March 12, 1963 W. P. KENNEDY 3,081,037

ADJUSTABLE PATTERN SPRINKLER

Filed May 29, 1962 2 Sheets-Sheet 1

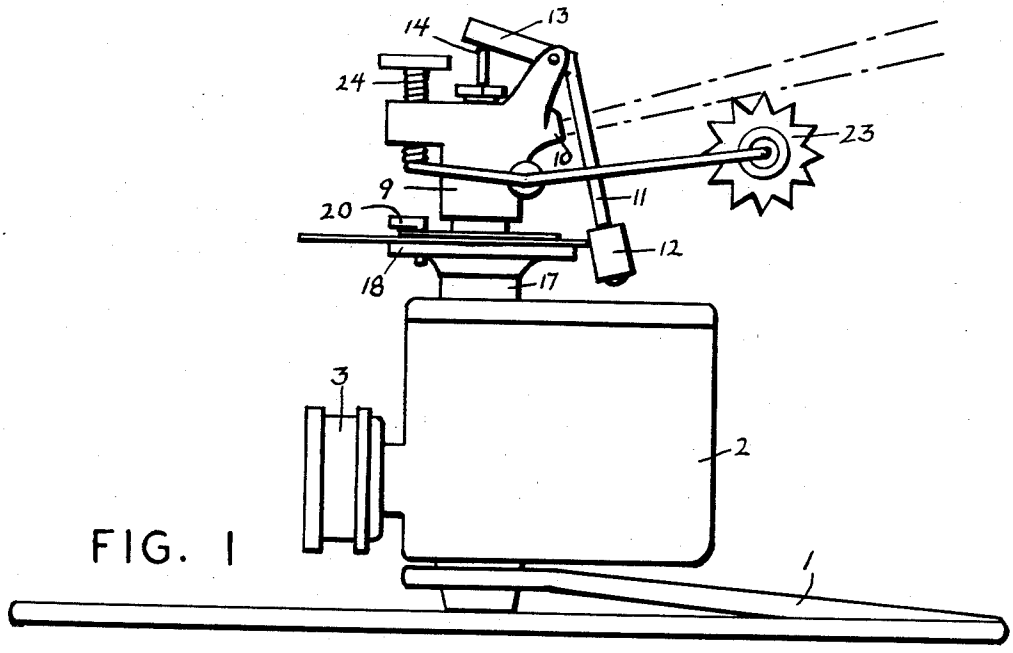


FIG. 1

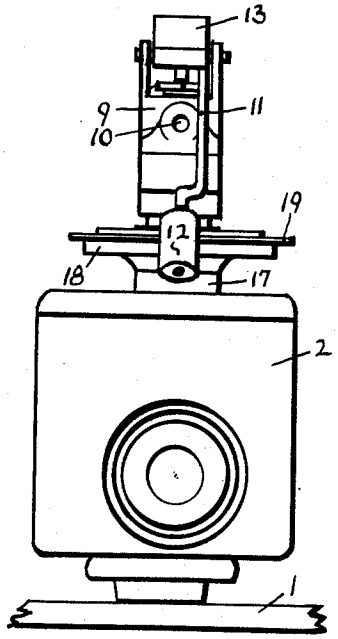


FIG. 2

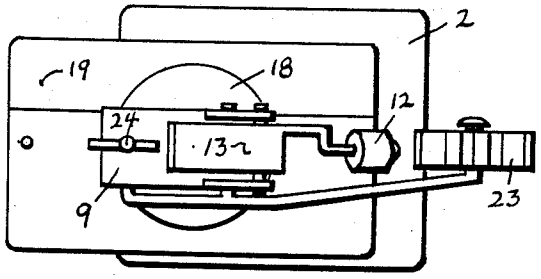


FIG. 3

INVENTOR.

