

July 24, 1962

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3,045,932

SPRAY NOZZLE

Filed June 22, 1959

2 Sheets-Sheet 1

FIG. 1

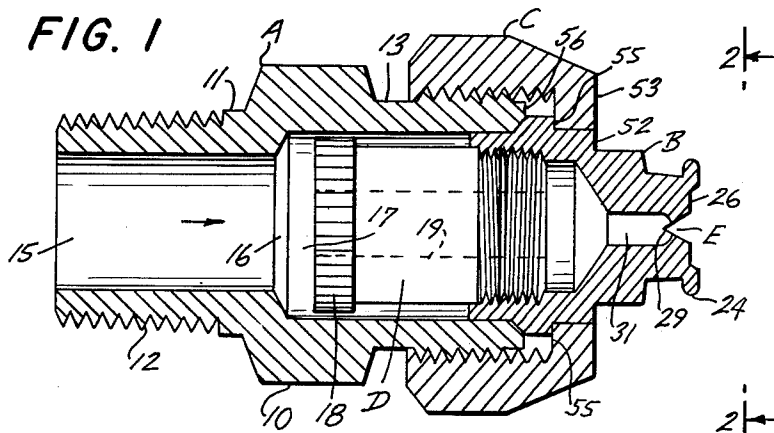


FIG. 2

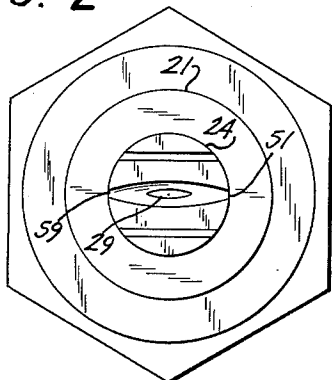


FIG. 3

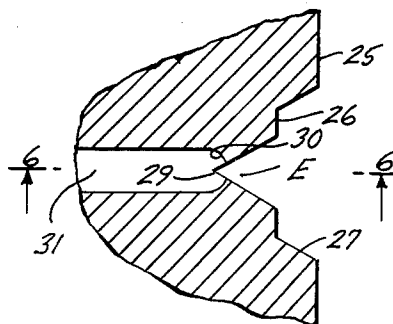
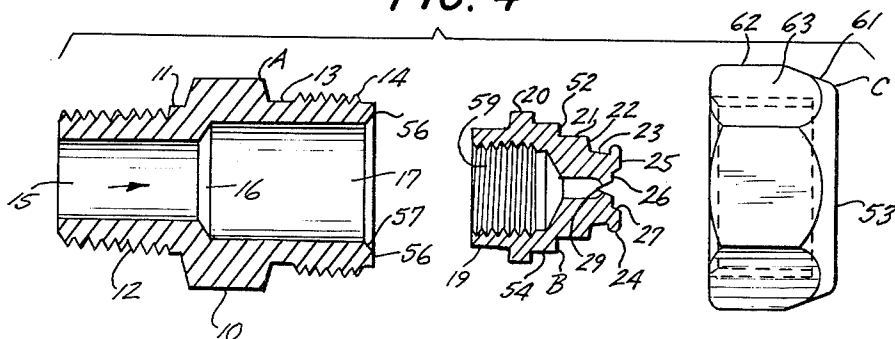


FIG. 4



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2 Sheets-Sheet 2

FIG. 5

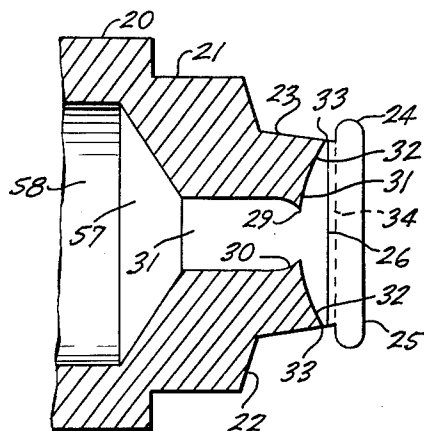
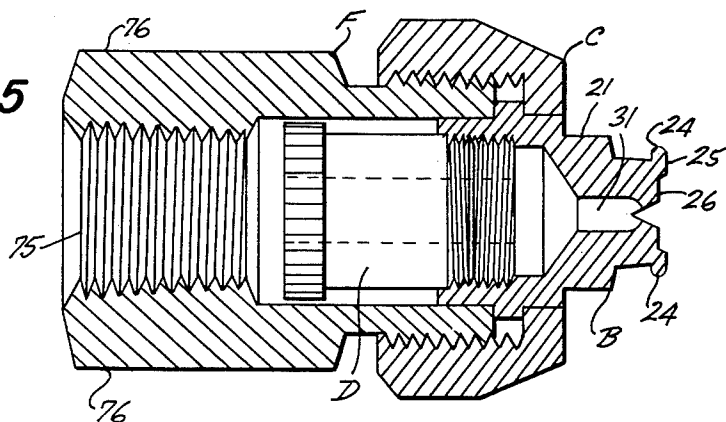


