



12

EUROPEAN PATENT SPECIFICATION

45 Date of publication of patent specification :
29.06.94 Bulletin 94/26

51 Int. Cl.⁵ : **F24H 1/34, F24H 9/14,
F24D 3/08**

21 Application number : **92201126.7**

22 Date of filing : **16.04.92**

54 **Combined central-heating and water-heating boiler comprising a heat exchanger with built-in pumps.**

30 Priority : **17.04.91 NL 9100666**

43 Date of publication of application :
21.10.92 Bulletin 92/43

45 Publication of the grant of the patent :
29.06.94 Bulletin 94/26

84 Designated Contracting States :
**AT BE CH DE DK ES FR GB GR IT LI LU NL PT
SE**

56 References cited :
**EP-A- 0 340 370
DE-A- 3 842 463
NL-A- 8 801 761**

73 Proprietor : **DEJATECH B.V.**
Waterloostraat 6
NL-5935 BG Steyl (NL)

72 Inventor : **Deckers, Jan Hubertus**
Waterloostraat 6
NL-5935 BG Steyl (NL)

74 Representative : **Smulders, Theodorus A.H.J.,
Ir. et al**
Vereenigde Octrooibureaux
Nieuwe Parklaan 97
NL-2587 BN 's-Gravenhage (NL)

EP 0 509 611 B1

Note : Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid (Art. 99(1) European patent convention).

Description

This invention relates to an improvement of a combined central-heating and water-heating boiler.

In a combined central-heating and water-heating appliance, in some manner or other a water tank (boiler) has been added to a central-heating boiler, so that the contents of the former are heated by water that has been heated in the central-heating boiler and circulates in a closed circuit. In principle, there are two possible designs, namely:

- a tapping or through-flow boiler, which is filled completely with water from the closed circuit of the central-heating boiler and comprises a coil connected at one end to the water mains while at the other end hot water for domestic use can be tapped. This is a compact design which can be supplied in a size of approximately 30x30x100 cm. Its operation is comparable to that of a (gas) water heater;
- a storage boiler, in which a large quantity of water for domestic use is stored, which is heated by heated central-heating water directed through a coil. This design is comparable with an (electric) boiler. The dimensions of storage boilers are generally larger, for instance approximately 60x60x100 cm.

Both types can be arranged adjacent to the central-heating boiler and, in principle, in both cases, elsewhere (i.e. in the central-heating boiler) water is heated for a specific purpose, namely the heating of space, the heated water is passed through radiators, and the heated water also heats water that is being supplied for a different purpose (domestic use).

To provide that heated central-heating water is directed either to the radiators or to the sanitary hot-water appliance depending on the instantaneous need for heating of space or hot sanitary water, typically use is made of a distributor valve or re-set valve in the central-heating water circuit. NL-A-8 801 761 discloses a combined central-heating and water-heating boiler and proposes to replace the single pump and the distributor or re-set valve by two pumps, one pump serving to supply the central-heating water circuit and the other pump serving to direct the hot central-heating water to a boiler tank or tap vessel of a sanitary water appliance, while only one of the two pumps is operative at any given time. In further elaboration, the above-mentioned application proposes a double-pump wherein the two pumps are joined by a coupling member in which is provided a branched passage with a two-way valve via which the pumps are connected with an external pipe connection. Under the influence of the instantaneous flow, the two-way valve automatically takes up a position in which the circuit that is switched off is effectively isolated.

The object of the invention is to provide a further

constructional simplification of a combined central-heating and water-heating boiler of the above-described type, in which a coupling member and a two-way valve are superfluous.

To that end, in a combined boiler in which the boiler body comprises a heat exchanger formed from aluminum or an aluminum alloy, this heat exchanger comprising a flue and a central-heating water section comprising a serpentine or zig-zag central-heating water channel, the flue and the water section being separated by a dividing wall, spaced-apart pairs of connections for the suction and delivery sides of two pumps are provided in the water section of the heat exchanger, while in each pair of connections the suction and delivery connections of the pumps are separated from each other by partitions.

Owing to this specific arrangement of the two pumps with associated control, by activating the relevant pump while the other pump is switched off, central-heating water can be directed either into the space heating circuit or to the boiler or tap vessel of the sanitary water appliance. A distributor or reset valve is not necessary and in particular when use is made of a pump having the suction opening and the delivery opening in the same end face, supply and drain pipes from the pumps to the heat exchanger can be omitted. The operations for assembling such a compact combined boiler are thus reduced to a minimum.

