conventional means such as utilizing a support rod or chain or hook or
5 a suspending hook device for fastening a standing lamp or ceiling lamp or a standing fan or ceiling fan, thereby being able to be vertically installed at the top of a building or the top of a structural unit having internal space or a moveable object.

FIG. 37 is a schematic structural view of one embodiment showing
10 single electric energy application device assembly (108) being installed with plural heat-dissipating structures having internally recycling heat transfer fluid flowing in tubes for being horizontally and penetratingly installed on a wall.

As shown in FIG. 37, the main configuration is that single electric
15 energy application device assembly (108) is horizontally installed with two or more than two of the heat-dissipating structures having internally recycling heat transfer fluid flowing in tubes, the fastening means can be the conventional means such as horizontally installing a window-type air conditioner on a wall or the window of a freezing cabinet of a
20 transportation vehicle, thereby being able to be horizontally installed on the lateral side of a building or the lateral side of a structural unit or a moveable object.

FIG. 38 is a schematic structural view of the first embodiment showing the heat dissipater of the present application being installed with
25 a conical flow guiding body (1040) having thermal conductivity and being installed in a downward configuration.

As shown in FIG. 38, the internal of the heat-dissipating structure of the present invention is configured as a conical flow guiding body (1040) having thermal conductivity, so as to reduce the flowing resistance of the
30 internal fluid, and the top thereof is suspended through a hanging chain.

FIG. 39 is a schematic structural view of the second embodiment showing the heat dissipater of the present application being installed with a conical flow guiding body (1040) having thermal conductivity and being installed in a downward configuration.

5 As shown in FIG. 39, the internal of the heat-dissipating structure of the present invention is configured as a conical flow guiding body (1040) having thermal conductivity, so as to reduce the flowing resistance of the internal fluid, and the top thereof is suspended through a hanging tube and a brocket.

10 FIG. 40 is a schematic structural view of the third embodiment showing the heat dissipater of the present application being installed with a conical flow guiding body (1040) having thermal conductivity and being installed in a downward configuration.

15 As shown in FIG. 40, the internal of the heat-dissipating structure of the present invention is configured as a conical flow guiding body (1040) having thermal conductivity, so as to reduce the flowing resistance of the internal fluid, and the top thereof is fixed suspended through having an extended external tube to be combined with a fixed holder (555) with connecting and fastening function and heat-dissipating property.

20 FIG. 41 is a bottom side view of FIG. 38, FIG. 39 and FIG. 40.

FIG. 42 is a cross sectional view of FIG. 38, FIG. 39 and FIG. 40 taken along A-A.

25 The heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus can not only be applied for being combined and installed as what the embodiments has disclosed above, but also can be applied in the electric energy application device assembly (108) composed of various lamps and/or the heat discharging device used for discharging heat to the exterior or an electric heater or air warmer or heat pump having the heat
30 discharging device, and/or the cold discharging device used for

discharging cold to the exterior or an air conditioner having the cold discharging device, the theory and structure of installing the external tube with a suspending manner and the heat-dissipating structure of the internally recycling heat transfer fluid are the same as the disclosed
5 embodiments therefore no further illustration is provided.

CLAIMS

1. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus, which is to provide one or more than one of external tubes (101) suspendedly
5 installed and capable of performing temperature equalizing operation with an external gaseous environment or a liquid or solid environment which is manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body, the interior of the external tube (101) is provided with an inner tube (103), the inner
10 diameter of the external tube (101) is larger than the outer diameter of the inner tube (103), the space defined by the diameter differentiation is formed as a heat transfer fluid path, the distal end of the external tube (101) is sealed, the distal end of the inner tube (103) is shorter than the distal end of the external tube (101) or preformed with fluid
15 holes, the distal ends of both tubes are formed with a flow returning segment allowing the heat transfer fluid to be returned;

The front tube port of the external tube (101) and the front tube port of the inner tube (103) allow the heat transfer fluid passing an electric energy application device assembly (108) and/or a heat
20 dissipater thereof to be transferred, wherein one of the tube ports allows the heat transfer fluid to be transferred for passing the electric energy application device assembly (108) and/or the heat dissipater thereof, and the other tube port allows the heat transfer fluid which already passed the electric energy application device assembly (108)
25 and/or the heat dissipater thereof to be returned;

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and
30 lead to a common electric energy application device assembly (108),

or respectively lead to a corresponding electric energy application device assembly (108), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

5 One or more than one of fluid pumps (105) are serially installed on the closed recycling heat transfer fluid path, the flowing direction thereof can be selected from one flowing direction or two flowing directions enabled to be switched or periodically changed;

