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 [33] **Great Britain**
 [31] **32,737/68**

[56]

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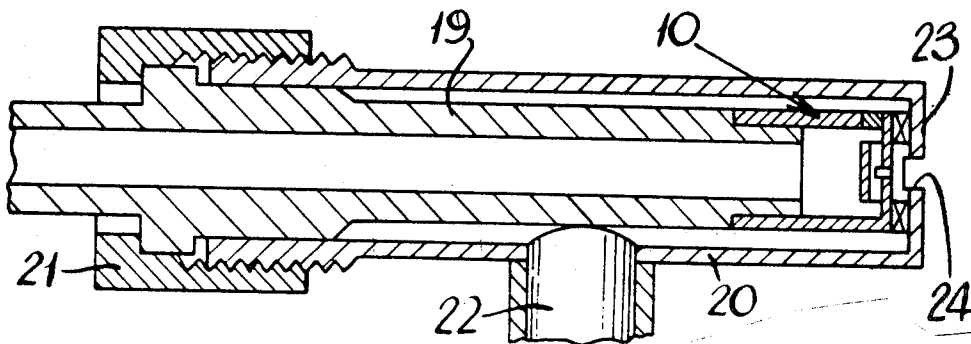
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[54] **LIQUID SPRAY NOZZLES**
3 Claims, 5 Drawing Figs.

[52] U.S. Cl. **239/426,**
239/434, 239/545, 239/597
 [51] Int. Cl. **B05b 1/04**
 [50] Field of Search **239/426,**
434, 601, 422, 593, 595, 597, 599, 596, DIG. 11

ABSTRACT: A liquid spray nozzle consists of a tubular body closed at one end by an end wall. The end wall is formed with an internal annular groove defining an island through which a diametral drilling is formed. A slot in the external surface of the end wall intersects the drilling.

The nozzle assembly also includes an air casing which defines air nozzles positioned to create a flat fan-shaped airflow pattern enclosing the flat fan-shaped liquid spray pattern produced by the nozzle assembly.



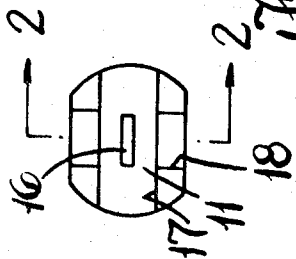


Fig. 1.

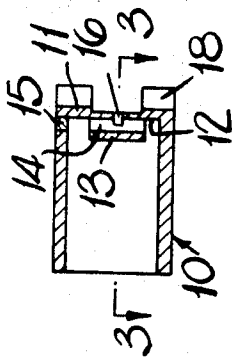


Fig. 2.

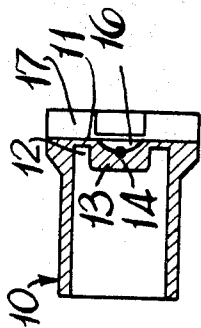


Fig. 3.

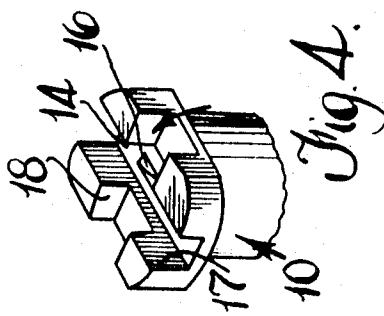


Fig. 4.

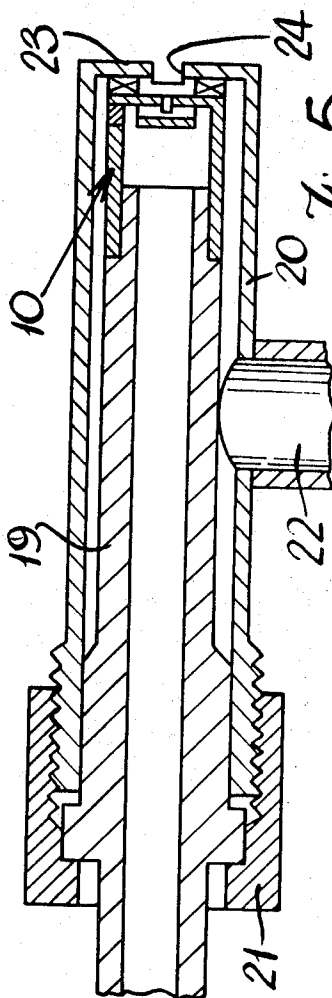


Fig. 5.

