

Description

[0001] The present invention relates to a wall-mounted combination boiler for instant sanitary and heating system.

[0002] It is known that so-called wall-mounted combination boilers, capable of supplying hot water to the heating system and to a heat exchanger which heats water for sanitary use, have become extremely widespread in houses.

[0003] Currently, an instant wall-mounted combination boiler, i.e., a boiler provided with an instant heat exchanger for producing sanitary water, requires a few dozen seconds, typically 30-40 seconds, to reach the thermal steady state from the time when the boiler ignites; during this time interval, the water that flows out of a fitting of the sanitary system has not yet reached the intended temperature.

[0004] The aim of the present invention is to obviate this drawback by providing a wall-mounted combination boiler capable of ensuring immediate availability of sanitary hot water.

[0005] The above aim and other objects which will become apparent hereinafter are achieved by a wall-mounted combination boiler for instant sanitary and heating system, according to the invention, characterized in that it comprises a circuit, provided with a circulator, for connecting a gas-water heat exchanger of a boiler to a surface heat exchanger for instant heating of the water of the sanitary system, said circuit comprising a manifold provided with connectors respectively to the delivery and the return of a heating system, said circuit being provided with means for the automatic adjustment of the operation of the burner of said gas-water heat exchanger and of said circulator, said means being adapted to keep the water of said circuit constantly at the temperature suitable to ensure immediate heating of the sanitary water that flows through said instant surface heat exchanger.

[0006] Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein the only figure is a schematic diagram of the invention.

[0007] With reference to the above figure, it is noted first of all that all the components of the wall-mounted boiler are contained within an enclosure, represented by the dot-and-dash line designated by the reference numeral 1, and that the boiler has connections 2 and 3 respectively for receiving cold water of the sanitary system and for delivering heated water to the users of the sanitary system, symbolically represented by a faucet 4, delivery and return connections, respectively designated by reference numerals 5 and 6, coupled to floor heating units of rooms, schematically represented by a coil 7, and connections 8 and 9, which are connected to

radiators for heating other rooms, schematically designated by the reference numeral 10.

[0008] The devices of the boiler comprise a manifold 11, which receives, by means of a line 12, the hot water produced by a gas-water heat exchanger 13. Delivery and return connections, respectively designated by the reference numerals 14 and 15, of a heating system branch off from manifold 11. The heating system is divided into two circuits which are meant to serve the underfloor coil 7 and the radiators 10 at different temperatures: for example, the coil 7 can be supplied with water at 35°C and the radiators 10 can be supplied with water at 55°C.

[0009] The first circuit comprises a delivery line 16, which connects the connection 14 of the manifold 11 to a circulator 17 for sending water to the connection 8 to the radiators 10, which are accordingly supplied exclusively with water that arrives directly from manifold 11, and the reference numeral 18 designates a return line of the cold water from the connection 9 to radiators 10 to the connection 15 of the manifold 11.

[0010] The second circuit draws, by means of the line 19, hot water from the delivery line 16, and said line 19 reaches a mixing valve 20 in order to be mixed with cold water which is drawn, by means of a line 21, from a line 22 for return from the coil 7, which is connected to the connector 6 at one end and to the return line 18 of the first circuit at the other end. In this manner, the coil 7 is fed with water which is mixed at a temperature which is lower than the temperature in the manifold 11 and is conveyed to the connection 5 from a line 23 with a circulator 24.

[0011] In addition to the two described circuits of the room heating system, a third circuit branches out from the manifold 11 and is meant to heat the water of the sanitary system. Such circuit first of all comprises a line 25, which branches out from a connection 26 of the manifold 11.

[0012] The line 25 reaches a three-way valve 27, which selectively sends water to a line 28 for connection to a line 29 for return to the gas-water heat exchanger 13 of the boiler, complete with a circulator 30, and to a line 31 that supplies an instant surface heat exchanger 32 of the sanitary cold water that reaches the boiler by means of the connection 2, reaches a shunt valve 27 by means of a line 33 for actuating, in a known manner, the automatic selection of said valve with priority to the sanitary system, passes through the instant heat exchanger 32, and reaches, after being heated, the connection 3 to the sanitary users such as 4 by means of a line 34.

[0013] The water that had entered the heat exchanger 32 by means of the line 31 is cold when it leaves the exchanger by means of the line 35 for connection to the line 29 for return to the gas-water heat exchanger 13.