The structure of the heat transfer fluid path formed between the mentioned electric energy application device assembly (108) and/or
10 the heat dissipater thereof and the external tube (101) and the inner tube (103) includes one or more than one of followings:

(a) the interior of the electric energy application device assembly (108) is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel to pass through, the fluid inlet port
15 and the fluid outlet port are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);

(b) the heat dissipater installed in the electric energy application device assembly (108) is formed with one or more than one of heat transfer fluid paths connected in parallel to pass through, the fluid inlet
20 port and the fluid outlet port are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);

(c) one or more than one of heat transfer fluid paths formed in the interior of the electric energy application device assembly (108) are
25 connected in serial or in parallel with the heat transfer fluid paths formed in the heat dissipater, the fluid inlet port and the fluid outlet port are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);

(d) the electric energy application device assembly (108) is
30 formed with two or more than two of heat transfer fluid paths

connected through external tubes so as to form the fluid inlet port and the fluid outlet port respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103), or the interior thereof is bent to the U-like shape or L-like shape, and the fluid inlet port and the flow outlet port at the same or different sides are respectively communicated with the tube port of the external tube (101) and the tube port of the inner tube (103);

(e) the exterior of the electric energy application device assembly (108) is installed with a sealed housing, thereby forming a space between the above two for allowing the heat transfer fluid to pass, the electric energy application device assembly (108) is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel, one end thereof is formed with a heat transfer fluid inlet/outlet port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108), and a heat transfer fluid connection port is formed on the sealed housing for being communicated with the tube port of the external tube (101);

(f) a sealed space allowing the heat transfer fluid to pass is formed between the electric energy application device assembly (108) and the heat dissipater thereof, and the exterior and the installed housing, the electric energy application device assembly (108) and/or the heat dissipater thereof is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel, one end thereof is formed with a heat transfer fluid inlet/outlet port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108) and/or the heat dissipater thereof, a heat transfer fluid inlet/outlet port is formed on the sealed housing for being communicated with the tube port of the external tube (101);

(g) a sealed housing is jointly formed through the exterior of the electric energy application device assembly (108) and/or the heat dissipater thereof and the matched housing, the interior of the electric energy application device assembly (108) and/or the heat dissipater thereof and the matched housing is formed with a space allowing the heat transfer fluid to pass and leaded to the tube port of the external tube (101), the electric energy application device assembly (108) and/or the heat dissipater thereof is formed with one or more than one of heat transfer fluid paths connected in serial or in parallel, one end thereof is formed with a heat transfer fluid connection port which is leaded to the tube port of the inner tube (103), the tube port at the other end is leaded to the space formed between the housing and the electric energy application device assembly (108) and/or the heat dissipater thereof, a heat transfer fluid connection port is formed on the sealed housing for being communicated with the tube port of the external tube (101);

The gaseous or liquid heat transfer fluid pumped by the fluid pump (105) passes the external tube (101) of the closed recycling heat transfer fluid path and the exposed portion of the relevant structure, thereby enabling to perform temperature equalizing operation with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

The mentioned electric energy application device assembly (108) includes an illumination device utilizing electric energy being converted into photo energy, e.g. an illumination device adopting LED and/or a photovoltaic, e.g. a solar panel and/or a wind power generator and/or a transformer and/or an electric driven motor, and/or a heat discharging device used for discharging heat to the exterior or an electric heater or air warmer or heat pump having the heat discharging device, and/or a cold discharging device used for discharging cold to the exterior or an air conditioner having the cold discharging device, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric energy application device assembly (108).

2. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein mainly consists:

-- external tube (101): constituted by one or more than one of hollow tube members with materials having mechanical strength, the tube body is divided into a front tube body, a mid tube body and a distal tube body, wherein:

The front tube body is mainly served to be installed with the electric energy application device assembly (108);

The mid tube body is served to provide a support function and to transfer the thermal energy between the interior and the exterior of the tube;

The distal tube body is served to perform temperature equalizing operation with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

The external tube (101) includes being formed in round shape or

other geometric shapes, and being made of a material having mechanical strength and better heat conductivity or a material having heat insulation property; the mentioned external tube (101) can be optionally installed with heat transfer fins (2001) at the exterior thereof according to actual needs;

The mentioned mechanical structure between the external tube (101) and the electric energy application device assembly (108) includes one or more than one of geometrically extended structures in one dimension or two dimensions or three dimensions; as followings:

- (a) formed in the linear structure;
- (b) formed in the bending structure with vertical angle or certain non-vertical angle;
- (c) formed in the U-shaped structure;
- (d) formed in the swirl structure with one or more loops;
- (e) formed in the spiral structure;
- (f) formed in the wavelike bending structure oriented towards up/down or left/right;

