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Abstract

The artificial rainfall device comprises a sleeve (1), a water tank (2), a coiled plastic pipe (3) and a Tipping-bucket-type self-metering rain gauge (4), wherein a telescopic support rod (5) is movably connected inside the sleeve (1). A magnetic pump (7) is fixedly connected to one side of the bottom of the inner wall of the water tank (2), the water inlet of the magnetic pump (7) is communicated with a water pumping pipe (8), and the water outlet of the magnetic pump (7) is communicated with a water inlet pipe (9) which is far away from the magnetic pump (7). One end of the water inlet pipe (9) extending to the top of the water tank (2) is communicated with one end of the coiled plastic pipe (3) through a water inlet pipe interface (10), a water inlet valve (11) is fixedly connected inside the water inlet pipe (9), a precision flowmeter (12) is fixedly connected to one side of the surface top of the water inlet pipe (9), and a conical small hole is formed at the bottom of the surface of the coiled plastic pipe (3).

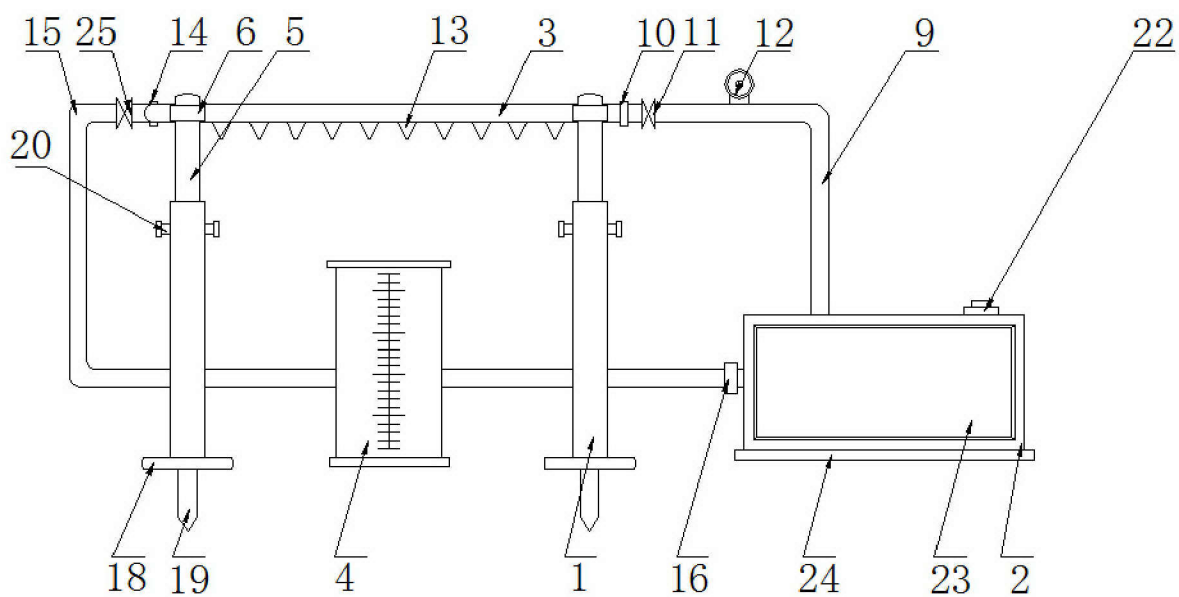


Figure 1

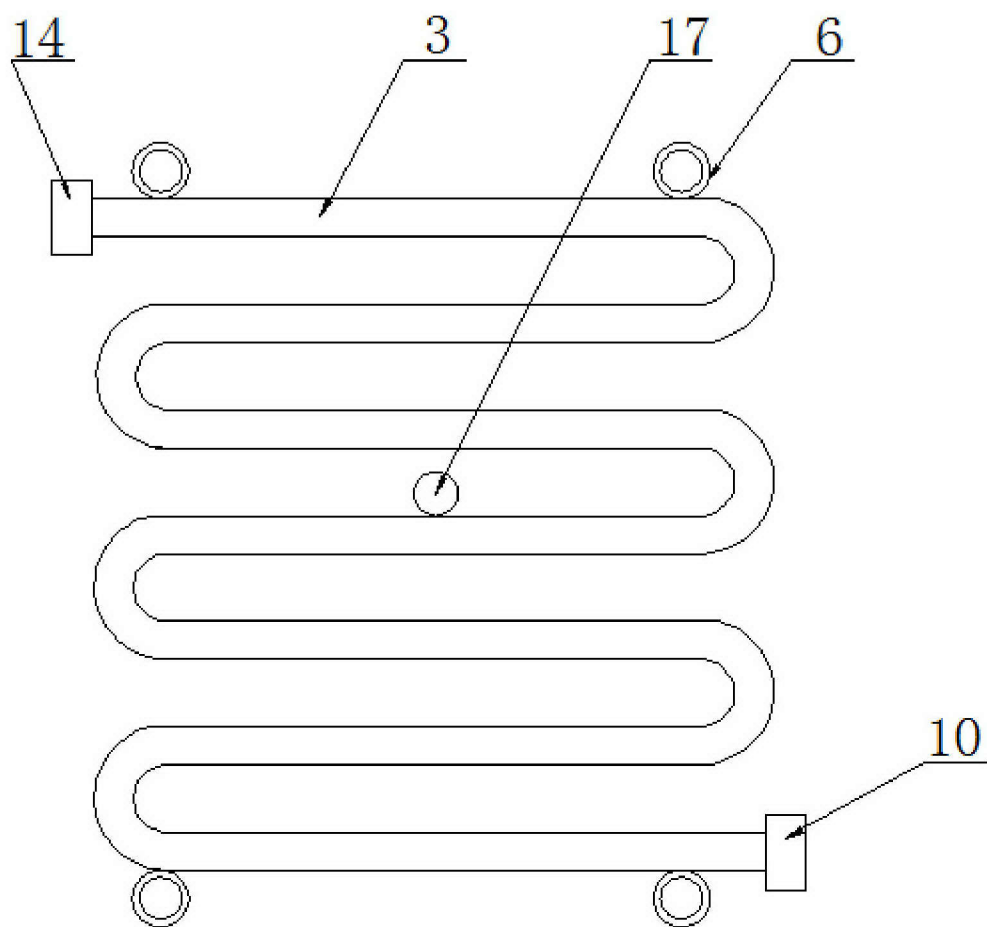


Figure 2

Artificial rainfall device

Technical field

The invention relates to an artificial rainfall device.

Background art

The experiment of soil infiltration and runoff yield in alpine meadow is a key and important means to study soil infiltration, water movement and runoff yield on slope in alpine meadow. However, the conditions and resources in alpine region are limited, so in order to better simulate the natural rainfall process, it is necessary to simulate the natural rainfall manually.

Aim of invention

