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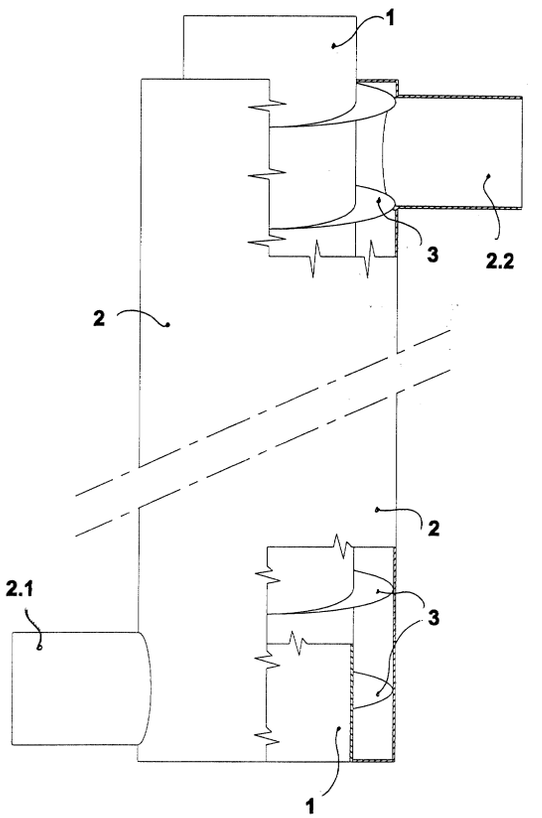
(54) Flue with heat exchanger for heating rooms

(57) Flue for stoves or similar equipment, comprising two concentric tubes (1,2), one of which (1) is internal and through, while the other (2) is closed at the ends and provided with two openings (2.1,2.2) on its lateral surface; a helical foil (3) is positioned between the two tubes (1,2), creating a spiral-shaped forced path to be followed by the air between the lower and the upper opening of the external tube (2). A fan or another forced ventilation means may be provided to draw the air and blow it in through the lower or upper opening (2.1,2.2). This makes it possible to recover part of the heat, which otherwise would be dispersed towards the outside, in order to heat the room in which the stove is positioned or even another room.



EP 1 134 532 A1

Description

[0001] The present invention concerns the sector of room heating and in particular it concerns a new flue equipped with heat exchanger for heating rooms.

[0002] In many houses the heating of rooms is achieved by means of stoves, which are used exclusively for heating purposes or also for cooking food.

[0003] These stoves essentially comprise a furnace and are provided with a flue for the outflow of flue gases.

[0004] The heat generated by the combustion process is partly radiated by the stove and partly transported by the flue gases, so that even the flue heats up and radiates a certain quantity of heat.

[0005] In case of very large rooms, several stoves are necessary to ensure uniform temperature in the various areas of the room.

[0006] Almost all the heat transported by the flue gases is dispersed in the atmosphere together with the flue gases themselves.

[0007] As a consequence of this, the heat actually used to heat the room is much less than the heat generated by the combustion process.

[0008] The subject of the present patent is a new flue that uses the heat transported by the flue gases to heat the room better.

[0009] The new flue comprises, in its main parts, two concentric tubes, one of which is internal and through, while the other is external and closed at the ends and is provided with two connection openings (unions).

[0010] Each one of the two openings of the external tube is positioned on the lateral surface of said tube, near one of its ends.

[0011] A fan, or another forced ventilation means is provided to draw the air from the zone around the stove and blow it into the lower opening.

[0012] Between the external and the internal tube a helical foil is provided to create a forced path for the blown air, between the two tubes and from one opening of the external tube to the other.

[0013] The new flue constituted as described above replaces completely or partially the flue positioned directly on the stove; the upper outlet of the internal tube of the new flue is connected with the remaining part of the flue that conveys the flue gases towards the outside.

[0014] The flue gases emitted by the stove pass through the internal tube of the new flue, transferring a considerable part of their heat to the internal tube itself.

[0015] The air blown in between the internal and the external tube follows the entire spiral-shaped path defined by the foil positioned between the two tubes and flows out through the upper opening. Along the spiral-shaped path, the air that has been blown in receives heat from the internal tube, so that it will heat the room when it flows out of the upper opening of the new flue.

[0016] It is possible to connect said upper opening of the flue with a tube or duct that conveys the air heated by the new flue into another room.

[0017] The new flue, constructed as described above, makes it possible to recover part of the heat that otherwise would be dispersed towards the outside and heat the room in which the stove is positioned or even another room.

[0018] The flue gases are not negatively affected by the temperature decrease, since the quantity of heat still transported by said gas does not prevent the stack effect.

[0019] The air heated by means of the new flue can easily heat another room not directly exposed to the presence of the stove.

[0020] The following is just an example among many of a practical embodiment of the invention in question, illustrated in the enclosed drawing.

[0021] The figure shows the new flue, in partial section, comprising an internal tube (1) into which the flue gases flow, an external tube (2) concentric with the internal tube (1), a helical foil (3) included between the external tube (2) and the internal tube (1).

[0022] The ends of the external tube are closed, except for two openings (2.1, 2.2) - the lower opening (2.1) and the upper opening (2.2) provided on the lateral surface of the external tube (2) itself.