-- inner tube (103): constituted by a tube member having an outer diameter smaller than the inner diameter of the external tube (101) and made of a hard material, e.g. metal material, or a flexible material or a soft material, e.g. plastic, or a fabric or other materials having similar properties, the inner tube (103) is formed in a linear or bended or curved shaped or can be freely deformed if being made of the flexible material or the soft material thereby being enabled to be installed in the external tube (101) without affecting the smoothness of the heat transfer fluid path, the front portion thereof is leaded to the heat transfer fluid path of the electric energy application device assembly (108) or the heat dissipater thereof installed at the front portion of the external tube (101), the distal portion thereof is leaded to the mid portion or extended to the distal portion of the external tube (101), a diameter

differentiation is formed between the outer diameter of the inner tube (103) and the inner diameter of the external tube (101) thereby forming a reversed space which can be served as the heat transfer fluid path, so the fluid path allowing the heat transfer fluid to pass is formed through the inner tube and two tube ports at two ends of the inner tube and the reserved space formed between the outer diameter of the inner tube and the inner diameter of the outer tube, and selected locations defined on the mentioned fluid path can be serially installed with one or more than one of fluid pumps (105), the space defined between the front portion of the inner tube (103) and the front portion of the external tube (101) is served to allow the electric energy application device assembly (108) to be installed;

The inner tube (103) includes being formed in round shape or other geometric shapes, and being made of (a) a hard material or flexible material or soft material having heat insulation property, or (b) a hard material or flexible material or soft material having better heat conductivity, and the exterior of the tube member is provided with a heat insulation material, or (c) a hard material or flexible material or soft material having better heat conductivity, and the interior of the tube member is provided with a heat insulation material, or (d) a hard material or flexible material or soft material having better heat conductivity;

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common electric energy application device assembly (108), or respectively leaded to a corresponding electric energy application device assembly (108), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

-- fluid pump (105): constituted by a pump driven by an electric motor, and used to pump the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- electric energy application device assembly (108): served to be disposed on a fastening and supporting structural member (100) and constituted by an illumination device driven by electric energy, and/or a power generator driven by the kinetic power provided by external gaseous or liquid fluid, and/or a device driven by photo energy for generating electric energy and also generating thermal loss, and/or a transformer and/or an electric driven motor, and/or a heat discharging device used for discharging heat to the exterior or an electric heater or air warmer or heat pump having the heat discharging device, and/or a cold discharging device used for discharging cold to the exterior or an air conditioner having the cold discharging device, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric energy application device assembly (108);

According to the heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus, with the pumping operation provided by the fluid pump (105), the gaseous or liquid heat transfer fluid is allowed to pass the heat transfer fluid outlet port at the front portion of the inner tube (103), then pass the heat transfer fluid path formed on the surface or the interior of the electric energy application device assembly (108) which generates thermal loss during operation and the heat dissipater thereof, then pass the heat transfer fluid path formed by the separated space defined between the interior of the external tube (101) and the inner tube (103) thereby being leaded to the distal tube body of the external tube (101) then returned from the heat transfer fluid inlet port at the

distal end of the inner tube (103), thereby forming a closed recycling heat transfer fluid loop, or the heat transfer fluid pumped by the fluid pump (105) can pass the mentioned paths in a reverse order and in the reverse flowing direction thereby forming a closed recycling heat transfer fluid loop having reverse order and reverse flowing direction, so through the heat transfer fluid passing the outer surface of the electric energy application device assembly (108) and the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed.

3. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claims 1 or 2, wherein the front tube body of the external tube (101) which allows the electric energy application device assembly (108) to be installed can be further installed with a housing (106) for protecting the electric energy application device assembly (108), and the space formed through the surface of the electric energy application device assembly (108) or the surface of the heat dissipater thereof can be served as a heat transfer fluid path (107) for transferring the heat transfer fluid; it mainly consists:

-- external tube (101): constituted by one or more than one of hollow

tube members with materials having mechanical strength, the tube body is divided into a front tube body, a mid tube body and a distal tube body, wherein:

5 The front tube body is mainly served to be installed with the electric energy application device assembly (108) and the housing (106);

 The mid tube body is served to provide a support function and to transfer the thermal energy between the interior and the exterior of the tube;

10 The distal tube body is served to perform temperature equalizing operation with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

 The external tube (101) includes being formed in round shape or
15 other geometric shapes, and being made of a material having mechanical strength and better heat conductivity or a material having heat insulation property; the mentioned external tube (101) can be optionally installed with heat transfer fins (2001) at the exterior thereof according to actual needs;

