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(54) CONTROL VALVE FOR THE PASSAGE OF GAS IN RADIANT STOVES

(57) The valve body includes an axial bore in which a shaft, which is axially arranged with respect to another shaft onto which the control knob is fitted, is slidable, both shafts being biased towards an idle position in which the flow of gas is shut off.

The inner shaft can be driven by pushing the outer shaft against the action of a spring, and therefore upon said outer shaft being pushed inwards, the sliding of the inner shaft results in a gasket being moved by the free end of said inner shaft against the action of a spring, which gasket when at rest tends to seal the flow or communication between the branch through which gas is supplied to the valve and the duct leading towards the first burner.

In order for opening to take place and hence for gas to flow and be communicated towards the second burner, the outer shaft must stop being pushed, whereupon the latter shaft will tend to retrieve its initial position due to the existing spring.

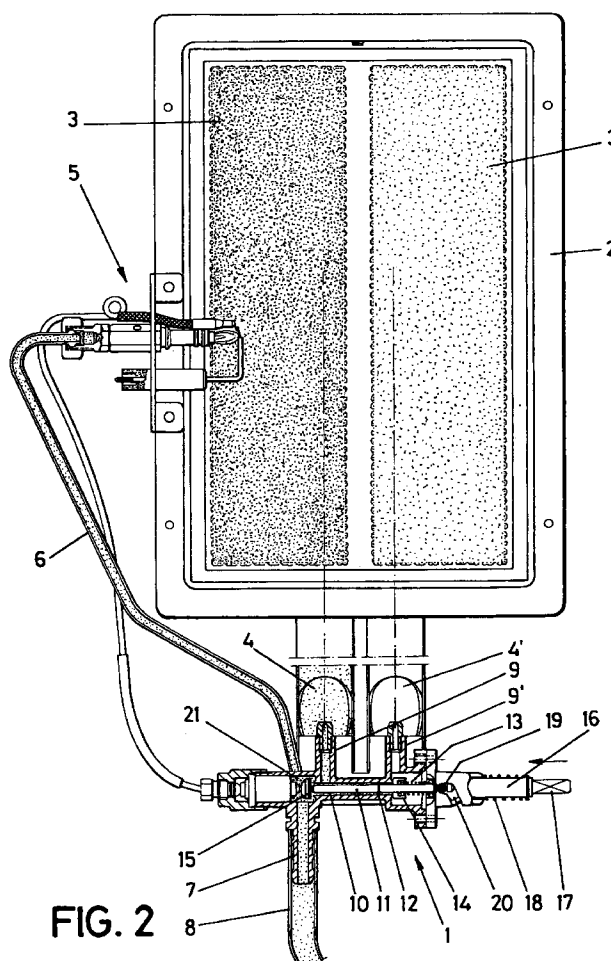


FIG. 2

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Description

OBJECT OF THE INVENTION

[0001] The invention relates to a new gas flow control valve applicable to radiant heaters having two or more burners, and the arrangement of the actual valve with respect to the burners as a whole.

[0002] The object of the invention is to provide a valve in which the gas flow to one, two or more burners in a radiant heater may be controlled, relying upon a simple and effective mechanism that may be easily worked. The object of the invention is also the arrangement of the valve close to the burners in order to avoid the respective gas flow ducts and connectors.

BACKGROUND OF THE INVENTION

[0003] In radiant heaters, irrespective of the number of burners and therefore of plates, the valve with which the gas flow to such burners and towards the actual lighting system is controlled, is mounted in an area close to the respective control knob, specifically in contact therewith, which results in the actual valve lying at a distance from the burners, thereby requiring gas ducts to be laid out from said valve to the various burners existing at each radiant plate.

[0004] Naturally, the need to have gas ducts leading from the valve to the burners also results in the need to use respective connectors and sealing gaskets. Even if high quality materials are used and checks or controls are regularly or frequently made, there is clearly a risk of potential leakage, for the existence of rather long ducts and connectors between the valve outlets and their coupling to the burners doubtless results in the possibility of gas leakage occurring, with the ensuing serious and indeed deadly consequences of this.

DESCRIPTION OF THE INVENTION

[0005] The valve disclosed herein solves the aforesaid drawbacks based upon a new approach as regards construction, operation and indeed arrangement within the heater as a whole.

