

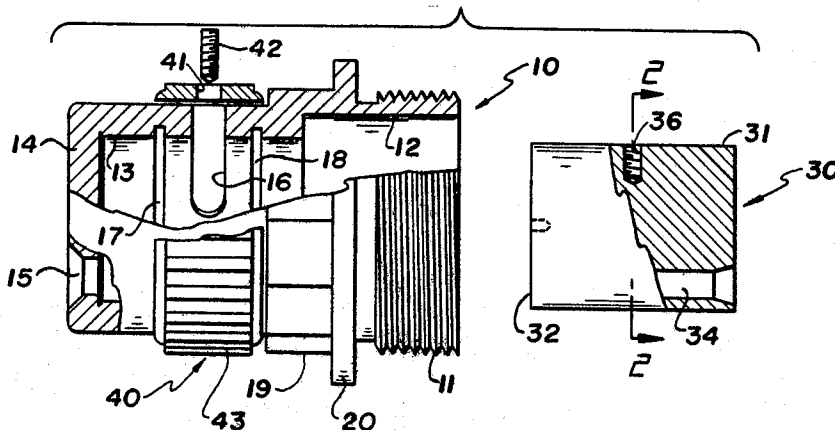
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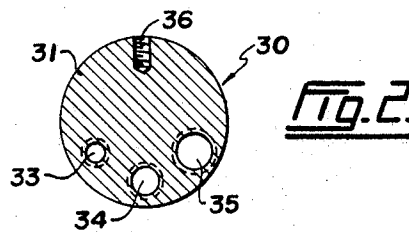
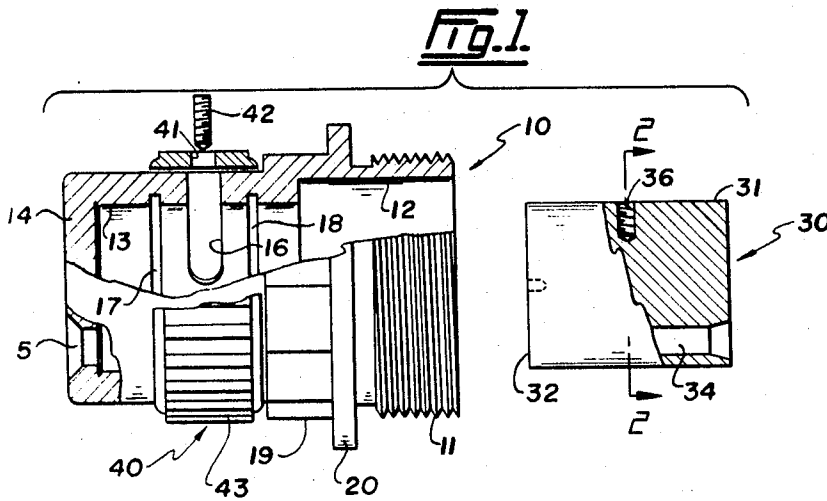
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[54] **HOSE NOZZLE**
9 Claims, 2 Drawing Figs.

[52] U.S. Cl. 239/394
 [51] Int. Cl. A62c 31/02
 [50] Field of Search 239/392,
 393, 394, 395; 251/207; 222/(No Search)

ABSTRACT: A fire fighter's hose nozzle with a plurality of differently sized apertures adapted to be brought, selectively, into an operating position to vary the range and pattern of the spray produced by the nozzle.





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HOSE NOZZLE

BACKGROUND OF THE INVENTION

In fighting fire it is necessary that the hose should be able to produce a jet of different ranges and having different patterns to suit the conditions of the fire. This is particularly the case in fighting forest fires.

PRIOR ART

The existing equipment comprises either a complex and expensive adjustable nozzles or a plurality of nozzles are provided, each producing a particular type of jet.

