Sept. 25, 1951 G. W. VEACH 2,569,081

SPRAY NOZZLE

Filed Jan. 14, 1949

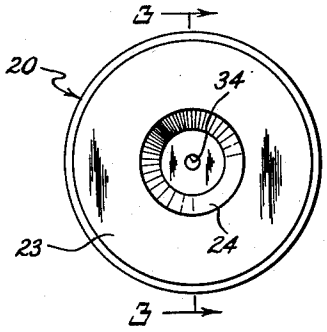


Fig. 1

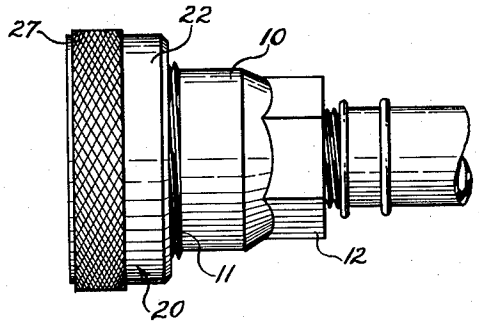


Fig. 2

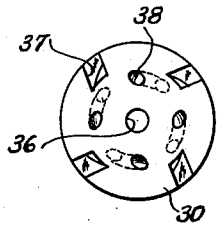


Fig. 4

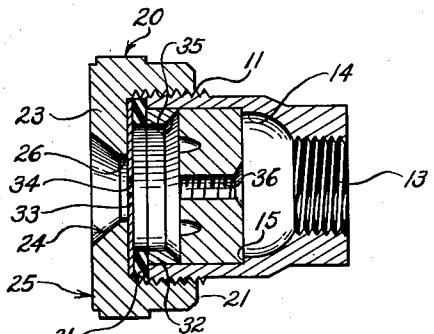


Fig. 3

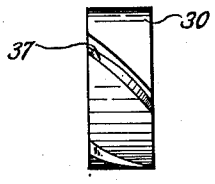


Fig. 5

INVENTOR

George W. Veach

By

Edwin A. Block

Attorney

Patented Sept. 25, 1951 2,569,081

UNITED STATES PATENT OFFICE

2,569,081

SPRAY NOZZLE

George W. Veach, Red Hook, N. Y.

Application January 14, 1949, Serial No. 70,979

2 Claims. (Cl. 299—120)

1

The present invention relates to improvements in spray nozzles and has for a primary object to provide a device which is capable of delivering an atomized spray for a great distance.

Another object of the invention is to provide a spray nozzle having means for whirling multiple streams for discharge as a fine spray.

A further object of the invention is to provide fluid guide means for discharging solid and vortical sprays in a chamber in the nozzle.

Still another object of the invention is to provide a guide member which divides a fluid stream into a center whirling discharge and into concentric vortical discharges.

Other objects and advantages of the invention will become apparent as the description progresses.

In the accompanying drawing in which is illustrated a preferred example of the invention,

Figure 1 is a front elevational view of the nozzle;

Figure 2 is a side elevational view of the same;

Figure 3 is a longitudinal section taken along the plane of line 3—3 of Figure 1;

Figure 4 is a front elevational view of an inner part of the nozzle; and

Figure 5 is a side elevation of the same.

Referring to the drawing wherein like characters of reference designate corresponding parts throughout, 10 indicates an essentially tubular body the inner larger end of which has exterior screw threads 11. The outer reduced end of body 10 has a non-circular, advantageously hexagonal exterior contour 12 and is provided with a threaded bore 13. The larger bore of the body, indicated at 14, is shouldered inwardly of bore 13, as indicated at 15.

On the externally threaded end of the body is fitted a cap 20 having internal threads 21 in its annular flange 22 engageable with threads 11. In the center of end wall 23 of the cap is provided a frusto-conical orifice 24 having a decreasing taper from its outer planar face 25 to a relatively short cylindrical bore 26. The circumference of cap 20 is advantageously knurled, as indicated at 27.