In a preferred embodiment of the invention, the pumps can be connected, from the flue gas side of the flat boiler, to the water side at the discharge end of the flue section, where they take the place of heat-absorbing projections, a lesser number of which are required in that area on account of the volume reduction of cooling flue gases.

Thus a very flat compact combined central-heating and water-heating boiler can be obtained which can be mounted on the wall in a simple manner.

In principle, the above-mentioned features can also be used in a normal central-heating boiler without sanitary water appliance. In that case, only one pump is connected in the manner described above. If such an appliance is connected at a later time, the second pump can be connected at that time.

To clarify the invention, one embodiment of the apparatus will now be explained, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a sectional view taken on the line I-I of Fig. 2, of the central-heating water side of the heat exchanger with pump connections according to the invention;

Fig. 2 is a side-elevation of the heat exchanger with built-in central-heating and boiler pumps; and

Fig. 3 shows a front view of the apparatus according to the invention.

Fig. 1 shows a section through the water section of a heat exchanger 1 of a combined central-heating and water-heating boiler in which the water section comprises a zig-zag channel system 2. According to the invention, partitions 3 and 4 have been arranged in the zig-zag channel system 2 in a suitable manner and on opposite sides of these partitions, connection points 3p, 3z and 4p, 4z, respectively, have been provided for the direct connection of two pumps 5 and 6, respectively. When tapping sanitary water from the boiler or tap vessel 7 via tap 8, the pump 5 is switched on and pump 6 is switched off. The water in the heat exchanger 1 is then forced via the opening 3z, the pump 5 and the delivery connection 3p into the heat exchanger compartment 9, closed off by partition 3, and directed via outlet opening 10 from the heat exchanger 1 to the boiler or tap vessel 7, where it heats the sanitary water. When there is a need for space heating, pump 5 is switched off and pump 6 is switched on. The water in the heat exchanger 1 is then forced via the opening 4z, pump 6 and the delivery connection 4p into the heat exchanger compartment 11, closed off by partition 4, and directed via outlet aperture 12 from the heat exchanger 1 to the space heater 13, where it heats the space to be heated. In the outlet openings 10 and 12, non-return valves (not shown) may be provided, which close when the associated pump is not in operation.

Fig. 2 is a side elevation of the apparatus, showing that the burner 14 is connected direct to flue 15 and that, from the side of the flue 15, the pumps 5, 6 are connected direct to the water section 16 of the heat exchanger 1.

Fig. 3 shows the burner space 17 and it can be clearly seen that the pumps 5 and 6, which are connected direct to the water section 16 of the heat exchanger 1, are arranged at the discharge end 18 of flue 15, where they take the place of heat-absorbing projections (not shown), a lesser number of which are required in that area because of the volume reduction of cooling flue gases.

It will be clear that the invention is not limited to the above-described embodiment. Essential to the invention is that the pumps are connected direct to the heat exchanger so that a compact combined central-heating and water-heating boiler is obtained without distributor or re-set valves and/or similar elements that are susceptible to failure.

Claims

1. A combined central-heating and water-heating boiler in which the boiler body comprises a heat exchanger (1) formed from aluminum or an aluminum alloy, said heat exchanger (1) comprising a flue (15) and a central-heating water section (16) comprising a serpentine or zig-zag central-

heating water channel (2), said flue (15) and said water section (16) being separated by a dividing wall, characterized in that spaced-apart pairs of connections (3p, 3z, 4p, 4z) for the suction (3z, 4z) and delivery sides (3p, 4p) of two pumps (5, 6) are provided in the water section (16) of the heat exchanger, while in each pair of connections (3p, 3z, 4p, 4z) the suction (3z, 4z) and delivery (3p, 4p) connections of the pumps (5, 6) are separated from each other by partitions (3, 4).

2. A combined central-heating and water-heating boiler according to claim 1, characterized in that, from the flue gas side (15) of the heat exchanger (1), the pumps (5, 6) are connected to the water section (16) at the discharge end of the flue gas section (15), at which discharge end said pumps (5, 6) take the place of heat-absorbing projections.
3. A combined central-heating and water-heating boiler according to claim 1 or 2, characterized in that, if no sanitary water appliance (7) is present, only one pump (5) is connected in the manner described above.

