

12

EUROPEAN PATENT APPLICATION

21 Application number: 85830024.7

51 Int. Cl.⁴: **F 23 C 7/02**, F 23 M 9/04,
F 23 M 5/00

22 Date of filing: 05.02.85

30 Priority: 09.02.84 IT 2079684 U

71 Applicant: **FERROLI INDUSTRIE RISCALDAMENTO**
S.p.A., Box No. 79, I-37047 San Bonifacio (Verona) (IT)

43 Date of publication of application: 28.08.85
Bulletin 85/35

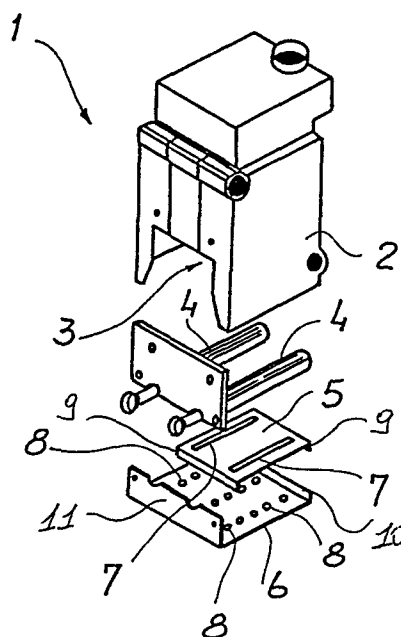
72 Inventor: **Feroli, Dante, Via Ritonda, San Bonifacio**
(Verona) (IT)

64 Designated Contracting States: **AT BE DE FR GB NL**

74 Representative: **Cicogna, Franco, Ufficio Internazionale**
Brevetti Dott. Prof. Franco Cicogna Via Visconti di
Modrone, 14/A, I-20122 Milano (IT)

54 **An improved heating appliance.**

57 A heating appliance (1) comprises a body (2) defining a combustion chamber (3) within which are located burners (4) of a type which rely on atmospheric air drawn into the appliance for support of combustion of the fuel supplied to the burners. The opening in the body (2) through which air to support combustion is drawn is closed by two panels (5, 6) each having respective sets of apertures (7, 8) which are located in such a way as not to be in alignment with one another to create a slight resistance to air flow thereby avoiding the chimney effect of the appliance when the burners (4) are not in operation. The presence of the panels (5, 6) also serves to prevent the loss of heat by radiation from the burners (4) through what would otherwise be an opening in the body (2), and heating of the panels (5, 6) by such radiation is recovered by conduction to the incoming air during operation of the burners.



An Improved Heating Appliance.

The present invention relates to a heater appliance having a so-called "atmospheric" burner, that is a
5 burner in which the oxygen for supporting combustion of the fuel supplied to the burner is obtained by drawing atmospheric air into the appliance. When used herein-
after the term "atmospheric burner" will be understood to relate to a burner as defined hereinabove.

10

As is known, heating appliances having one or more atmospheric burners usually have a side or lower face of the combustion chamber open for the purpose of allow-
ing free entry of air necessary for supporting complete
15 combustion of the fuel in the appliance.

Laboratory tests have shown, however, that in such

- 2 -

heaters there is a significant dispersion of heat through the open side of the combustion chamber due to radiation from the burner during the operation of the appliance. In appliances which are not intended to heat the immediate environment, for example water heaters or central heating boilers, this is a considerable disadvantage. Moreover, when the burner is not operating the heating appliance can become a dissipator of heat due to the so-called chimney effect by which warm air from the environment surrounding the appliance becomes transferred through the flue provided for venting the combustion products to the outside atmosphere in use of the appliance. Thus, in the prior art appliances a not insignificant part of the heat energy is uselessly dissipated to the outside, with a consequent effect on the running costs, an effect which becomes ever more significant when the increasing costs of fuel products is taken into account.

The present invention seeks therefore to at least reduce the above mentioned disadvantages by providing a heating appliance with an atmospheric burner having a significantly improved thermal efficiency obtained without the necessity of substantial or complex modifications of the burner itself.

