Sept. 8, 1959 C. F. LE DEIT 2,903,190

SPRINKLER HEAD

Filed Sept. 4, 1956

FIG_1

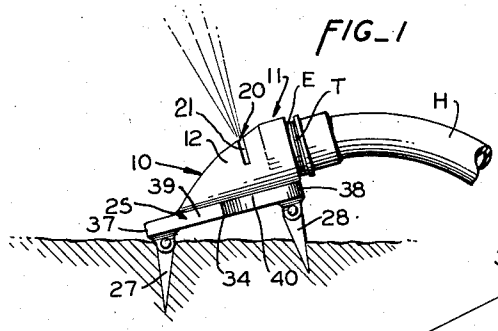


FIG_2

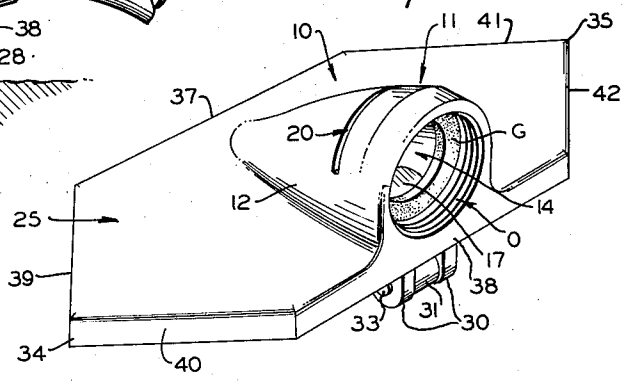
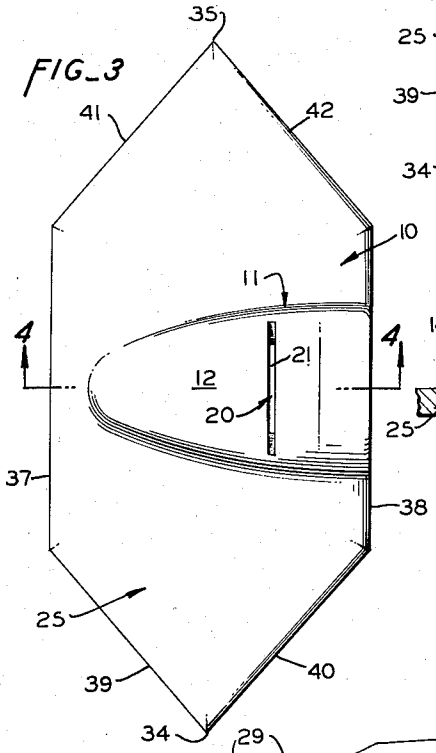


FIG_3



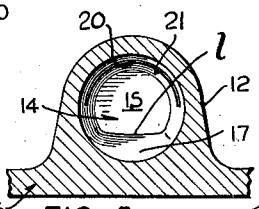
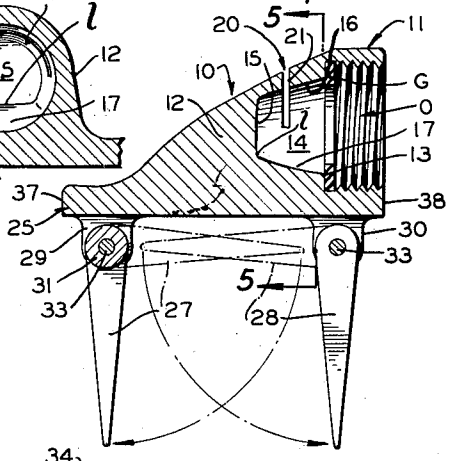


FIG_5

FIG_4



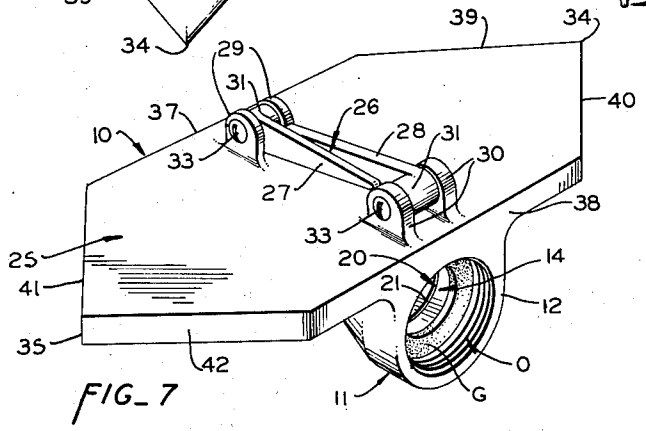


FIG_7

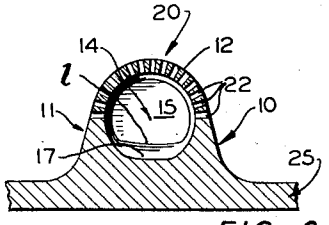


FIG_6

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SPRINKLER HEAD

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This invention relates to sprinkler heads and more particularly to certain novel improvements therein.

