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(11) **EP 1 033 539 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.09.2000 Bulletin 2000/36

(51) Int. Cl.⁷: **F24D 3/10**, F24D 19/10

(21) Application number: **00103934.6**

(22) Date of filing: **25.02.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **02.03.1999 IT VR990023**

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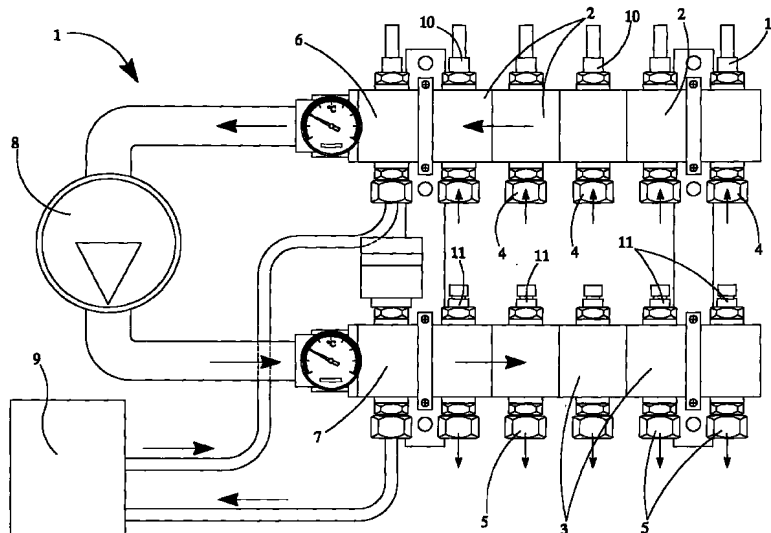
(54) **Modular collector provided with a system of thermoregulation for heating plants with radiating panels or the like**

(57) The present modular collector is mounted on a heating plant with radiating panels arranged in either the floor or walls or ceiling. This modular collector is basically formed by a series of sectional continuous modules. Compared with the known solutions, the modular collector in question has the important advantage of ensuring a rapid, precise balancing of each circuit since the setting up can be accomplished in a short time.

In general, the present collector consists of two series of modules, i.e. a series of return modules (2) and a series of delivery modules (3). The series of

return modules (2) is provided with a further delivery module (6) while the series of delivery modules (3) is provided with a further return module (7). The modules (6, 7) act as mixing valve.

The delivery and return modules are connected through a pump (8). During the operation, the pump (8) generates both a depression in the return collector, modules (2), and a pressure in the delivery collector, modules (3), proportionally to the load losses of the plant.



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Description

[0001] The present invention proposes a modular collector provided with a system of thermoregulation. In particular, this modular collector can be used in heating plants with radiating panels or the like.

[0002] A collector according to the present invention is the main component of a heating plant with radiating panels to be arranged in either a floor, or walls, or ceiling. This collector is basically formed by a series of sectional continuous modules having a high water capacity.

[0003] In addition, the present collector is simple and practical to be assembled and controlled. This collector has many advantages over the known solutions. The main advantage is to ensure a quick, precise balancing of each circuit, the setting up being accomplished in a short time.

[0004] According to the known art, the heating of houses, flats and buildings in general is obtained by using different systems permitting the heat diffusion. Most systems make use of water as medium for the heat propagation in the ambient.

[0005] As is known, the systems which use water as a vehicle for the propagation of heat utilize two fundamental supplying technologies, i.e. the technology making use of the central heating with radiators or convectors and the technology making use of radiating panels to be arranged in the floor, or walls or ceiling.

[0006] The system with radiators or convectors utilizes outer distribution units which are arranged in general along the perimetric walls of the rooms while the system with radiating panels consists of a series of pipes which are buried in either the floor or walls or ceiling and lead to a central station.

[0007] In general, the technology that utilizes the radiating panels is better than the technology that utilizes the radiators because the technology utilizing radiating panels offers a greater comfort with a better propagation of the heat in the absence of air movements, on avoiding dust displacements, formation of halos and undesirable hygienic situations. In addition, the technology with radiating panels permits a better use of the room in the absence of heating bodies and permits both an energy conservation and an economic saving with a better propagation of heat making use of a low temperature heating fluid.

[0008] However, it has been found that the use of radiating panels gives rise to some disadvantages caused above all by a difficult control of the heat distribution. In fact, it is necessary that each single pipe of the floor circuit be fed by a fluid flow at a fixed temperature.

[0009] As a matter of fact, it is not sufficient to control the delivery temperature of the boiler which supplies the whole plant with the heat because a room could have a different factor of dispersion of heat in respect to another room and therefore, in some rooms the temper-

ature could be too high while in other rooms the temperature could be too low.

[0010] The aim of the present invention is to remove the above-described drawbacks by utilizing a new collector which, as said, is the main component of a heating plant with radiating panels arranged in the floor, walls or ceiling, the main characteristic of which is the presence of suited means of thermoregulation.

[0011] An advantage of the present invention is to carry out a collector for radiating panels arranged in the floor, walls or ceiling, which comprises suited regulators which are able to ensure a quick, precise balancing of the single circuits, the setting up being accomplished in a short time.

[0012] Another advantage of the present invention is to carry out a simple collector, practical to be assembled and suited to all the needs since this collector may be assembled with the wished number of modules according to the size of the room to be heated.

