(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 733 860 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
25.09.1996 Bulletin 1996/39

(51) Int Cl.[6]: **F23Q 23/08**, F23Q 9/04

(21) Application number: **96301921.1**

(22) Date of filing: **20.03.1996**

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

(30) Priority: **21.03.1995 GB 9505632**

(71) Applicant: **ROBINSON WILLEY LIMITED**
Old Swan, Liverpool L13 4AJ (GB)

(72) Inventor: **Charmer, Robert**
Chorley, Lancashire PR6 7JS (GB)

(74) Representative:
Gilmour, David Cedric Franklyn et al
POTTS, KERR & CO.
15 Hamilton Square
Birkenhead Merseyside L41 6BR (GB)

Remarks:
Claim 12 is deemed to be abandoned due to non-payment of the claims fee (Rule 31 (2) EPC).

(54) Testing device for gas pilot light

(57) A portable device for testing the performance of an oxygen-depletion-sensing pilot light jet comprising a reservoir for containing a gas mixture which has an oxygen content just below the level at which the oxygen-depletion-sensing pilot light should safely operate, a gas mixture flow control means in communication or communicable with gas mixture applicator means; said applicator means in a first arrangement permitting said gas mixture to flow from said flow control means to atmosphere at ambient pressure and said applicator means including a supply duct locatable adjacent and/or over the air inlet aperture of an oxygen-depletion-sensing pilot light jet to supply said gas mixture thereto at ambient atmospheric pressure, or in a second arrangement said applicator means comprising a housing locatable to surround an oxygen-depletion-sensing pilot light jet and the air inlet aperture therefor and preferably also the ignition means for the pilot light, to enable supply said gas mixture to the air inlet aperture and to provide said gas mixture as a localised ambient environment to the pilot light.

EP 0 733 860 A2

Description

The present invention relates to a testing device for a gas pilot light and more particularly to a portable device for testing the performance of an oxygen-depletion cut-out system of a gas fire or other gas appliance.

It is important from a safety point of view to ensure that a gas fire or other gas appliance does not continue to burn when the level of oxygen in a room falls below a safe-level for example, as a result of carbon monoxide/dioxide being returned to the room because of a blocked flue. An oxygen-depletion sensing (ODS) pilot jet has been designed such that the pilot light jet has two flames - one directed to the region of the main gas burner and the other directed to a thermocouple. Oxygen is supplied to said flames via an air inlet aperture in the pilot gas supply line and the pilot light device and the air inlet aperture are designed such that in normal conditions, the pilot flames are stable but such that should the oxygen level being supplied to the air inlet aperture drop below the requisite level, the flame becomes unstable and the flame acting on the thermocouple ceases to act on such with the result that the main gas valve supplying the gas fire or like installation shuts off the gas supply to the main burner. Such oxygen-depletion sensing pilot lights (ODS pilot lights) are known and comprise an important safety device and it is a testing device for such with which the present invention is concerned.

With the increasing requirements for safety monitoring in respect of gas appliances, the present invention is concerned with providing a method and apparatus for testing or assessing the performance of an oxygen depletion pilot light to ensure that it is still functioning correctly after the device has been in use some time.

According to the present invention there is provided a portable device for testing the performance of an oxygen-depletion-sensing pilot light jet comprising a reservoir for containing a gas mixture which has an oxygen content just below the level at which the oxygen-depletion-sensing pilot light should safely operate, a gas mixture flow control means in communication or communicable with gas mixture applicator means; said applicator means in a first arrangement permitting said gas mixture to flow from said flow control means to atmosphere at ambient pressure and said applicator means including a supply duct locatable adjacent and/or over the air inlet aperture of an oxygen-depletion-sensing pilot light jet to supply said gas mixture thereto at ambient atmospheric pressure, or in a second arrangement said applicator means comprising a housing locatable to surround an oxygen-depletion-sensing pilot light jet and the air inlet aperture therefor and preferably also the ignition means for the pilot light, to enable supply said gas mixture to the air inlet aperture and to provide said gas mixture as a localised ambient environment to the pilot light.

Preferably in the first arrangement the free end of the supply duct will be so shaped as to be closely locatable against the surface surrounding the air inlet aperture of the pilot light and may possibly have sealing means which may be provided in different replaceable forms as an adaptor to different surfaces. Attachment means may also be provided for releasably holding said supply duct over said air inlet aperture.