The invention aims to provide an artificial rainfall device, which solves the problems that the artificial rainfall device is heavy in workload and unsafe to operate, consumes more water resources and has poor stability under the condition of high mountain wind.

Summary of invention

According to the technical scheme of the invention, the artificial rainfall device comprises a sleeve, a water tank, a coiled plastic pipe and a tipping bucket type self-rainfall meter, wherein a telescopic support rod is movably connected inside the sleeve, the top end of the telescopic support rod penetrates through the sleeve and extends to the top end of the sleeve, One side of the bottom of the inner wall of the water tank is fixedly connected with a magnetic pump; the water inlet of the magnetic pump is communicated with a water pumping pipe; the water outlet of the magnetic pump is communicated with a water inlet

pipe; one end of the water inlet pipe extending to the top of the water tank is communicated with one end of a coiled plastic pipe through a water inlet pipe interface;

Preferably, the other end of the coiled plastic pipe is communicated with a water outlet pipe through a water outlet pipe interface, the end of the water outlet pipe far away from the coiled plastic pipe is communicated with one side of a water tank through a water tank interface, and a water outlet valve is fixedly connected inside the water outlet pipe.

Preferably, the surface of the coiled plastic pipe is fixedly connected with a round vial.

Preferably, a foot pedal is fixedly connected to the bottom of the sleeve surface, and an insert block is fixedly connected to the bottom of the foot pedal.

Preferably, the tops on both sides of the sleeve surface are movably connected with adjusting knobs.