[0013] A further advantage of the present invention is to ensure a regulation of the temperature of each room so that each room may have a different temperature by using suited regulators.

[0014] All the above-described particular aims and advantages can be reached according to the present invention by a modular collector provided with a system of thermoregulation for heating plants with radiating panels or the like, characterized by the fact of consisting of a series of delivery modules and a series of return modules, the delivery modules and the return modules being connected to each other by at least a pump; during the running, the pump generates both a depression in the return collector and a pressure in the delivery collector proportionally to the load losses of the panel plant, and by the fact that at least two additional modules are provided in the collector, i.e. a delivery module and a return module acting as a mixing valve.

[0015] The invention will be better understood from the following description, set forth as a non-limitative example, and from the accompanying drawing in which the only figure shows a general diagram of a plant according to the present invention.

[0016] With reference to the accompanying drawing, number 1 denotes a collector according to the present invention on the whole. The collector 1 is basically formed by a series of return modules 2 and a series of delivery modules 3.

[0017] The series of modules 2, 3 are parallel to each other.

[0018] Each module 2 is provided on the lower part with a return intake 4 while each module 3 is provided on the lower part with a delivery intake 5. Each intake 4, 5 is connected with a conduit of the plant.

[0019] The collector is further provided with two additional modules 6 and 7, i.e. a delivery module 6 and a return module 7, acting as a mixing valve.

[0020] The delivery modules are connected with the return modules through at least a pump 8. During the

operation, the pump 8 generates both a depression in the delivery collector, modules 2, and a pressure in the delivery collector, modules 3, proportionally to the load losses of the plant.

[0021] The delivery module 6 (at a high temperature) is assembled with the return collector 2 (at a low temperature) of the plant. The module 6 permits to mix the delivery vector fluid coming from a heat generator 9 with the return vector fluid coming from the panel plant. Thus, the mixing takes place inside the collector itself.

[0022] The return module 7 (at a high temperature) is assembled with the delivery collector 3 (at a low temperature) of the plant. Since the module 7 is equipped with a valve for the thermoregulation, the module 7 itself causes the return of the vector fluid to the heat generator 9 and therefore, the module 7 permits a modulation of the temperature according to the need of the panel plant.

[0023] The following types of thermoregulation may be applied to the described collector:

- Bleed thermoregulation and/or thermoregulation with fixed point and thermostatic control;
- Thermoregulation with fixed point and electric control;
- Modulating climatic thermoregulation with outer probe and delivery probe.

[0024] The return modules 2 of the collector of the panel plant are provided with passage indicators 10 acting as a check and stop valve. If the pump is not operating, the return modules 2 prevent the vector fluid coming from the heat generator 9 (at a high temperature) from circulating in the panel plant (at a low temperature).

[0025] In this way, it is possible to avoid plant unbalances that could alter a correct plant running.

[0026] As said, the delivery collector and the return collector of the plant are connected through a pump 8 which during the operation generates a depression in the return collector and a pressure in the delivery collector proportionally to the load losses of the plant.

[0027] In this way, a real forced circulation of the vector fluid at a high temperature is obtained from and to the heat generator 9 in case this is necessary for the thermoregulation.

[0028] The so-described collector permits therefore to utilize an only adduction line (ad a high temperature) from the heat generator to the inside of the distribution box in which the collector is contained.

[0029] Advantageously, regulators 11 are arranged in the delivery modules (at a low temperature) and permit a temperature regulation in each room.

[0030] A technician of this field can make changes and variants to the above-described invention and obtain solutions which must be considered as included in the scope of protection of the invention itself in case

such changes and variants should be included in the following claims.

Claims

1. Modular collector (1) provided with a thermoregulation system for heating plants with radiating panels or the like, characterized by the fact of consisting of a series of delivery modules (3) and a series of return modules (2), the delivery modules and the return modules being connected to each other by at least a pump (8) which during the operation generates both a depression in the return collector and a pressure in the delivery collector proportionally to the load losses of the panel plant, and by the fact that at least two additional modules are provided in the collector, i.e. a delivery module (6) and a return module (7) acting as a mixing valve.
2. Modular collector (1) provided with a thermoregulation system as claimed in claim 1, characterized by the fact that the additional delivery module (6) (at a high temperature) is assembled with the return collector (at a low temperature) of the plant.
3. Modular collector (1) provided with a thermoregulation system as claimed in the foregoing claims, characterized by the fact that the additional delivery module (6) permits to mix the delivery vector fluid coming from a heat generator (9) with the return vector fluid coming from the panel plant right in the inside of the collector itself.
4. Modular collector (1) provided with a thermoregulation system as claimed in the foregoing claims, characterized by the fact that the additional return module (7) (at a high temperature) is assembled with the delivery collector (at a low temperature) of the plant and since the module (7) is equipped with a valve for the thermoregulation, the module (7) itself causes the return of the vector fluid to the heat generator (9) and therefore, the module (7) permits a modulation of the temperature according to the need of the panel plant.
5. Modular collector (1) provided with a thermoregulation system as claimed in the foregoing claims, characterized by the fact that the following types of thermoregulation may be applied to the described collector: bleed thermoregulation and/or thermoregulation with fixed point and thermostatic control; thermoregulation with fixed point and electric control; modulating climatic thermoregulation with outer probe and delivery probe.