The applicator means preferably has a main duct or chimney-like member for venting the gas mixture to atmosphere. The applicator means is preferably in the form of a main tubular member with a normally lowermost inlet aperture in communication via the gas mixture flow control means (valve) of the gas mixture reservoir and having said supply duct extending therefrom and preferably at right angles and preferably from a normally lower region adjacent but spaced from the valve to enable supply at atmospheric pressure. It is important that the gas mixture of the testing device should not be applied to the air inlet aperture of the pilot light jet at other than ambient atmospheric pressure or substantially ambient pressure since an inaccurate test might otherwise result.

In the alternative second arrangement of the applicator means according to the invention such comprises a housing which encloses the whole of the ODS pilot light including the air inlet therefor to provide an ambient atmosphere of said gas mixture for the whole of the pilot light and its flame and preferably the ignition device although an opening may be provided in the housing to permit the pilot light to ignite the adjacent burner in normal manner although preferably the supply to the burner is closed so that only the pilot light is lit. At least one wall portion of the housing will preferably be removable to permit location of the housing over the pilot jet. It is expected that for each range of fire, an especially shaped housing will have to be provided and contoured such as to enable the housing to locate on and around the pilot and its ignition device and such as to prevent or minimize any inflow of ambient air.

Also according to the present invention a method of testing the performance of an oxygen depletion sensing pilot light jet of a gas fire or other gas appliance insitue, comprises applying an oxygen depleted gas mixture to at least the air inlet of said pilot jet and when the pilot light is lit, and determining whether the pilot flame ceases to act upon the thermocouple of the appliance so as to cut off the main gas supply.

Preferably in the second arrangement at least, the housing will be located around at least the pilot jet with the inlet in the housing for the gas mixture initially being open to atmosphere so that the pilot flame becomes stable once the adjacent metals become heated. The reservoir containing the depleted oxygen gas mixture is then connected to the inlet or communicates therewith such that said gas mixture enters the housing either by being drawn in by the flame burning and/or by being under slight pressure.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is a schematic part section part elevation of a portable testing device forming one embodiment of the first arrangement of the invention illustrated located in position against an oxygen depletion sensing pilot jet; and

Fig. 2 is a schematic perspective view of a further portable testing device forming a second embodiment of the second arrangement of the invention.

A testing device according to the present invention is intended for use with an oxygen depletion sensing gas pilot nozzle or jet 1 (such as sold under the trade mark "SIT") which in use has a gas outlet duct and flame 2 directed to the main gas burners (not shown) of the gas fire (not shown) and a thermocouple, gas outlet duct and flame 3 directed to play the flame against a thermocouple 6 with said pilot light being ignitable by a piezo-electric device 7 in known manner. The gas is supplied to the pilot jet 1 via duct 5 and an air inlet aperture 4 is provided in the pilot light jet 1 which jet is designed in known manner such that under normal conditions of operation with the requisite amount of oxygen, the flames from apertures 2 and 3 are just on the limit of stability and such that when the level of oxygen entering through aperture 4 drops below the safe level, flame 3 becomes unstable and ceases to burn and play against thermocouple 6 with the result that the thermocouple acts via an electromagnetic valve (not shown) to cut off the gas supply to the fire in known manner.

A testing device 8 according to the present invention comprises a pressurized or pressurizable gas bottle 9 forming a reservoir for a gas mixture which has an oxygen content at least just below the level of oxygen required for safe operation of the gas fire. The gas bottle 9 is secured by threaded means 10 to a duct leading via a valve 11 to an applicator means 12. The applicator means 12 comprises a main chimney or tubular body 13 with its normally upper end 13' open to atmosphere and with the tubular body 13 being of a sufficiently large size as to enable gas exiting from the reservoir bottle 9 to be at ambient atmospheric pressure. An applicator or supply duct 14 extends laterally of the main duct 13 and is locatable over the air inlet aperture 4 of the pilot jet 1 and the whole device is designed such that the test gas flowing from bottle 9 is at atmospheric or substantially atmospheric pressure as it enters the air inlet aperture 4 so as to give a proper test result.

