



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.09.1999 Bulletin 1999/36

(51) Int Cl. 6: **F24H 9/02**

(21) Application number: **99104382.9**

(22) Date of filing: **04.03.1999**

(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

(72) Inventor: **Tommasini, Isabella
45038 Polesella (IT)**

(74) Representative: **Jorio, Paolo et al
STUDIO TORTA S.r.l.,
Via Viotti, 9
10121 Torino (IT)**

(30) Priority: **05.03.1998 IT BO980130**

(71) Applicant: **CIB S.r.l.
45030 Villamarzana (IT)**

(54) **A cover for a combustion boiler and a boiler provided with such a cover**

(57) A combustion boiler is provided with a central body (2) defined by a combustion chamber (9), a heat exchanger (10) and a hood (11) for the aspiration of

fumes emitted by the said combustion, and is housed in a cover (3) provided with first and second self-supporting half-shells (19, 20) made from plastics material and connectable to each other to form the cover (3).

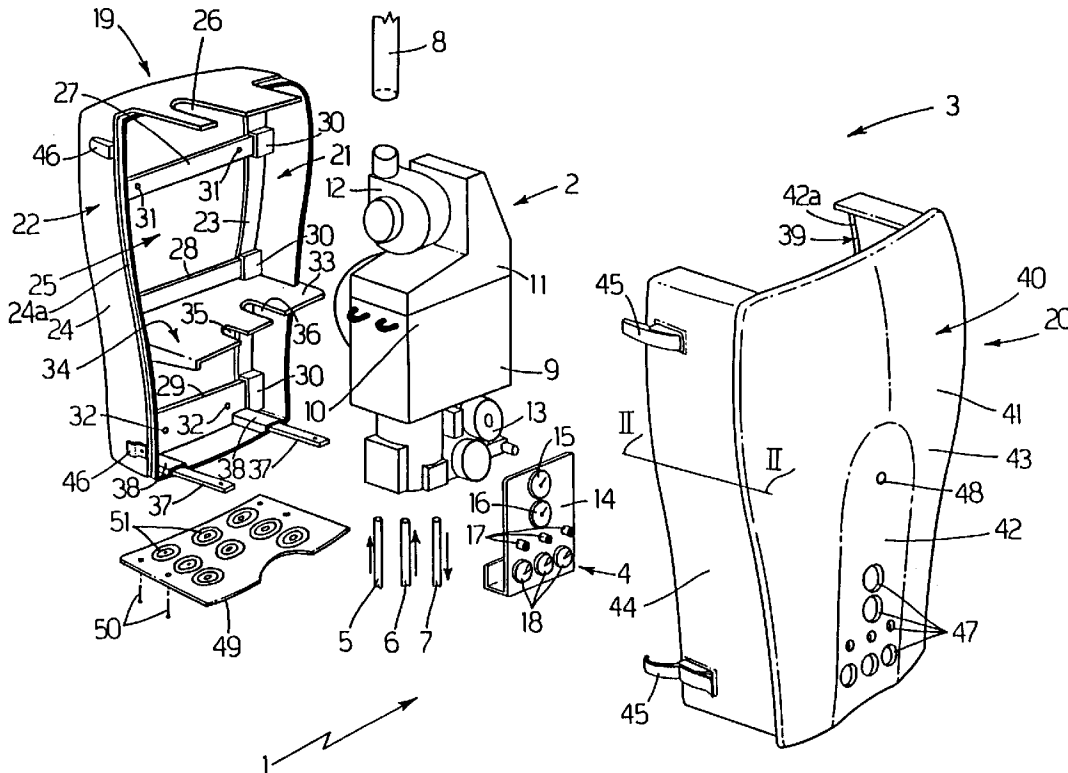


Fig.1

Description

[0001] The present invention relates to a cover for a combustion boiler.

[0002] In particular, the present invention relates to a cover for a domestic combustion boiler, to which the present invention refers explicitly without loss of its generality thereby.

[0003] Combustion boilers usually have a central body comprising a combustion chamber, a heat exchanger for transferring the energy between the fumes produced by the combustion and a mass of water, and a fume intake/aspiration flue. The covers of the aforesaid boilers comprise panels of sheet metal attached to each other to form spaces enclosing the associated central bodies. This type of cover also has a hinged panel which is movable between a closed position and an open position in order to access the aforesaid central body. As well as covering the central body, which improves the aesthetic appearance of the boiler itself, the metal panels of the cover are relatively rigid and are connected to support elements located inside the cover in order to support the central body of the boiler and, therefore, they also form the supporting frame of the boiler itself.