There are many different types and forms of sprinklers adapted to be connected to a garden hose for spreading and/or spraying water emanating therefrom. The present invention contemplates the provision of a sprinkler head which facilitates a good fan shaped spray which will spread the water over a lawn or the like with assurance that little or no run-off will occur. To this end I provide a cap type head, into which the water is directed from the hose, with a vertically disposed orifice or orifices and a deflector cooperating therewith to direct the flow up through the orifice with a minimum of loss of force or flow.

Another object is to provide a cap type sprinkler head in which the water receiving chamber is restricted somewhat in space or volume capacity with an orifice so disposed as to throw a stream of water therefrom with force. In this connection it is an object to provide the restricted chamber with a deflector surface diametrically opposite the orifice so that the water is directed toward the orifice with a minimum of resistance to flow.

Another object is to provide such a sprinkler head with a vertically disposed orifice or a plurality of orifices in radial array relative to the restricted chamber so as to discharge water therefrom at right angles with respect to the direction of flow of the water entering such chamber.

It is yet another object to provide the sprinkler head of the present invention with a flat base for supporting the same with the axis of its water receiving chamber horizontally disposed. In conjunction with this object it is a further object to provide the base with a number of tines or spikes by which the sprinkler head can be securely anchored in a desired position relative to the surface of earth upon which it is placed. This is very important particularly when it is considered that sprinkler heads must often times be placed on inclined lawns, banks, or hillsides.

It is another object of this invention to provide oppositely disposed tines or spikes and to provide them with pivotal connection to the underside of the base of the sprinkler so that the tines will fold back upon same and be out of the way when their use is not required. This pivotation of the tines relative to the base is further important in effecting a tilt to the latter whereby the fan shaped spray of water emanating from the sprinkler head can be directed at an angle relative to vertical if desired.

These and other objects and advantages of the present invention will become apparent in the following description when read in the light of the drawings in which:

Fig. 1 is a side view of the sprinkler head of the present invention connected to a hose and anchored to earth.

Fig. 2 is a perspective view of the sprinkler head only of Fig. 1 and at larger scale with respect thereto,

Fig. 3 is a top plan view of Fig. 1.

Fig. 4 is a section through Fig. 3 taken along line 4—4 thereof which coincides with admittance flow of water into the same.

Fig. 5 is a fragmentary transverse section through Fig. 4 and taken substantially along line 5—5 thereof.

Fig. 6 is a view similar to that of Fig. 5 but taken at the plane of discharge of water from the sprinkler head to show a modified form of discharge opening therefor.

Fig. 7 is a perspective view similar to that of Fig. 2 but with the sprinkler head disposed bottom side up.

In the drawing, 10 generally indicates the sprinkler head embodying the present invention. Briefly it consists of a casting, preferably of metal, so formed as to provide a cap-like fitting 11 provided with standard threads T as its admittance opening O adapted to fit on the discharge end E of a water line such as a garden hose H as seen in Fig. 1.

The cap-like fitting 11 more particularly comprises a bullet shaped body 12 in which the threaded admittance opening O terminates in a shoulder portion 13 against which a rubber washer or gasket G bears to provide a seal between the threaded discharge end E of the hose H and the sprinkler head body.

Just inside the shoulder 13 the body 12 is so formed as to provide a chamber 14 in axial alignment with the threaded admittance opening O. This chamber 14 extends into the bullet shaped body 12 a distance substantially comparable to the diameter of the chamber 14 at the plane of the open end of the latter adjacent the shoulder portion 13. The opposite end of the chamber 14 is a blunt surface 15 having a diameter a little over ⅔ that of the open end or larger end of the chamber. The center of the round blunt end 15 has its axis concentric relative to the axis of the admittance opening O of the fitting 11. Thus a tapering inner wall 16 is provided within the chamber 14 with the exception of one zone comprising an inclined plane to provide a deflector 17 for directing the flow of water toward an orifice 20 formed diametrically opposite to the deflector 17. As best seen in Figs. 5 and 6, the inclined deflecting surface 17 terminates at a line —1— chordally disposed along the otherwise round blunt wall or end surface 15 of the chamber 14.