William P. Kennedy

March 12, 1963 W. P. KENNEDY 3,081,037

ADJUSTABLE PATTERN SPRINKLER

Filed May 29, 1962 2 Sheets-Sheet 2

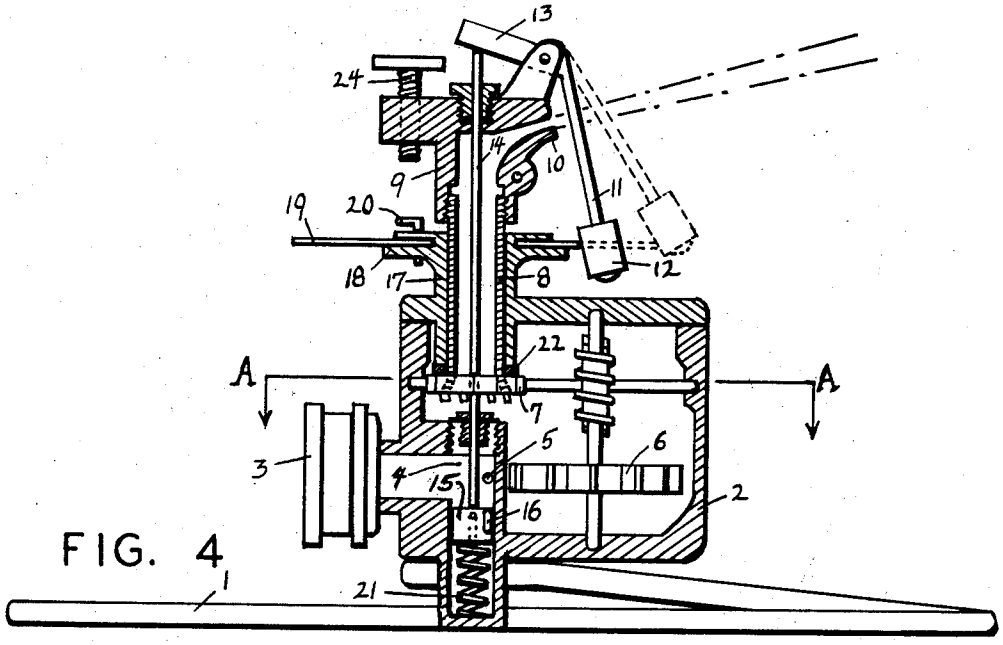


FIG. 4

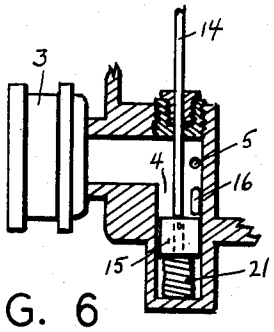
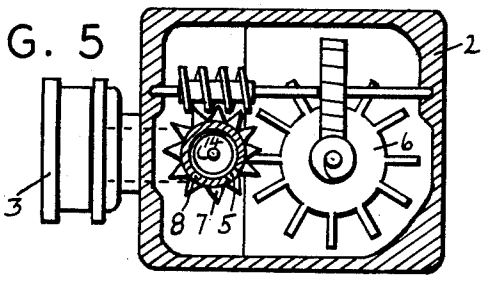


FIG. 6

FIG. 5



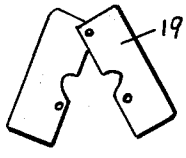


FIG. 9

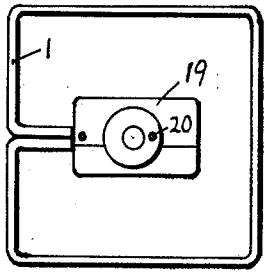


FIG. 8

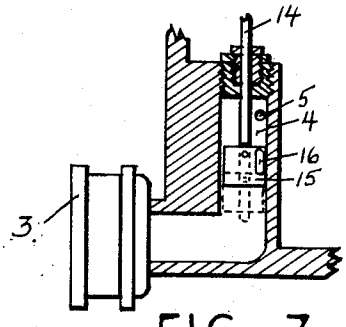


FIG. 7

INVENTOR.

William P. Kennedy

United States Patent Office

3,081,037
Patented Mar. 12, 1963

3,081,037

ADJUSTABLE PATTERN SPRINKLER

William P. Kennedy, 304 Freyer Drive, Marietta, Ga.

Filed May 29, 1962, Ser. No. 198,514
9 Claims. (Cl. 239—97)

This invention relates to water motor powered irrigation sprinkling devices that have rotary water distribution means and is particularly concerned with such devices that embody cam means mounted interchangeably upon the body of the device with said cam means enabling the device to sprinkle any one of a multiplicity of area spray patterns.