Brief description of drawings

Fig. 1 is a front view of the structure of the present invention;

Fig. 2 is a top view of the coiled plastic pipe structure of the present invention;

Fig. 3 is a sectional view of the water tank structure of the present invention;

Fig. 4 is a sectional view of the sleeve structure of the present invention.

Detailed description of the Preferred Embodiments

With reference to figs. 1-4, the embodiment of the present invention provides a technical scheme: the artificial rainfall device can be easily carried and operated when studying the infiltration and runoff of alpine meadow soil, and can ensure the normal and accurate experiment, at the same time, it also solves a series of problems caused by excessive pressure of the existing device, and the water consumption is greatly reduced, the device is cleaned more quickly and conveniently, and is not easy to be blocked. The artificial rainfall device comprises a sleeve 1, a water tank 2, a coiled plastic pipe 3 and a Tipping-bucket-type self-metering rain gauge 4. The sleeve 1 can easily enter hard soil under the action of the pedal 18, meanwhile, the needle-like head of the insert block 19 is designed to have stronger grip, and the height of the supporting mechanism can be adjusted arbitrarily by the adjusting knob 20, which is more stable and simple than the device lying on the ground. One side of the top of the water tank 2 is provided with a water injection port 21, and the inside of the water injection port 21 is movably connected with a piston 22. The front of the water tank 2 is fixedly connected with an observation window 23. The observation window 23 can observe the water capacity inside the water tank 2, which is convenient for subsequent water filling. The bottom of the water tank 2 is fixedly connected with a protective plate 24, the bottom of the surface of the sleeve 1 is fixedly connected with a foot pedal 18, and the bottom of the foot pedal 18 is fixedly connected with an insert block 19. The tops on both sides

of the surface of the sleeve 1 are movably connected with adjusting knobs 20, the surface of the coiled plastic pipe 3 is fixedly connected with a round leveling bubble 17, and the inside of the sleeve 1 is movably connected with a telescopic support rod 5. The other end of the coiled plastic pipe 3 is communicated with a water outlet pipe 15 through a water outlet pipe interface 14, and the end of the water outlet pipe 15 far away from the coiled plastic pipe 3 is communicated with one side of the water tank 2 through a water tank interface 16. A water outlet valve 25 is fixedly connected inside the water outlet pipe 15, which can prevent the rainfall device from being damaged due to excessive pressure and has many controllable elements. When the device is cleaned again, the water outlet pipe 15 and the water tank interface 16 are disconnected. The magnetic pump 7 and water inlet valve 11 are opened for flushing, which is more convenient and quick and saves water resources. The top end of the telescopic support rod 5 penetrates through the sleeve 1 and extends to the top end of the sleeve 1. The top of the surface of the telescopic support rod 5 is fixedly connected with an annular buckle 6. The surface of the coiled plastic pipe 3 is fixedly connected with the surface of the annular buckle 6. A water outlet of the magnetic pump 7 is communicated with a water inlet pipe 9, and the diameter of the water inlet pipe 9 is larger than that of the water outlet pipe 15, so that the water flow can quickly fill the rainfall device, and a certain pressure can be ensured to ensure that the conical orifice 13 can normally discharge water; the cooperation of the water inlet valve 11 and the water outlet valve 25 enables the

rainfall intensity to be well controlled; and one end of the water inlet pipe 9 far away from the magnetic pump 7 penetrates through the water tank 2 and extends to the top of the water tank 2. One end of the water inlet pipe 9 extending to the top of the water tank 2 is communicated with one end of the coiled plastic pipe 3 through a water inlet pipe interface 10, the inside of the water inlet pipe 9 is fixedly connected with a water inlet valve 11, one side of the top of the surface of the water inlet pipe 9 is fixedly connected with a precision flowmeter 12, and the bottom of the coiled plastic pipe 3 is provided with tapered holes 13. The coiled plastic pipe with tapered holes 13 adopts the idea of "dropper technology", and a large number of practical experiments ensure that each tapered hole 13 can smoothly discharge water.