The orifice 20 previously mentioned is an opening radiating over 180° around that portion of the bullet-like body diametrically opposite the deflector 17. This orifice may be constructed in various manners as for example the half circle slit 21 in Figs. 1 through 5 of the drawing; or it may be a series of radial bores 22 (Fig. 6) arranged in alignment across 180 degrees of the body 12 in that zone thereof diametrically opposite the deflector surface 17.

In addition to the foregoing it will be noted that the orifice 20, be at the continuous slit 21 or the aligned radial bores 22, provides a discharge outlet by which a fan shaped spray of water results. Moreover it will be noted that the orifice 20 (which spans 180° of the bullet shaped body) is disposed transverse to the axis thereof, that is to say, the axis along which the water enters the sprinkler head via the threaded admittance opening O. It will therefore be appreciated that the water flowing into the chamber 14 tends to become pressurized due to the tapering side wall 16 as well as the meeting with resistance at the blunt end wall 15. Consequently the escapement of this water via the transversely disposed orifice 20 results in a pressurized fan shaped spray which radiates from the bullet-like head 12. In this connection it should be noted that the stream of water flowing into the chamber 14 from the supply line or hose H is de-

flected angularly upward by the inclined surface 17 diametrically opposite the orifice 20. As a result the fan shaped spray emitting from the orifice is discharged therefrom with a greater and more direct force than it would by the mere pressurized condition of the water within the tapered, blunt ended chamber 14.

As best seen in the drawings, the bullet-like body 12 is formed integrally with a foot portion 25 in the shape of a flat base plate. This flat base plate 25 is formed beneath the inclined deflector 17 or diametrically opposite to the half circle orifice 20, the foot portion being adapted to lie flat upon the surface being watered so that the fan shaped spray is disposed perpendicular to that surface or more specifically with respect to the flat base plate 25.

A pair of spikes 26 extending from the underside of the base plate 25 are adapted to be pressed into the earth surface upon which the plate rests so as to anchor the sprinkler head 10 relative to the earth. These spikes 26, in accordance with the present invention, are pivotally mounted upon the underside of the base plate 25 to facilitate anchoring the latter at an angle relative to horizontal if desired as illustrated in Fig. 1. In this manner the bullet-like body of the sprinkler head can be disposed in such a position that the fan shaped spray of water emitting therefrom can be discharged in a plane which is off vertical or at an angle relative to horizontal or the plane upon which the sprinkler is placed. This is very important since a lawn surface may not be level. It may be sloping or a bank with surface at considerable degrees off horizontal. In such cases a truly vertical spray can be attained by setting the spikes 26 at a proper position to assure that the fan shaped spray will be vertically discharged irrespective of the slope of the lawn surface.

In connection with the feature of making the spikes 26 adjustable relative to the flat base plate 25, the structure I want to protect is the interfitting relation of the two spikes 27 and 28 relative to each other when they are swung back toward the underside of the plate 25. To this end I provide a pair of ears 29 and 30 for each of the spikes 27 and 28 respectively. Moreover, each set of ears in each pair thereof is spaced from each other a distance twice the thickness of the spike associated therewith. In addition thereto, each spike 27 and 28 is alike and interchangeable in that each has a boss formation 31 formed at its end which is pivotally connected to the sprinkler head.

This boss 31 has an axial bore through which a pin 33 can extend. Each boss is of a length to fit between the spaced ears of one pair thereof, either 29 or 30, as the case may be. Each pair of ears (29 and 30) is provided with aligned bores to receive the pin 33 upon which the boss 31 is disposed so as to support the spike formed with the latter for swinging movement. In accordance with the present invention the boss 31 of the spike 27 is disposed in the plane of swing of the other spike 28 while the latter has its boss 31 in the plane of swing of the first named spike 27. In this manner the two spikes are disposed to lie side by side against the bottom surface of the base 25 as shown in Fig. 7 (see also dot-dash position thereof in Fig. 4).

In conjunction with the pivoted spikes 27 and 28, I want to point out particularly that they are mounted on the base plate 25 so as to swing in a plane parallel to the longitudinal axis of the bullet-like body 12 formed integrally on the upper side of the plate 25. More particularly the two spikes 27 and 28 are preferably centered upon the bottom surface of the plate 25 so that the meeting line between the two spikes is substantially coincident to and with the vertical plane in which the long axis of the bullet-like body 12 is disposed. Note also that this is the axis of the tapering chamber 14 and coincident with the line of flow of water into the latter from the water supply line or hose H.

From the foregoing it will be apparent that the spikes 27 and 28 are pivotally mounted adjacent the fore and aft edges 37 and 38, respectively, of the base plate 25 and therefore facilitate a fore to aft, or vice versa, tilt to the fan shaped spray of water emanating from the orifice 20 of the sprinkler head 10.

