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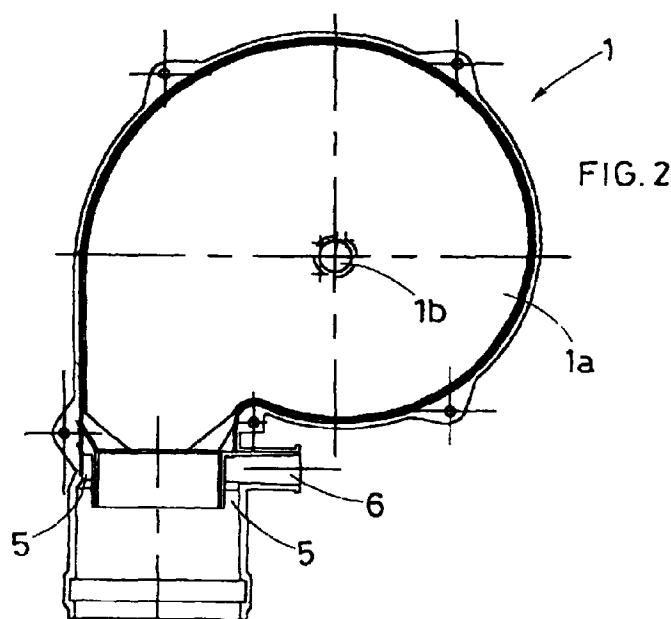
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(54) Fan casing with condensate collection and drainage

(57) This inventions relates to a fan for gas boilers with proof combustion comprising a centrifuge rotor housed inside a spiral ending with a delivery nozzle that

features a female attachment and is internally provided with an annular tank with a small nozzle for drainage.



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Description

[0001] This patent application refers to a fan for installation in gas boilers with proof combustion, which is provided with a device for the collection and drainage of the condensate water that forms and drips on the internal walls of the pipe for the expulsion of fumes.

[0002] As it is known, the combustion chamber of the "proof combustion" boilers is hermetically sealed and works in light depression thanks to the suction action of a fan, used to suck in the fumes of the combustion chamber and push them along the flue from which the said fumes are expelled into the air.

[0003] The flue used by this particular model of boilers with high thermal efficiency is of a particular type, since it is composed of two concentric pipes with different diameter separated by an annular cavity.

[0004] The internal pipe is inserted into the delivery opening of the fan, while the cavity communicates with the combustion chamber whose pressure is lower than the atmosphere due to the suction produced by the fan.

[0005] This means that while the fumes are pushed by the fan along the internal pipe of the flue, the external comburent air is sucked by the combustion chamber in which it arrives after going through the cavity of the flue in opposite direction with respect to the fumes.

[0006] In this particular type of flue, special attention must be paid to the condensate of the steam contained in the combustion products. It is obvious that the walls of the internal pipe of the flue are constantly cooled down by the external air current, at room temperature, that goes through the cavity surrounding the pipe.

[0007] When the hot fumes coming from the combustion chamber reach the cold walls of the expulsion pipe, the steam contained in the fumes inevitably condenses and forms drops of condensate water that drip along the internal surface of the expulsion pipe.

[0008] Up to now the condensate water has been collected and drained through appropriate devices inserted along the flue and located outside the boiler.

[0009] The purpose of the present invention is to provide the proper solution to collect the condensate water in the lowest point possible, so as to intercept and drain outside all the condensate water that drips along the internal surfaces of the fumes expulsion pipe.

[0010] At this purpose the collection and drainage point of the condensate water has been moved inside the boiler, precisely inside the fan, which has been especially designed to feature a delivery opening with female attachment including an annular tank for the collection and drainage of the condensate water.

[0011] For clearer explication, the description of the fan model according to this invention continues with reference to the enclosed drawings, which only have an explanatory, not restrictive purpose, where:

- Fig. 1 is a view of the first of the two semi-shells used to build the fan casing according to this invention;

tion;

- Fig. 2 is a view of the internal side of the first of the two semi-shells as mentioned above;
- Fig. 3 is a view of the external side of the first of the two semi-shells as mentioned above;
- Fig. 4 is a view of the second of the two semi-shells used to build the fan casing according to this invention;
- Fig. 5 is a view of the internal side of the second of the two semi-shells as mentioned above;
- Fig. 6 is a view of the external side of the second of the two semi-shells as mentioned above;

[0012] With reference to the above mentioned figures, the fan according to this invention features an ordinary centrifuge rotor with cylindrical cage configuration - not shown in the enclosed drawings since it is of known structure and does not have anything to do with the present invention - housed inside a spiral composed of two semi-shells (1 and 2).

[0013] The bottom wall (1a) of the first semi-shell (1) features a small central hole (1b) for the shaft of the electrical motor (not shown) that operates the above mentioned rotor, which is screwed onto the external side of the bottom wall (1a) that is provided with an annular series of drilled indentations (1c) used to fix the support U bolt (C) of the motor-rotor assembly with the interposition of anti-vibration rubber collars (G).

[0014] The bottom wall (2a) of the second semi-shell (2) features a wide circular window (2b) that represents the suction opening of the fan.

[0015] The casing of the fan is obtained by matching the two semi-shells (1 and 2) to obtain a spiral ending with a nozzle of circular delivery (4) obtained half with the semi-shell (1) and half with the semi-shell (2).

[0016] The fan according to the present invention is characterized in that it features a delivery nozzle (4) with female attachment so that the fumes expulsion pipe is inserted inside the nozzle (4) - and not outside as it happens in the known type of fans provided with a delivery nozzle with male attachment.

[0017] Secondly, the fan according to the present invention is characterized in that inside the nozzle (4) the fan features an annular tank (5), half obtained with semi-shell (1) and half with semi-shell (2).

[0018] The annular tank (5) is externally provided with a small radial nozzle (6) through which the condensate water is directed inside a tube - not shown and inserted on the nozzle - that conveys it towards the drainage pipe.

[0019] Half of the small drainage nozzle (6) is obtained with semi-shell (1) and half with semi-shell (2).

Claims

1. Fan for boilers with proof combustion, provided with a device for the collection and drainage of condensate water, of the type comprising a centrifuge rotor

housed inside a spiral made up of two symmetrically matched semi-shells (1 and 2), characterized in that:

- a) the spiral ends with a cylindrical delivery nozzle (4) - half of which is obtained with semi-shell (1) and half with semi-shell (2) - that features a female attachment: 5
- b) an annular tank (5) is located inside the nozzle (4) - half of which is obtained with semi-shell (1) and half with semi-shell (2) - that is 10
externally provided with a small drainage nozzle (6), with radial orientation - half of which is obtained with semi-shell (1) and half with semi-shell (2). 15

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