The sprinkler of the present invention has certain features of control and operation similar to, and represents improvements over, the sprinkler shown in my Patent No. 3,026,044, dated March 20, 1962.

The principal object of this invention is to provide means to reduce the power required for rotation of the distribution means so as to enable the device to sprinkle a greater range of pattern sizes than heretofore possible.

A further object of the invention is to provide a device composed of fewer and less complex parts than previous sprinklers of this type which would result in a lower price and less possibility of misadjustment in use.

It is another object of the invention to provide a structure that is designed so as to greatly reduce the possibility of damage to the device from careless grasping of the sprinkler by a user in moving it from one location to another, with the attendant dragging of an attached hose line, by having the logical handhold portions of the device of a nature to withstand such usage.

Numerous other objects, features, and advantages of the present structure will be apparent from the consideration of the following specification taken into conjunction with the accompanying drawings, in which:

FIG. 1 is a side elevation of the device.

FIG. 2 is a front elevation of the device with certain auxiliary parts removed and the base fragmented so as to show the basic machine more clearly.

FIG. 3 is a view of the top of the device with the base not shown.

FIG. 4 is a sectional view of a portion of FIG. 1 with one of the device's valve fluid control ports shown fully closed.

FIG. 5 is a sectional view of FIG. 4, taken on the line A—A.

FIG. 6 is a fragmentary sectional view of a portion of FIG. 4, showing the valve aforementioned fluid control port fully opened.

FIG. 7 is a fragmentary sectional view of the aforementioned fluid control port showing alternate means to actuate the port's sliding cover by means of water pressure without the use of a spring as previously shown.

FIG. 8 is a plan view in reduced scale of the base portion of the device with the distribution head removed so as to show means for stationing cams.

FIG. 9 is a plan view in reduced scale of a cam showing its split and hinged construction.

Referring to the drawings, the numeral **1** designates the base of the device upon which a water motor **2** is fixedly mounted. Water enters the motor through the hose coupling connection **3** and passes to a cylinder **4** within the motor. This cylinder includes a permanently open port **5** which directs a portion of the entering water so as to activate a water wheel **6** which transmits its motion through a worm gear train to the gear **7** stationed on the lower end of a hollow revolvable spindle **8** upon which is threadedly connected at its other end a distribution head **9**. This head includes an inclined nozzle **10** from which all water entering the motor is distributed. Pivotally

mounted upon the head is a lever **11** which includes a roller **12** at one end and a plate **13** at its other end which contacts one end of a plunger **14** which has mounted on its other end a hollow circular sleeve **15**. This sleeve is closely fitted but readily slideable within the cylinder **4** and is stationed so as to control flow of water through the elongated port **16**. This action is shown in FIGS. 4 and 6. As the valve sleeve **15** is moved varyingly across the elongated port **16** it not only increases or decreases the flow from said port but causes an increase or decrease in the velocity of the flow emitting from the permanently open port **5**. It can thus be seen that at such time the port **16** is fully open maximum flow would emit the nozzle **10** but at this time minimum flow would be emitting from port **5** and thus impart a slow rotation to the water wheel **6**. On the other hand, when the port **16** is fully closed minimum flow would emit the nozzle but maximum flow with a higher velocity would be emitting from port **5** thus driving the water wheel at its fastest rotation. This arrangement causes the distribution head to revolve fastest when the nozzle stream is shortest and to revolve slowest when the nozzle stream is longest with rotational speeds and stream ranges between these points being proportional. This variable speed of rotation is essential to proper distribution of sprinkled fluid in a device of this nature, the speed required on a short throw being much faster than that required on a long throw.

The revolvable spindle **8** is supported by an integrally formed spindle housing **17** on the water motor with said sleeve being doubly flanged at **18** so as to support a hingedly split cam **19**. Lateral turning of the supported cam is precluded by means of the removable pin **20**. As the distribution head **9** revolves, the roller **12** and the lever **11** follows the contour of the mounted cam, the force required for contact being imparted by means of the expansive spring **21** in the cylinder **4** as shown in FIGS. 4 and 6 or by means of water pressure alone as shown in FIG. 7. The variable contour of the cam would cause the lever **11** to move in and out as the distribution head revolves and thus activate the plunger **14** and thus control the ports in the cylinder **4** which would control the speed of rotation and length of stream of the water emitting from the nozzle **10** and thus produce an area irrigation pattern substantially in conformance with the shape of a cam stationed upon the device.

