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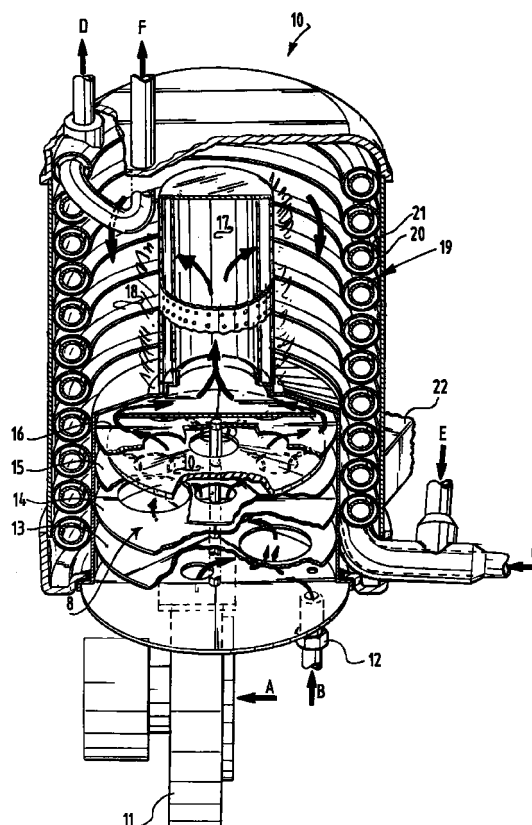
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(54) **Burner apparatus having valve means**

(57) The present invention relates to a device for combusting fuel and oxidizing agents, for instance for space heating, wherein the device comprises:

- a burner (1A);
- supply means for supplying the fuel and the oxidizing agent to the burner; and
- discharge means for discharging combustion gases from the burner (1A), wherein supply of fuel and/or oxidizing agent, and/or discharge of the combustion gases takes place in forced manner, and wherein a non-return valve (30) is arranged in either the supply means or the discharge means.



EP 0 981 023 A1

Description

[0001] Combustion devices for heating water in central-heating systems can nowadays be constructed very compactly, for instance for heating an apartment in a larger building. Such compact combustion devices can then be connected to for instance a collective supply conduit for supply of air and/or a collective discharge for discharge of combustion gases.

[0002] As well as compactness, efficiency at full load and/or at relatively low load is also of increasing importance in the context of increasing environmental requirements and fuel costs. It has further been found in practice that noise nuisance can occur at relatively low loads of compact combustion devices, for instance because of the eigenfrequency of particular spaces in such a compact combustion device.

[0003] The present invention has for its object to obviate one or more of the above stated problems and provides a device for combusting fuel and oxidizing agent, for instance for space heating, wherein the device comprises:

- a burner;
- supply means for supplying the fuel and the oxidizing agent to the burner; and
- discharge means for discharging combustion gases from the burner, wherein supply of fuel and/or oxidizing agent, and/or discharge of the combustion gases takes place in forced manner, and wherein a non-return valve is arranged in either the supply means or the discharge means.

[0004] When the burner is connected to a collective air conduit in the switched-off situation, the closing means prevent relatively cold air entering the interior thereof, which may reduce efficiency. In the case of connection to a collective discharge conduit for the combustion gases, the closing means prevent the possibility of combustion gases from another combustion device being drawn into the interior of the boiler, which is likewise undesirable.

[0005] In a preferred embodiment of the device according to the present invention, wherein the closing means are formed by a valve which can move freely up and downward between baffle-like members forming part of mixing means, it has further been found that the noise nuisance is prevented, probably because the resistance in the air path is increased.

[0006] In order to prevent an undesired whine of relatively high frequency, the up and downward movable disc-like valve is preferably arranged with some clearance round a central shaft.

[0007] Further advantages, features and details of the present invention will be elucidated on the basis of the following description with reference to the annexed figure, in which a preferred embodiment of a device according to the present invention is shown.

[0008] On the underside of a device 10 air is supplied as according to arrow A via a fan 11, while the gas for combusting is supplied under some pressure via connection 12 as according to arrow B. Arranged in a mixing space 8 are disc-shaped baffles 13, 14, 15 and 16, in which passage openings for the gas and the air are provided which are successively offset relative to each other for mixing the gas and the air in efficient manner, as indicated schematically by the arrows. The mixture of air and gas is subsequently carried into the interior of burner 17 and burns in the annular space 18 to heat the helical pipe 19 which in the present case comprises an inner pipe 20 and an outer pipe 21. The combustion gases are urged downward and discharged via a discharge conduit 22 for the combustion gases.

[0009] Inner pipe 20 and outer pipe 21 are connected to a central-heating system and the circuit for hot water, further details of which are described in the Netherlands patent application 1004410, the content of which must be deemed as interpolated herein. Tap water for heating is fed for instance as according to arrow C and drained as according to arrow D, while water for heating for the central-heating system is fed for instance as according to arrow E and drained as according to arrow F.

[0010] A substantially disc-shaped valve 30 is arranged between mixing baffles 14 and 15 for free movement with some clearance round a central shaft 31. If device 10 is switched off and combustion is stopped, fan 11 will also be switched off, whereby disc 30 drops due to its own weight onto disc 15 and closes the openings therein. The air path through the combustion device is hereby closed and relatively cold air and/or combustion gases are prevented from being able to enter the interior thereof.

[0011] When the central-heating boiler is switched on again and fan 11 activated, the closing disc 30 is raised slightly by the air flow brought about by the fan. At switch-on as much hot air and/or combustion gas as possible is therefore still situated in the space, which reduces standstill losses.