[0004] The metal panels of known type are attached with increasing frequency to panels made from insulating material which provide both acoustic and thermal insulation.

[0005] The requirement of providing boiler covers which insulate the boilers acoustically and thermally is particularly important nowadays. In fact, boilers are increasingly installed in kitchens, bathrooms or, in some cases, in the living rooms of a house and, therefore, the requirement of preventing the boilers from generating any disturbance to the environment in which they are installed becomes more important. Furthermore, in addition to the requirements described above, the requirement also exists of providing aesthetically attractive boiler covers which adapt to the style of decoration in the part of the house in which the boilers are installed.

[0006] The known covers are unable to satisfy the requirements described above due to the fact that the metal panels cannot be shaped simply and economically in order to achieve particular aesthetic shapes. Furthermore, the covers comprising the metal panels are also inefficient from the point of view of thermal and acoustic insulation if there are no further insulating panels, which must be fitted inside the covers and which increase the manufacturing costs of the boilers.

[0007] The object of the present invention is therefore to provide a cover which is free from the disadvantages described above.

[0008] According to the present invention there is provided a cover for a combustion boiler; the said cover being characterised in that it includes first and second half-shells connectable to each other to form the said cover, and in that the said first and second half-shells are man-

ufactured from plastics material.

[0009] This arrangement is particularly advantageous due to the fact that, on the one hand, the plastics material is easily workable in order to provide the cover with the particular aesthetic shapes and has a greater thermal and acoustic insulating capacity than the metal materials and, on the other hand, the half-shells have a greater structural rigidity than the simple flat walls. Therefore, the synergy deriving from the use of the plastics material together with the use of a shell shape formed from two half-shells ensures the necessary rigidity for the cover such that this latter is able to act as a frame, in addition to which it is easy to work in order to obtain the desired aesthetic shapes, and improved thermal and acoustic insulation is ensured.

[0010] The present invention will now be described with reference to the accompanying drawings which illustrate a non-limitative embodiment, in which:

- Figure 1 is an exploded view of an embodiment of a boiler including a cover according to the invention; and
- Figure 2 is a view in section of a detail of Figure 1, taken on the line II-II.

[0011] In Figure 1, the reference numeral 1 indicates a wall-mounted gas combustion boiler for heating a mass of water circulating in a circuit of known type, not illustrated. The boiler 1 comprises a central body 2, a cover 3 and a control panel 4. The boiler 1 is connected to a gas supply pipe 5, a cold water supply pipe 6, a hot water outlet pipe 7 and an exhaust pipe 8 for the fumes produced by the gas combustion. The pipes 6 and 7 form part of the aforesaid known circuit, not illustrated.

[0012] The body 2 comprises a combustion chamber 9, a heat exchanger 10 located above the combustion chamber 9, and a fume aspiration hood 11 located above the heat exchanger 10, connected to the fume aspiration pipe 8 and attached to an aspiration fan 12. The body 2 also includes a water pump 13 located below the chamber 9 and connected to the water supply pipe 6.

[0013] The control panel 4 comprises a support plate 14, a thermometer 15, a pressure switch 16, a series of indicator lights 17 and control knobs 18. The thermometer 15 is connected to a sensor of known type, not illustrated, for detecting the temperature of the water leaving the heat exchanger 10, while the pressure switch 16 is connected to a sensor of known type, not illustrated, for detecting the water pressure in the aforesaid circuit.

[0014] The cover 3 comprises a half-shell 19 and a half-shell 20 made from relatively rigid plastics material, that is, the half-shells 19 and 20 are formed from a plastics material of a density which ensures not only that the shape of the half-shells 19 and 20 is stable, but that they are also capable of supporting predetermined loads. The half-shells 19 and 20 are connectable to each other to form the cover 3.

[0015] The half-shell 19 is formed as a single block of plastics material and comprises an inner surface 21, an outer surface 22, a substantially flat rear wall 23 and a substantially annular side wall 24 located along the perimeter of the wall 23. The wall 23 is suitable for locating against a wall and has a central aperture 25, while the side wall 24 has a slot 26 housing the pipe 8.

[0016] The half-shell 19 comprises an upper plate 27, a central plate 28 and a lower plate 29, all of which are formed in metal, are elongate in shape and are disposed horizontally through the central aperture 25. The plates 27, 28 and 29 have respective opposite ends which are embedded in the plastics material of the half-shell 19 which has reinforcing elements 30 made from plastics material at each of the aforesaid ends. The upper plate 27 and the lower plate 29 have respective holes 31 and 32 which are used to attach the boiler 1 to a wall by means of screws of known type, not illustrated, or by means of expansion plugs of known type, not illustrated.