Both of these sets of equipment have the disadvantage of being expensive and the purchase of them by an industrial concern represents a considerable outlay for which no immediate return is forthcoming. The equipment comprising a plurality of different nozzles if particularly cumbersome in operation inasmuch as it generally involves the closing down of the pumping operation from the water supply to the hose whilst one nozzle is replaced and it often happens that the pumping source is quite remote from the position at which the fire is being fought so that quite lengthy delays in changing the nozzles and inconvenience is caused. The adjustable nozzles do not have this disadvantage but of course they are more complex and considerably more expensive.

The present invention seeks to provide a simple adjustable nozzle.

BRIEF STATEMENT OF THE INVENTION

The nozzle of this invention comprises a body having a cylindrical passageway and an end wall having an eccentrically disposed aperture therethrough. A rotatable cylindrical valve member is fitted into the passageway to slide over the end wall and the valve member has two or more bores therethrough of different diameters, positioned to be brought, selectively, into register with the aperture upon rotation of the valve member in the passageway.

It will be appreciated that when one bore is brought into the operative position fully registering with the aperture in the end wall of the body member, the passage of water through the other bore or bores is substantially prevented by the end wall which obturates the adjacent ends of the other of the bores. It will be appreciated that by bringing a blank face of the valve member into register with the aperture a shutoff facility is provided.

BRIEF DESCRIPTION OF THE FIGURES OF THE DRAWINGS

An embodiment of the invention is illustrated in the accompanying drawings in which:

FIG. 1 is an exploded view, partly in section, of a nozzle according to this invention; and

FIG. 2 is a section on the line II-II of FIG. 1.

DESCRIPTION OF A PREFERRED EMBODIMENT

The nozzle of this invention comprises a body 10 a valve member 30 and an operating ring 40.

The body is of generally cylindrical shape having external screw threads 11 at its open, rear end by which it can be attached to the end of a hose. Obviously the screw threads could be formed internally to allow the body to be fitted to an externally threaded hose fitting if need be.

The inner surface of the body defines a cylindrical passageway having a larger diameter portion 12 at the rear end of the body and a smaller diameter portion 13 at the forward end of the body. An end wall 14 closes the forward end of the body and has an outlet aperture 15 formed therethrough in a position offset from the centerline of the passageway.

It is within the narrow part 13 of the passageway that the valve member 30 is located and the front face 32 of the valve member seats upon the rear face of the end wall 14. To ensure

a proper face to face relationship, the corner between the inner surface of the body and the end wall is undercut. It will be appreciated that the passageway is generally formed in a solid block of brass or other water resistant material by a boring operation and that in such an operation it is virtually impossible to form a sharp corner in a position such as the junction between the cylindrical wall and the end wall 14. Thus if the corner was not undercut the valve member would tend to ride on the radius formed at that corner.

A part annular slot 16 is formed in the wall of the body in the region of the narrow section 13 and annular grooves 17 and 18 are formed in the inner surface of the body to each side of the slot 16 for the location of O-rings.

The outer surface of the body is provided with a flattened wrench grip 19 and a locating flange 20.

The valve member comprises a cylinder 31 of a diameter to fit closely within the narrow section 13 of the body but to be rotatable in that section.

The front face 32 of the valve member is carefully finished to be smooth but it will be appreciated it is extremely difficult accurately to center the valve member during turning so that a pip will often be formed at the center of the face 32. To avoid this a small hole is drilled in that front face. In this way face to face relationship between the face 32 and the end wall of the body is ensured.

It will be appreciated that when the valve member is located within the body the O-ring is located in grooves 17 and 18 of the section 13 of the body, cooperating with the outer surface of the valve member will prevent water from reaching the slot 16 in the valve body.

As will be seen from FIG. 2 of the drawings, the valve member 31 has three bores 33, 34 and 35 formed therethrough, and which extend generally parallel to the axis of the valve member and are on the same pitch circle as is the aperture 15 in the end wall of the body so that by rotating the valve member within the body one or other of the bores 33, 34 and 35 can be brought into register with the aperture 15.

To consolidate the jet through the bores 33, 34 and 35 the rear parts of those bores are tapered slightly at an angle of say, between 18° and 22°.

A tapped hole 36 is formed in the valve member for cooperation, in a manner described hereinafter with a control member.