FIG. 6

FIG. 7

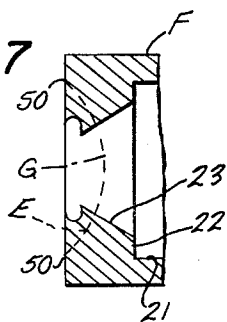
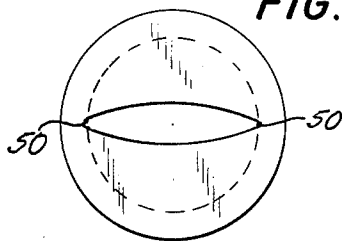


FIG. 8



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SPRAY NOZZLE

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4 Claims. (Cl. 239-601)

The present invention relates to a spray nozzle and it particularly relates to a novel spray nozzle for giving a predetermined pattern to a water or other liquid spray.

It is among the objects of the present invention to provide a novel spray nozzle which will give an accurate predetermined spray pattern for agricultural or industrial spraying purposes and in which the liquid spray will be distributed uniformly and in finely divided particles over the area to be covered by the spray without variation and distribution of the spray or in the size of the liquid particles which are sprayed.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

FIG. 1 is a transverse longitudinal sectional view of the complete spray unit.

FIG. 2 is a front elevational view taken from the line 2-2 of FIG. 1 upon the same scale as FIG. 1.

FIG. 3 is an enlarged fragmentary transverse sectional view showing the manner in which the V-slot intersects the end of the central opening, and upon an enlarged scale as compared to FIGS. 1 and 2.

FIG. 4 is a separated view, partly in longitudinal section and partly in side elevation, showing the separated elements which make up the spray nozzle of FIG. 1.

FIG. 5 is a transverse sectional view showing an alternative form of nozzle in longitudinal section, with the mounting thread consisting of an interior tap thread rather than an exterior thread, as shown in FIG. 1.

FIG. 6 is a fragmentary transverse sectional view taken along the major axis of the slot and upon an enlarged scale as compared to FIGS. 1, 2 4 and 5.

FIGS. 7 and 8 are diagrammatic views illustrating the manner in which the slot has been formed so as to eliminate the feather edge thereof, FIG. 7 being a side sectional view and FIG. 8 being a top plan view.

Referring to FIGS. 1 to 4, there is shown a base mounting element A, a spray control element B and a clamping element C to clamp the element B on to the element A. There is also shown an intermediate plug element D.

Referring particularly to FIGS. 1 to 4, the base element A has an enlarged central hexagonal portion 10 with a reduced diameter tapered portion 11, having a mounting thread 12 which may be a pipe thread. The other end of the base fitting A has a reduced diameter portion 13 with a machine thread 14.

Interiorly, the unit A has an inlet passage 15 which terminates at the shoulder 16 and opens into the socket 17.

The socket 17 may receive a plug member D having an enlarged knurled end portion 18 with a through passage

2

19 to control the flow of liquid to the spray control nozzle B.

The upper end of the socket 17 receives the reduced diameter end portion 19, which may be press-fitted thereinto.

The nozzle control element B to which the invention is particularly directed has the press-fitted insert portion 19 to be forced into the outer end of the socket 17, and it has an enlarged shoulder 20 with the outside cylindrical portion 21, which is cut away, as indicated at 22 and 23.

The surfaces 21, 22 and 23 which are shown as external surfaces in FIGS. 4 and 6 are indicated by the same numerals where they are shown as internal surfaces in diagrammatic FIG. 7.

At the end of the control nozzle is the outwardly projecting lip 24 which terminates in the flat face 25.

The flat face 25 has a plateau portion 26 with oblique side walls 27 and extending diametrically across the plateau 26 is the V-cut or slot E.

The V-slot, as shown in FIGS. 3 and 6, at this lowest central portion 29 will cut across the semi-spherical end portion 30 of the central slot 31.

It will be noted by reference to FIG. 6 that the V-slot reaches a maximum depth at 31 adjacent the central dome 30 and then becomes shallower at 32 toward the outside edges, and at its end 33 it terminates below the level of the plateau 26.

It will be noted that the plateau in turn is below the level or plateau 25 of the lower face 34 of the outer or terminal bead 24.

