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(54) SEALING ARRANGEMENT FOR USE IN A
 COMBUSTION ASSEMBLY

(71) We, LUCAS INDUSTRIES LIMITED, a British company, of Great King Street, Birmingham B19 2XF, do hereby declare the invention for which we pray that a patent
 5 may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to a sealing
 10 arrangement for use in a combustion assembly particularly, though not exclusively, in a gas turbine engine.

According to one aspect of the present
 15 invention, there is provided a sealing arrangement for use in a combustion assembly, comprising a first member having therein a first aperture which is arranged to
 20 accommodate a fuel spray device, with clearance and a second aperture which is arranged to accommodate an igniter such that the first member is located by said
 25 igniter in use, and a second member having therein a first aperture which is arranged to accommodate the fuel spray device such that the second member is located by said
 30 fuel spray device in use and a second aperture which is arranged to accommodate the igniter with clearance, the first and second members being relatively movable.

According to another aspect of the present
 35 invention, there is provided a combustion assembly comprising a casing, a flame tube disposed within the casing and having opening means therein, an igniter and a fuel
 40 spray device mounted on the casing and disposed in the opening means, and a sealing arrangement for sealing the igniter and fuel spray device in the opening means, the sealing arrangement including first and
 45 second members mounted on the flame tube so as to overlie the opening means, the first member having therein a first aperture through which the fuel spray device extends with clearance and a second aperture
 50 through which the igniter extends, the first member being located by the igniter, the second member having therein a first aperture through which the fuel spray device extends and a second aperture through which the igniter extends with clearance,

the second member being located by the
 fuel spray device, the first and second members being relatively movable so as to
 permit relative axial and radial movement
 between the flame tube and the fuel spray
 55 device and igniter mounted on the casing caused in use by thermal expansion.

Preferably, the first and second members each include a respective plate, the plates
 60 being in mutual facial contact.

The second aperture in the first member can be defined by a grommet which is
 located by the igniter. Similarly, the first
 aperture in the second member also can be
 65 defined by a grommet which is located by the fuel spray device.

The axis of the grommet can be inclined
 to the perpendicular to the plate in the
 second member, where the fuel spray device
 is inclined relative to the igniter. 70

Advantageously, the members rest on a
 wall of the flame tube and are held in position by straps mounted on the flame tube
 wall. Most advantageously, the members
 rest on a platform which stands proud of
 75 the flame tube wall and which surrounds the opening means.

An embodiment of the present invention will now be described, by way of example,
 with reference to the accompanying drawings, in which:— 80

Fig. 1 is a schematic axial sectional view of part of an annular combustion assembly, which forms part of a gas turbine engine, including a sealing arrangement according
 85 to the present invention;

Fig. 2 is a section taken along the line A-A in Fig. 1;

Fig. 3 is an enlarged view of the sealing arrangement of Figs. 1 and 2; and 90

Figs. 4 and 5 are plan views of respective parts of the sealing arrangement of Figs. 1 to 3.

Referring first to Figs. 1 and 2, the combustion apparatus comprises an outer casing
 95 10 on which are mounted an igniter 12 and a fuel spray device 11, the latter having its axis inclined relative to the former. Disposed within the casing 10 is a flame tube 13 which has an opening 14 in its outer 100

wall, through which opening 14 the igniter 12 and fuel spray device 11 extend. A sealing arrangement 15 is provided for substantially sealing the igniter 12 and fuel spray device 11 in the opening 14, although in practice leakage of a small amount of air will occur through the sealing arrangement 15.

The sealing arrangement 15 is shown in detail in Fig. 3; and comprises generally a first seal member 16 and a second seal member 17. The members 16 and 17 rest on a platform 18 which stands proud of the outer wall of the flame tube 13 on the outside thereof and which surrounds the opening 14. An opening 19 is provided in the platform 18, and the members 16 and 17 overlie both the opening 19 and the opening 14 in the flame tube wall.