20 -- inner tube (103): constituted by a tube member having an outer diameter smaller than the inner diameter of the external tube (101) and made of a hard material, e.g. metal material, or a flexible material or a soft material, e.g. plastic, or a fabric or other materials having similar properties, the inner tube (103) is formed in a linear or bended or
25 curved shaped or can be freely deformed if being made of the flexible material or the soft material thereby being enabled to be installed in the external tube (101) without affecting the smoothness of the heat transfer fluid path, the front portion thereof is leaded to the heat transfer fluid path of the electric energy application device assembly
30 (108) or the heat dissipater thereof installed at the front portion of the

external tube (101), the distal portion thereof is leaded to the mid portion or extended to the distal portion of the external tube (101), a diameter differentiation is formed between the outer diameter of the inner tube (103) and the inner diameter of the external tube (101) thereby forming a reversed space which can be served as the heat transfer fluid path, so the fluid path allowing the heat transfer fluid to pass is formed through the inner tube and two tube ports at two ends of the inner tube and the reserved space formed between the outer diameter of the inner tube and the inner diameter of the outer tube, and selected locations defined on the mentioned fluid path can be serially installed with one or more than one of fluid pumps (105), the space defined between the front portion of the inner tube (103) and the front portion of the external tube (101) is served to allow the electric energy application device assembly (108) to be installed;

The inner tube (103) includes being formed in round shape or other geometric shapes, and being made of (a) a hard material or flexible material or soft material having heat insulation property, or (b) a hard material or flexible material or soft material having better heat conductivity, and the exterior of the tube member is provided with a heat insulation material, or (c) a hard material or flexible material or soft material having better heat conductivity, and the interior of the tube member is provided with a heat insulation material, or (d) a hard material or flexible material or soft material having better heat conductivity;

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common electric energy application device assembly (108), or respectively leaded to a corresponding electric energy application

device assembly (108), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

-- fluid pump (105): constituted by a pump driven by an electric motor, and served for being used to pump the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- housing (106): made of a material having heat conductive or heat insulation property and used for covering the exterior of the electric energy application device assembly (108) so as to be sealed relative to the exterior, the heat transfer fluid is pumped by the fluid pump (105) for flowing from the heat transfer fluid outlet port at the front portion of the inner tube (103) to the space formed by the housing (106) and the electric energy application device assembly (108), then passing the heat transfer fluid path formed by the partitioned space defined by the inner diameter of the external tube (101) and the outer diameter of the inner tube (103) to be leaded towards the distal end of the external tube (101), then returning via the heat transfer fluid inlet port at the distal end of the inner tube (103), thereby forming a closed recycling heat transfer fluid loop, or forming a closed recycling heat transfer fluid loop having opposite flowing direction through changing the fluid flowing direction in which the fluid pump (105) is pumping;

-- electric energy application device assembly (108): served to be disposed on a fastening and supporting structural member (100) and constituted by an illumination device driven by electric energy, and/or a power generator driven by the kinetic power provided by external gaseous or liquid fluid, and/or a device driven by photo energy for generating electric energy and also generating thermal loss, and/or a transformer and/or an electric driven motor, and/or a heat discharging device used for discharging heat to the exterior or an electric heater or air warmer or heat pump having the heat discharging device, and/or a cold discharging device used for discharging cold to the exterior or an

air conditioner having the cold discharging device, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric energy application device assembly (108);

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation software; the drive control circuit device (112) is optionally installed;

-- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the load is overheated, the operation of electric energy application device assembly (108) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the temperature protecting device (102) is optionally installed;

According to the heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus, with the pumping operation provided by the fluid pump (105), the gaseous or liquid heat transfer fluid is allowed to pass the heat transfer fluid outlet port at the front portion of the inner tube (103), then pass the heat transfer fluid path formed on the surface or the interior of the electric energy application device assembly (108) which generates thermal loss during operation and the heat dissipater (104) thereof, then pass the heat transfer fluid path formed between the interior of the external tube (101) and the inner tube (103) thereby being leaded to the distal end of the external tube (101) then returned from the heat transfer fluid inlet port at the distal end of the inner tube (103), thereby forming a closed recycling heat transfer fluid loop, or the heat transfer fluid pumped by the fluid pump (105) can pass the mentioned paths in a reverse order and in the reverse flowing direction

thereby forming a closed recycling heat transfer fluid loop having reverse order and reverse flowing direction, so through the heat transfer fluid passing the outer surface of the electric energy application device assembly (108) and the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed.

4. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the electric illuminating device (109) is adopted as the electric energy application device assembly (108) and/or the heat dissipater (104) thereof, and the main configuration includes one or more than one of the external tube (101), the inner tube (103), the fluid pump (105), and the electric energy application device assembly (108) is designed to adopt the electric illuminating device (109) which generates thermal loss e.g. the illumination device adopting LED, and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the electric illuminating device (109);

When two or more than two of the external tubes (101) are

installed and individually provided with the inner tube (103) therein,
the fluid paths formed by the individual external tube (101) and the
inner tube (103) thereof can be connected in serial or in parallel and
leaded to a common electric illuminating device (109), or respectively
5 leaded to a corresponding electric illuminating device (109), and can
be designed to share a common fluid pump (105) or respectively
installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105)
passes the heat transfer fluid path (1041) in the interior of the electric
10 illuminating device (109) or the heat dissipater (104) thereof, and
passes the heat transfer fluid path (107) formed between the interior of
the external tube (101) and the inner tube (103), so through the heat
transfer fluid passing the outer surface of the electric illuminating
device (109) and/or the heat dissipater (104) thereof, and/or the
15 exposed portion of the external tube (101), temperature equalizing
operation is enabled to be performed with the external gaseous
environment or the liquid or solid environment manually installed but
not disposed in the stratum or liquid of the shallow ground natural
thermal energy body;

20 When the external tube (101) is formed as a vertically upward or
obliquely upward or spirally upward structure, the fluid can take
advantage of the physical effect of hot ascending/cold descending to
allow the fluid having higher temperature to ascend in the inner tube
and the fluid having lower temperature to descend in the interior of the
25 external tube, thereby forming a flow recycling, and/or the fluid pump
(105) can be further installed;

-- electric illuminating device (109): related to a moveable lamp such
as a desk lamp, standing lamp, working lamp, illumination lamp or a
lamp installed inside or outside of a building, constituted by an
30 illuminating device utilizing electric energy being converted into photo

energy which is composed of various gaseous lamps, solid-state LED or OLED, and other peripheral devices e.g. a light-pervious member (1061) shall be provided according to actual needs, and further including a display screen, a billboard, a signal or a warning sign operated through the photo energy of the electric illuminating device (109);

-- fluid pump (105): constituted by a pump driven by an electric motor, and served for being used to pump the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation software; the drive control circuit device (112) is served to provide the input voltage, the current and the working temperature to the electric illuminating device (109) and to control the operation timing of the fluid pump (105);

-- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, installed in the electric illuminating device (109) or the heat dissipater (104) thereof, so when the temperature is abnormal, the operation of electric illuminating device (109) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the temperature protecting device (102) is optionally installed.

5. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the photovoltaic (110) is adopted as the electric energy application device assembly (108), and the main configuration includes one or more than one of the external tube (101), the inner tube (103), the fluid pump (105), and the electric energy application device assembly (108) is designed to adopt the

photovoltaic (110) capable of converting photo energy into electric energy and generating thermal loss, and drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the
5 operation of the photovoltaic (110);

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and
10 leaded to a common photovoltaic (110), or respectively leaded to a corresponding photovoltaic (110), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105)
15 passes the heat transfer fluid path (107) on the surface or the interior of the backside substrate of the photovoltaic (110) and/or the heat dissipater (104) thereof, and passes the interior of the external tube (101), so through the heat transfer fluid passing the outer surface of the photovoltaic (110) and/or the heat dissipater (104) thereof, and/or the
20 exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the
25 external tube, thereby forming a flow recycling, and/or the fluid pump
30

(105) can be further installed;

-- photovoltaic (110): constituted by various types of photovoltaic which receives lights for generating and outputting electric energy, e.g. a solar panel, and other relevant peripheral devices;

5 -- fluid pump (105): constituted by a pump driven by an electric motor, and served for being used to pump the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation
10 software; the drive control circuit device (112) is served to control the input voltage, the current and the working temperature of the photovoltaic (110) and to control the operation timing of the fluid pump (105);

-- temperature protecting device (102): constituted by the
15 electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the temperature of the photovoltaic (110) is abnormal, the operation of photovoltaic (110) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the
20 temperature protecting device (102) is optionally installed.

6. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the wind power generating device (111) is adopted as the electric energy application device assembly (108), and
25 the main configuration includes one or more than one of the external tube (101), the inner tube (103) and the fluid pump (105), and the electric energy application device assembly (108) is designed to adopt a wind power generator (222) of the wind power generating device (111), and peripheral devices, drive control circuits devices, overload
30 protecting devices and/or temperature protection devices are optionally

installed according to actual needs for assisting the operation of the wind power generating device (111);

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common wind power generator (222), or respectively leaded to a corresponding wind power generator (222), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105) passes the heat transfer fluid path in the interior of the wind power generator (222) of the wind power generating device (111) and/or the heat dissipater thereof, or further including the heat transfer fluid path in the drive control circuit device (112) and/or the heat dissipater thereof, and the closed heat transfer fluid path is jointly defined by the inner tube (103) and the partitioned space formed between the inner tube (103) and the interior of the external tube (101) thereby allowing the heat transfer fluid to flow therein, and the temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body through the exposed portion of the external tube (101);

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump

(105) can be further installed;

-- wind power generating device (111): constituted by wind turbine blades and the wind power generator (222) driven thereby and/or the drive control circuit device (112) and other relevant peripheral devices, wherein the wind power generator (222) and/or the drive control circuit device (112) are the main components receiving the heat dissipating operation;

-- fluid pump (105): constituted by a pump driven by a wind power driven rotating shaft or driven by electric energy, used for pumping the gaseous or liquid heat transfer fluid with respect to the controlled flowing direction and flowing rate of the fluid to be pumped;

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation software, used for controlling the operation of the system in the wind power generating device (111), including the output voltage, the current and the working temperature of the wind power generator (222), AC and DC converting, parallel controlling of AC output electric energy and public electricity system, and controlling the operation timing of the fluid pump (105);

-- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the temperature of the wind power generating device (111) is abnormal, the system operation of the wind power generator (222) and/or the wind power generating device (111) can be controlled directly or through the drive control circuit device (112), and controlling the fluid pump (105); the temperature protecting device (102) is optionally installed.

7. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as

claimed in claim 1, wherein the transformer (444) is adopted as the electric energy application device assembly (108), and the main configuration includes one or more than one of the external tube (101), the inner tube (103) and the fluid pump (105), and the electric energy application device assembly (108) is designed to adopt a transformer (444), and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the transformer (444);

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common transformer (444), or respectively leaded to a corresponding transformer (444), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105) passes the heat transfer fluid path (107) in the interior of the transformer (444) or the heat dissipater thereof, and passes the interior of the external tube (101), so through the heat transfer fluid passing the outer surface of the transformer (444) and/or the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to

allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

5 -- transformer (444): provided with winding sets, magnetic conductive wirings and an enclosure, used for outputting and inputting single-phase or three-phase (including multiple-phase) AC electric energy, or inputting and outputting pulse electric energy; the transformer includes the self-coupled or separated-winding transformer
10 having a dry structure containing gas or wet structure containing cooling fluid, the surface or the exterior of the transformer is formed with a pipeline heat dissipating structure allowing the fluid to pass, or formed with a fluid inlet/outlet port allowing the fluid to flow in or out the internal space of the transformer; the transformer is combined on
15 the fastening and supporting structural member (100) through a transformer support rack (445);

 -- fluid pump (105): constituted by a pump driven by electric energy, and used for pumping the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

20 -- drive control circuit device (112): constituted by solid-state, or electromechanical components, or chips and relevant operation software; the drive control circuit device (112) is used for controlling the output voltage, the current and the working temperature of the transformer (444), and controlling the operation timing of the fluid
25 pump (105);

 -- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the temperature of the transformer (444) is abnormal, the
30 operation of transformer (444) and the fluid pump (105) can be

controlled directly or through the drive control circuit device (112); the temperature protecting device (102) is optionally installed.

8. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the motor (333) driven by electric energy is adopted as the electric energy application device assembly (108), and the main configuration includes one or more than one of the external tube (101), the inner tube (103) and the fluid pump (105), and the electric energy application device assembly (108) is designed to adopt an electric driven motor (333), and peripheral devices, drive control circuits devices, overload protecting devices and/or temperature protection devices are optionally installed according to actual needs for assisting the operation of the motor (333);

When two or more than two of the external tubes (101) are installed and individually provided with the inner tube (103) therein, the fluid paths formed by the individual external tube (101) and the inner tube (103) thereof can be connected in serial or in parallel and leaded to a common motor (333), or respectively leaded to a corresponding motor (333), and can be designed to share a common fluid pump (105) or respectively installed with a fluid pump (105);

Wherein: the heat transfer fluid pumped by the fluid pump (105) passes the heat transfer fluid path in the interior of the electric driven motor (333) or the heat dissipater thereof, and passes the interior of the external tube (101), so through the heat transfer fluid passing the outer surface of the motor (333) and/or the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body;

When the external tube (101) is formed as a vertically upward or obliquely upward or spirally upward structure, the fluid can take advantage of the physical effect of hot ascending/cold descending to allow the fluid having higher temperature to ascend in the inner tube and the fluid having lower temperature to descend in the interior of the external tube, thereby forming a flow recycling, and/or the fluid pump (105) can be further installed;

