Feb. 1, 1955 J. U. BETE ET AL 2,701,165

FOG NOZZLE

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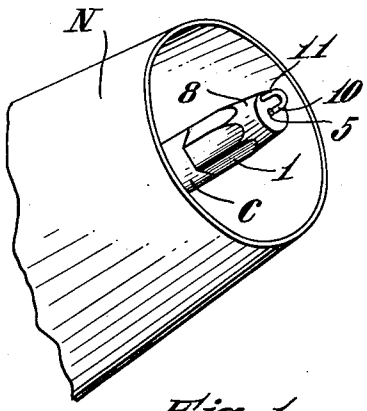


Fig. 1

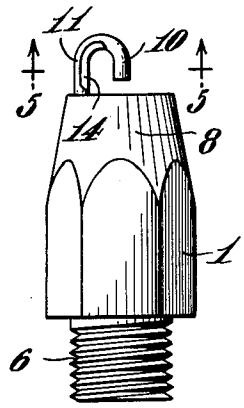


Fig. 2

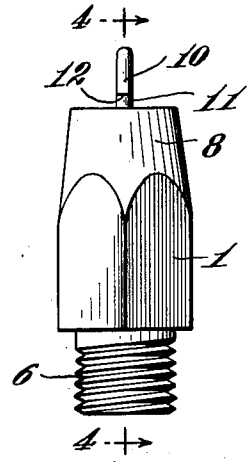


Fig. 3

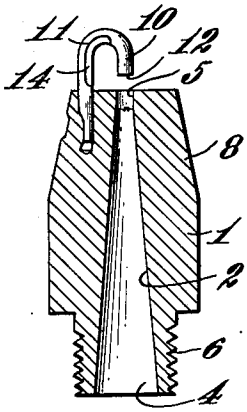


Fig. 4

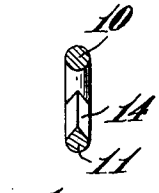


Fig. 5

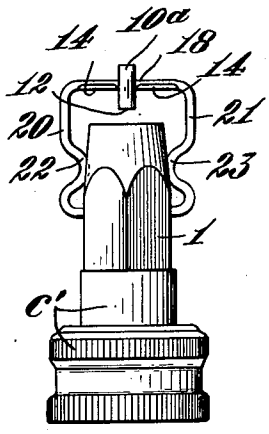


Fig. 6

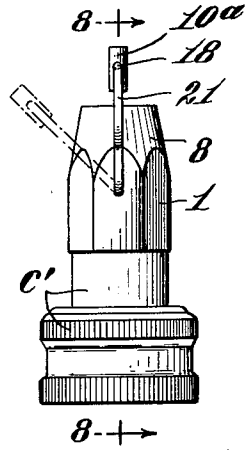


Fig. 7

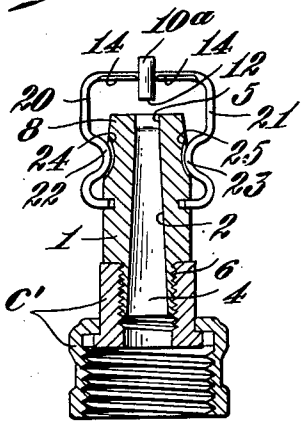


Fig. 8

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FOG NOZZLE

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1 Claim. (Cl. 299—129)

Fog nozzles are now commonly used in such diversified applications as humidifiers, cooling systems, dust control, curing concrete, applying insecticides and other antibiotics, etc., and in all such applications it is highly desirable that the nozzle produce a uniform spray pattern or cone of a homogeneous fog.

It is the principal object of the present invention to provide a nozzle which not only meets the aforementioned requirements, but which is also non-clogging, reliable and efficient in operation and relatively inexpensive to manufacture and install. Further objects relate to various features of construction and will be apparent from consideration of the following description and the accompanying drawings, wherein:

Fig. 1 is a perspective view showing my improved fog nozzle associated with the nozzle of a mist sprayer;

Figs. 2 and 3 are elevational views taken at right angles to each other of the fog nozzle shown in Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is an enlarged section on the line 5—5 of Fig. 2;

Figs. 6 and 7 are views, corresponding to Figs. 2 and 3, showing another embodiment of the invention; and

Fig. 8 is a section on the line 8—8 of Fig. 7.

In accordance with the present invention my improved fog nozzle comprises a tubular member or the like having a bore which tapers from its inlet end to its discharge end, the outer surface of the tubular member preferably being streamlined at least in the area adjacent to its discharge end so as to insure the maintenance of a uniform spray pattern or cone of a homogeneous fog as hereinafter more fully explained.

A jet-dispersing member having an active surface of approximately the same size and shape as the discharge opening is supported in alignment therewith and with its active surface spaced from the discharge opening a distance not less than approximately one-half nor more than approximately three times the diameter or major dimension of the discharge opening so that the high velocity jet issuing therefrom impinges upon the active surface to produce a homogeneous fog of predetermined shape.

Referring to Figs. 1 to 5, the embodiment shown therein comprises a length of hex bar stock of metal or any other suitable material bored to provide an internal conical taper or bore **2** having an inlet opening **4** and a discharge opening **5** adjoining the smaller end of the tapered bore. The inlet end of the member **1** is turned down and threaded as shown at **6** to provide a connection with a conduit or coupling C by which it may be supported within the discharge opening of a nozzle N of a mist sprayer or other type of equipment.