According to the present invention, there is provided a heating appliance having an atmospheric burner, comprising a heater body defining a combustion chamber within its interior, in which at least one atmospheric burner can be located, characterised by the fact that the bottom wall of this combustion chamber is consti-

- 3 -

tuted by a pair of panel elements spaced from one another and provided with apertures for the introduction of air to support combustion of fuel by the burner.

- 5 An advantage of the present invention is that heat losses from the heater appliance due to radiation through an air inlet opening during operation of the burner are totally eliminated, and losses by convection attributable to the chimney effect which takes place in heater
10 appliances at times when the burner is not in operation are drastically reduced. Another advantage of the heating appliance of the present invention lies in the fact that the effective thermal efficiency of the appliance is significantly improved, thus contributing to a significant
15 reduction in the running costs. Further, a heating appliance formed in accordance with the principle of the present invention is able to offer the widest guarantee of reliability and safety in use.
- 20 One embodiment of the present invention will now be more particularly described by way of non-limitative example only, with reference to the accompanying drawings, in which:
- 25 the single figure schematically illustrates a heating appliance formed according to the principles of the present invention in a perspective and partially exploded view.
- 30 Referring now to the drawing, the heating appliance which is generally indicated with the reference numeral 1, comprises a heater body 2 which can be made in any shape

- 4 -

or configuration which is considered suitable.

The heater body 2 defines, internally, a combustion chamber generally indicated with the reference numeral 3, within which are located burners 4, preferably gas burners, of the so-called atmospheric type.

The heating appliance of the present invention is particularly characterised by the fact that the lower part of the combustion chamber, that is to say the side which in a conventional heater is left open, is provided with a first panel element 5 and a second panel element 6, which both lie in substantially horizontal planes and which are spaced from one another. The panel elements 5 and 6 are provided with apertures which allow the introduction into the combustion chamber of secondary air, necessary for the completion of the combustion of the fuel burnt by the burner.

The utilisation of the panel elements 5 and 6 offers the possibility of obviating the heat dissipation phenomenon which occurred in prior art heaters, without reducing the heating capacity of the apparatus. The panel elements 5 and 6 are advantageously made of sheet metal or possibly any other material able to resist the high temperatures experienced in operation of the burner.

In a preferred embodiment, which is not in any way intended in a binding sense, the first panel element 5 is flat with two opposite edges being provided with transverse flanges 9 facing downwardly and resting on the second panel element, which is also flat and has two

- 5 -

upwardly directed flanges 10,11 on the edges correspondent to those of the upper panel 5. The flange 11 is larger than the flange 10 and has recesses or notches in its free edge to receive the burner 4.

5

In the embodiment illustrated in the drawing the first panel element 5 is provided with through-slots 7, whilst the second panel element is provided with through-holes 8, which constitute the said apertures. Obviously the conformation of the apertures is not, per se, binding, in that it is possible to adopt any conformation considered suitable. An advantageous criterion to follow is that, given the disposition of the apertures on the first panel element 5, the second panel element 6 is provided with apertures in such a way that the apertures themselves are not in mutual alignment, so as to eliminate or at least reduce to the minimum the chimney effect, which occurs when the burner is not in operation. The apertures which, as has been said, may be constituted by slots or holes, are disposed and dimensioned in such a way as to allow only the quantity of combustion air necessary for complete combustion of the gas to be drawn into the appliance.

Moreover, the arrangement of the various apertures on the panel elements 5 and 6 in such a way that they are not in alignment offers the possibility of creating a significant hydraulic resistance so that, when the burner is not operating, the chimney effect is substantially nullified. This arrangement also allows the dispersion of heat downwardly of the combustion chamber due to radiation during operation of the burner to be eliminated,

- 6 -

and the heat, which is transmitted to the panel elements by radiation during operation of the burners, is advantageously recovered by conduction to the air which is drawn through the apertures in the panels into the combustion chamber during the operation of the burner.

