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SPRAY NOZZLE

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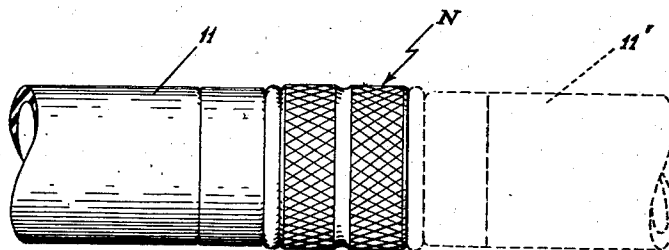


Fig. 1

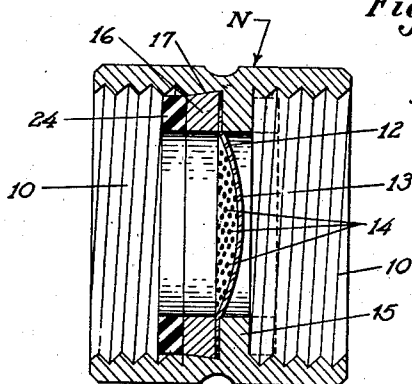


Fig. 2

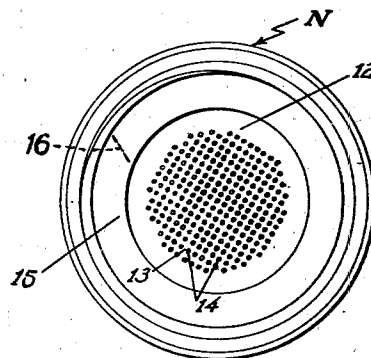


Fig. 3

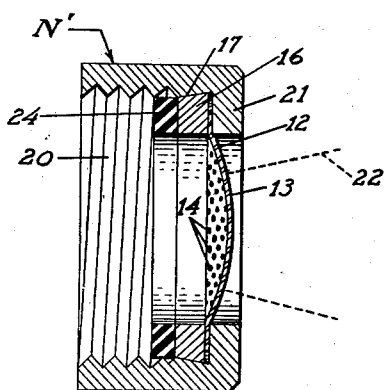


Fig. 4

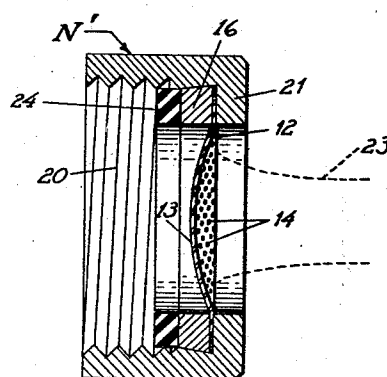


Fig. 5

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SPRAY NOZZLE

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3 Claims. (Cl. 299-141)

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This invention relates to spray nozzles, and more particularly to nozzles useful in watering lawns, gardens, shrubbery and the like.

Among the objects of this invention are to provide a nozzle which will discharge a more effective and efficient spray; to provide such a nozzle which will produce a small diameter strong stream or wide, soft spray, as desired; to provide such a nozzle which is reversible on the end of a hose or the like, to produce a strong stream or a wide, soft spray; to provide such a nozzle which is very simple in construction and does not require an adjustment of movable parts; and to provide such a nozzle which is cheap to manufacture.

Other objects and novel features of this invention will become apparent from the following description, taken in connection with the accompanying drawing, in which:

Fig. 1 is a side elevation of a nozzle constructed in accordance with this invention, attached to the end of a hose;

Fig. 2 is a longitudinal section through the nozzle of Fig. 1;

Fig. 3 is an end view of the nozzle;

Fig. 4 is a longitudinal section of an alternative nozzle construction; and

Fig. 5 is a section of the nozzle of Fig. 4, with certain parts thereof in a different position.

A nozzle N, constructed in accordance with this invention and as illustrated in Figs. 1 to 3, inclusive, may include a relatively short tubular shank provided with threads 10 at either end thereof for attachment to a hose 11, with the hose in either the full position of Fig. 1, or the dotted position 11'. Disposed substantially transversely and adjacent the terminus of the discharge bore of the nozzle is a partition, such as disc 12, having a curved surface portion 13, provided with a plurality of holes or apertures 14. The disc 12 may be secured in the nozzle in a suitable manner, as against an inwardly extending flange 15 by a snap ring 16 which, as in Fig. 3, is split so that it may be placed in or removed from a conical groove 17 adapted to retain the ring in the nozzle.

The nozzle N', shown in Figs. 4 and 5, comprises a cap provided with threads 20 for attaching the nozzle to a hose or the like, and having a flange 21 against which a disc 12 is secured by a snap ring 16. The disc 12 is, of course, constructed in the same manner as the disc of nozzle N. The principal difference between the nozzles N and N' lies in the fact that the nozzle N may be reversed on the hose to cause the curved surface portion 13 either to extend outwardly and thereby become a convex surface, or to extend

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inwardly and thereby become a concave surface. In the case of the nozzle N', on the other hand, the disc may be reversed in position by removal of the snap ring or other securing means to change the curved surface portion from convex to concave, or vice versa. Or, the disc may be relatively permanently secured in either position, as desired.

