# PATENT SPECIFICATION

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COMPLETE SPECIFICATION

## Improvements in or relating to Water Monitor Hoses

I, YEE LAIN CHEW, of No. 17, High Street, Gopeng, Perak, Malaya, a Chinese Citizen, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to water monitor hoses, such as may be used for example in fire equipment, wherein the nozzle is mounted for universal movement to allow the water to be played as may be required.

The object of the invention is to provide for improving the means of manipulation of the nozzle, while maintaining mechanical strength and reasonable weight in the equipment as a whole.

According to the invention there is provided fire hose or like water monitor equipment wherein a nozzle head consists of ball and socket parts one of which carries a bearing for assisting rotation of the nozzle head about an axis (usually vertical) through the ball and in the direction of water flow, the parts being releasably secured together by means which include an expansible coupling ring which engages in a recess in the one part, to retain the bearing thereon disengagement of the ring from the recess allowing the parts to be separated.

In carrying out the invention, the coupling ring is held in position by an axially slidable washer of **U**-cross section which, in the assembled position, engages the ring at its inner periphery and embraces the bearing race housings at its outer wall.

Advantageously, the relatively adjustable head parts forming the universal joint are held together against separation by water pressure or otherwise by a link or shackle which pivotally connects the movable head part to one of the bearing race housings. The link or shackle conveniently may be extended for manipulation by the operator. for which purpose it may extend over the head as a **U**-shape member the bight of which forms the hand hold. A feature of the invention is the use of a sealing gasket of the character described in co-pending Application No. 29228/52 (Serial No. 735,192). To this end the head parts consist of a hollow ball and a relatively movable member which carries the nozzle and which is supported by the ball with the gasket interposed between them to form a seal in all positions of adjustment of the nozzle member, the gasket being clamped by flanges on the nozzle carrying member of the head. In this arrangement the bearing aforesaid may be releasably mounted on a tubular extension of the ball forming a water inlet thereto, and the shackle connects the nozzle carrying member of the head and the housing for the movable race of the bearing.

Preferably the gasket employs a skirt which extends over a portion of the inner half of the ball to provide effective sealing in all positions of adjustment of the head without obstruction to the water flow therethrough.

In order that the invention may be readily understood and carried into effect, one practical embodiment thereof by way of example, will now be described with reference to the accompanying drawings in which:—

Fig. 1 is a side elevation of the water monitor according to the invention:

Fig. 2 is a sectional elevation on the line II—II of Fig. 1 to an enlarged scale;

Fig. 3 is a sectional elevation on the line III—III of Fig. 2;

Fig. 4 is a transverse section on the line IV—IV of Fig. 2;

Fig. 5 is an exploded sectional view of the ball joint head and the bearing on which the nozzle can rotate about a vertical axis; and

Fig. 6 is a sectional view through the head showing the maximum positions of elevation and depression of the nozzle about a hori-

[*Price* 3/-]

zontal axis (the pivots 26) through the ball.

The monitor shown consists of a nozzle carrying head part 11 in the form of a tubular elbow which is flanged at 30 for connection thereto of the nozzle tube 37 to which the nozzle 37*a* is secured. A horizontal handle bar 36 is supported parallel with the nozzle tube but projects rearwardly thereof, being carried by a bracket 30*a* and a clamp 32, the inner end nearest the nozzle being gripped by a clamping ring 35 which at 34 is secured about the nozzle tube 37. The handle 36 is for turning the nozzle about a vertical axis through the head, and may also be used for elevation and depression.

The fixed part of the head consists of a tubular elbow 10 which is flanged at one end 12 for connection to the water supply conduit (not shown), and at the opposite end terminates in a ball 16 forming part of the universal joint by which the nozzle and the head part 11 can be moved up and down and about a vertical axis as may be required. Between the ball 16 and the lower portion of the elbow 10, a tubular extension of the elbow carries a ball race bearing 24 which provides for easy turning of the head part 11 about the vertical axis even under water pressure.

The movable head part 11 has a socket seating which embraces the ball, the actual bearing being on a skirted gasket 21 of the character set forth in my co-pending Application No. 29228/52 (Serial No. 735,192) which is held clamped in position between a flange 17 of the head part 11 and a flange plate 17*a*, the two flanges being secured together by the screw bolts 17*b*.

Connection between the movable head part 11 and the fixed head part 12 to prevent separation under water pressure and otherwise, is provided by shackle links 27 which at one end are connected by pivots 26 to the flanges 17, 17*a* of head part 11, and at the opposite (lower) end are connected by pivots 25 to the rotational housing of the bearing 24. Conveniently, as shown, the links are extended into a continuous loop 27*a* which embraces the head part 11 but lies rearwardly thereof to provide a hand hold by which the nozzle may be readily depressed or elevated by the operator. It will be observed that the pivots 26 are in the axis of the ball 16 and that the handle loop 27*a* is set back a few degrees from the vertical axis by right angle connecting pieces 27*b* from the pivots 26. Thus only a few degrees movement of the handle loop 27*a* is necessary from the maximum elevated position shown in full lines in Fig. 6 to maximum depressed position shown in dotted lines, as will be clearly seen from that drawing. However, elevation and depression can also be obtained by the use of the handle bar 36.