[0006] More specifically, the valve of the invention comprises, as is conventionally the case, a tubular body with a branch for the gas main to be coupled, another branch for the duct supplying the burner, and a bore for mounting the elements that open and shut the outlet toward the burners, and for mounting the control knob.

[0007] Based upon these characteristics, the structure of the inventive valve is particular in that it is on the one hand assembled close to the burners, being coupled thereto through ducts provided in the actual valve, without there being any need for the classic conventional ducts required in conventional radiant heaters, which gas ducts and their connectors and sealing gaskets are therefore eliminated, thereby for the cost of the heater to

be reduced, because parts are eliminated, and for the risk of gas leakage to be improved.

[0008] Furthermore, the valve body includes an axial bore in which a shaft, which is axially arranged with respect to another shaft upon which the control knob is mounted, is slidable, both of which shafts are biased towards an idle position in which the supply of gas both to the ducts coupled to the burners and the duct supplying the lighting system is hence cut off.

[0009] The inner shaft can be driven by pushing the outer shaft against the action of a spring, and therefore upon said outer shaft being pushed inwards, the internal shaft slides, which results in a gasket being moved by the free end of said inner shaft against the action of a spring, which gasket when at rest tends to shut off the flow or communication between the branch through which gas is supplied to the valve and the duct leading towards the first burner. Thus, upon said gasket being displaced, flow is allowed towards the first burner, the gas flow towards the second burner remaining cut off because said axial inner shaft includes another gasket acting as a gas-tight shutting means to prevent flow towards such second burner.

[0010] In order for opening to take place and hence for gas to flow and be communicated towards the second burner, the outer shaft or, in other words, the control knob, must stop being pushed, whereupon the shaft will tend to retrieve the original position due to the spring associated therewith, which outer shaft must concurrently be turned to allow the inner axial shaft to move back and thereby the latter's gasket to move to enable a flow towards the second burner, which outer shaft must be turned in order for a spigot solidly attached thereto to run along a peripheral groove or slot of the valve body and thereby allow the retraction of said outer shaft of the control knob and hence the axial shaft opening and shutting off the flow to the respective burners.

[0011] Consequently, the main characteristics of the valve lie in the fact that it includes or is provided with two sliding axial shafts, both of which are associated with return springs, the outer shaft having cotter means in order that, upon being turned, it may be moved backwards and hence so may the inner axial shaft be moved in order for gas flow to be opened or communicated with the burners.

[0012] As was also noted before, it is a novel feature of the invention that the general valve body be mounted close to the actual burners, thereby eliminating gas flow ducts and connectors, avoiding possible risks of leakage in conventionally required installations.

DESCRIPTION OF THE DRAWINGS

[0013] In order to provide a fuller description and contribute to the complete understanding of the characteristics of this invention, in accordance with a preferred practical embodiment thereof, a set of drawings is attached hereto as an integral part of the specification

which, while purely illustrative and not fully comprehensive, shows the following:

Figure 1.- Is a schematic elevation view of a radiant heater having two plates, and of the burners and the respective valve made in accordance with the object of the present invention, as indeed of the lighting system ducts. Said figure shows the valve when idle or cut off both for the lighting system and for the actual burners.

Figure 2.- Is a view as in the preceding figure, albeit in this case with the valve in a position in which the inner axial shaft has been displaced in order to open the flow of gas to the lighting system duct and to the duct supplying one of the heater's two burners.

Figure 3.- Is a view similar to the preceding one, albeit in this case with the valve operated in such a way as to allow flow not only to the duct supplying the lighting system and the first burner, but also to the duct allowing gas to flow to the second burner.

PREFERRED EMBODIMENT OF THE INVENTION

[0014] With reference to the foregoing figures, the valve subject of the invention, generally designated with reference numeral (1), applies to any type of radiant heater which, in the case in hand, is a heater (2) having a pair of plates (3) and (3') which may be supplied through their respective burners (4) and (4'), the heater moreover including the corresponding lighting system (5) with a duct (6) through which gas is supplied to such lighting system (5), all as is conventionally the case.

[0015] Furthermore, and as is also conventionally the case, the valve (1) of the invention includes a branch (7) for the general gas main (8) to be coupled, and therefore based upon all of these characteristics, said valve (1) is particular in that it is fitted with a pair of branches (9) and (9') through which the valve (1) is coupled directly to the burners (4) and (4'). In other words, said valve (1) is mounted or arranged within the heater as a whole in an area close to the heater's actual burners, which means that there are no conventionally required gas flow ducts and all risk of leakage is therefore avoided.