In this respect, the pressure of gas being permitted to flow through valve 11 and the dimensioning of the main duct means 13 and supply duct 14 should be dimensioned to enable gas mixture at or substantially at atmospheric pressure to be applied to the aperture 4. Suitable sealing means 15 such as in the form of an annular resilient ring may be provided at the edge of the free end of supply duct 14 to ensure proper sealing against the surfaces surrounding inlet aperture 4. The end of duct 14 may be appropriately shaped to fit against said surrounding surfaces.

It is even envisaged that the free end of duct 14 may have different seating pieces securable thereon as adaptors to different feed pipes for different pilot jets depending on the fire being tested and to ensure a proper sealing/seating. Additionally, releasable securement means, such as a clip, may be provided for releasably securing the supply duct 14 in position over the aperture 4. Instead of a supply duct 14, an open collar or other open channel means may be provided to surround or partially surround the pilot jet feed pipe in the region of inlet aperture 4 to provide said mixture thereto.

In practice, the pilot flame will be first lit and allowed to become stable by the heating up of adjacent surfaces before the gas mixture is allowed to be drawn in.

In the embodiment of Fig. 2, a portable box-like housing 16 is provided having a transparent viewing window 17 of suitable heat resistant glass to enable the pilot jets 2 and 3 to be viewed. In Fig. 2, the electrode 7 of the piezo-electric device and the thermocouple 6 have been omitted for the sake of clarity but such will be encompassed within the housing.

The reservoir 9 for said oxygen depleted gas mixture which contains oxygen just below the level at which the oxygen-depletion-sensing pilot light should operate, is connected via pipe 18 and an inlet aperture 18' in the housing base to the interior of the housing 16. Control valve 11 is also provided to control the gas mixture flow.

An outlet aperture 19 is provided in the rear of the housing 16 (or the top) to vent the gas mixture from reservoir 9 to atmosphere at atmospheric pressure. It will be appreciated that the housing 16 also surrounds the air inlet 4. By providing the housing to surround all the ignition and nozzle and flame area a more accurate representation of oxygen depletion is created for the test purposes.

It will be appreciated that because the pilot jet 1, thermocouple 6 and ignition electrode 7 are mounted on a support bracket 20 which is detachably mounted on the gas fire in a position to enable the flame from nozzle 2 to ignite the gas burner (not shown), it will be necessary to construct the housing 16 in parts (not shown) to permit mounting on the requisite surrounding manner. For example, the housing 16 may have a removable or separable bottom panel. Alternatively, and preferably the lower half of the back panel of housing may be detachably removable to permit location of housing 16 and then be mounted in part or completely to close the bottom part. If need be the support bracket for the pilot jet may be loosened or removed to permit location. It is even envisaged that each gas fire may be constructed to include a side wall part and preferably releasable retaining means for the housing 16 to facilitate the mounting and testing operation.

In its broadest aspect the method of the present invention may be performed by an operator inhaling and simply blowing air gently through a duct such as a straw or tube, to the region of the inlet 4.

Whilst an air mixture of 2% carbon dioxide in air has

been mentioned, any suitable gas mixture may be provided to represent oxygen depleted air.

Claims

1. A portable device for testing the performance of an oxygen-depletion-sensing pilot light jet comprising a reservoir for containing a gas mixture which has an oxygen content just below the level at which the oxygen-depletion-sensing pilot light should safely operate, a gas mixture flow control means in communication or communicable with gas mixture applicator means; said applicator means in a first arrangement permitting said gas mixture to flow from said flow control means to atmosphere at ambient pressure and said applicator means including a supply duct locatable adjacent and/or over the air inlet aperture of an oxygen-depletion-sensing pilot light jet to supply said gas mixture thereto at ambient atmospheric pressure, or in a second arrangement said applicator means comprising a housing locatable to surround an oxygen-depletion-sensing pilot light jet and the air inlet aperture therefor and preferably also the ignition means for the pilot light, to enable supply said gas mixture to the air inlet aperture and to provide said gas mixture as a localised ambient environment to the pilot light.

2. A device as claimed in claim 1, in which the free end of the supply duct is so shaped as to be closely locatable against the surface surrounding the air inlet aperture of the pilot light.

3. A device as claimed in claim 2, in which the free end has sealing means for sealing against said surrounding surface.

4. A device as claimed in claim 3, in which the sealing means is provided in different replaceable forms as an adaptor to different surfaces.

