April 15, 1952 W. W. SPOONER 2,593,357

NOZZLE FOR THE EJECTION OF FLUID STREAMS

Filed June 8, 1948

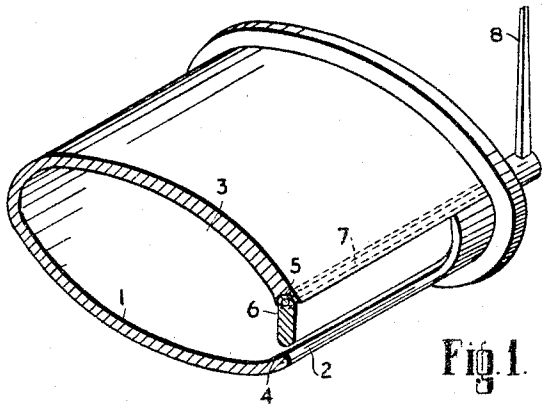


Fig. 1.

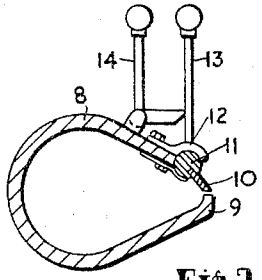


Fig. 2.

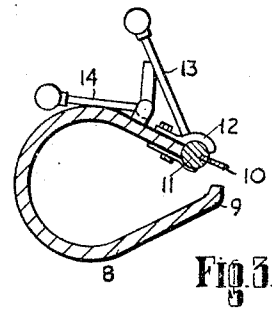


Fig. 3.

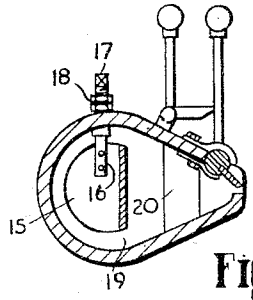


Fig. 5.

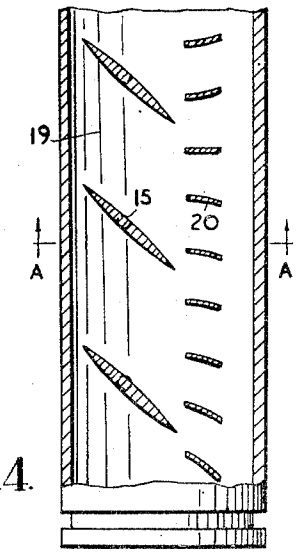


Fig. 4.

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NOZZLE FOR THE EJECTION OF FLUID STREAMS

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3 Claims. (Cl. 299—149)

1

The present invention relates to improvements in nozzles for the ejection of fluid streams.

Where nozzles are used for the ejection of fluid streams such as air, gas or water, taken by way of example, the nozzle is apt to become choked with particles of dust or fibre, and this is particularly the case where, for instance, nozzles are used in washing machines for textile material where the washing liquor is circulated in closed cycle.

According to the present invention the mouth of the nozzle is partly obturated by means of an eccentric element disposed at right angles to the axis of the nozzle and rotatable about a parallel axis to vary the opening of the nozzle.

The invention is further described with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view, partly in section, of one form of nozzle according to this invention,

Fig. 2 is a corresponding view of another form of construction in one position of the parts,

Fig. 3 is a view corresponding to Fig. 2 in another position of the parts,

Fig. 4 is an end sectional elevation of another form of nozzle,

Fig. 5 is a section on the line A—A of Fig. 4.

In a simple form of construction the nozzle is formed by a tubular element 1, roughly oval in cross section, to which fluid under pressure is fed axially of the tubular element from both ends and which is provided with a longitudinal gap or slit 2 from which a stream of fluid at high velocity is ejected, the pressure energy of the fluid within the chamber 3 of the nozzle being converted to kinetic energy in the nozzle gap 4 acting as a venturi.