The undercut 23 is of conical shape and extends from the beveled ledge 22 up to the under-face 34 of the terminal bead 24.

Referring to FIGS. 7 and 8, it will be noted that the slot E would normally extend entirely within the cylindrical body F but for cutting away, as indicated at 21, 22 and 23. As a result, the feathered ends 50 of the end of the top of the slot E have been cut away, as is indicated in FIGS. 7 and 8.

Referring to FIG. 2, it will be noted that the ends of the slot terminate at the rounded portions 51, where the ends of the slot cross the terminal bead 24.

The interior opening at 29 at the bottom of the slot E will retain its feathered ends, as shown in FIG. 2. The intermediate step 52 will be flush with the top face 53 of the clamping nut C.

The clamping nut C has a cylindrical portion therein, which receives the cylindrical space 54 of the inlet B.

The enlarged portion 20 will be clamped by the interior shoulder 55 against the top face 56 of the base portion A, which face 56 is relieved, as indicated at 57.

The interior of the spray control element B has a conical chamber 57 which fits into the passageway 31, which in turn receives liquid from the enlarged chamber 58, into which the liquid passes from the plug throughway 19.

The interior inlet end of the control element B has a threaded portion 59, into which the threaded portion 60 of the plug D may be screwed.

The clamping nut C has a conical nose portion 61 and a hexagonal base portion 62 and an interior threaded portion 63 for screwing on to the machine thread 14 of the base element A.

The alternative form, as shown in FIG. 5, has the same clamping nut C as FIGS. 1 to 4, and the same nozzle control element B as in FIGS. 1 to 3, and the same plug element D as in FIGS. 1 to 3.

The base unit F, however, instead of having an external thread, has an internal thread 73 which permits mounting upon a threaded projecting element or liquid inlet connection.

The exterior face 76 may be a hex or round, as the case may be.

3

The spray fitting as shown is relatively simple, may be made of screw machine parts, and will give an accurate spray distribution because of elimination of the feather edge 50, with assurance of a uniform distribution and uniform particle size.

The capillary effect resulting from liquid running along the feather edges is eliminated and the plateau 26, together with the bead 24, will be positioned a substantial height above the location of the slot E to give maximum effective distribution.

The plug D may be eliminated or its size may be changed so as to give varying flow to the nozzle B. The depth of the V-cut may be varied, as may be the depth of the undercut 23 so as to cut off more of the converging feather edge 50, as is possible in the manner indicated in FIG. 8.

The bottom edge of the slot will always be circular, as indicated at G in FIG. 7, but the rounded end portion 30 and the central passage 31 should always extend on both sides of the apex of the V-slot E.

As many changes could be made in the above spray nozzle, and many widely different embodiments of this invention could be made without departure from the scope of the claims, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed.

What is claimed is:

1. In a four part spray nozzle construction of the type having a hexagonal base with threaded end portions and a central axial longitudinal through passage relatively narrow at the inlet end and relatively wide at the outlet end with an intermediate beveled shoulder, a cylindrical insert in said relatively wide part of the through passage abutting said shoulder at its inlet end and extending slightly beyond the outlet end of the base and having a threaded exterior outlet portion and a through longitudinal axial passageway, a tip having an interiorly threaded inlet end threaded onto the threaded exterior

4

outlet portion of the cylindrical insert and inserted between and filling the space in the outlet ends of the cylindrical insert and the hexagonal base, said tip having a peripheral spray bead portion giving a spray devoid of feather edging and with uniform sized spray particles, said tip having a cylindrical body with a relatively wide diameter central base portion, a relatively narrow diameter intermediate diameter portion and a terminal end enlarged diameter portion forming an end plateau said end plateau being transversely grooved with a V-cross sectional groove forming an oval passageway, and said plateau being provided with a recessed portion on both sides of said groove and said bead portion having a central axial passageway leading centrally through the bead portion to the central bottom portion of the groove, said groove having a downwardly convexly curved bottom edge projecting into said oval passageway.

2. The nozzle construction of claim 1, said last mentioned means including a hexagonal nut having an inward turned portion engaging and pressing said insert shoulder to abut the outlet end of the base and having a greater diameter than the enlarged exterior body portion of the base.

3. The nozzle construction of claim 1, said insert having a threaded inlet end portion and a cylindrical plug having a central through passage threaded into the inlet of said insert and having an enlarged knurled end portion substantially completely filling the lower portion of the enlarged outlet recess of the base.

4. The nozzle construction of claim 1, the ends of said V-cut extending beyond the opposite edges of the lower plateau so as to form V-shaped notches in the end of said plateau and said V-cut having a maximum width at the central portion of the lower plateau and the minimum width at edges of the plateau and having curved side faces.

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