[0017] The central plate 28 is coupled in known way, not illustrated, to a metal bracket 33 which has a substantially horizontal surface 34 for supporting the combustion chamber 9, and slots 35 and 36 housing the known supply pipes, not shown, located between the pump 13 and the chamber 9. In practice, the bracket 33 supports the central body 2 and is rigidly connected to the half-shell 19 which acts as the support frame for the boiler 1.

[0018] The half-shell 19 also includes two guides 37 which are located at the base of the half-shell 19 itself and extend transversely with respect to the rear wall 23. The guides 37 have respective ends which are embedded in the plastics material of the half-shell 19 which has reinforcing elements 38 at the aforesaid ends.

[0019] Like the half-shell 19, the half-shell 20 is formed as a single piece of plastics material and includes an inner surface 39 and an outer surface 40. The half-shell 20 also includes a front wall 41 comprising a concave portion 42 connected to a convex portion 43, and a shaped side wall 44 disposed substantially along the perimeter of the wall 42, which is connectable to the side wall 24 of the half-shell 19. The side wall 24 of the half-shell 19 includes an edge 24a complementary in shape to an edge 42a formed on the side wall 42 of the half-shell 20 so that when the half-shell 20 is connected to the half-shell 19, the edges 24a and 42a interpenetrate one another.

[0020] The half-shell 20 has snap-engagement hooks 45 which are distributed along the side wall 44 and engage respective slots 46 distributed along the side wall 24 of the half-shell 19.

[0021] The concave portion 42 of the front wall 41 has a plurality of holes 47 through which the thermometer 13, the pressure switch 16 and the indicator lights 17 are visible, and through which the control knobs 18 project. The concave portion 42 has a further hole 48 for monitoring the combustion chamber 9, that is, for so-called flame control.

[0022] In addition to the half-shells 19 and 20, the cover 3 includes a base closure panel 49 which is fixed to the half-shell 19 by screws 50. The panel 49 has pre-weakened zones 51 which can easily be removed in the event that it is necessary to form apertures of dimensions corresponding to the dimensions of the pipes 5, 6 and 7.

[0023] In order to manufacture the half-shells 19 and 20, polymeric materials have particularly advantageous characteristics in comparison with the other plastics materials. In fact, polyurethane, polypropylene, polystyrene, polyethylemethacrylate and the composite epoxy resins with polymers ensure, on the one hand, good workability and, on the other hand, have good characteristics of mechanical rigidity as well as satisfactory thermal and acoustic insulation characteristics.

[0024] In a particular embodiment, not illustrated, the inner surfaces 21 and 39 of the respective half-shells 19 and 20 are relatively rough, while the respective outer surfaces 22 and 40 are relatively smooth. The inner roughness improves the acoustic insulation.

[0025] According to a further embodiment that is not illustrated, the inner walls 21 and 39 are rusticated in order to improve the acoustic insulation.

[0026] With reference to Figure 2, the front wall 41 of the half-shell 20 is located between the inner surface 39 and an outer surface 40, and comprises a portion 52 adjacent the surface 40 and a portion 53 adjacent the wall 39. The portion 52 has a relatively high density which ensures the rigidity of the half-shell 20, while the portion 53 has a relatively low density in order to achieve the thermal and acoustic insulation. The portion 52 and 53 are theoretically separated in Figure 2 by the broken line 54 which separates the portion 53 which confers the structural rigidity on the half-shell 20 from the portion 52 which ensures the thermal and acoustic insulation. In reality, the density of the wall 41 gradually decreases from the outer surface 40 towards the inner surface 39. The variation in density across the wall 41 is made possible by using the above indicated polymers which are used to form both the half shell 19 and the half shell 20, and are worked in order to provide a degree of expansion which gradually increases from the respective outer surfaces 22 and 40 towards the respective inner surfaces 21 and 39.

[0027] In this way it is possible to provide the half-shells 19 and 20 with, on the one hand, a high thermal and acoustic insulation capacity and, on the other hand, sufficient structural rigidity.

[0028] According to a further embodiment that is not illustrated, the concave portion is covered by a transparent cover which is movable between a closed position and an open position.