Leakage of water between the spindle **8** and the spindle housing **17** is precluded by means of the water seal washer **22**. Water pressure within the motor causes a tighter seat on this washer as the pressure within the motor increases. The present structure, as differentiated from previous structures of this type, avoids a tightening of this seal when the nozzle flow is reduced by means of placing the valve on the water supply side of the seal. This arrangement causes the seal to be loosest when the flow out of the nozzle is reduced and the nozzle stream is shortest, and to be tightest when the flow from the nozzle is fullest and the nozzle stream is longest thereby distinctly aiding the action of the ports **5** and **16** in causing an increase in rotational speed by the head the more the volume of distributed water is reduced.

In order to obtain proper distribution of water in the central portion of a pattern, a spinnable wheel **23** is mounted upon the distribution head **9** with the wheel adjustable vertically into the jet stream emitting from the nozzle **10**. Adjustment into the jet stream is made by means of the threaded bolt **24**. This feature is shown by FIGS. 1 and 3. It is possible to cause this vertical diffusion of the nozzle jet stream by cutting a vertical slot into the lower side of the nozzle's round discharge opening but such an arrangement would not be as satisfactory as a vertically adjustable wheel for this purpose

because of such a nozzles lack of adjustability. Under some circumstances a combination of adjustable spinner and slotted nozzle would possibly be desirable, such as in the case of extremely low water pressures.

It is believed that the nature and advantages of my invention will be clear from the foregoing description. Having thus described my invention, I claim:

1. A cam-controlled pattern sprinkler, including a base, a fluid-tight housing fixedly mounted upon said base, with said housing encasing a reduction geared water motor with a fluid entry in said housing to said motor and a fluid exit in said housing from said motor with means to station a pattern cam upon said housing, a rotary distribution head including a jet stream producing nozzle with said distribution head being mounted upon said housing at said fluid exit and rotated by said water motor, fluid volume control means to cause said nozzle to emit a variable short to long range jet stream, means to cause the rotation speed of said distribution head to increase when said nozzle emits a short range jet stream and the rotation speed of said distribution head to decrease when said nozzle emits a long range jet stream and in which said fluid volume control means include a cylinder with one fluid entry and two fluid exits with one exit being permanently open to deliver fluid to drive a water wheel in said water motor and the other exit having means to deliver fluid bypassing said wheel and having means to be variably opened and closed to vary flow of fluid from said exit by means in association with and controlled by said pattern cam.

2. The device as claimed in claim 1, in which the action of said fluid volume control means is controlled by said pattern cam by means of lever means in association with said fluid volume control means and said pattern cam.

3. The device as claimed in claim 1, in which said rotary distribution head is mounted upon a spindle revolvable within a spindle housing integral to said water motor with said spindle including a seal to prevent leakage between said spindle and said spindle housing, means to cause friction upon said seal to be least when said jet emitting from said nozzle is shortest and friction upon said seal to be greatest when said jet emitting from said nozzle is longest.

4. The device as claimed in claim 3, in which said effect upon said seal is the result of placing said fluid volume control means between said fluid entry means and said seal.

5. The device as claimed in claim 1, in which said means to vary flow from said variable flow exit include a movable sleeve slideable within a housing including said exit and variably blocking fluid flow from said exit by means of said sleeve variably covering said exit.

6. The device as claimed in claim 5, in which the movement of said sleeve in one direction is imparted by means in association with said pattern cam and in the other direction by means of an expansive spring.

7. The device as claimed in claim 5, in which the movement of said sleeve in one direction is imparted by means in association with said pattern cam and in the other direction by means of water pressure.

8. The device as claimed in claim 1 including means to adjustably diffuse said jet stream emitting from said nozzle, in which said diffusion means include a spinnable wheel adjustable into or out of said jet stream emitting from said nozzle.

9. The device as claimed in claim 3, in which the final gear of said reduction geared water motor is affixed to and revolves said spindle.

References Cited in the file of this patent

UNITED STATES PATENTS

2,601,559	Riblet	June 24, 1952
2,780,488	Kennedy	Feb. 5, 1957
2,962,220	Woods	Nov. 29, 1960
3,026,044	Kennedy	Mar. 20, 1962