-- motor (333): constituted by a revolving electromechanical device driven by AC or DC electric energy for outputting rotational kinetic energy thereby driving the motor driven load (334);

-- fluid pump (105): constituted by a pump driven by the electric motor, used for pumping the gaseous or liquid heat transfer fluid according to the controlled flowing direction and flowing rate;

-- drive control circuit device (112): constituted by solid-state or electromechanical components, or chips and relevant operation software; the drive control circuit device (112) is used for controlling the input voltage, the current and the working temperature of the electric driven motor (333), and controlling the operation timing of the fluid pump (105);

-- temperature protecting device (102): constituted by the electromechanical thermal actuated switch or thermal braking fuse, or solid-state temperature detecting unit or solid-state temperature switch unit, so when the temperature of the electric driven motor (333) is abnormal, the operation of motor (333) and the fluid pump (105) can be controlled directly or through the drive control circuit device (112); the temperature protecting device (102) is optionally installed.

9. A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the front portion of the external tube (101) and the inner tube (103) can be further formed with a manifold

structure for being installed with plural the same or different electric energy application device assemblies (108) which can share the mid tube body and the distal tube body, and the main configuration includes the mentioned external tube (101), the inner tube (103), the fluid pump (105), wherein the front portion of the external tube (101) is formed with a manifold structure allowing plural electric energy application device assemblies (108) to be installed thereon, and formed with a common mid tube body and distal tube body of the external tube (101), and same or different electric energy application device assemblies (108) are respectively installed on the manifold formed on the front portion of the external tube (101), and correspondingly installed with an inner tube (103) in the external tube (101);

Wherein: the heat transfer fluid pumped by the fluid pump (105) passes the heat transfer fluid path on the surface or in the interior of the individual electric energy application device assembly (108) or the heat dissipater (104) thereof, and passes the interior of the external tube (101), so through the heat transfer fluid passing the outer surface of the electric energy application device assembly (108) or the heat dissipater thereof, and/or the exposed portion of the external tube (101), temperature equalizing operation is enabled to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural thermal energy body.

10.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the structure formed through the external tube (101) and the inner tube (103) includes one and more than one of followings:

the external tube (101) and the inner tube (103) are arranged in coaxial or in a substantially parallel manner, the space defined by the

periphery of the inner tube (103) and between the external tube (101) and the inner tube (103) is served to allow the heat transfer fluid to pass, the inner tube (103) installed in the external tube (101) is shorter than the external tube (101), a length differentiation is formed between the distal end thereof and the sealed part at the distal portion of the external tube (101) and a supporter (1033) is provided for fastening, thereby forming the space allowing the heat transfer fluid to pass;

the external tube (101) and the inner tube (103) are installed in parallel, the distal end of the inner tube (103) inside the external tube (101) is combined with the sealed part at the bottom of distal portion of the external tube (101), and the distal end of the inner tube (103) or a transversal hole (1031) or a notch (1032) penetrating the inner tube at the distal portion of the inner tube (103) are forming the space allowing the heat transfer fluid to pass;

the external tube (101) and the inner tube (103) are eccentrically arranged, the distal end of the inner tube (103) installed inside the external tube (101) is shorter, a length differentiation is formed between the distal end thereof and the sealed part at the bottom of the distal portion of the external tube (101) thereby forming a space allowing the heat transfer fluid to pass;

the external tube (101) and two or more than two of the inner tubes (103) are installed in parallel, the distal portion of the inner tube (103) installed inside the external tube (101) is shorter, a length differentiation is formed between the distal portion thereof and the sealed part at the bottom of the distal portion of the external tube (101) thereby forming a space allowing the heat transfer fluid to pass;

the external tube (101) and the inner tube (103) are arranged in coaxial or in a substantially parallel manner, the space defined by the periphery of the inner tube (103) and between the external tube (101) and the inner tube (103) is served to allow the heat transfer fluid to

pass, the inner tube (103) installed inside the external tube (101) is shorter than the external tube (101), a length differentiation is formed between the distal portion thereof and the sealed part at the bottom of the distal portion of the external tube (101) thereby forming a space
5 allowing the heat transfer fluid to pass, a spiral flow guiding structure (2003) is further installed between the external tube (101) and the inner tube (103) thereby increasing the length of the heat transfer fluid path formed between the external tube (101) and the inner tube (103).

11.A heat-dissipating structure having suspended external tube and
10 internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass is formed through the space defined by the heat dissipater (104) of the electric energy application device assembly (108) and the housing (106) and the heat transfer fluid
15 path (1041) of the heat dissipater (104), and the main configuration is that a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass is formed through the space defined by the heat dissipater (104) of the electric energy application device assembly (108) and the housing (106) and the heat transfer fluid path (1041) of the
20 heat dissipater (104).