By this invention the gap 2 or nozzle opening is adjustable by means of a bar 5 mounted in bearings in the element 1 and having an eccentric portion 6, this bar 5 being mounted on a spindle 7 eccentric thereto and which may be provided with an operating handle 8 which may have means to lock it in any desired position of adjustment. It will consequently be seen that by turning the bar 5 about the axis of the spindle 7, the effective width of gap 2 of the nozzle can be adjusted.

Where a plurality of nozzles are used in parallel, a common control element may be provided for their simultaneous adjustment.

In the modified form of construction shown in Fig. 2, the nozzle tube or conduit 8 has a fixed lip 9 and an adjustable lip cooperating with it formed of a flap 10 mounted on a bar 11

2

rotatable in bearings 12, the bar 11 being connected to an operating lever 13 which may be locked in various positions of adjustment by a locking lever 14. When therefore it is desired to clean the nozzle against accumulations of dust or fibre or dirt, the lever 13 can be released by turning down the lever 14 and the flap 10 brought into the position shown in Fig. 3.

Internally of the conduit are provided angularly adjustable vanes or guides such as 15 (Figs. 4 and 5) which conveniently may be in the form of butterfly valves mounted on spindles 16 and provided with adjusting heads 17 and lock nuts 18, so that their angular adjustment may be set as desired. A number of such valves are disposed along the length of the nozzle tube 19 and each is individually adjustable. Cooperating therewith deflectors plates 20 may be provided, either internally or externally of the tube 19, those shown in the drawing being internally disposed thereof, which deflector plates are disposed to radiate outwards from the centre of the nozzle tube 19, so that the emergent stream is directed fanwise from the centre thereof.

This fluid nozzle has a particular scope of utility in connection with washing machines for textiles, as it is now possible to control the effect of the fluid streams impacting upon a web of cloth moved continuously past the nozzle, so that this is acted upon uniformly and does not tend to pucker or run in folds or be displaced sideways by the fluid stream impacting upon it.

Conveniently a pair of such nozzles may be disposed on either side of a continuously moving web of cloth running between them and the nozzles may, if desired, further be submerged in a liquid bath for the treatment of said fabric web.

I declare that what I claim is:

1. A nozzle for the ejection of a fluid stream comprising a conduit having a slit in its wall parallel to its axis, a bar mounted on one side of said slit with its axis parallel to the axis of the slit, a flap projecting therefrom, means to rotate said bar about an axis parallel to said slit to vary its width of opening, and adjustable vanes in planes intersecting said slit at right angles thereto.

2. A nozzle for the ejection of a fluid stream comprising a conduit having a slit in its wall parallel to its axis, a flap one edge of which bounds one side of said slit, means to rotate said flap about an axis spaced away from said edge and parallel to said slit to vary its width of

opening, and adjustable vanes in planes intersecting said slit at right angles thereto.

3. A nozzle for the ejection of a fluid stream comprising a conduit having a slit in its wall parallel to its axis, a bar mounted on one side of said slit with its axis parallel to the axis of the slit, a flap projecting therefrom, means to rotate said bar about an axis parallel to said slit to vary its width of opening, guide vanes disposed within said conduit butterfly valves disposed within said conduit on the opposite side of said guide vanes to said slit, and means to adjust individually said butterfly valves.

WILLIAM WYCLIFFE SPOONER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,290	Kellogg et al.	Aug. 16, 1839
296,225	Schulze-Berge	Apr. 1, 1884
578,400	Gilmore	Mar. 9, 1897
712,209	Stiner	Oct. 28, 1902
768,095	Twist	Aug. 23, 1904
880,644	Fawcett	Mar. 3, 1908
935,745	Dodge	Oct. 5, 1909
1,564,963	Kirgan	Dec. 8, 1925
1,706,020	Barfoed	Mar. 19, 1929
2,154,731	Crowley	Apr. 18, 1939
2,268,014	Bridges	Dec. 30, 1941
2,297,979	Peck	Oct. 6, 1942
2,369,326	Tirrell	Feb. 13, 1945

FOREIGN PATENTS

Number	Country	Date
8,461	Great Britain	Apr. 16, 1908
270,857	Germany	Mar. 4, 1914