5. A device as claimed in any of claims 1 to 4, in which attachment means are provided for releasably holding said supply duct over said air inlet aperture.

6. A device as claimed in any of claims 1 to 5, in which the applicator means has a main duct or chimney-like member for venting the gas mixture to atmosphere.

7. A device as claimed in claim 6, in which the applicator means is in the form of a main tubular member with a normally lower-most inlet aperture in communication via the gas mixture flow control means (valve) of the gas mixture reservoir and having said supply duct extending therefrom.

8. A device as claimed in claim 7, in which said supply duct extends from a normally lower region adjacent but spaced from the valve to enable supply at atmospheric pressure.

9. A device as claimed in claim 1, in which where the applicator means is a housing which encloses the whole of the ODS pilot light including the air inlet therefor to provide an ambient atmosphere of said gas mixture for substantially the whole of the pilot light and its flame except for an opening provided in the housing to permit the pilot light to ignite the adjacent burner in normal manner.

10. A device as claimed in claim 9, in which at least one wall portion of the housing is removable to permit location of the housing over a pilot jet.

11. A device as claimed in claim 9 or 10, in which the housing is also such as to be capable of surrounding the ignition means for a pilot light.

12. A portable device for testing the performance of an oxygen-depletion-sensing pilot light jet substantially as herein described with reference to Fig. 1 or to Fig. 2 of the accompanying drawings.

13. A method of testing the performance of an oxygen depletion sensing pilot light jet of a gas fire or other gas appliance in situ, comprising applying an oxygen depleted gas mixture to at least the air inlet of said pilot jet and when the pilot light is lit, and determining whether the pilot flame ceases to act upon the thermocouple of the appliance so as to cut off the main gas supply.

14. A method as claimed in claim 13, in which the oxygen depleted mixture is applied by an operator inhaling and simply blowing air gently through a duct, such as, for example, a straw or tube, to the region of the inlet.

