

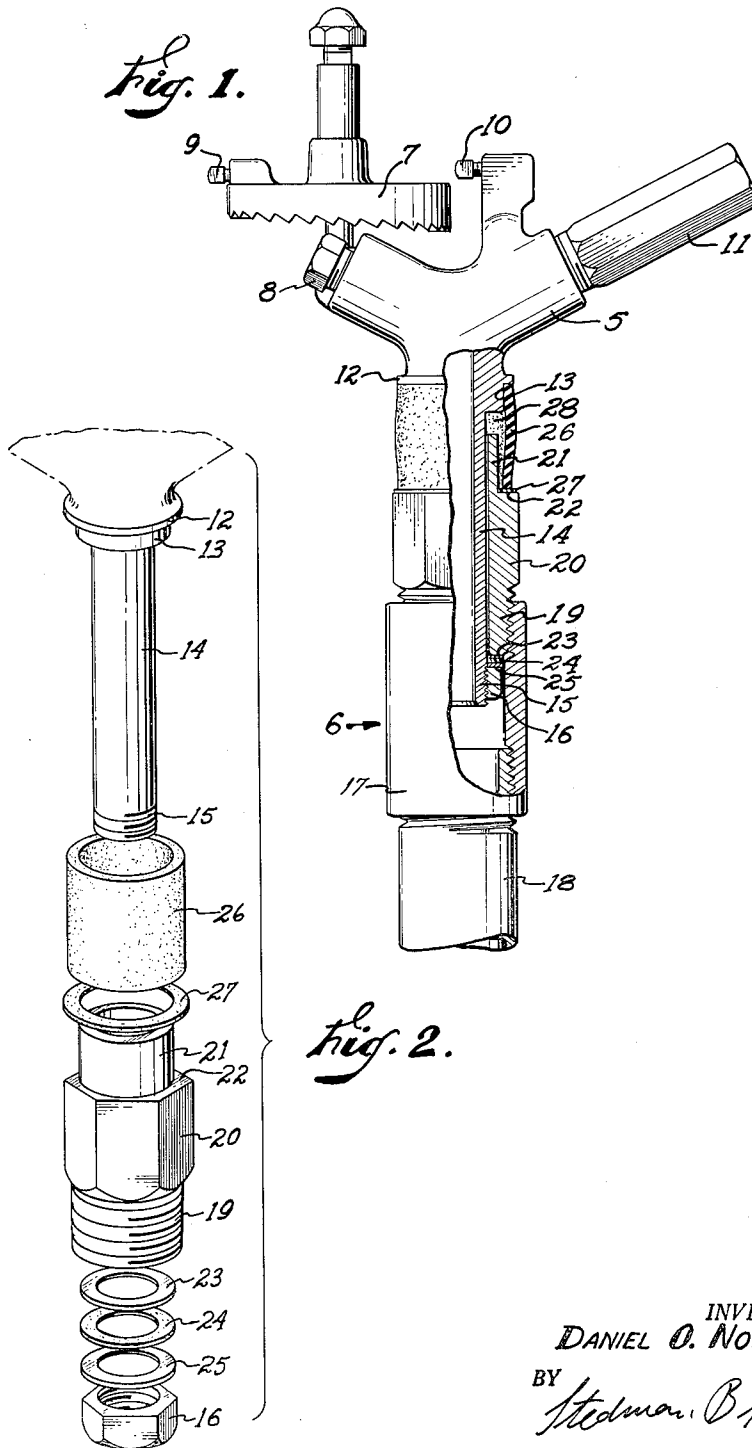
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SEALING DEVICE FOR ROTARY SPRINKLERS

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1

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SEALING DEVICE FOR ROTARY SPRINKLERS

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1 Claim. (Cl. 285—275)

This invention relates to rotary lawn sprinklers and more particularly relates to sealing means interposed between the rotating and stationary parts of a sprinkler, this point being frequently a source of leakage which not only is inconvenient but may develop into such a loss of pressure as to cut materially into the efficiency of the sprinkler.

It is an object of this invention to provide a seal which effectively prevents leakage between the rotating sprinkler nozzle and the stationary portion of the sprinkler to which the piping or hose conducting water to the sprinkler is attached.

A further object of the invention is to provide a seal having such low friction that the sprinkler is not hampered in its rotation, but may easily be caused to rotate by forces developed by the flow of water, even at low volumes and/or pressures.

More specifically, an object of this invention is to provide sealing means having lateral or constrictive pressure on one of the two relatively movable units of a rotary sprinkler, and end-thrust pressure on the other of the two units, with a small bearing surface thereon and anti-friction devices to minimize the friction upon said other unit, the sealing means being resilient and so devised as to increase both the constrictive pressure and the end-thrust pressure with a single adjustment.

Still another object of this invention is to so seal the relatively rotating parts of the device as to prevent the entry of grit, which may be entrained in the water, and so to prevent wear upon the contacting surfaces.

My device is herein illustrated as being applied to a sprinkler of the type claimed in my application for patent Serial No. 584,711, filed concurrently herewith, and now matured into Patent 2,862,763 but obviously may be applied to other types of sprinklers, for example the sprinkler disclosed in my copending application Serial No. 352,738, filed May 4, 1953, now matured into Patent No. 2,745,698.

In accompanying drawings, illustrative of the principles of my invention,

Fig. 1 is an elevational view of a rotary sprinkler, in part broken away to show construction in section; and

Fig. 2 is an exploded view of the sprinkler parts effecting the seal.