Claims

1. A cover for a combustion boiler; the said cover be-

- ing characterised in that it comprises first and second self-supporting half-shells (19, 20) connectable to each other to form the said cover (3) and in that the said first and second half-shells (19, 20) are formed from plastics material.
- 2.** A cover according to Claim 1, characterised in that the said first and second half-shells (19, 20) are formed from polymeric plastics material.
- 3.** A cover according to Claim 2, characterised in that the first half-shell (19) has an inner surface (21) and an outer surface (22), and the second half-shell (20) has an inner surface (39) and an outer surface (40), the said polymeric plastics material having a density which decreases from the said outer surfaces (22, 40) towards the said inner surfaces (21, 39).
- 4.** A cover according to Claim 2 or Claim 3, characterised in that the first half-shell (19) has an inner surface (21) and an outer surface (22), and the second half-shell (20) has an inner surface (39) and an outer surface (40), the said inner surfaces (21, 39) being rough.
- 5.** A cover according to any of Claims from 2 to 4, characterised in that the first half-shell (19) has an inner surface (21) and an outer surface (22), and the second half-shell (20) has an inner surface (39) and an outer surface (40), the said inner surfaces (21, 39) being rusticated.
- 6.** A cover according to any preceding claim, characterised in that the said first half-shell (19) has metal inserts embedded in the said plastics material.
- 7.** A cover according to Claim 6, characterised in that the said metal inserts comprise at least one attachment plate (27; 28; 29).
- 8.** A cover according to Claim 6 or Claim 7, characterised in that the said metal inserts comprise guides (37) for connecting the first and the second half-shell (19, 20).
- 9.** A cover according to any preceding claim, characterised in that it includes a base panel (49) attachable to the said first half-shell (19).
- 10.** A cover according to any preceding claim, characterised in that the said first half-shell (19) has an edge (24a), the said second half-shell (20) having an edge (42a) attachable to the edge (24a).
- 11.** A combustion boiler provided with a central body (2) comprising a combustion chamber (9), a heat exchanger (10) and a hood (11) for the aspiration of fumes emitted by the said combustion; a container (3) for housing the said central body (2); the said boiler comprising a cover (3) according to any preceding claim.
- 12.** A boiler according to Claim 11, characterised in that at least one of the said first and second half-shells (19, 20) is rigidly coupled to a support element (33) of the said body (2).
- 13.** A boiler according to Claim 11 or Claim 12, characterised in that it includes a control panel (4), the said second half-shell (20) having at least one aperture (47) for accessing the said control panel (4).
- 14.** A boiler according to Claim 13, characterised in that the said second half-shell (20) has a door that is movable between an open position and a closed position for covering the said aperture (47).
- 15.** A boiler according to Claim 14, characterised in that the said door is made from transparent material.