Fitted within the larger bore of body 10 is a fluid guide 30, in the form of a flat circular plug having a snug sliding fit in the forward end of the body and bearing against shoulder 15.

The forward face of guide member 30 is held spaced from the inner face of cap 20 by a packing ring 31 and a spacing ring 32. Packing ring 31 is of resilient packing material, such as rubber, and is interposed between the forward end of

2

body 10 and a disk 33 of relatively thin metal or like material held flat against the inner face of the cap. At its center disk 33 has a relatively small discharge aperture 34 coaxial with the outlet opening 24 of the cap. Spacing ring 32 is an annulus of metal or other suitable material fitted between the packing ring and the front of plug 30, the inner end of the spacer being bevelled, as shown at 35, so that its inner end terminates in a thin edge meeting the guide plug adjacent its circumference. The internal diameters of the packing and spacing rings approximately correspond to form a cylindrical chamber between disk 33 and the guide member.

The guide member or plug 30 has a central bore formed with a spiral rib 36 coaxial with aperture 34 of the disk. In its circumference, plug 30 is provided with a plurality of, in the present example four, grooves 37 directed at an angle, in the embodiment shown approximately 45°, to the axis of the plug and preferably tapered longitudinally so that the ends have greater depth than the center part, as shown at Figure 4. In that part of the plug substantially medially of its axis and its circumference are provided four through bores 38 having a circumferential angularity of approximately 30° with respect to the axis.

The nozzle is assembled by slidably inserting plug 30 into the end of body 10 until it abuts shoulder 15. Ring 32 is then fitted against the plug. Disk 33 is placed within the cap and resilient ring 31 fitted against its circumferential margin. The cap is then screwed on the body until ring 31 is tightly compressed.

The water, spraying solution or other liquid to be sprayed is delivered into the rear end of the nozzle assemblage under pressure through a suitable conduit, such as pipe 40. The fluid is caused to flow through and issue from guide 30 in multiple streams, the center ribbed bore directing a substantially solid whirling discharge. The angularly directed circumferential and intermediate passages 37 and 38 discharge a plurality of streams describing vortices about the center discharge.

The whirling streams issuing centrally, circumferentially and from intermediate positions of the axis of the guide and body commingle in the chamber provided between plug 30 and disk 33 to effect a whirling motion of the fluid causing delivery through aperture 34 and the flaring discharge orifice, of a fine spray which can be projected for a relatively great distance.

This makes the device particularly useful in

spraying tall as well as smaller trees and fire fighting.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited to that which is shown in the drawing and described in the specification but only as indicated in the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a spray nozzle, a tubular body having an inlet opening at one end, a cap normally closing the opposite end, and having an outlet opening therein, a guide member slidably fitted in said body and having a central and a plurality of peripheral passages for directing fluid therethrough axially of the body, said guide member having a plurality of passages intermediate the central and peripheral passages for directing streams at an angle to the axis of the body and to commingle with the central and peripheral streams in said chamber.

2. In a spray nozzle, a tubular body, a cap fitted on the outlet end of said body, a guide member fitted within said body and having flat parallel end faces, said guide member having a central passage therethrough, a plurality of grooves in its periphery and a plurality of spirally directed passages intermediate the center passage and periphery, and an annular member fitted in said body between the guide member and cap to provide a mixing chamber, said annular member having that end directed toward the guide member bevelled so as to direct the streams from the peripheral grooves toward the axial center of the chamber.

GEORGE W. VEACH.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
220,277	Forster	Oct. 7, 1879
848,995	Hull	Apr. 2, 1907
1,163,591	Eneas	Dec. 7, 1915
1,202,051	Gibbons	Oct. 24, 1916
1,230,725	Kraus	June 19, 1917
1,395,442	MacGregor	Nov. 1, 1921
1,513,624	Parker	Oct. 28, 1924
2,110,409	Veach et al.	Mar. 8, 1938
2,213,928	Gold et al.	Sept. 3, 1940