In addition to the foregoing, I desire to point out that the base plate 25 spreads laterally from the long axis of the bullet-like body 12 which is centrally disposed when viewed from above (see Fig. 3). In other words, the base plate 25 is substantially twice as wide transversely of the body 12 as it is from its fore to aft edges 37 and 38. With this in mind note now that each end, 34 and 35, of the base plate 25 has its corners cut away so as to provide diagonally disposed edges 39 and 40 at the end 34 as well as similarly disposed edges 41 and 42 at the end 35. Thus it will be seen that where these diagonal edges merge an apex is formed at the extreme end 34 and 35, respectively, of the base plate.

By the provision of these diagonal edges 39, 40, 41 and 42 it is possible to tilt the base plate 25 at various positions relative to the surface upon which the sprinkler head is mounted. For example, it will be noted in Fig. 1 that the fore edge 37 of the base 25 is disposed upon the surface of the earth. By placing the diagonal edge 39 upon the earth and adjusting the spikes 27 and 28 to anchor it there, the fan shaped spray can be directed obliquely, i.e., in a plane other than straight up or at an angle relative thereto. Thus it will be seen that the sprinkler head of the present invention can be disposed in many different positions relative to the surface to be watered so as to obtain the most advantageous results both from the standpoint of wind forces as well as the slope of the surface upon which the water falls.

While I have described my sprinkler in specific detail, it will be appreciated that it is susceptible to alteration, variation and modification without departing from the spirit of my invention. I therefore desire to avail myself of all variations, alterations and/or modifications as fairly come within the purview of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. In a sprinkler head of the type having a cap-like body provided with an admittance opening adapted to fit a hose connection and an internal chamber, tapered toward a blunt end wall for receiving water from a hose; an inclined deflector surface along one side of said chamber terminating chordally of said blunt end wall, and an orifice formed transversely of said cap-like body diametrically opposite said deflector surface.

2. The structure as in claim 1, in which the orifice in said cap-like body is at right angles with respect to the longitudinal axis of said cap-like body.

3. The structure as in claim 1 in which the orifice in said cap-like body comprises a 180 degre slit disposed at right angles to the longitudinal axis of said cap-like body.

4. The structure as in claim 1 in which the orifice in said cap-like body consists of a plurality of radially disposed apertures formed in said cap-like body substantially midway the ends thereof and in alignment transversely of the longitudinal axis of said cap-like body.

5. The structure as in claim 1 in which the orifice in said cap-like body consists of a plurality of radially disposed apertures formed in said cap-like body throughout 180 degrees thereof substantially midway the ends thereof and in alignment transversely of the longitudinal axis of said cap-like body.

6. In a sprinkler head of the type having a cap-like body adapted to fit the discharge end of a garden hose and provided with a tapered chamber along its long axis terminating in a blunt wall; a deflector surface in said tapered chamber terminating chordally of said blunt wall below the longitudinal axis thereof, said cap-like body having an orifice formed therein diametrically opposite

said deflector surface, and a plate-like base formed integrally with said cap-like body beneath said deflector plate.

7. In a sprinkler head of the type having a cap-like body adapted to fit the discharge end of a garden hose and provided with a tapered chamber along its long axis terminating in a blunt wall; a deflector surface in said tapered chamber terminating chordally of said blunt wall below the longitudinal axis thereof, said cap-like body having an orifice formed therein diametrically opposite said deflector surface, a plate-like base formed integrally with said body beneath said deflector surface, and a pair of spikes extending from the underside of said plate-like base for anchoring the latter relative to the surface on which said sprinkler head is to be placed.

8. In a sprinkler head of the type having a cap-like body adapted to fit the discharge end of a garden hose and provided with a tapered chamber along its long axis terminating in a blunt wall; a reflector surface in said tapered chamber terminating chordally of said blunt wall below the olngitudinal axis thereof, said cap-like body having an orifice formed therein diametrically opposite said deflector surface, a plate-like base formed integrally with said body beneath said deflector surface, and a pair of spikes pivotally connected to the underside of said plate-like base for anchoring the latter to the surface on which said sprinkler head is to be placed.

9. In a sprinkler head of the type having a cap-like body adapted to fit the discharge end of a garden hose and provided with a tapered chamber along its long axis terminating in a blunt wall; a deflector surface in said tapered chamber terminating chordally of said blunt wall below the longitudinal axis thereof, said cap-like body having an orifice formed therein diametrically opposite said deflector surface, a plate-like base formed integrally with said body beneath said deflector surface, and means on the underside of said plate-like base for anchoring said sprinkler head relative to a surface on which it is placed comprising a pair of spikes, means adjacent the fore edge of the underside of said base pivotally connected to one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said cap-like body, and means adjacent the aft edge of the underside of said base pivotally connected to the other one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said body.