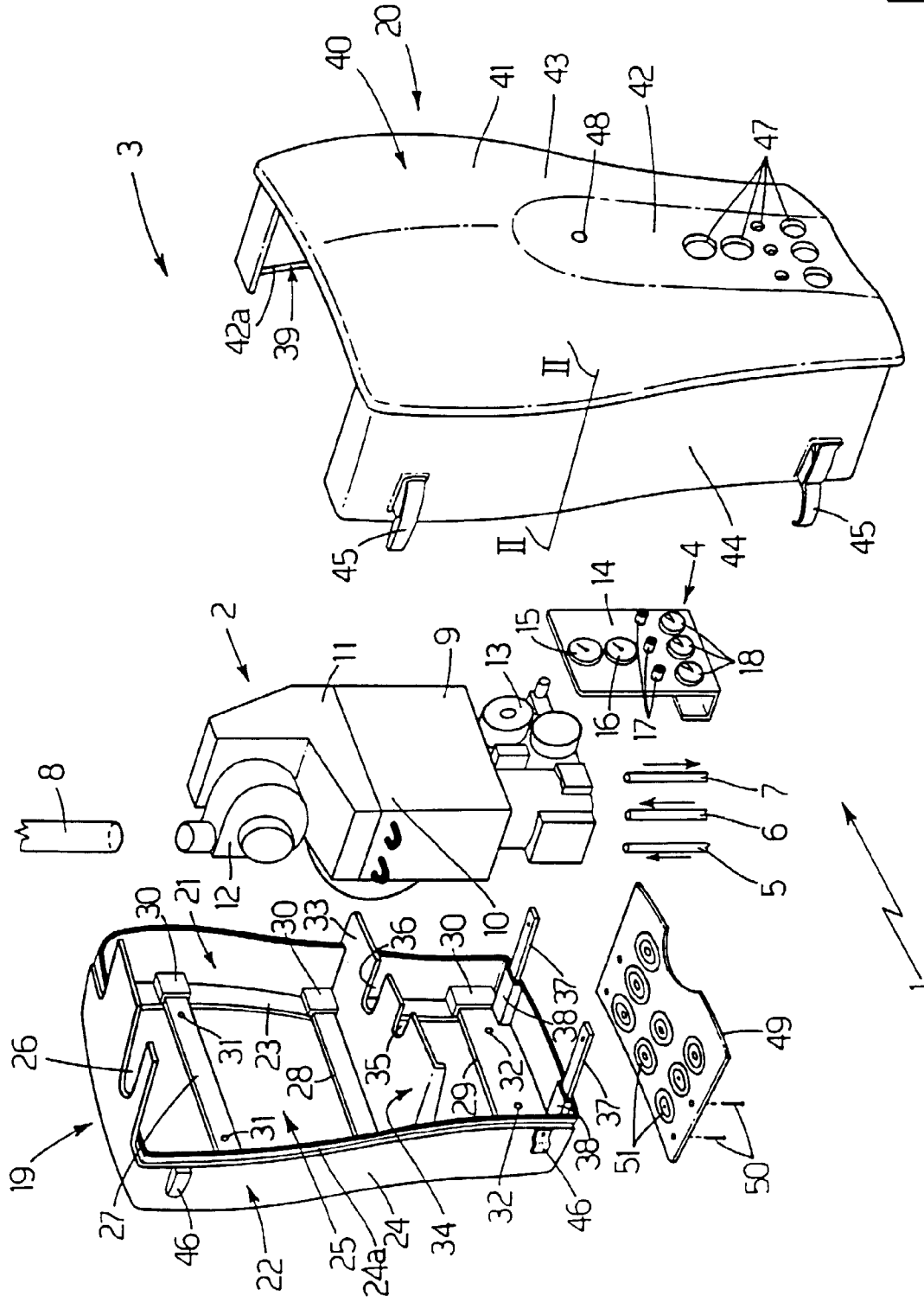


Fig.1

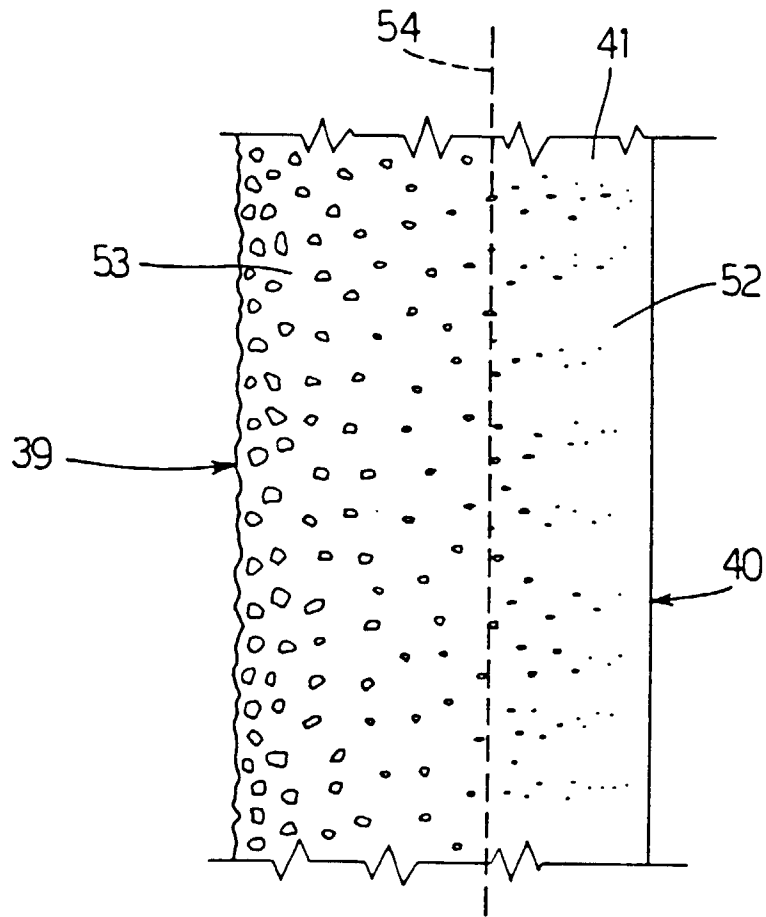


Fig.2