[0014] An important characteristic of the invention consists of the fact that the third circuit that branches out from the manifold 11 is provided with means for the

automatic adjustment of the operation of the burner of the gas-water heat exchanger 13 of the boiler and of the circulator 30; such means are adapted to keep the water of said circuit constantly at a temperature which ensures immediate heating of the sanitary water that passes through the instant heat exchanger 32.

[0015] Said means can comprise, for example, a probe for detecting the temperature of the water, which is inserted in the manifold 11, is suitable to send, according to requirements, a command signal for switching on or off the burner of said gas-water heat exchanger 13 and the circulator 30.

[0016] Another important characteristic of the invention consists of the fact that the manifold 11 has a capacity which is limited to a value between 6 and 10 liters; a particularly favorable situation is thus produced because this capacity is small enough to avoid undesirable overall dimensions and excessive heat loss but is sufficient to cope with the demand of hot water in the short interval, usually equal to 30-40 seconds, that the system needs to reach the steady state, ensuring immediate availability of hot water.

[0017] The described invention is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; in particular, the capacity of the manifold 11 can be outside the range of values cited by way of example and the automatic adjustment means included in the third circuit that branches out from the manifold may be any; the shunt valve 27 may also be omitted and in this case the water drawn from the manifold 11 is fed directly to the heat exchanger 32.

[0018] The manifold 11 may also be arranged on the line 29 for the return of the water from the instant heat exchanger 32 to the gas-water heat exchanger 13.

[0019] The heating system can also provide for the presence of a single circuit.

[0020] The disclosures in Italian Patent Application No. MN98A000044 from which this application claims priority are incorporated herein by reference.

[0021] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A wall-mounted combination boiler for instant sanitary and heating system, characterized in that it comprises a circuit, provided with a circulator, for connecting a gas-water heat exchanger of a boiler to a surface heat exchanger for instant heating of the water of the sanitary system, said circuit comprising a manifold provided with connectors respectively to the delivery and the return of a heating

system, said circuit being provided with means for the automatic adjustment of the operation of a burner of said gas-water heat exchanger and of said circulator, said means being adapted to keep the water of said circuit constantly at a temperature suitable to ensure immediate heating of the sanitary water that flows through said instant surface heat exchanger.

2. The wall-mounted boiler according to claim 1, characterized in that the manifold is interposed on the line for delivering hot water from the gas-water heat exchanger to the surface heat exchanger for the instant heating of the water of the sanitary system.

3. The wall-mounted boiler according to claim 1, characterized in that the manifold is interposed on the return line of the cold water from the surface heat exchanger for instant heating of the water of the sanitary system to the gas-water heat exchanger.

4. The wall-mounted boiler according to one or more of the preceding claims, characterized in that the circuit for connecting the gas-water heat exchanger to a surface heat exchanger for instant heating of the water of the sanitary system comprises a three-way shunt valve which is suitable to receive the water that arrives from said gas-water heat exchanger in order to send it selectively to said surface heat exchanger and directly to the return line from said surface heat exchanger to the gas-water heat exchanger, said shunt valve being adapted to provide said selection automatically with priority to the sanitary system.

5. The wall-mounted boiler according to one or more of the preceding claims, characterized in that the manifold has a limited capacity.

6. The wall-mounted boiler according to claim 5, characterized in that the manifold has a capacity which is limited to values substantially between 6 and 10 liters.

7. The wall-mounted boiler according to one or more of the preceding claims, characterized in that the means included in the circuit, provided with a circulator, for connecting the gas-water heat exchanger of the boiler to a surface heat exchanger for instant heating of the water of the sanitary system, suitable for the automatic adjustment of the operation of the burner of said gas-water heat exchanger and of said circulator, comprise a probe for detecting the temperature of the water, said probe being inserted in the manifold that is included in said circuit and being adapted to send, according to requirements, a signal for switching on and off said burner and said circulator.

8. The wall-mounted boiler according to one or more of the preceding claims, characterized in that the heating system comprises two circuits, each circuit being provided with a circulator and comprising heating elements which are supplied with water at different temperatures, a first circuit being supplied exclusively by means of the hot water that arrives from the manifold, a second circuit comprising a three-way mixing valve upstream of the set of heating elements, said valve being adapted to mix hot water that arrives from the manifold with water drawn from the return line of the circuit.

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