[0012] The present invention is not limited to the above described preferred embodiment; the rights sought therefor are defined by the following claims, within the scope of which many modifications can be envisaged.

Claims

1. Device for combusting fuel and oxidizing agents, for instance for space heating, wherein the device comprises:

- a burner;
- supply means for supplying the fuel and the oxidizing agent to the burner; and
- discharge means for discharging combustion gases from the burner, wherein supply of fuel and/or oxidizing agent, and/or discharge of the

combustion gases takes place in forced manner, and wherein a non-return valve is arranged in either the supply means or the discharge means.

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2. Device as claimed in claim 1, wherein the supply means comprise mixing means for mixing the fuel and the oxidizing agent.
3. Device as claimed in claim 2, wherein the mixing means comprise two or more baffle-like members in which holes are arranged. 10
4. Device as claimed in claim 1, 2 or 3, wherein the supply means comprise a fan for supplying air at some overpressure. 15
5. Device as claimed in claim 1, 2, 3 or 4, wherein the closing means comprise an up and downward movable disc in the air path. 20
6. Device as claimed in claim 3, 4 or 5, wherein the disc is provided centrally with an opening for arranging thereof with the necessary clearance on a central shaft. 25
7. Device as claimed in claim 5 or 6, wherein in the rest position the disc closes the opening in one of the baffle-like members. 30

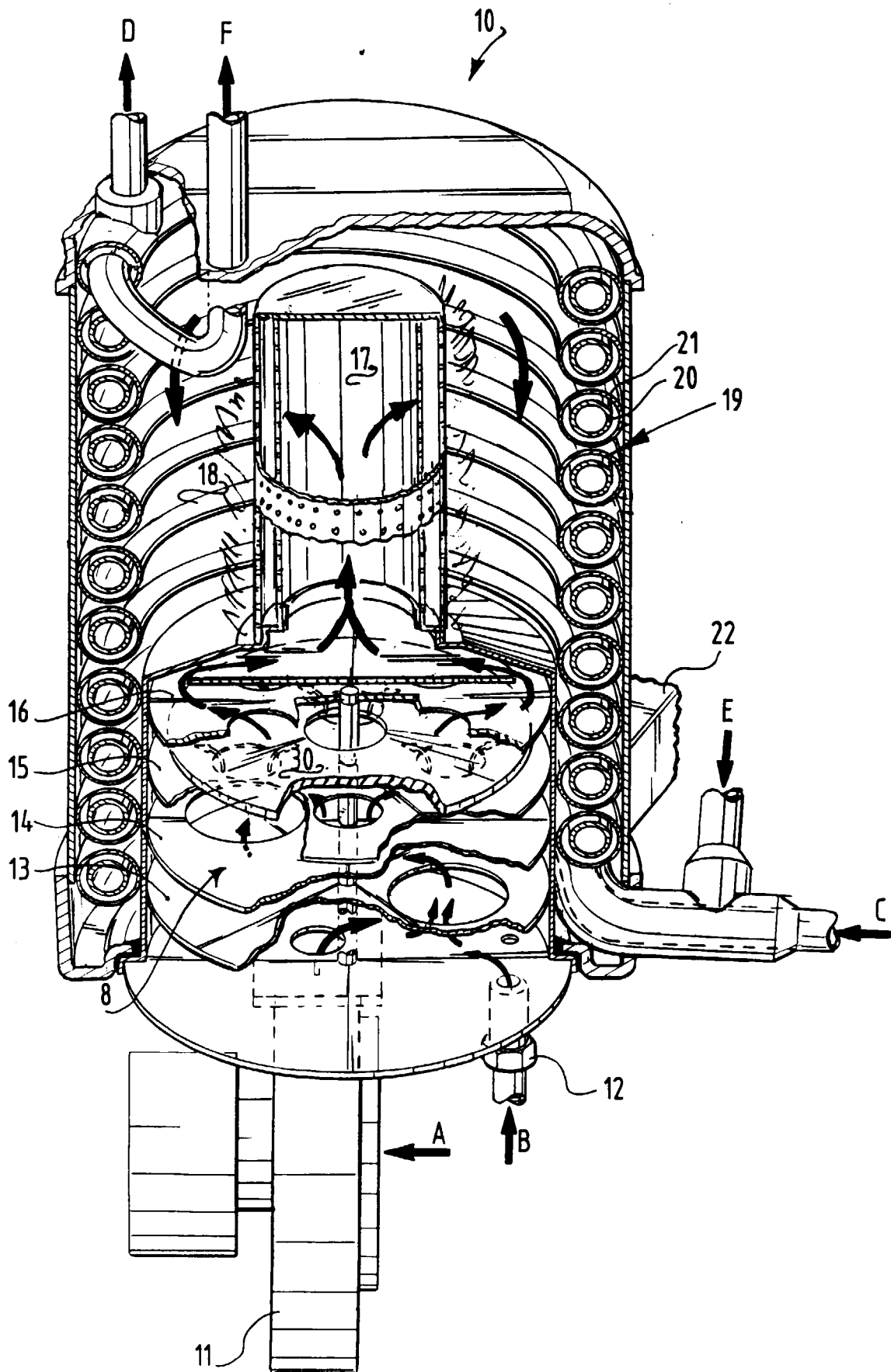
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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 2666

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		17 November 1999	Van Gestel, H
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 99 20 2666

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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