June 21, 1938. A. C. LUSHER ET AL 2,121,741

HOSE NOZZLE

Filed April 3, 1937

Fig. 1.

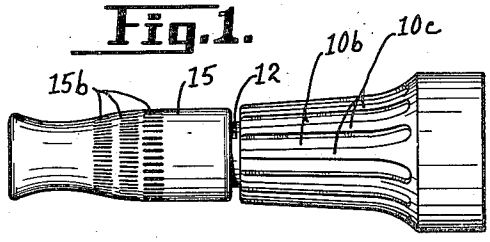


Fig. 2.

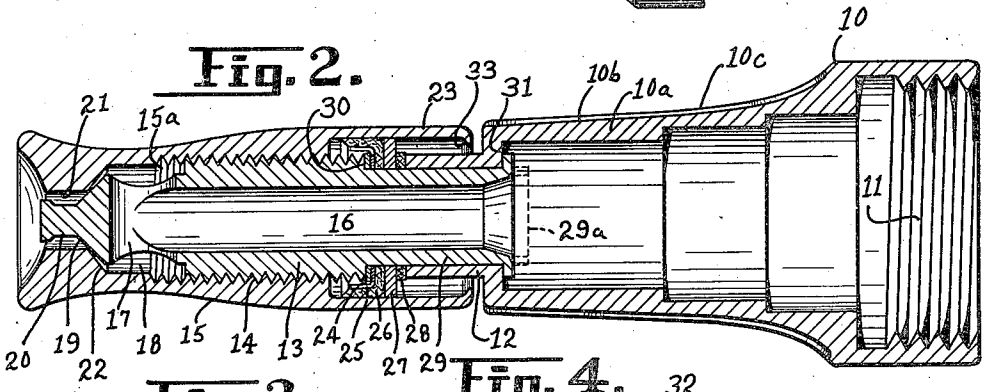


Fig. 3.

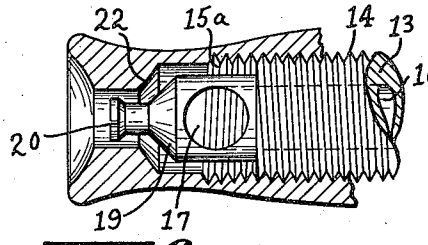


Fig. 4.

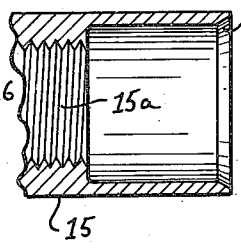


Fig. 5.

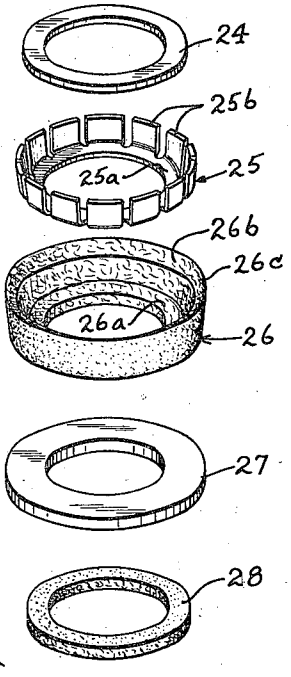


Fig. 6.

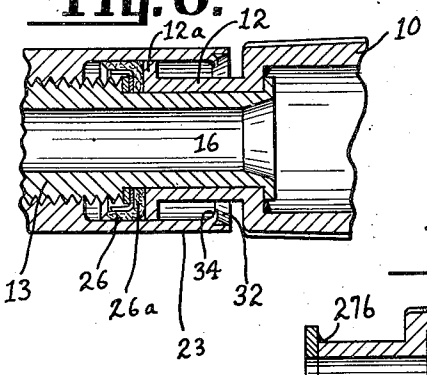
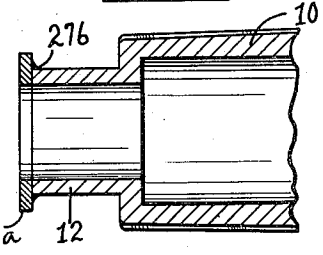


Fig. 7.