The seal member 16 (shown in detail in Fig. 4) rests directly on the platform 18, and includes a plate 21 having a first aperture 22 therein through which the fuel spray device 11 extends with clearance, and a grommet 23 mounted on the plate 21. The grommet 23 defines a second aperture in the member 16 through which the igniter 12 extends, the grommet 23 being located by the latter.

The seal member 17 (shown in detail in Fig. 5) rests on top of the seal member 16 and includes a plate 24, which is in facial contact with the plate 21, and a grommet 25 mounted on the plate 24. The grommet 25 defines a first aperture in the member 17 through which the fuel spray device 11 extends, the grommet 25 being located by the latter. A second aperture 26 is provided in the plate 24, and the igniter 12 together with grommet 23 extends through the aperture 26 with clearance.

Because of the inclination of the fuel spray device 11 relative to the igniter 12, the aperture 22 in the member 16 and the grommet 25 of the member 17 have their axes inclined to the perpendicular to the plates 21 and 24.

As can be seen in Fig. 2, the seal members 16 and 17 are held in position on the platform 18 by means of straps 28 which are mounted on the outer wall of the flame tube 13 and which engage the upper surface of the plate 24. The straps 28 serve to urge the plates 21 and 24 into facial engagement, whilst permitting the members 16 and 17 to slide relative to one another in the longitudinal direction of the combustion assembly. The straps 28 also retain the members 16 and 17 in position in a manner which enables the fuel spray device 11 and igniter 12 to be easily re-engaged with the members 16 and 17 after they have been removed therefrom for inspection or servicing. The members 16 and 17 are slidable relative to one another so as to permit

axial and radial movement between the flame tube 13 and the fuel spray device 11 and igniter 12 mounted on the outer casing 10, caused in use by thermal expansion.

As indicated above, the sealing arrangement 15 does not produce a perfect seal, but reduces air leakage therethrough to a minimum.

WHAT WE CLAIM IS:—

1. A sealing arrangement for use in a combustion assembly, comprising a first member having therein a first aperture which is arranged to accommodate a fuel spray device with clearance and a second aperture which is arranged to accommodate an igniter such that the first member is located by said igniter in use, and a second member having therein a first aperture which is arranged to accommodate the fuel spray device such that the second member is located by said fuel spray device in use and a second aperture which is arranged to accommodate the igniter with clearance, the first and second members being relatively movable.

2. A sealing arrangement as claimed in claim 1, wherein the first and second members each include a respective plate, the plates being in mutual facial contact.

3. A sealing arrangement as claimed in claim 1 or 2, wherein the second aperture in the first member is defined by a grommet which is arranged to be located by the igniter in use.

4. A sealing arrangement as claimed in claim 1, 2 or 3, wherein the first aperture in the second member is defined by a grommet which is arranged to be located by the fuel spray device in use.

5. A sealing arrangement as claimed in claim 4, wherein the second member includes a plate, and the axis of said grommet is inclined to the perpendicular to said plate so that the fuel spray device is inclined relative to the igniter in use.

6. A combustion assembly comprising a casing, a flame tube disposed within the casing and having opening means therein an igniter and a fuel spray device mounted on the casing and disposed in the opening means, and a sealing arrangement for sealing the igniter and fuel spray device in the opening means, the sealing arrangement including first and second members mounted on the flame tube so as to overlie the opening means, the first member having therein a first aperture through which the fuel spray device extends with clearance and a second aperture through which the igniter extends, the first member being located by the igniter, the second member having therein a first aperture through which the fuel spray device extends and a second aperture through which the igniter extends with clearance, the second member being located

by the fuel spray device, the first and second members being relatively movable so as to permit relative axial and radial movement between the flame tube and the fuel spray device and igniter mounted on the casing caused in use by thermal expansion.

7. A combustion assembly as claimed in claim 6, wherein the first and second members each include a respective plate, the plates being in mutual facial contact.