[0016] The valve (1) moreover has an axial bore (10) within which an inner axial shaft (11) having an annular stop (12) at approximately the midpoint is slidably mounted, said shaft (11) being associated with a spring (13) which constantly biases same inwards, said sliding being limited by a sealing gasket (14). The inner free end of said shaft (11) faces a gasket (15) which shuts off the gas flow into the valve when the valve is in the idle position shown in figure 1, whereas the gasket 14, as shown in figure 2, is the means shutting off the gas flow to the second burner (4').

[0017] Facing the inner axial shaft (11) is another shaft (16) whose outer end terminates in a head (17) in which the respective control knob may be coupled, said outer shaft (16) being constantly biased by a spring (18) and further having a spigot (19) which plays within a peripheral groove serving as a cotter (20), provided in the actual valve body (1).

[0018] In accordance with these characteristics, the valve works as follows:

[0019] Starting from the position shown in figure 1, in which the valve is not working, i.e. it is idle and there is hence no gas flow towards the burners (4) and (4'), nor indeed towards the lighting system (5), if the knob coupled to the end or head (17) of the outer axial shaft (16) is actuated, pushing the shaft inwards by pressing such knob, then upon sliding from the position of said shaft (16) shown in figure 1, the axial shaft (11) is pushed inwards. Said sliding results in the gasket (15) being pushed against the action of a spring (21) associated with said gasket (15), which separation will let gas in towards the bore (10) of the valve body, and thus gas flow towards the first burner (4) shown in figure 2. However, in this position, the burner (4') receives no supply, for the gas flow towards such burner is cut off by the gasket (14), which remains lying against the end of the axial bore (10), thus preventing the arrival of gas towards the second burner (4'), said gasket (14) being actually pushed by the spring (13) associated with the aforesaid inner axial shaft (11).

[0020] Starting from said position of figure 2, in which the gas reaches the burner (4) and the radiant plate (3) of the heater is therefore on, in order for the second plate (3') to be lit, it will be necessary to stop pushing or pressing the shaft (16), the latter shaft tending to retrieve its outward position by action of the spring (18), whereupon it will no longer push the inner axial shaft (11), although gas will continue to enter the duct (10) because the gasket (11) will be kept drawn away from the entry to such duct or bore (10) attracted by an electromagnet, as is conventionally the case.

[0021] As said shaft (16) slides backwards, once it is no longer pushed, by action of the spring (18), it must be turned in order for its spigot (19) to run along the groove or cotter-like slot (20) provided in the valve body, which turning action allows said shaft (16) to slide back and hence the inner axial shaft (11) to similarly slide backwards, the gasket (14) being drawn away from the rear end of the bore or duct (10) and therefore allowing gas to flow towards the second burner (4'), as shown in figure 3.

[0022] We feel that the description need not be extended any longer for any expert in the art to have grasped the full scope of the invention and the advantages it offers.