From what has been described above the manner in which the invention achieves the stated intentions will be appreciated. In particular, it is emphasised that it succeeds in achieving significant advantages with negligible costs in the production phase and without any cost in the maintenance phase. It is also suitable to emphasise that the presence of the panel elements offers the possibility of saving almost all of the heat which in the prior art heaters is dispersed towards the outside, thus contributing to the optimisation of the effective efficiency of the heater.

In practice, the materials used, as long as they are compatible with the specific use, as well as the contingent forms and dimensions, may be any suitable according to requirements.

Claims:

1. A heating appliance (1) having an atmospheric burner (4), comprising a heater body (2) defining a combustion chamber (3) within its interior, in which at least one atmospheric burner (4) can be located, characterised by the fact that the bottom wall of this combustion chamber is constituted by a pair of panel elements (5,6) spaced from one another and provided with apertures (7,8) for the introduction of air to support combustion of fuel by the burner.

2. A heating appliance according to Claim 1, characterised by the fact that the said panel elements (5,6) both lie in substantially horizontal planes.

3. A heating appliance according to Claim 1, or Claim 2, characterised by the fact that the panel elements (5,6) are each generally flat with flanges (9, 10,11) on corresponding opposite edges thereof, the flanges (9,10,11) on each panel (5,6) being directed towards the other panel.

4. A heating appliance according to any preceding claim, characterised by the fact that the said apertures in at least one of the panels (5,6) are constituted by slots (7) and the apertures on the other panel (6) are constituted by an array of through-holes (8).

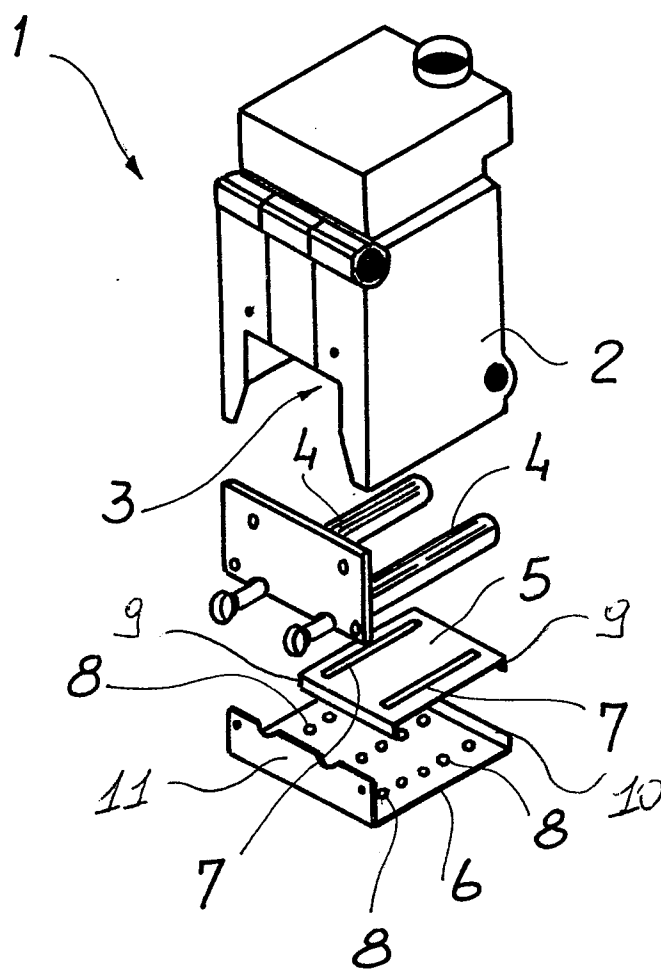
5. A heating appliance according to any preceding claim, characterised by the fact that the aper-

0153281

- 8 -

tures (7) provided on one of the panel elements (5), are not in alignment with the apertures (8) provided on the other panel element (6).

4/4

FIG. 1