Jan. 2, 1951 R. A. GILMOUR 2,536,167

DISCHARGE CONTROL VALVE MECHANISM FOR WATER NOZZLES

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Fig. 2

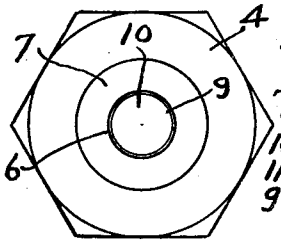


Fig. 1

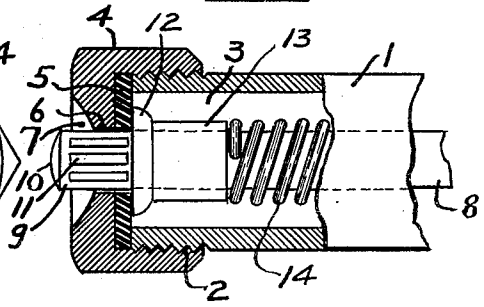


Fig. 4

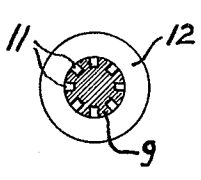
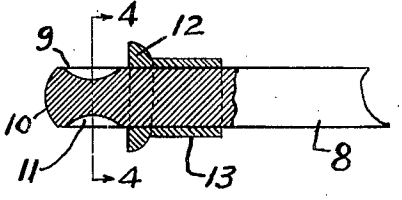


Fig. 3



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DISCHARGE CONTROL VALVE MECHANISM FOR WATER NOZZLES

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1 Claim. (Cl. 299—141)

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This invention relates to an improved valve mechanism, and while primarily designed and intended for use in controlling the discharge of water from a hose nozzle, it will be obvious that the device may be employed in connection with any other type of nozzle, or for any other purposes wherein it is found to be applicable.

Important objects and advantages of the invention are to provide a valve mechanism of the character described, which will function most efficiently for controlling the discharge of water from a hose nozzle from a full stream discharge to a discharge in spray form of any desired density, which embodies a novel valve head that cannot shift or vibrate laterally in the associated discharge port during spraying operations but must remain centralized in the discharge port and thereby effect and assure the uniform spread of the spray discharge, which is simple in its construction and arrangement, durable, and comparatively economical in its manufacture and use.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the novel construction, combination and arrangement of parts herein specifically described and illustrated in the accompanying drawing, but it is to be understood that changes in the form, proportions and details of construction may be resorted to that come within the scope of the claims hereunto appended.

In the drawing wherein like numerals of reference designate corresponding parts throughout the several views:

Figure 1 is a fragmentary, enlarged, side elevational view, partly in cross section, of a hose nozzle embodying a discharge control valve mechanism constructed in accordance with the invention.

Figure 2 is a front end view of the valve mechanism.

Figure 3 is a fragmentary side elevational view, partly in cross section, of the valve stem and of associated parts.

Figure 4 is a sectional view taken on line 4—4, Figure 4.

Referring in detail to the drawing 1 represents a nozzle having an exteriorly threaded front end portion 2, and being provided with a cylindrical bore 3 having an open front end.

A nozzle cap nut 4 is detachably engaged on the threaded front end portion 2 of the nozzle 1, and a suitable annular gasket 5 is mounted and engaged between the cap nut and the front

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open end of the nozzle to prevent leakage therebetween. The cap nut is provided with a comparatively small, centrally disposed, discharge port 6, which is surrounded by a dome-shaped recess 7 that is formed in the front face of the cap nut.

A valve stem 8 extends longitudinally through the diametric center of the nozzle bore 3, and is longitudinally shiftable in the latter. The front end portion of the valve stem is formed to provide a valve head 9, which latter normally projects into the discharge port 6 of the cap nut 4. The valve head is formed with a rounded free end 10 to direct the valve head into the discharge port during the operation of the valve mechanism in the manner to be described.

The most important feature of the present invention resides in the formation of the valve head 9, which is formed with a plurality of longitudinally extending discharge grooves 11. The discharge grooves are arranged to surround the valve head in regularly spaced relation to each other and the bottoms thereof are concavely curved in the longitudinal direction, as clearly illustrated in Figures 3 and 4.

An annular sealing flange 12, carried by a connecting sleeve 13, is permanently secured in a fixed position on the valve stem 8 directly rearward of the valve head 9.

A spiral spring 14 is mounted on the valve stem 8, and the front end thereof abuts against the rearward end of the connecting sleeve 13. The normal action of the spring tends to force the valve stem in the forward direction within the nozzle bore 3.

When the valve mechanism is in the closing position, as shown in Figure 1, the front face of the sealing flange 12 seats flatly against the rearward face of the gasket 5, and thereby prevents the discharge of water from the nozzle bore 3 through the discharge port 6 in the cap nut 4. The sealing action of the abutment of the flange against the gasket is effected by the pushing force of the spring 14 and is augmented by the water pressure within the nozzle bore 3.

In practice the operation of the improved valve mechanism is as follows: When the valve stem 8 is retracted in the nozzle bore 3 a distance to cause the valve head 9 to entirely clear the discharge port 6, a stream of water to the full capacity of said port will discharge through the latter.

The diameter of the valve head 9 is approximately commensurate to the diameter of the discharge port 6 to allow only a free sliding fit of the valve head in said port, whereby, when

the valve stem 8 is advanced to project the valve head into the discharge port 6, the water must be ejected through the grooves 11 while being forced through the discharge port.

Due to the sliding fit of the valve head 9 in the discharge port 6, as stated, said valve head will be maintained perfectly centralized in the discharge port and thereby eliminate any untoward lateral vibration of the valve head, and in consequence assure a perfectly uniform spread of water in spray form, when the water is ejected through the discharge grooves 11, through the discharge port 6, and through the recess 7 in the cap nut 4.

It will here be noted that the density of the spray discharge is determined and controlled by the position of the valve head 9 in the discharge port 6 of the cap nut 4. When the valve stem 8 is retracted to position the transverse centers of the grooves 11 at the vertical center of the port, the density of the spray will be greatest. By advancing the valve head to dispose the transverse center of the grooves forwardly of the vertical center of the port, the density of the spray is considerably reduced, and by retracting the valve head to dispose the transverse centers of the grooves rearwardly of the vertical center of the port the spray may be reduced to the minimum. In other words, any spray density may be produced by the adjustment of the grooved valve head in the discharge port, and the spray, regardless of its density will be spread uniformly during discharge operations.

The present invention provides a most durable and efficient device of its kind, which may be economically manufactured, and successfully and conveniently employed for the purposes and in the manner herein set forth.

What I claim is:

A discharge control valve mechanism for a fluid nozzle, comprising the combination of a cap member having a screw thread attachment to the front end of the nozzle and being provided with a centrally disposed discharge port, a flat annular gasket secured in said member by the attachment of the latter with the front end of the nozzle, a valve stem mounted for longitudinal movement in said nozzle, a valve head of uniform diameter throughout its length shiftably engaging in said port and in said gasket and being carried at the front end of said stem in longitudinal alignment with the latter, said head being formed with a plurality of longitudinally extending grooves for controlling the discharge of the fluid through said port, said grooves being disposed around said head in regularly spaced relation to each other and having the bottoms thereof concavely curved in the longitudinal direction, the forward ends of said grooves disposed in close proximity to the forward free end of said valve head, a sleeve fixed at the front end of said stem, an annular flange carried by said sleeve and seating against said gasket operable for closing the valve mechanism, and a spring mounted on said stem and engaging said sleeve operable for forcing said flange to the closing position against said gasket.

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