12.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein at least two heat transfer fluid paths (1041) of the heat dissipater (104) installed in the electric energy application
25 device assembly (108) are connected with a U-shaped connection tube (1042) in serial, so as to constitute a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass.

13.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as
30 claimed in claim 1, wherein through the space defined by the electric

energy application device assembly (108) and the housing (106) and the heat transfer fluid path (1081) provide by the electric energy application device assembly (108), a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass is formed.

5 14.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein at least two of the heat transfer fluid paths (1081) provided by the electric energy application device assembly (108) are connected in serial with a U-shaped connection tube (1042),
10 thereby to constitute a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass.

15.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein at least one heat transfer fluid path (1081)
15 provided by the electric energy application device assembly (108) and at least one heat transfer fluid path (1041) provided by the heat dissipater (104) thereof are connected in serial with a U-shaped connection tube (1042), thereby to constitute a heat transfer fluid path allowing the gaseous or liquid heat transfer fluid to pass.

20 16.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the applicable fields are very flexible, wherein the heat-dissipating structure having internally recycling heat transfer fluid flowing in tubes and installed in the electric energy
25 application device assembly (108) can be one or more than one, the exposed portion of the external tube (101) enables the temperature equalizing operation to be performed with the external gaseous environment or the liquid or solid environment manually installed but not disposed in the stratum or liquid of the shallow ground natural
30 thermal energy body, the surface of the external tube (101) can be

optionally installed with external heat guiding plates (201), the portion of the surface of the external tube (101) which is disposed in the interior of the electric energy application device assembly (108) can be optionally installed with inner heat guiding plates (203), and the
5 installation and operating direction are not limited; the main configuration is that the heat-dissipating structure having internally recycling heat transfer fluid flowing in tubes is combined and vertically installed in electric energy application device assembly (108), the fastening means can be the conventional means such as utilizing a
10 support rod or chain or hook or a suspending hook device for fastening a standing lamp or ceiling lamp or a standing fan or ceiling fan, thereby being able to be vertically installed at the top of a building or the top of a structural unit having internal space or a moveable object.

17.A heat-dissipating structure having suspended external tube and
15 internally recycling heat transfer fluid and application apparatus as claimed in claim 16, wherein the installation means includes one or more than one of followings:

the heat-dissipating structure having internally recycling heat transfer fluid flowing in tubes is combined and horizontally installed in
20 the electric energy application device assembly (108), the fastening means can be the conventional means such as horizontally installing a window-type air conditioner on a wall or the window of a freezing cabinet of a transportation vehicle, thereby being able to be horizontally installed on the lateral side of a building or the lateral side
25 of a structural unit or a moveable object;

single electric energy application device assembly (108) is vertically installed with two or more than two of the heat-dissipating structures having internally recycling heat transfer fluid flowing in tubes, the fastening means can be the conventional means such as
30 utilizing a support rod or chain or hook or a suspending hook device

for fastening a standing lamp or ceiling lamp or a standing fan or ceiling fan, thereby being able to be vertically installed at the top of a building or the top of a structural unit having internal space or a moveable object;

5 single electric energy application device assembly (108) is horizontally installed with two or more than two of the heat-dissipating structures having internally recycling heat transfer fluid flowing in tubes, the fastening means can be the conventional means such as horizontally installing a window-type air conditioner on a wall or the
10 window of a freezing cabinet of a transportation vehicle, thereby being able to be horizontally installed on the lateral side of a building or the lateral side of a structural unit or a moveable object.

18.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as
15 claimed in claim 1, wherein the internal of the heat-dissipating structure is further configured as a conical flow guiding body (1040) having thermal conductivity, so as to reduce the flowing resistance of the internal fluid, and the top thereof is suspended through a hanging chain.

20 19.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the internal of the heat-dissipating structure is further configured as a conical flow guiding body (1040) having thermal conductivity, so as to reduce the flowing resistance of
25 the internal fluid, and the top thereof is suspended through a hanging tube and a brocket.

20.A heat-dissipating structure having suspended external tube and internally recycling heat transfer fluid and application apparatus as claimed in claim 1, wherein the internal of the heat-dissipating
30 structure is further configured as a conical flow guiding body (1040)

having thermal conductivity, so as to reduce the flowing resistance of the internal fluid, and the top thereof is fixed suspended through having an extended external tube to be combined with a fixed holder (555) with connecting and fastening function and heat-dissipating property.

5