Having reference to the details of the drawing I have shown a lawn sprinkler having a rotary head 5 and a stationary hose or pipe connection 6, the head 5 having a rotating disc 7 caused to revolve by the action of a jet of water emanating from a jet nozzle 8. The disc 7 carries a hammer 9 which strikes upon an anvil 10 carried by the head 5, causing the head 5 to revolve in a series of short angular movements. The disc 5 is moved upwardly in a sector of its revolution by a cam, not shown, to bring the hammer 9 into the plane of the anvil 10, the low point of the cam occurring at or just before the instant of impact and permitting the disk to drop when checked by the impact so that the hammer 9

2

will pass under the anvil 10 as rotation of the disk is resumed. The main stream of water emanates from nozzle 11. The mechanism so far recited is the subject of my aforesaid application Serial No. 584,711.

5 The head 5 is provided with a downwardly facing annular shoulder 12, a short annular portion 13 of slightly reduced diameter extending downwardly from the shoulder 12, and a water tube 14 of further reduced diameter extending downwardly from the portion 13 and threaded at its lower end 15 to receive a nut 16. The pipe or hose connection 6 comprises a pipe coupling 17, threaded at one end to receive a pipe or hose 18 and threaded at its other end to receive the male end 19 of a sleeve 20. The sleeve 20 has an upwardly extending annular portion 21 which has an external diameter slightly less than that of the annular portion 13, and which is defined in relation to the sleeve 20 by a horizontal annular shoulder 22. The tube 14 fits revolvably within the sleeve 20, the fit being sufficiently loose to obviate friction between these parts.

15 Between the nut 16 and the end 19 of the sleeve 20, I place a washer 23, of anti-friction material, such as any of various plastic washers now readily available, and below the washer 23 I place a rubber washer 24. A third washer 25, of metal, may be placed below the washer 24 to prevent tearing or distorting the rubber washer 24 when the nut 16 is turned up on the tube 14. The washers 23, 24, and 25 will all revolve with the tube 14 and nut 16, but the washer 23 presents only a very narrow and practically frictionless surface to the lower end 19 of the sleeve 20 which is stationary.

25 Upon the annular portion 13 of the head 5 is a tightly fitting collar 26 of soft rubber which may be stretched over the portion 13 and which depends downwardly therefrom. The dependent portion of the rubber collar 26 fits loosely about the upstanding and narrower portion 21 of the stationary sleeve 20, so as to have virtually no lateral or compressive friction therewith. Between the lower end of the collar 26 and the shoulder 22 of the sleeve 20 is disposed an anti-friction washer 27, which may be of the same material as the washer 23. The dependent length of the collar 26 is such that when the lower end of it is in contact with the washer 27 on the shoulder 22, a gap 28 will remain between the portions 13 and 21.

30 In assembling the sealing device, the collar 26 is stretched upon the annular portion 13, and the sleeve 20 with the washer 27 in place is then placed upon the tube 14, with the annular portion 21 extending loosely within the collar 26 and separated from the portion 13 by the gap 28. The nut 16, with washers 23, 24, and 25, is then placed upon the tube 14 and turned up so as to reduce slightly the gap 28 and to place the collar 26 under end compression, causing it to buckle in relation to the portion 21. There will of course, also be compression upon the washer 27 and on the washers 23, 24, 25 at opposite ends of the sleeve 20. The coupling 17 may then be employed to couple the pipe 18 to the sleeve 20.

35 In operation, it will be apparent that water from the pipe 18 must either ascend through the tube 14 to the head 5, or pass around the nut 16, the washers 23, 24, 25, and try to escape between the tube 14 and the sleeve 20 through the gap 28, assuming that all threaded joints have been made tight. However, the rubber washer 24 is under end compression and in contact with the tube 14. If it does not entirely prevent the escape of water, it at least acts as a filter to prevent entrained grains of sand from entering between the tube 14 and the sleeve 20. The anti-friction washer 23, also under end compression, may receive a few drops of clean water to lubricate it, and in those circumstances will last indefinitely, permitting the nut 16 to rotate freely relatively to the

3

sleeve 20. At the upper end of the sleeve 20, the stretched fit of the collar 26 upon the annular portion 13 prevents any escape of water. Such water as arrives at the gap 28 must seek its outlet around the washer 27. But the collar 26 is under end compression sufficient to buckle it, and the washer 27 is under compression from the collar. Like the washer 23, the washer 27 may receive an occasional drop of clean filtered water which will serve to lubricate its contact with the shoulder 22, and cause it to last indefinitely, but the water leakage at this stage is so extremely attenuated as to be imperceptible, and full line pressure is available at the head 5.

Obviously, the sealing device herein described will function in any position, and the relative terms "upper" "lower" "up" "down," and the like used in this specification and in the claim are merely representative of directions and positions as illustrated in the drawing.

The described embodiment is not to be construed as a limitation upon the invention, the scope of which is deemed to include any desirable constructive modification within the spirit and breadth of the appended claim.

I claim:

In a rotary sprinkler having a rotating head, sealing means comprising: a tube depending from said head and affixed thereto to rotate therewith and having an enlarged portion at its upper end and a further enlarged portion above said first mentioned enlarged portion providing a downwardly facing radial shoulder; a sleeve adapted to be affixed to stationary conduit means supplying said head, and encompassing said tube, and having an external annular shoulder facing said head and a diametrically reduced portion between said annular shoulder and said head; said tube extending loosely through said sleeve and having an end extending beyond the end of said sleeve distant from said head; a nut on said end

4

of said tube, adjustable to impose end thrust upon said sleeve; a sealing washer and an anti-friction washer disposed between said sleeve and said nut in superimposed relationship; a second anti-friction washer on said annular shoulder of said sleeve; and a resilient elongated collar having its one end tightly engaging said first mentioned enlarged portion of said tube and abutting said radial shoulder and having its other end loosely encompassing said reduced portion of said sleeve and abutting on said second anti-friction washer, whereby when said nut is adjusted to impose end thrust on said sleeve, said collar then supports said tube and said head thereon.

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