Between the central body portion **1** and the discharge

end the outer surface is streamlined, i. e., formed with the uniform taper indicated by the numeral **8**, for the purpose of maintaining a predetermined spray pattern when associated with a mist sprayer nozzle N. In this connection it will be noted that by streamlining the outer surface of the nozzle, the air stream flowing about the nozzle is brought into more intimate contact with the fog and the area of turbulence which would otherwise be created near the orifice is greatly reduced, if not virtually eliminated. A further advantage is that large undesirable drops and jets, caused by the supporting member for the jet-dispersing pin, appear to be directed by the air stream toward the center of the cone where their presence is less objectionable.

The jet-dispersing member **10** and its supporting means **11** consist of a single length of wire of circular cross-section bent into an approximate J-shape, the longer supporting leg **11** being formed with a flat which is staked into an opening in the body **1**, as shown in Fig. 4. The end of the shorter leg or pin **10** is approximately the same size and shape as the discharge opening **5** and is cut flat so that the active surface **12** thus produced is normally disposed at right angles to the axis of the jet issuing from the opening **5**. Although the spacing **12** from the end of the discharge opening **5** may vary within the limits above specified, it is preferably spaced approximately the diameter of the discharge opening **5**, and with this construction and arrangement a homogeneous fog of conical shape is produced.

Since the spray cone strikes the intermediate portion of the supporting member **11** and thus tends to produce undesirable large drops, this portion of the supporting arm may be streamlined, i. e., cut away to provide a relatively sharp edge as indicated at **14** in Figs. 2, 4 and 5, thus providing a construction wherein there is less interference with the sheet and the undesirable large drops are not only reduced in number, but the dripping which would otherwise occur is virtually eliminated.

The flow rate and coverage expressed as the diameter of the base of the fog cone vary in accordance with the size of the orifice opening **5** and the pressure to which the liquid being sprayed is subjected, as shown by the following table:

Orifice Diameter (Inches)	Coverage (Inches)	Flow Rate—Gallons Per Hour (Water) At—									
		10 p. s. i.	20 p. s. i.	30 p. s. i.	40 p. s. i.	50 p. s. i.	60 p. s. i.	70 p. s. i.	80 p. s. i.	90 p. s. i.	100 p. s. i.
.015	10	1	1½	2	2¼	2½	2¾	3	3¼	3½	3¾
.020	12	2	2¾	3½	4	4½	5	5½	5¾	6	6½
.024	15	3	4¼	5	6	6½	7¼	7¾	8¼	8¾	9¼
.028	18	4	5¾	7	8	9	10	10½	11½	12	12½
.032	21	5½	7½	9	11	12	13	14	15	16	17
.040	24	8½	12	14	17	19	20	22	24	25	27
.048	27	12	17	21	24	27	29	32	34	36	38
.054	30	16	23	28	32	36	39	43	46	48	51
.066	36	22	32	39	45	50	55	59	63	67	71
.080	48	34	46	56	65	73	80	86	92	98	103

The embodiment shown in Figs. 6 to 8 is substantially identical in all material particulars to that shown in Figs. 1 to 5 and the same or similar reference characters are applied to corresponding parts. In this embodiment the nozzle **1** is connected to a hose coupling C' and the jet-dispersing member **10***a* consists of a cylindrical pin **10***a* carried by the closed end **18** (Fig. 6) of a U-shaped supporting member having legs **20** and **21** embracing diametrically opposite portions of the body **1**. The closed end **18** of the U-shaped member which is positioned in the path of the dispersed spray jet or sheet may be streamlined as indicated by the numeral **14** to attain the advantages above mentioned.

The free ends of the legs **20** and **21** are bent inwardly into openings in the body of the nozzle **1**, as shown in Fig. 8, thus providing pivotal connections permitting the supporting member to be swung from operative position, shown by the full lines of Figs. 6 to 8, to an inoperative position, as shown by the broken lines of Fig. 7. In order to maintain the supporting member in operative position its legs **20** and **21** are bent inwardly, as shown at **22** and **23**, so as to snap into elongate slots or recesses **24** and **25**

formed in the body of the nozzle 1, as shown in Fig. 8. Due to the resiliency of the legs, the U-shaped supporting member may easily be swung to and from operative position.

This construction and arrangement of parts make it possible to swing the entire jet-dispersing assembly out of the way of the jet so that a straight high velocity stream can be employed at the option of the operator, and this has been found to be a particularly advantageous feature in such applications as fire protection where it may be desirable to have either type of spray instantly available; also for watering lawns, washing cars, etc.

While we have shown and described desirable embodiments of the invention it is to be understood that this disclosure is for the purpose of illustration and that various modifications and changes may be made without departing from the spirit and scope of the invention as set forth in the appended claim.

We claim:

A fog nozzle comprising a tubular member having a bore tapering from its receiving end to its discharge end, the outer face of said tubular member being provided with diametrically opposite recesses, a pin-like jet-dispersing member having an active surface of approximately the same size and shape as the discharge opening, and means for supporting said jet-dispersing member in operative position with its active surface in alignment with said bore and spaced from said discharge opening a distance not less than one-half nor more than three-times the cross-sectional dimension of said discharge opening so that a jet issuing therefrom impinges on said active surface to produce a homogeneous fog of predetermined shape, said means consisting of a generally U-shaped member the closed end of which carries said jet-dispersing member and the legs of which are pivotally secured to the body of said tubular member so that their intermediate portions snap into said recesses when said jet-dispersing member is swung to operative position.

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