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NOZZLE FOR THE EJECTION OF FLUID STREAMS

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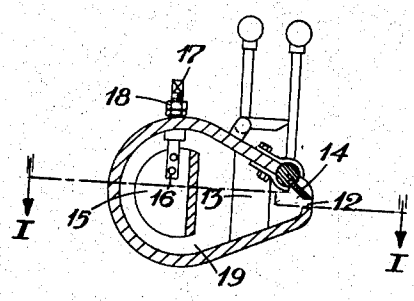


Fig. 2.

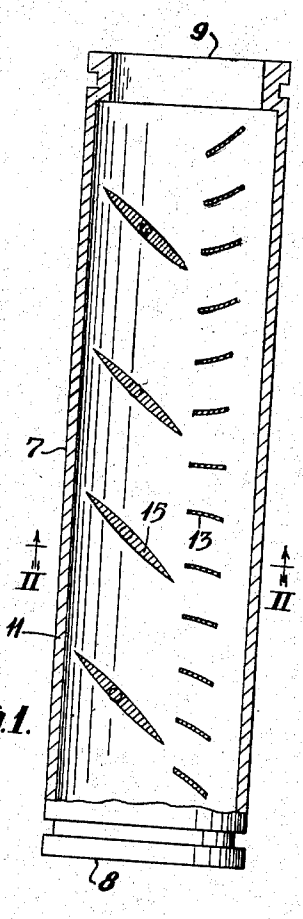


Fig. 1.

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NOZZLE FOR THE EJECTION OF FLUID STREAMS

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Original application June 8, 1948, Serial No. 31,645, now Patent No. 2,593,357, dated April 16, 1952. Divided and this application January 4, 1950, Serial No. 136,688. In Great Britain April 2, 1948

4 Claims. (Cl. 299—138)

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The present invention relates to improvements in nozzles for the ejection of fluid streams of the type in which fluid emerges at high velocity from a slot or slit-like outlet.

An object of the present invention is to control the direction and the pressure or volume, or both, of the emergent stream along the said slit.

According to the present invention a nozzle having a slot or slit-like outlet for the ejection of a fluid stream embodying means to direct the discharging fluid fanwise progressively outwardly towards each end of the nozzle.

According to the present invention a nozzle having a slot or slit-like outlet for the ejection of a fluid stream embodying means to direct the discharging fluid fanwise progressively outwardly from the centre of the nozzle towards each end thereof. Flat or curved baffles are preferably disposed within the nozzle to deflect the fluid discharged therefrom.

According to a further feature of the invention a nozzle comprising a conduit having a longitudinal outlet slit is additionally provided with adjustable vanes in the form of vanes or butterfly valves disposed within the conduit to enable the distribution of fluid emerging from the nozzle throughout its length to be controlled.

Preferably the vanes or butterfly valves are pivoted about an axis substantially perpendicular to the longitudinal axis of the slit.

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, since the stream, when applied transversely of a web of cloth, tends to spread the cloth out sidewardly in both directions from the underneath thereof.

The invention is further described with reference to the accompanying drawings which show by way of example an embodiment of the invention, and in which:

Fig. 1 is a sectional plan view of one form of nozzle embodying the present invention on the line I—I of Fig. 2, and

Fig. 2 is an end sectional elevation along the line II—II of Fig. 1.

The invention is illustrated by way of example with reference to its embodiment in a nozzle such as is described and claimed in my co-pending application No. 31,645, dated June 8, 1948, now Patent No. 2,593,357. The nozzle is formed by a

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tubular element 11 roughly oval in cross section to which fluid under pressure is fed axially from its two open ends 8, 9, and which is provided with a longitudinal slot or slit-like outlet 12 from which a stream of fluid at high velocity is ejected. In the embodiment shown one wall of the nozzle includes a hinged flap or like displaceable part 14 which can be displaced to increase the size of the nozzle outlet for cleaning or clearing purposes, but it will be understood that the present invention is not limited to such a nozzle and it is equally applicable to nozzles having fixed walls. Baffles 13 are disposed within the conduit and are generally positioned so as to direct fluid emerging from the nozzle outwardly from the centre 7 towards the ends 8, 9 of the tubular housing 11. The baffles are directed with increasing angularity outwardly from the axis of said tubular housing towards its two ends 8, 9, according to their distance from the centre 7 of the nozzle. The baffles may be flat but are preferably curved as illustrated in Fig. 1 of the drawing.

The present invention may be applied to nozzles formed on the surface of a pressure chamber of relatively large capacities or as illustrated in the embodiment shown in the drawings, to a nozzle in the form of a conduit having a longitudinal outlet or slit and into which fluid under pressure may be introduced at one end. Adjustable vanes may be conveniently provided in the conduit and pivoted at points intermediate their length. These valves or vanes 15 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 11 and each is individually adjustable.

By adjustment of the valves or vanes 15 it is possible to ensure that a uniform distribution of fluid emergent from the nozzle is obtained throughout its length or alternatively that any given or desired distribution can likewise be obtained.

I declare that what I claim is:

1. In a nozzle for the ejection of a sheet-like fluid stream and formed of a tubular housing open at both ends for the entry of fluid thereto and having a single continuous slot outlet in its wall parallel to its longitudinal axis, the provision of a plurality of guide vanes within the housing disposed substantially wholly between the axis of the housing and the slot at spaced intervals along the slot, said guide vanes extending substantially at right angles to a plane which

contains the axis of said housing and passes through the slot, and each group of vanes on opposite sides of the mid-length of said slot being oppositely inclined, when viewed in cross section in said plane, outwardly towards the nearer end of the slot.

2. In a nozzle according to claim 1 a plurality of vanes on each side of the mid-length of the slot which proceeding towards the ends of the slot are increasingly inclined outwardly towards the ends of the slot nearer thereto.

3. In a nozzle according to claim 2 the vanes on either side of the mid-length of the slot being slightly curved in cross section convexly towards the mid-length of the slot.

4. In a nozzle formed of a tubular housing open at both ends for the entry of fluid and having a single continuous slot outlet in its wall parallel to its longitudinal axis, a plurality of guide vanes within the housing at spaced intervals longitudinally of the slot, each of said guide vanes extending at right angles to a plane containing the axis of said housing and passing through said slot, said guide vanes being curved and disposed divergently towards the slot and increasingly outwardly from the centre of said slot towards its two ends.

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