10. In a sprinkler head of the type having a cap-like body adapted to fit the discharge end of a garden hose and provided with a tapered chamber along its long axis terminating in a blunt wall; a deflector surface in said tapered chamber terminating chordally of said blunt wall below the longitudinal axis thereof, said cap-like body having an orifice formed therein diametrically opposite said deflector surface, a plate-like base formed integrally with said body beneath said deflector surface, and means on the underside of said plate-like base for anchoring said sprinkler head relative to a surface on which it is placed comprising a pair of spikes, means adjacent the fore edge of the underside of said base pivotally connected to one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said cap-like body, and means adjacent the aft edge of the underside of said base pivotally connected to the other one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said body, said spikes being offset relative to each other so as to lie side by side adjacent the underside of said base and to either side of a plane congruent to the long axis of said cap-like body.

11. In a sprinkler head of the type having a cap-like body provided wtih a blunt walled chamber and a threaded opening communicated therewith adapted for connection to a garden hose; an inclined deflector along the bottom zone of said chamber terminating chordally at said blunt end wall, said cap-like body having an orifice formed therethrough diametrically opposite said deflector surface substantially midway the ends of said chamber, a plate-like base formed integrally with said cap-like body beneath said deflector surface, and means on the underside of said plate-like base for anchoring said sprinkler head relative to a surface on which it is placed comprising a pair of spikes, means adjacent the fore edge of the underside of said base pivotally connected to one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said cap-like body, and means adjacent the aft edge of the underside of said base pivotally connected to the other one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said body, said spikes being offset relative to each other so as to lie side by side adjacent the underside of said base and to either side of a plane congruent to the long axis of said cap-like body.

12. In a sprinkler head of the type having a cap-like body adapted to fit the discharge end of a garden hose and provided with a tapered chamber along its long axis terminating in a blunt wall, a deflector surface in said tapered chamber terminating chordally of said blunt wall below the longitudinal axis thereof, said cap-like body have an orifice formed therein diametrically opposite said deflector surface, a plate-like base formed integrally with said body beneath said deflector surface, and a pair of spikes pivotally connected to the underside of said plate-like base for anchoring the latter to the surface on which said sprinkler head is to be placed, said base plate having a breadth substantially double the fore to aft dimension thereof, and diverging edges at the lateral extremities of said base plate cooperating with said spikes for tilting said sprinkler head obliquely relative to the surface on which it is to be placed.

13. In a sprinkler head of the type having a cap-like body adapted to fit the discharge end of a garden hose and provided with a tapered chamber along its long axis terminating in a blunt wall, a deflector surface in said tapered chamber terminating chordally of said blunt wall below the longitudinal axis thereof, said cap-like body having an orifice formed therein diametrically opposite said deflector surface, a plate-like base formed integrally with said body beneath said deflector surface, and means on the underside of said plate-like base for anchoring said sprinkler head relative to a surface on which it is placed comprising a pair of spikes, means adjacent the fore edge of the underside of said base pivotally connected to one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said cap-like body, and means adjacent the aft edge of the underside of said base pivotally connected to the other one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said body, said base plate having a breadth substantially double the fore to aft dimension thereof, and diverging edges at the lateral extremities of said base plate cooperating with said spikes for tilting said sprinkler head obliquely relative to the surface on which it is to be placed.

14. In a sprinkler head of the type having a cap-like body adapted to fit the discharge end of a garden hose and provided with a tapered chamber along its long axis terminating in a blunt wall, a deflector surface in said tapered chamber terminating chordally of said blunt wall below the longitudinal axis thereof, said cap-like body having an orifice formed therein diametrically opposite said deflector surface, a plate-like base formed integral with said body beneath said deflector surface, and means on the underside of said plate-like base for anchoring said sprinkler head relative to a surface on which it is placed comprising a pair of spikes, means adjacent the fore edge of the underside of said base pivotally connected to one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said cap-like body, and means adjacent the aft edge of the underside

of said base pivotally connected to the other one of said spikes affording swinging movement thereof in a plane parallel to the long axis of said body, said spikes being offset relative to each other so as to lie side by side adjacent the underside of said base and to either side of a plane congruent to the long axis of said cap-like body, said base plate having a breadth substantially double the fore to aft dimension thereof, and diverging edges at the lateral extremities of said base plate cooperating with said spikes for tilting said sprinkler head obliquely relative to the surface on which it is to be placed.

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