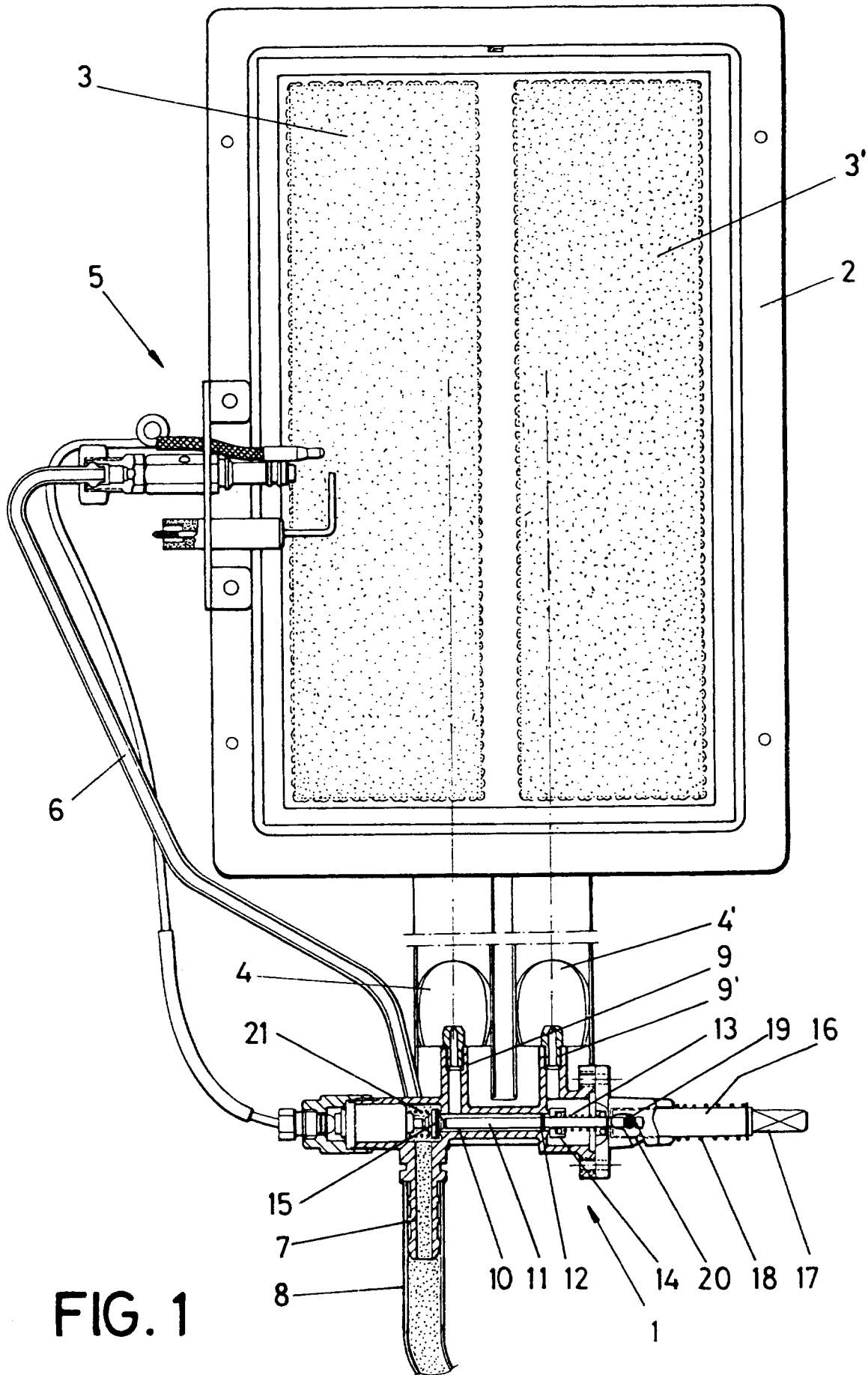
[0023] The materials, shape, size and layout of the elements may be altered provided that this entails no modification of the essential features of the invention.

[0024] The terms used to describe the invention

herein should be taken to have a broad rather than a restrictive meaning.

Claims

1. A gas flow control valve in radiant heaters, applicable to heaters having several radiant plates supplied through the respective burners, which heaters are provided with the conventional lighting system, and wherein the subject valve consists of a tubular body with a side branch for the respective gas main to be coupled, and having means, such as an electromagnet, for keeping the gas flow towards the valve and towards the lighting system open once the valve has been actuated, essentially characterised in that the tubular body of the valve as such is axially and correlatively fitted with two shafts associated with two springs, the inner shaft constituting the means opening the gas flow both towards the burners and towards the actual lighting system, whereas the second and outermost shaft is linked to the respective control knob and constitutes the means pushing and/or releasing said inner axial shaft to allow gas to flow towards all the burners, said hand-driven outer shaft being moreover provided to have a spigot which, upon being turned, plays within a peripheral groove or slot serving as a cotter provided in the actual valve body. 5 10 15 20 25
2. A gas flow control valve in radiant heaters, as in claim one, characterised in that the inner axial shaft has its inner end facing the respective gasket shutting off the flow of mains gas into the valve body, and therefore upon pushing said axial shaft inwards, said gasket is moved and gas therefore flows towards the valve body and towards the first burner. 30 35
3. A gas flow control valve in radiant heaters, as in the preceding claims, characterised in that the inner axial shaft has a gasket shutting off the passage of gas towards the second burner, when it lies against the rear end of the duct of the valve body in which said axial shaft slides, which gasket moves away from said end and allows gas to flow towards the second burner when the outer shaft associated with the respective knob is operated. 40 45
4. A gas flow control valve in radiant heaters, as in claim one, characterised in that the valve body has a pair of side branches through which said valve body is coupled directly to the heater's respective burners, without the installation requiring any gas flow ducts or connectors. 50 55