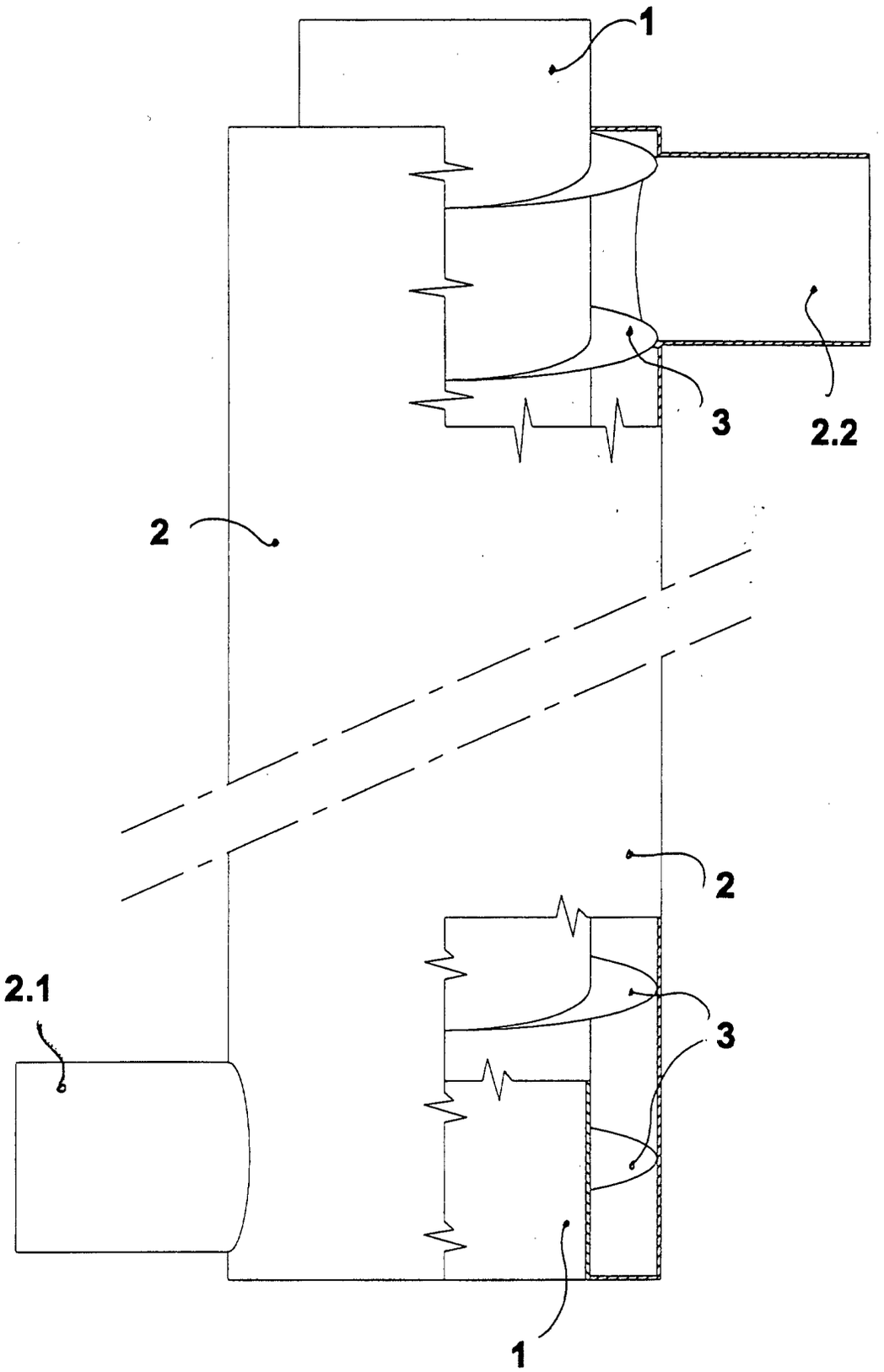
[0023] The air, if necessary blown by a fan, flows into the lower opening (2.1), follows the spiral-shaped path touching the internal tube (1) and heating up, then flows out of the upper opening (2.2) at increased temperature.

[0024] Therefore, with reference to the above description and to the enclosed drawing, the following claims are put forth.

Claims

1. Flue, **characterized in that** it comprises two concentric tubes, one of which is internal and through, while the other is closed at the ends and provided with two openings on its lateral surface, and wherein a helical foil, positioned between the two tubes, creates a forced spiral-shaped path to be followed by the air between the lower and the upper opening of the external tube.

2. Flue according to claim 1, **characterized in that** it is provided with a fan or another forced ventilation means that draws the air and blows it in through the lower or upper opening.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EUROPEAN SEARCH REPORT

Application Number
EP 01 10 6011

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 4 381 819 A (PAOLINO) 3 May 1983 (1983-05-03) * abstract; figure 2 *	1,2	F28D7/02 F28D7/10
X	US 2 756 032 A (DOWELL) * the whole document *	1,2	
X	FR 2 297 382 A (PIOT) 6 August 1976 (1976-08-06) * page 2, line 25 - page 3, line 36; figures 1-4 *	1	
X	FR 1 031 365 A (REKUPERATOR K.G. SCHACK & CIE) 18 June 1953 (1953-06-18) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

F28D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27 April 2001	Beltzung, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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27-04-2001

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82