8. A combustion assembly as claimed in claim 6 or 7, wherein the second aperture in the first member is defined by a grommet which is located by the igniter.

9. A combustion assembly as claimed in claim 6, 7 or 8, wherein the first aperture in the second member is defined by a grommet which is located by the fuel spray device.

10. A combustion assembly as claimed in claim 9, wherein the fuel spray device is inclined relative to the igniter, the second member includes a plate, and the axis of

said grommet is inclined to the perpendicular to the plate.

11. A combustion assembly as claimed in any one of claims 6 to 10, wherein the members rest on a wall of the flame tube and are held in position by straps mounted on the flame tube wall.

12. A combustion assembly as claimed in claim 11, wherein the members rest on a platform which stands proud of the flame tube wall and which surrounds the opening means.

13. A sealing arrangement for use in a combustion assembly, substantially as hereinbefore described with reference to the accompanying drawings.

14. A combustion assembly substantially as hereinbefore described with reference to the accompanying drawings.

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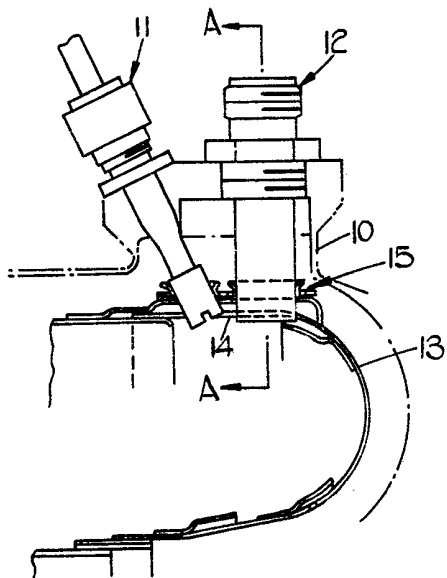


FIG. 1.

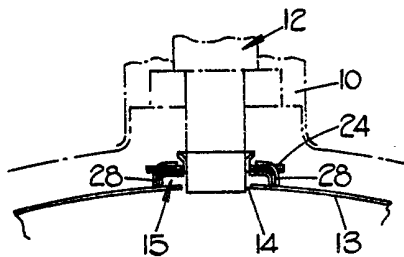


FIG. 2.

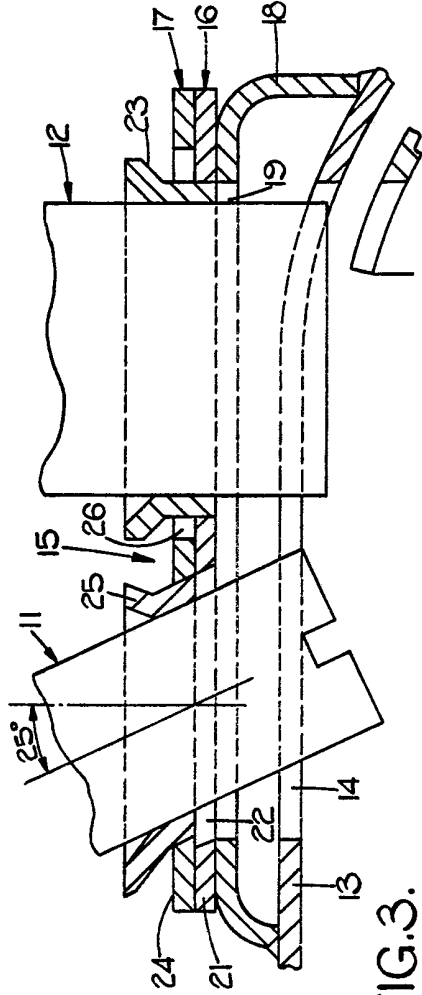


FIG. 3.

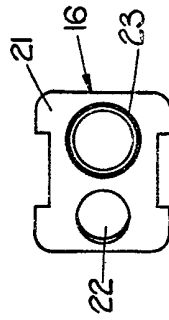


FIG. 4.



FIG. 5.