In accordance with this invention, the peripheral extent of holes 14 is less than the diameter of the discharge bore at the disc. That is, the holes 14 do not extend even as far as the snap ring 16. Also, the holes have diameters or widths no greater than, and preferably, less than the thickness of the disc. This limitation of the extent and size of the holes, in combination with the convexity of concavity of the curved or otherwise formed surface portion 13, is believed to result in the spray produced by the nozzle of this invention.

As illustrated in Fig. 4, when the off-set or curved surface portion is convex, or extends outwardly, the water flowing in the direction of the arrow is discharged in a relatively wide, gentle spray 22. However, if the position of the disc is reversed so that the curved surface portion 13 is concave, or extends inwardly, the water will emerge from the nozzle in the form of a relatively fine, strong stream 23.

An advantage of the nozzle N, of Figs. 1 to 3, inclusive, is the fact that the nozzle need only be reversed on the hose to convert the discharge from a wide, gentle spray to a fine, strong stream. Since very little sprinkling or watering is done except under one of these conditions, it will be apparent that the nozzle N has particular utility as a household nozzle. A further advantage of the reversible construction of Figs. 1 to 3 lies in the fact that in case the holes 14 become clogged for any reason, the nozzle can be reversed on the hose to clear the holes by the reverse flow of water.

Where a considerable amount of sprinkling or watering is done with the same spray, then the nozzle N' of Figs. 4 and 5 is particularly useful, although the time required to change the disc 12 from the convex position of Fig. 4 to the concave position of Fig. 5 is usually relatively short.

Normally, a sealing washer 24 of rubber or the like, is inserted within the nozzle and, depending upon the desired position of the disc, is clamped against either the ring 16 or the flange 15, as in the full and dotted positions of Fig. 2, respectively. Such a washer will, of course, be

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clamped against the ring 16 of the nozzle N', in the position of either Fig. 4 or Fig. 5.

The curved surface portion 13 is preferably a spherical segmental cap, i. e., in section the arc of a circle, and the holes 14 extend radially, or substantially perpendicular to the surface of the disc. It will be understood, however, that the holes may extend at various other angles, and that the surface portion 13 may have other shapes, such as partially elliptical or conical. Also, it will be understood that the disc may be relatively permanently secured within the nozzle, as by brazing, soldering, or the like. Also, the partition may be formed integrally with the nozzle, or in any other suitable manner.

The nozzle of this invention is relatively inexpensive to make, since the disc 12 may be stamped out of sheet metal with the holes punched after the curved surface has been formed, or the disc perforated prior to the formation of the curved surface. Alternatively, a curved circular section of screen may be stamped out, and attached by brazing or soldering to a frame or ring of sheet metal to provide a flange by which the disc may be fastened in the nozzle. Or, a section of screen may be stamped out and soldered, brazed or otherwise securely attached to flange 15 of nozzle N or flange 21 of nozzle N'.

From the foregoing, it will be apparent that the nozzle of this invention is relatively simple in construction; and is efficient in use because it is light in weight and easy to handle. Also, it requires considerably less material than the ordinary nozzle formed with a relatively long tapered outer shell adapted to be screwed inwardly or outwardly over a stem which must be machined relatively accurately to provide proper clearance between the stem and the shell.

It will be understood that although two different embodiments of the invention, and alternative ways in which the disc or partition may be formed, have been illustrated and/or described, other embodiments may exist and various other changes may be made, all without departing from the spirit and scope of this invention.

What is claimed is:

1. A spray nozzle comprising a cap having a discharge bore and provided adjacent one end with integral internal threads for attachment to

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the threaded end of a conduit and adjacent the other end with an integral inwardly extending annular flange, a disc positioned in the bore and having its surface on one side adjacent the periphery engaging the side of the flange adjacent the threads, and means comprising a snap ring cooperating with the inner portion of the bore for maintaining the said disc surface engaged with the flange, said ring being of an external diameter as to be capable of being passed through the threaded portion of the bore and having a flat surface exposed to the threaded portion of the bore to receive a sealing washer, said disc having a curved surface portion provided with a plurality of holes the peripheral extent thereof being less than the diameter of the flange.

2. In a spray nozzle, a member provided with a bore having integral threads adjacent one end and an annular flange extending into the bore adjacent the inner end of the threads, said bore also being provided with an annular conical surface between the inner ends of the threads and the flange with its larger diameter adjacent the flange, a curved perforated disc having a peripheral portion for engaging the flange on side toward the threads, and a split ring having a peripheral conical surface for cooperation with the conical surface of the bore to thereby hold the disc engaged with the flange, said ring being of such outside diameter as to be capable of passing through the threaded portion of the bore and having a sealing washer engaging flat surface on its side toward the threads.

3. In a reversible spray nozzle provided with a bore having integral threads of like internal diameter adjacent each end and an integral annular flange between the threads extending inwardly to reduce the diameter of the bore, a curved perforated disc having a peripheral portion for engaging on side wall of the flange, and means comprising a split ring for cooperating with the bore between the peripheral portion of the disc and the adjacent threads for holding the disc in position against the flange, said ring on its side adjacent the threads and said flange on its side opposite the disc each being provided with flat annular surfaces for engagement by a sealing washer.

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