Aug. 8, 1950 R. H. GODDARD 2,518,002

MEANS FOR FEEDING CONCENTRIC LIQUID SPRAYS TO A ROTATING COMBUSTION CHAMBER

Filed Jan. 2, 1948

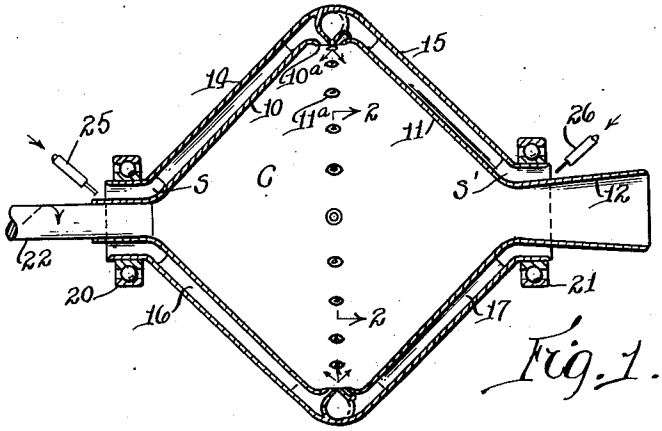

Fig. 1.

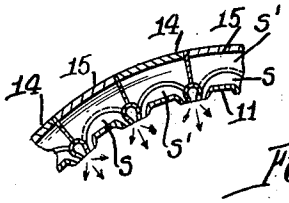

Fig. 2.

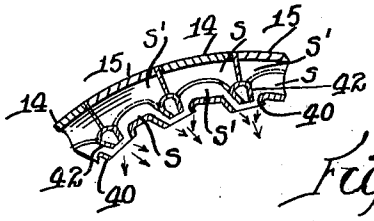

Fig. 4.

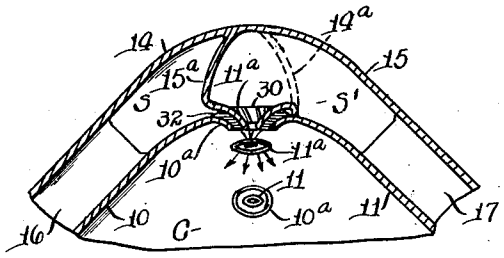

Fig. 3.

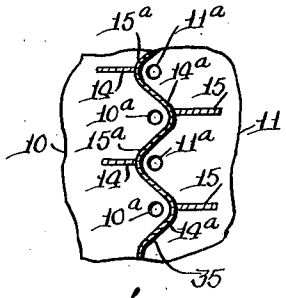

Fig. 5.

Fig. 6. Fig. 7.

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Patented Aug. 8, 1950 2,518,002

UNITED STATES PATENT OFFICE

2,518,002

MEANS FOR FEEDING CONCENTRIC LIQUID SPRAYS TO A ROTATING COMBUSTION CHAMBER

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Application January 2, 1948, Serial No. 82

3 Claims. (Cl. 60—35.6)

1

This invention relates to rotating combustion chambers having rearwardly directed discharge nozzles and as used in propulsion apparatus. It is the general object of this invention to provide improved concentric means for feeding combined sprays of two different combustion liquids to a rotating combustion chamber.

In the preferred form, the concentric sprays are fed to the rotating combustion chamber at the locus of greatest diameter, and are fed by centrifugal force which is developed by the rapid rotation of the combustion chamber.

A further feature of the invention relates to an improved construction by which the relative inner and outer positions of the two combustion liquids in adjacent sprays may be alternated.

The invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

Preferred forms of the invention are shown in the drawing, in which

Fig. 1 is a sectional longitudinal elevation showing one embodiment of this invention;

Fig. 2 is a detail transverse sectional view, taken along the line 2—2 in Fig. 1;

Fig. 3 is an enlarged sectional detail of certain parts shown in Fig. 1;

Fig. 4 is a view similar to Fig. 2 but showing a modified construction;

Fig. 5 is a diagrammatic view to be described; and

Figs. 6 and 7 are perspective views of outer and inner rotator members to be described.

Referring to the drawing, a combustion chamber C is shown as comprising oppositely disposed conical portions 10 and 11 and a rearwardly directed discharge nozzle 12. Jacket casing members 14 and 15 are mounted outside of the combustion chamber portions 10 and 11 and are maintained in spaced relation therefrom by partitions 16 and 17. These partitions divide the jacket spaces S and S' into outwardly extending compartments in which rapid rotation of the liquids supplied to the jacket spaces S and S' will be induced.

The combustion chamber and enclosing casings are mounted in bearings 20 and 21 and are rotatable as a unit therein. A drive shaft 22 is connected to the combustion chamber at the end thereof opposite the nozzle 12. The shaft 22 may be rotated from any convenient source of power.

A combustion liquid, as gasoline, is supplied to the jacket space S through a nozzle 25, and a second combustion liquid, as liquid oxygen, is

2

supplied to the jacket space S' through a second nozzle 26.

At the juncture of the chamber portions 10 and 11 and of the jacket casing members 14 and 15, the casing members are displaced inwardly as shown in Fig. 3 to provide end partitions 14a and 15a which combine to alternately close the ends of the jacket spaces S and S'.

On the section shown in Fig. 3, the space S' communicates with the chamber C through an opening in an inner spray portion 11a of the casing member 11, and the jacket space S communicates with the chamber C through an opening in an outer spray portion 10a of the chamber portion 10.

A spirally ribbed rotator 30 is mounted in the spray portion 11a, and a spirally ribbed rotator ring 32 is mounted in the space between the concentric spray portions 10a and 11a.

With this construction, a rotating spray of one liquid, as gasoline, will be injected under pressure through the outer conical passage between the parts 10a and 11a and around the rotator ring 32, and a rotating spray of a second combustion liquid, as liquid oxygen, will be similarly injected through the opening in the inner part 11a and around the rotator 30.

The outward projection of the jacket casing portions 14 and 15 preferably alternates circumferentially about the chamber C, so that, for each two adjacent combined sprays, the inner and outer relation of the two combustion liquids is reversed.

This alternation is shown diagrammatically in Fig. 5, with the alternately projecting portions indicated as a serpentine partition 35.

In Fig. 4 a modified construction is shown which is similar in construction and operation to that shown in Fig. 2, but in which the spray openings 40 and 41 are tangentially disposed in the direction of rotation of the combustion chamber, so that even more effective intermingling of the combustion liquids may take place.

Having thus described the invention and the advantages thereof, it will be understood that the invention is not to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what is claimed is:

1. In propulsion apparatus having a rotating combustion chamber with opposed and substantially conical jacketed body portions and with a rearwardly-directed discharge nozzle, that improvement which consists in providing devices to deliver concentric sprays of two different combustion liquids from the jacket spaces into said

chamber at each of a series of circumferentially spaced points which are located substantially at the greatest chamber diameter and substantially at the juncture of said opposed conical body portions, and in providing means to supply an inner liquid and an outer liquid concentrically to each delivery device from the jacket spaces, and in providing means to reverse the inner and outer concentric relationship of said liquids in circumferentially adjacent delivery devices.

2. The combination in propulsion apparatus as set forth in claim 1, in which the concentric delivery devices in said circumferential series are tangentially disposed.

3. The combination in propulsion apparatus as set forth in claim 1, in which the end portions of the jacketed body portions comprise a serpentine partition separating the jacket spaces and reversing the delivery of the two liquids as to their inner and outer relationship in circumferentially adjacent concentric sprays.

ESTHER C. GODDARD,
Executrix of the Last Will and Testament of Robert H. Goddard, Deceased.

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