Patentansprüche

1. Kombiniertes Zentralheizungs- und Wassererwärmungsboiler, bei dem der Boilerkörper einen Wärmetauscher (1) aufweist, der aus Aluminium oder einer Aluminiumlegierung besteht, wobei der Wärmetauscher (1) einen Rauchzug (15) und einen Zentralheizungswasserabschnitt (16) aufweist, der einen schlangenförmigen oder zickzackförmigen Zentralheizungswasserkanal (2) umfaßt, wobei der Rauchzug (15) und der Wasserabschnitt (16) durch eine Trennwand abgeteilt sind,
dadurch gekennzeichnet, daß
beabstandete Paare von Anschlüssen (3p, 3z, 4p, 4z) für die Ansaugseiten (3z, 4z) und die Abgabeseiten (3p, 4p) zweier Pumpen (5, 6) im Wasserabschnitt (16) des Wärmetauschers vorgesehen sind; während in jedem Paar von Anschlüssen (3p, 3z, 4p, 4z) die Ansauganschlüsse (3z, 4z) und die Abgabeanschlüsse (3p, 4p) der Pumpen (5, 6) voneinander durch Zwischenwände (3, 4) getrennt sind.
2. Kombiniertes Zentralheizungs- und Wassererwärmungsboiler nach Anspruch 1, dadurch gekennzeichnet, daß von der Rauchzugseite (15) des Wärmetauschers (1) her die Pumpen (5, 6) mit dem Wasserabschnitt (16) am Auslaßende des Rauchzugabschnittes (15) verbunden sind, wobei am Auslaßende die Pumpen (5, 6) an die

Stelle von wärmeabsorbierenden Vorsprüngen treten.

3. Kombiniertes Zentralheizungs- und Wassererwärmungsboiler nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß nur eine Pumpe (5) in der oben beschriebenen Weise angeschlossen ist, wenn kein sanitäres Wassergerät vorhanden ist.

10

Revendications

1. Chaudière mixte pour le chauffage central et le chauffage de l'eau dans laquelle le corps de chaudière comprend un échangeur thermique (1) constitué d'aluminium ou d'un alliage d'aluminium, ledit échangeur thermique (1) comprenant un carneau (15) et une section d'eau pour le chauffage central (16) comportant un canal d'eau pour le chauffage central en zig-zag ou en serpentin (2), ledit carneau (15) et ladite section d'eau (16) étant séparés par une cloison de séparation, caractérisée en ce que des paires espacées de connexions (3p, 3z, 4p, 4z) pour les côtes d'aspiration (3z, 4z) et d'alimentation (3p, 4p) de deux pompes (5, 6) sont prévues dans la section d'eau de l'échangeur thermique, cependant que, dans chaque paire de connexions (3p, 3z, 4p, 4z) les connexions d'aspiration (3z, 4z) et d'alimentation (3p, 4p) des pompes (5, 6) sont séparées les unes des autres par des séparations (3, 4).
2. Chaudière mixte pour le chauffage central et le chauffage de l'eau selon la revendication 1, caractérisée en ce que, à partir du côté des gaz de combustion (15) de l'échangeur thermique (1), les pompes (5, 6) sont connectées à la section d'eau (16) à l'extrémité d'évacuation de la section des gaz de combustion (15), extrémité d'évacuation à laquelle lesdites pompes (5, 6) prennent la place d'éléments en saillie absorbant la chaleur.
3. Chaudière mixte pour le chauffage central et le chauffage de l'eau selon les revendications 1 ou 2, caractérisée en ce que, si aucun appareil pour l'eau sanitaire (7) est présent, seule la pompe (5) est connectée de la manière décrite ci-dessus.