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LIQUID SPRAY NOZZLES

This invention relates to liquid spray nozzles and is particularly applicable to spray nozzles for use in burners of gas turbine engines.

A liquid spray nozzle in accordance with the invention comprises a tubular body having an end wall at one end thereof, said wall being formed in its interior surface with an annular groove defining an island through which a diametral bore communicating at its ends with opposite parts of said groove is formed and said end wall also being formed with an external slot extending in a direction transverse to said bore and in communication with said bore.

An example of the invention is illustrated in the accompanying drawings in which

FIG. 1 is an end elevation of the nozzle,

FIG. 2 is a section on line 2—2 in FIG. 1,

FIG. 3 is a section on line 3—3 in FIG. 2,

FIG. 4 is a perspective view of the end of the nozzle and

FIG. 5 is a section showing the nozzle in position in a support.

The nozzle comprises a tubular body 10 having an end wall 11. On the interior surface of this end wall there is formed, by spark erosion or otherwise, an annular groove 12 coaxial with the tubular body 10. This groove 12 defines an internal island 13 through which a bore 14 is formed by drilling. The drilling operation also causes a hole to be formed in one side of the wall of the body and this hole is filled with a plug 15. The bore 14 extends diametrically across the island 13 and communicates at its ends with opposite parts respectively of the groove 12. The external surface of the wall 11 is formed with a further slot 16 which extends perpendicularly to the bore 14 and intersects this bore. Thus, in use, when pressurized liquid is supplied to the interior of the body 10 two streams of liquid flow into the bore 14 from opposite ends thereof respectively and impinge at the center of this bore before being ejected in the form of an atomized spray through the slot 16. When sufficient liquid pressure is available a flat fan-shaped spray is produced.

The end wall of the body in fact forms part of a head which is in the general form of a disc with a pair of opposite portions removed to form flats. The slot 16 is formed in the base of a groove 17 extending diametrically across the outer face of the head. Another groove 18 extends transversely to the groove

17 and extends between the flats mentioned above.

As shown in FIG. 5 the nozzle is mounted for use on a supporting stem 19 through which pressurized liquid is supplied to the interior of the tubular body 10. The stem 19 and the tubular body 10 are enclosed within an outer sleeve 20 attached to the stem 19 by a union nut 21. The sleeve 20 has an inlet 22 for pressurized air which allows air to enter the annular space between the stem 19 and the tubular body 10 and the sleeve 20. The sleeve 20 has an end wall 23 against which the end face of the head of the nozzle abuts. The internal diameter of the sleeve 20 is such that the head is a close fit in this so that, only the grooves 18 communicate directly with the aforementioned annular space. The end wall 23 is formed with a diametral slot 24 aligned with the slot 16 in the nozzle body 10 so that, in use, when pressurized liquid and pressurized air are supplied to the stem 19 and the inlet 22 respectively a fan-shaped airflow pattern enveloping the similarly orientated fan-shaped liquid spray pattern is produced. The airflow assists in the proper atomization of the liquid issuing from the nozzle 10 and enables satisfactory atomization to be achieved even when only very low liquid and air pressures are available.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A liquid spray nozzle comprising a tubular body having an end wall at one end thereof, said wall being formed in its interior surface with an annular groove defining an island through which a diametral bore communicating at its ends with opposite parts of said groove is formed and said end wall also being formed with an external slot extending across the end wall in a direction transverse to said bore and intersecting said bore.

2. A liquid spray nozzle as claimed in claim 1 further comprising an outer sleeve in which the tubular body is fitted, said outer sleeve having an air inlet and a slot in one end overlying the slot in the tubular body, and the outer sleeve and the tubular body defining between them a pair of air nozzles arranged to direct airstreams towards one another in directions transverse to the lengths of said slots.

3. A liquid spray nozzle as claimed in claim 2 in which said end wall of the body forms an enlarged head on the tubular body, said head being formed with a first external groove in which the slot is formed and a second transverse external groove defining said air nozzles.

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