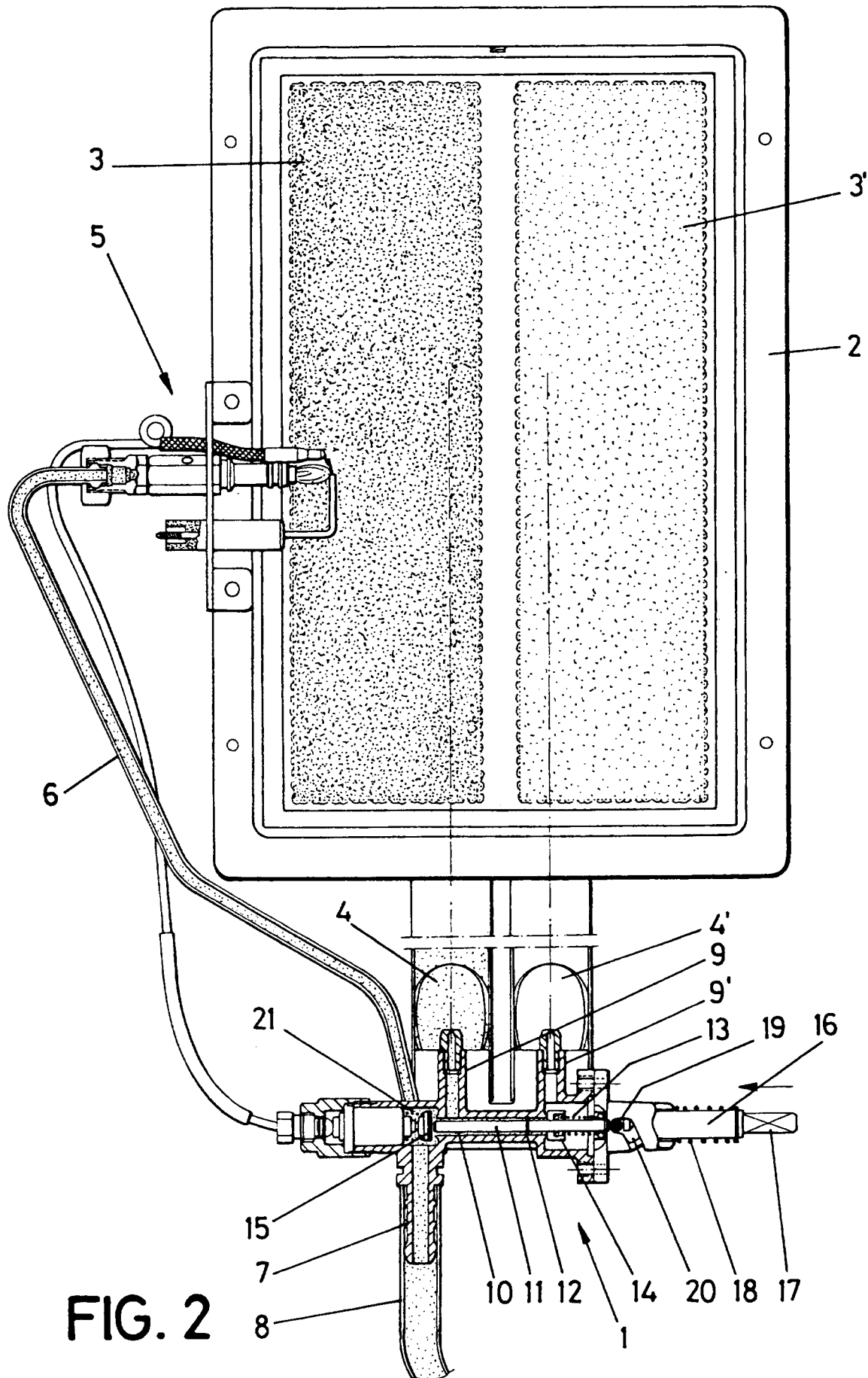


FIG. 2

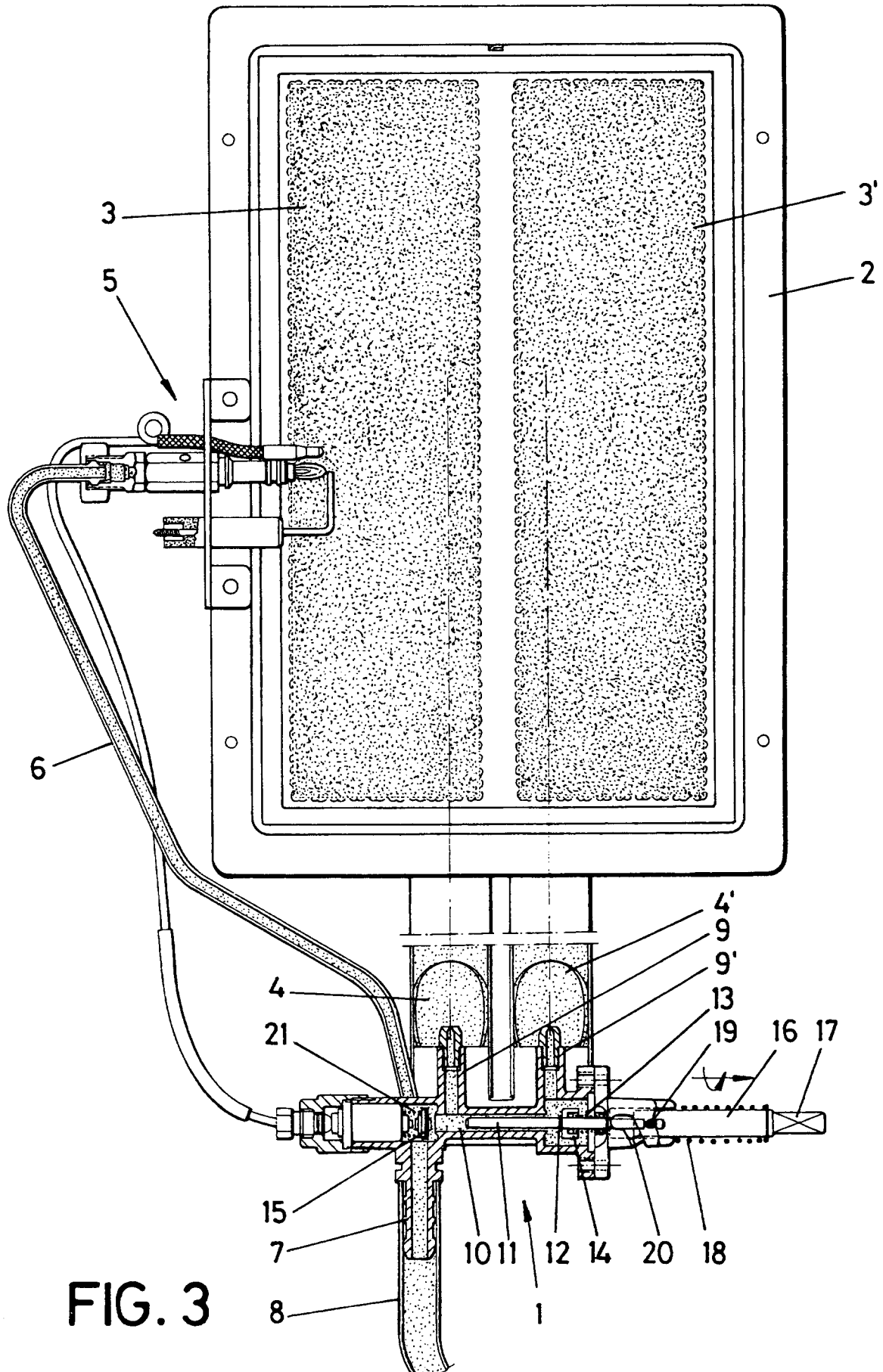


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 98/00113

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁶ F23N1/00;5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁶ F23N; F23D; F16K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, CIBEPAT, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES-8 406 698-A (SAUNIER DUVAL) 21 May 1984 (21.05.84) * line 81-209; figures 1-3 *	1-3
A	EP-0 281 269-A (BULLFINCH) 07 September 1988 (07.09.88) The whole document	1-3
A	US-4 1417 494-A (ANDO et al.) 03 April 1979 (03.04.79)	1

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

25 June 1998 (25.06.98)

Date of mailing of the international search report

9 July 1998 (09.07.98)

Name and mailing address of the ISA/

SPT0

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