Rotatably mounted on the outer surface of the section 13 of the body is a control ring 40 which overlies the slot 16 of the body. The outer surface of 40 is conveniently slotted as at 43 to provide a good hand grip so that it may be twisted about the body.

The control ring is formed with a radial hole 41 through which a threaded stud 42 is passed to be screw threaded into the tapped hole 36 of the valve member. The end of the stud projecting to the outside being cut off flush with the control ring. In this way rotation of the control ring will cause rotation of the valve member within the body and so bring one or other of the bores 33, 34 and 35 into register with the aperture 15. The slot 16 is conveniently of such length as to enable the valve member to be turned beyond the arc including the three bores so that a blank part of the face 32 can be brought into register with the aperture 15 to close off that aperture. This effectively provides the nozzle with a shutoff facility.

Preferably the openings of the bores 33, 34 and 35 on to face 32 are close together so that whilst one bore only may be brought into register with the aperture 15 it is also possible to bring two adjacent bores partly into register to produce a fine spray pattern.

In operation it is found that the valve member is surprisingly easy to rotate even through a considerable pressure is exerted on it by the flow of water through the nozzle tending to press it against the end wall 14 because water tends to enter between the surface 32 and the end wall 14, this water tending to resist the pressure of the water through the nozzle against the valve member. This effect can be obtained either by relying on the normal production flows in the two opposed surfaces, or by

making the surface 32 of very slightly conical form so that it is in sliding engagement with the end wall 14 at the center of that wall but leaves a small annular space into which water can enter through the bores not in register with the aperture. Alternatively a small lip can be formed around the edge of the aperture to space the end wall and surface 32 slightly apart and leave a small pressure space with which the bores not in register with the aperture communicate.

It will be appreciated that where the face 32 is made slightly conical there is a tendency for leakage through the bores when the nozzle is shut off but the space needed to relieve the pressure is so small that this tendency is only slight and can be considered insignificant.

I claim:

1. A nozzle for a fire fighter's hose comprising a body having a cylindrical passageway with an end wall having an eccentrically disposed aperture therethrough, a rotatable cylindrical valve member fitted into the passageway and having slidable engagement with the end wall, the valve member having three or more bores therethrough opening into an end surface of the valve member and each of different diameter to the other bores the end surface of the valve member also having a blank part, the bore and the blank part being positioned to be brought, selectively, into register with the aperture upon rotation of the valve member in the passageway, a control ring embracing the valve body and a slot in the valve body beneath the control ring and a connector element between the control ring and the valve member so that rotation of the control ring causes rotation of the valve member.

2. A nozzle as claimed in claim 1 in which the bores are close to each other so that each of two adjacent bores can be brought partly into register with the aperture.

3. A nozzle as claimed in claim 1 in which a small pressure

space is formed between the end wall and the valve member, with which the bores through the valve member communicate to relieve the pressure on the valve member.

4. A nozzle as claimed in claim 1 in which the valve member has sliding contact with a slightly raised portion of the end wall around the aperture and is spaced from the remainder of the end wall to define with that end wall a pressure space to relieve the pressure between the valve member and end wall.

5. A nozzle as claimed in claim 1 in which the valve member has sliding contact with a central region of the end wall and is slightly spaced from the end wall over the remaining area of that end wall to define a small pressure space.

6. A fire fighter's hose nozzle comprising a body having a cylindrical passageway and an end wall having an eccentrically disposed aperture communicating with that passageway, and rotatable cylindrical valve member fitted into the passageway having sliding engagement with the end wall, the valve member having at least two bores therethrough of different diameters positioned to be brought, selectively, into register with the aperture upon rotation of the valve member in the passageway, said body having an arcuate slot communicating with the passageway and a control member connected to the valve member through the slot.

7. A nozzle as claimed in claim 6 in which said control member comprises a ring embracing the body member with a connector element between the ring and the valve member.

8. A nozzle as claimed in claim 7 having sealing means between the valve member and the body to prevent the ingress of water to the slot.

9. A nozzle as claimed in claim 6 having sealing means between the valve member and the body to prevent the ingress of water to the slot.

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