A feature of the invention provides for releasably securing the bearing 24 in position without the use of screws, and that the two head parts 10, 11, can be separated by removing the pivot screws 26 which allows the upper part 11 to be lifted off the lower part 10. When so released, the bearing can be withdrawn from the head part 10 by axial displacement of a holding washer 22 which locates and engages a coupling ring 28 within a circumferential recess 10*a* in the tubular extension of the head part 10. The coupling ring 28 is an expansible member (e.g., split as shown) so that when the washer 22 is withdrawn axially it spreads apart radially out of the recess to allow the various parts to be removed axially from the head part 10 as shown in Fig. 5. In the assembled position the inner periphery of the washer engages about the compressed coupling ring 28 so holding it in the recess 10*a*, and a depending skirt 22*a* embraces the race housings of the bearing 24 to exclude dust and extraneous unwanted matter therefrom, as will be clear from Figs. 2 and 3. Thus a simple assembly which is substantially dust proof facilitates manufacturing operations, and any repairs that may be necessary.

A further feature of the invention is the use of the skirted gasket 21 aforesaid. The gasket ring is at the axis of turning of the ball 16 and by virtue of the extension of the ring between the clamping flanges 17 and 17*a* a secure and water tight joint, when the shackle links 27 are connected in position, is obtained. The gasket ring may extend across the whole of the flange area, as shown in Fig. 3, or preferably, the outer periphery may be short of the ring of fixing bolts 17*b* so that no piercing of the ring is necessary.

The advantage of the skirt 21*a* is that from the ring it extends over a part of the ball 16, and in maximum positions of depression and elevation it provides effective sealing without obstruction to water flow through the head as will be seen from Fig. 6 in particular.

What I claim is:—

1. Fire hose or like water monitor equipment, wherein a nozzle head, comprises ball and socket parts one of which carries a bearing for assisting rotation of the nozzle head about an axis through the ball and in the direction of water flow, the parts being releasably secured together by means which include an expansible coupling ring which engages in a recess in the one part to retain the bearing thereon, disengagement of the ring from the recess allowing the parts to be separated.

2. A fire hose or like water monitor according to Claim 1, wherein the coupling ring is held in position by an axially slidable washer on the related head part.

3. A fire hose or like water monitor according to Claim 2, wherein the retaining

zontal axis (the pivots 26) through the ball.

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The fixed part of the head consists of a tubular elbow 10 which is flanged at one end 12 for connection to the water supply conduit (not shown), and at the opposite end terminates in a ball 16 forming part of the universal joint by which the nozzle and the head part 11 can be moved up and down and about a vertical axis as may be required. Between the ball 16 and the lower portion of the elbow 10, a tubular extension of the elbow carries a ball race bearing 24 which provides for easy turning of the head part 11 about the vertical axis even under water pressure.

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2. A fire hose or like water monitor according to Claim 1, wherein the coupling ring is held in position by an axially slidable washer on the related head part.

3. A fire hose or like water monitor according to Claim 2, wherein the retaining

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washer has a skirt portion which embraces and covers the bearing race housings when the said washer is engaging the coupling ring.

4. A fire hose or like water monitor according to any one of the preceding claims, wherein the bearing is releasably secured to a tubular extension of the ball which forms the water inlet thereto and is constituted as the fixed member of the head, and a pivoted link or shackle device is provided for holding the socket bearing of the nozzle carrying part in position on the ball.

5. A fire hose or like water monitor according to Claim 4, wherein the said device consists of a pair of oppositely disposed links which are extended to form a handle loop embracing the nozzle carrying head part, the links being pivotally mounted on the fixed and movable head parts and connecting pieces being provided between the pivots on the movable head part and the links so as to offset the handle rearwardly of the nozzle, for manipulation purposes.

6. A fire hose or like water monitor according to either of the preceding Claims 4 and 5, wherein a sealing gasket ring forms the seating for the ball, the said gasket being held between flanges on the movable head part.

7. A fire hose or like water monitor according to Claim 6, wherein the gasket has a skirt which partially covers the ball and provides sealing throughout all positions from maximum to minimum elevation of the nozzle, without obstruction to water flow.

8. A fire hose or like water monitor constructed substantially as herein described with reference to and as illustrated in the accompanying drawings.

KINGS PATENT AGENCY LIMITED.
By
B. T. KING,
A.I.MECH.E., DIRECTOR,
Registered Patent Agent.
146a, Queen Victoria Street,
London, E.C.4.
Agents for the Applicant.

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