15

20

25

30

35

40

45

50

55

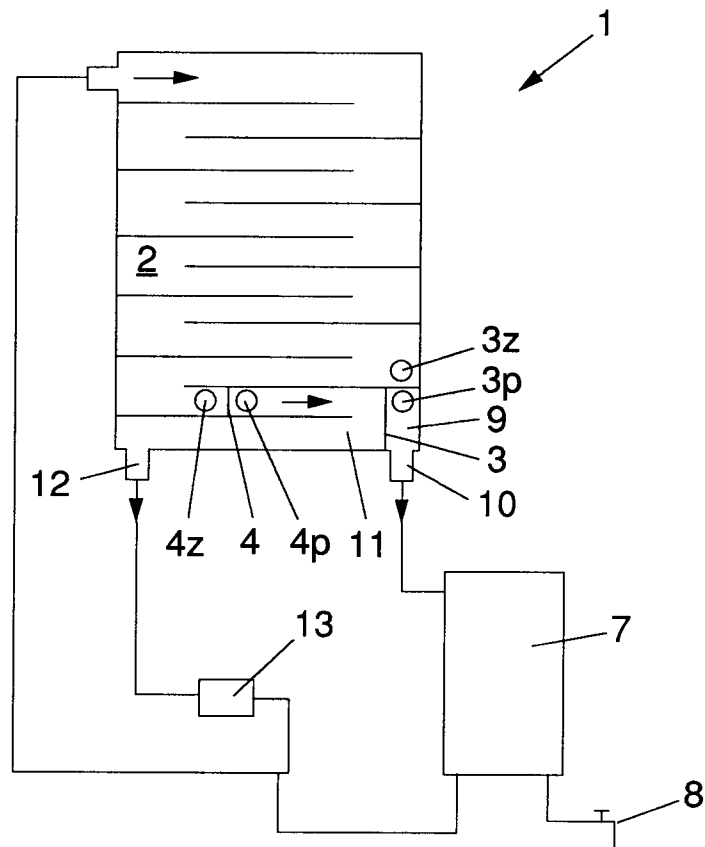


FIG. 1

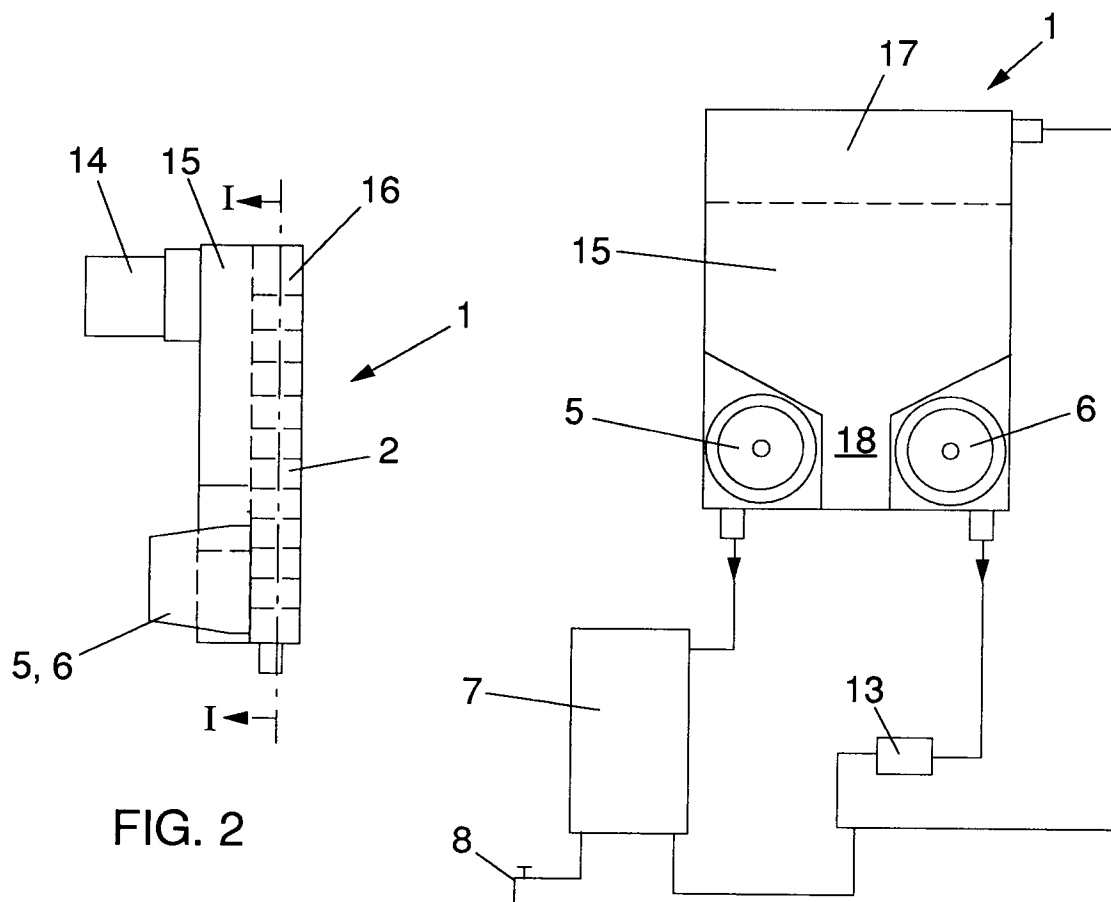


FIG. 2

FIG. 3