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HOSE NOZZLE

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6 Claims. (Cl. 299—131)

This invention relates to hose nozzles, and particularly to an improvement in that class of nozzles adapted to produce both a fine and coarse spray or a solid stream of water.

The principal object of this invention is to produce a hose nozzle having an improved and effective sealing construction between the adjustable members of the nozzle to prevent any leakage.

Another object is to provide a hose nozzle wherein the joint between the stationary and rotary part is placed relatively near the center of the complete nozzle to facilitate the gripping and manual adjustment of the same.

A still further object is to provide an effective shut-off valve construction adjacent the terminal end of the nozzle.

With these general objects in view, the invention consists of features, combinations, details, construction and arrangement of parts, which will first be described in connection with the accompanying drawing and the following specification.

In the drawing:

Fig. 1 is a side elevation view of the nozzle construction.

Fig. 2 is a longitudinal sectional view of the same on an enlarged scale, embodying the principles of the invention, and showing the adjustable nozzle end in its closed, shut-off position.

Fig. 3 is a fragmentary sectional view of the end of the nozzle, showing the adjustable end of the nozzle in open position.

Fig. 4 is a fragmentary sectional view of the inner end of the adjustable member showing the construction of the open end of the component sleeve prior its assembly.

Fig. 5 is a separated view of the several members that comprise the sealing unit for the nozzle.

Fig. 6 is a fragmentary longitudinal sectional view of the central portion of the nozzle, showing a modified construction.

Fig. 7 is a sectional view of the forward end of the body member showing a still further modified construction.

Referring now in detail to the several figures, the numeral 10 designates generally the hollow body member of the device, having its enlarged rear end provided with an internal thread 11 for attachment to the conventional threaded member usually found on end of hose. The foward end of the body member 10 is provided with a projecting reduced cylindrical sleeve neck 12 to which is attached a hollow stem member 13 in a manner to be more specifically described later. The intermediate portion of the stem member 13 is provided with an enlarged threaded section 14, capacitated to adjustably receive the threaded section 15a of an adjustable nozzle end 15.

The central hollow portion of the stem member 13 defines a suitable liquid conduit 16, the forward end of which is intercepted by a transverse opening 17, leading into a cylindrical chamber 18, formed at the intermediate portion of the adjustable nozzle end 15 ahead of the threaded section 15a. The end of the stem ahead of the transverse opening 17 is constructed with a conic section 19 which terminates in a projecting integral spray disseminating pen 20.

The cylindrical chamber 18 of the nozzle end 15 connects with a restricted discharge orifice 21 by means of an intermediate conic shaped reduction section 22. As best shown in Fig. 2, the angle of the conic section 22, with respect to the longitudinal axis of the nozzle is preferably greater than the angle of the conic section 19 on the end of the stem member 13, thus creating a line contact valve seat between the stem 13 and the nozzle end 15 to assure a perfectly tight liquid proof valve seal between the parts, when the nozzle end is screwed up to its closed position.

In order to provide for a liquid tight seal between the relative movable sections of the nozzle, the adjustable nozzle end 15 is constructed with a rearwardly extending cylindrical sleeve portion 23, which normally surrounds the reduced cylindrical neck 12 of the body member 10 in spaced relation thereto and is adapted to receive a sealing unit comprising a reinforcing washer 24, a spring spreader member 25, a fibrous cupped washer 26, which, in this particular instance is made of leather, a relatively heavy seating washer 27, and a small fibrous sealing washer 28. All these parts, being positioned in the order as shown in Fig. 5, are provided with central apertures to permit assembly in place in a compact position over the reduced unthreaded interior end 29 of the stem 16. The foremost member of the sealing unit which is the reinforcing washer 24, is adapted to abut against a stop shoulder 30, provided at the juncture between the enlarged threaded section 14, and the reduced interior end 29 of the stem 16. When all the elements, 24, 25, 26, 27, and 28, as shown in Fig. 5 which comprises the sealing unit, are assembled upon the reduced end 29 of the stem 16 in a compact position, as shown in Fig. 2, said reduced end 29 is then telescopically assembled into the interior of the cylindrical neck portion 12 of the body 10, by a drive fit, compressing all said ele-

ments of the sealing unit tightly together between the annular end of the reduced cylindrical neck 12 and the stop shoulder 30 of the stem. The inner end of the reduced section 29 of the stem 13 is provided with an interior beveled section 29a, a portion of which initially is adapted to extend beyond a shoulder 31 defined between the adjacent end of the body 10 and the reduced cylindrical neck 12. This construction is shown by dotted outline in Fig. 2. Subsequently the stem 13 is made permanently secure to the body by forming over the relatively weakened interior end 29a of the stem 13 against the inside shoulder 31 by an upsetting operation.