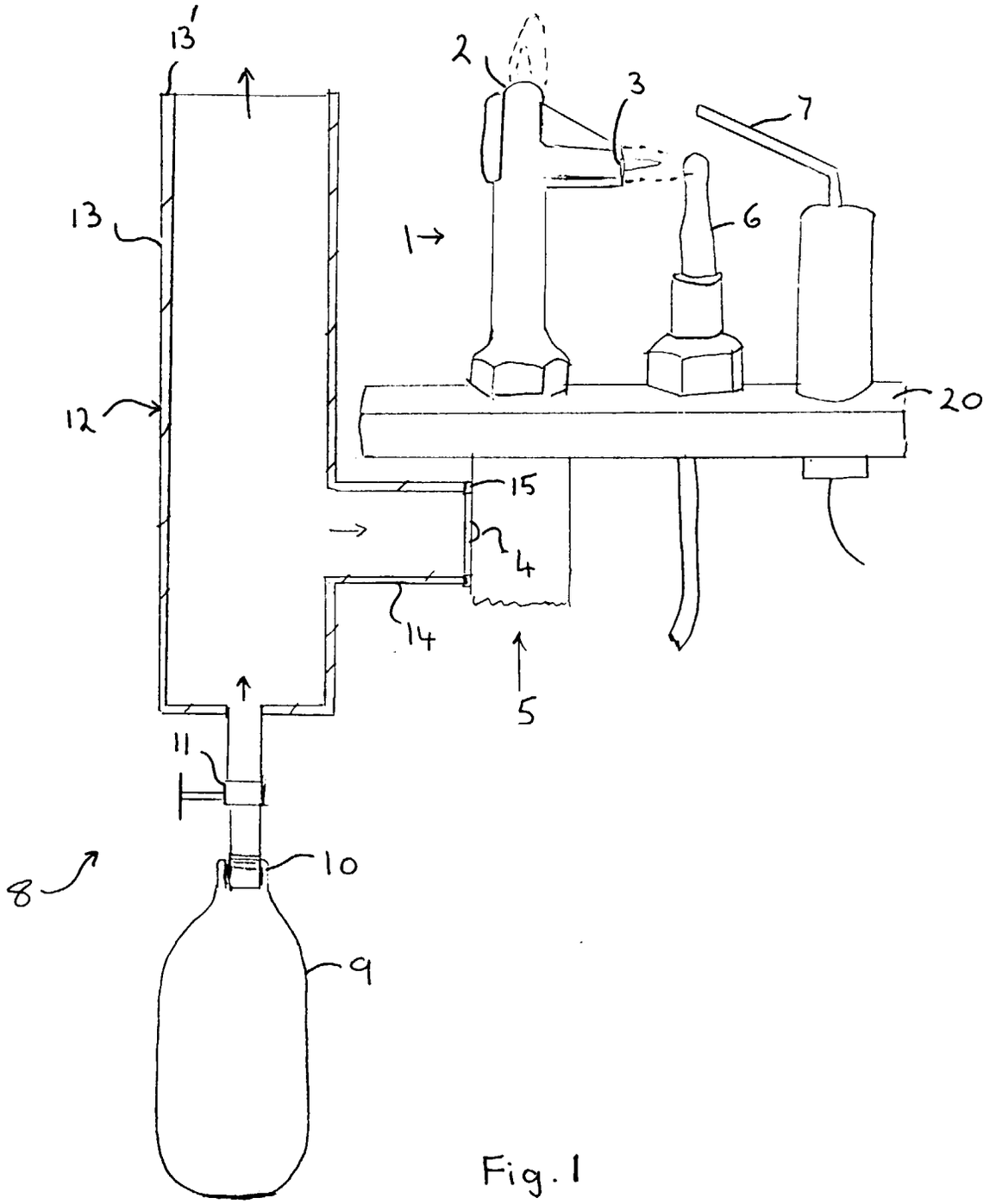

Fig. 1

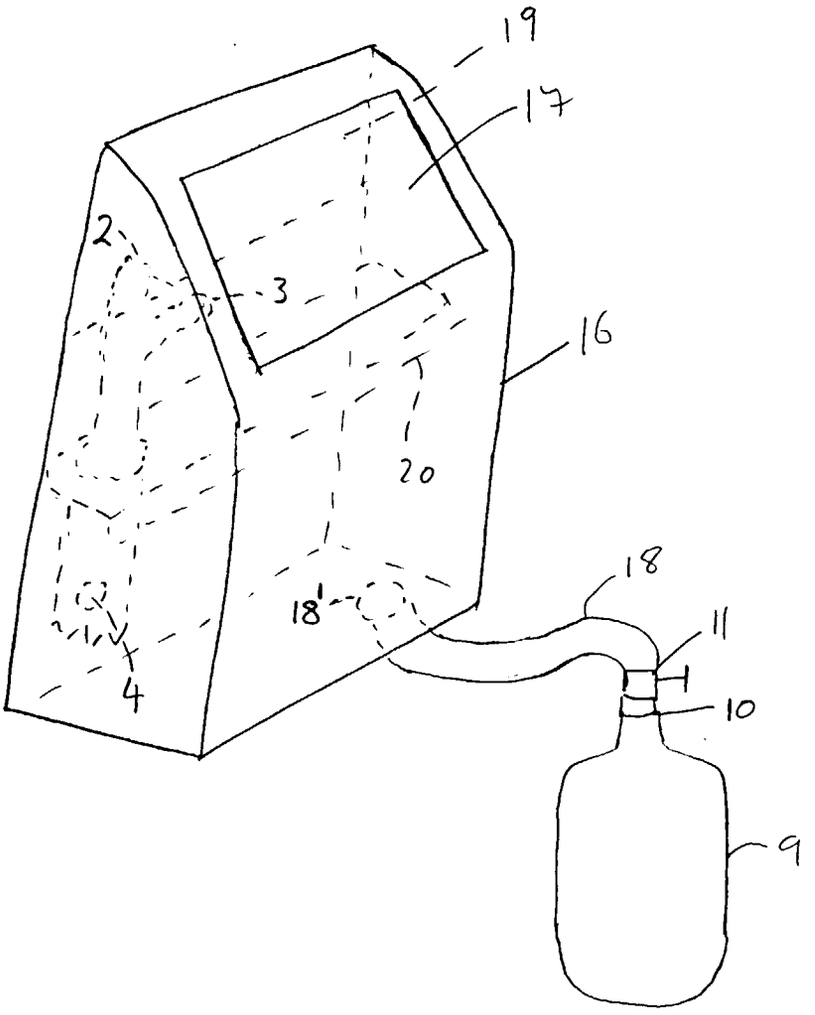

Fig.2