Before the assembly of the adjustable nozzle end 15 to the hollow stem member 13, the open end of the sleeve portion 23 of said nozzle end 15 is provided with an interior bevel 32 to facilitate assembly of the sleeve portion 23 over the elements of sealing unit, particularly as it engages with the forward end of the cupped washer 26. After the assembly of the nozzle end 15 to the stem 13, the end of the sleeve portion 23, which is naturally more or less weakened by the beveled end 32, is spun, or otherwise formed inwardly to define an inturned stop rim 33. This stop rim 33 will engage against the seating washer 27 when the nozzle end 15 is at its extreme advanced position to prevent complete disassembly of the latter from the body 10 of the nozzle unit.

The purposes and functions of each of the members 24 to 28 inclusive, of the sealing unit, are as follows:

The small fibrous sealing washer 28 is embraced between the annular end of the reduced cylindrical neck 12 of the body 10 and the adjacent seating washer 27, and serves to prevent any leakage of fluid between the seating washer 27 and the reduced cylindrical neck 12, in case any liquid should perchance seep forwardly between the connecting joint of the unthreaded interior end 29 of the stem 13 and the cylindrical neck 12. The seating washer 27 has an outside diameter adapted to have a free sliding fit within the interior diameter of the sleeve 23, and serves as a support or seat for the base portion 26a of the cupped washer 26. The forward end of the cupped washer 26 is provided with a beveled section 26b to create a feather edge 26c which, under any pressure of water seeping back through the threaded connection of the stem 13 and the nozzle end 15, will tend to initially force the feather edge 26c outwardly against the adjacent surface of the sleeve 23, and progressively increase the pressure of the side walls of said cupped washer outwardly against the sleeve portion 23 in ratio to the back pressure of the water.

From practice and experimentation, it has been found that a leather cupped washer, when subjected to long periods of non-use, is liable to dry, and more or less shrivel up, pulling away from the adjacent wall of the sleeve. Also, an unsupported cupped washer is liable to buckle when turning the nozzle end 15 for adjustment purposes, and break the seal between the movable parts. In order to overcome these faults, provision is made of a spring-fingered spreader member 25, which consists of a base ring 25a, having a series of upstanding resilient fingers 25b slightly spaced relative to each other and slightly inclined outwardly, relative to the axis of the spring member. These fingers are adapted to press outwardly against the interior wall of the cupped washer 26 and support the same at all times, and prevent any collapse of said wall under all conditions. The reinforcing washer 24, previously mentioned, is seated within the cupped part of the spreader member 25 and serves to prevent the spring fingers 25a from being distorted inwardly from their normal position, due to any excessive pressure that would otherwise be placed upon the ring part 25a of the spreader member 25 by the compressive forces between the stop shoulder 30 and the annular end of the reduced cylindrical neck 12 coincident with the assembly of the stem 13 to the body 10 in the absence of said reinforcing washer 24.

As pointed out, one of the features of this nozzle is to have the joint between the relatively movable parts substantially near the center of the nozzle unit. This is produced by having the forward portion of the body member 10 adjacent the threaded section produced with a relatively long tapering shank 10a, having a series of external longitudinal flutes 10b defining an equal number of upstanding ridges 10c therebetween, which serve as a gripping medium for the nozzle. The intermediate portion of the adjustable nozzle end 15 is also provided with a series of knurled rings 15a, three in this instance for the same purpose. The particular advantage of this construction of having a relatively long gripping shank 10a on the body member 10, is that it provides for a better hold for the operator then hithertofore where there was only a very small portion of the body member exposed for gripping purposes and which would have a tendency to have the nozzle twist off from the hose connection when effecting the adjustment of the nozzle end.

In Fig. 6, there is shown a modified construction of the nozzle, wherein the inner end of the sleeve neck 12 of the body 10 is provided with an integral outwardly formed flange 12a which serves as a seat for the cupped leather washer 26. By this construction, the seating washer 27 and the small fibrous washer 28 are omitted. If, perchance, any seepage of water is forced forwardly through the joint between the reduced section 29 and the neck 12, it will be sealed by the base part 26a of the cupped washer 26. In this modified construction, in order to prevent the disassembly of the adjustable nozzle end from the hose nozzle unit, the beveled end 32 of the skirt portion 23 is provided with a plurality of inwardly formed lugs that are sheared out of the face of the beveled section and are adapted to engage against the flange portion 12a as a stop, when the nozzle end is in its foremost position.

In Fig. 7, there is a further modified construction shown wherein the washer member 27a is permanently secured directly to the end of the cylindrical neck 12 of the body 10 as, for example, by means of a ring of solder 27b. This construction obviously eliminates the use of the small fibrous washer 28 and the liquid seal will be effected by the base end 26a of the cupped washer 26 engaging against the washer 27a.

While this invention has been shown and described in several forms, it will be understood that other changes and variations may be made in the specification and constructions shown and described without departing the scope of the invention as defined in the appended claims.

What is claimed is:

1. In a hose nozzle, a body member, a stem member carried by said body member, a nozzle end having axial adjustable engagement with said stem member, said nozzle end having a skirt member surrounding and in spaced relation to the connecting portions of said body and stem

member, and a sealing unit carried by one of said members and engaging with said sleeve to effect a liquid seal therebetween, said sealing unit comprising a pliable cupped washer, a supporting seat, and a resilient expanding member seated within said cupped washer.

2. In a hose nozzle, a hollow body member, a hollow stem carried by said body member and having an exterior threaded section, a rotatable nozzle end adjustable on said threaded section, said nozzle end having an integral tubular skirt member, and a sealing unit comprising a seating member, a cup-shaped fibrous washer, and an expansive resilient element positioned within the hollow of said cupped washer and adapted to force the wall of the latter outwardly against the adjacent surface of said skirt member to effect a liquid seal between the relative movable parts, and means formed on said skirt member adapted to engage with said seating member to prevent total disassembly of said nozzle end from said stem.

3. In a hose nozzle, a hollow body member having a reduced cylindrical neck at its forward end, a hollow stem comprising an intermediate enlarged exterior threaded section and a reduced smooth section defining a shoulder therebetween, a nozzle end axially adjustable with the threaded section of said stem and having a rearwardly extending skirt portion normally surrounding said neck, and a sealing unit permanently clamped between the annular end of said neck and said stem shoulder and cooperating with said skirt portion to effect a liquid seal between the relative movable parts.

4. A hose nozzle defined as by claim 3, wherein said sealing unit comprises a rigid seating washer, a pliable cupped washer resting against said seating washer, and a retaining ring seating in the base of said cupped washer and having a series of resilient fingers for holding the upstanding wall of said cupped washer in liquid tight engagement against the inner surface of said skirt.

5. In a hose nozzle, a body member having a relatively long shank terminating with an inwardly formed flange and a forwardly extending tubular neck, a hollow stem having an intermediate enlarged threaded section and a reduced rear portion defining an abutment shoulder therebetween, the rear portion adapted to be telescoped into said tubular neck and to initially extend beyond the inner flange wall of said body, an adjustable nozzle engaging with the threaded section of said stem, said nozzle having a cylindrical skirt portion surrounding the neck of said body and designed to be substantially in cylindrical alinement with the adjacent end of said body, a sealing unit fitted about said reduced rear portion and having cooperative engagement with the interior of said skirt to effect a liquid tight seal between the relative movable parts, said unit adapted to be tightly clamped between the abutment shoulder and the annular end of the tubular neck and held in permanent assembly by having the initially extended end of said reduced portion formed over against the body flange.

6. In a hose nozzle, a body member, a stem attached to said body member, a sealing element comprising a pliable cupped washer permanently clamped between said body and said stem, a nozzle end adjustably mounted on said stem, said nozzle end having an extended skirt portion adapted to extend back around said cupped washer, the pliable wall of said washer adapted to be forced outwardly against said skirt coincident with the force exerted by liquid pressure tending to leak past the relatively movable surfaces.

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