When in use, after selecting an appropriate experimental site, the four telescopic support rods 5 and the coiled plastic pipe 3 are connected by four ring buckles 6, and the sleeve 1 is fixed in a specific experimental place by a foot pedal 18. Observe whether the bubble of the round level bubble 17 is in the middle. If it is, the device is leveled. If it is not, it is necessary to turn the adjusting knob 20 to adjust the height of the supporting mechanism so that the rainfall device is in a horizontal position. Open the piston 22 on the water tank 2, deliver the water to the inside of the water tank 2 through the water inlet 21, and open the water inlet valve 11 and the precision flowmeter 12. At the same time, the water outlet valve 25 is opened, and the water in the water tank 1 is transported into the spiral plastic pipe 3 through the pumping pipe 8, the water inlet pipe 9 and the water

inlet pipe interface 10 with the maximum lift of the magnetic pump 7, so that the whole rainfall device can be filled. If the effect is not very good, the opening and closing of the water outlet valve 25 can be controlled (in a half-open state), so that the full effect of the rainfall device is better, because the rainfall device adopts the spiral plastic pipe 3 structure, which will make the whole process faster. Then adjust the opening of outlet valve 25, observe the degrees of precision flowmeter 12 with different openings, record the rainfall intensity corresponding to Tipping-bucket-type self-metering rain gauge 4, count the relationship between flow and rain intensity, draw a flow and rain intensity curve, observe the degrees on precision flowmeter 12 when adjusting the different openings of outlet valve 25, and find out the corresponding rain intensity. In this process, when the degree of precision flowmeter 12 is stable, the corresponding rain intensity is the real rain intensity. At the same time, the stopwatch starts to time, which is used as reference data for the rainfall calculated in the subsequent experiment. After the experiment is finished, for the second application of the device, the magnetic pump 7 is turned off, and each device is separated. The connecting part between the water inlet pipe 9 and the water outlet pipe 15 is blocked with a rubber plug to prevent the small debris outside from entering the device and causing the blockage of the conical hole 13 at the lower end of the coiled plastic pipe 3. All other parts can be collected and assembled, thus completing the whole work.

The embodiment discloses an artificial rainfall device, which

comprises a sleeve, a water tank, a coiled plastic pipe and a Tipping-bucket-type self-metering rain gauge, wherein a telescopic support rod is movably connected inside the sleeve; the top end of the telescopic support rod penetrates through the sleeve and extends to the top end of the sleeve; an annular buckle is fixedly connected at the top of the telescopic support rod surface. When studying the infiltration and runoff yield of alpine meadow soil, the device can be easily carried and operated, and the normal and accurate experiment can be ensured. At the same time, a series of problems caused by excessive pressure of the existing device are solved, and the water consumption is greatly reduced, and the device is cleaned more quickly and conveniently, which is not easy to block.

Claims:

1. The artificial rainfall device comprises a sleeve, a water tank, a coiled plastic pipe and a Tipping-bucket-type self-metering rain gauge, wherein a telescopic support rod is movably connected inside the sleeve, A magnetic pump is fixedly connected to one side of the bottom of the inner wall of the water tank, the water inlet of the magnetic pump is communicated with a water pumping pipe, and the water outlet of the magnetic pump is communicated with a water inlet pipe which is far away from the magnetic pump, One end of the water inlet pipe extending to the top of the water tank is communicated with one end of the coiled plastic pipe through a water inlet pipe interface, a water inlet valve is fixedly connected inside the water inlet pipe, a precision flowmeter is fixedly connected to one side of the surface top of the water inlet pipe, and a conical small hole is formed at the bottom of the surface of the coiled plastic pipe.

2. The artificial rainfall device according to claim 1 wherein the other end of the spiral plastic pipe is communicated with a water outlet pipe through a water outlet pipe interface, and the end of the water outlet pipe far away from the spiral plastic pipe is communicated with one side of the water tank through a water tank interface, and a water outlet valve is fixedly connected inside the water outlet pipe.

3. The artificial rainfall device according to claim 1, wherein the surface of the coiled plastic pipe is fixedly connected with a round level bubble.

4. The artificial rainfall device according to claim 1 wherein a

foot pedal is fixedly connected to the bottom of the surface of the sleeve, and an insert block is fixedly connected to the bottom of the foot pedal.

5. The artificial rainfall device according to claim 1, wherein the tops on both sides of the surface of the sleeve are movably connected with adjusting knobs.

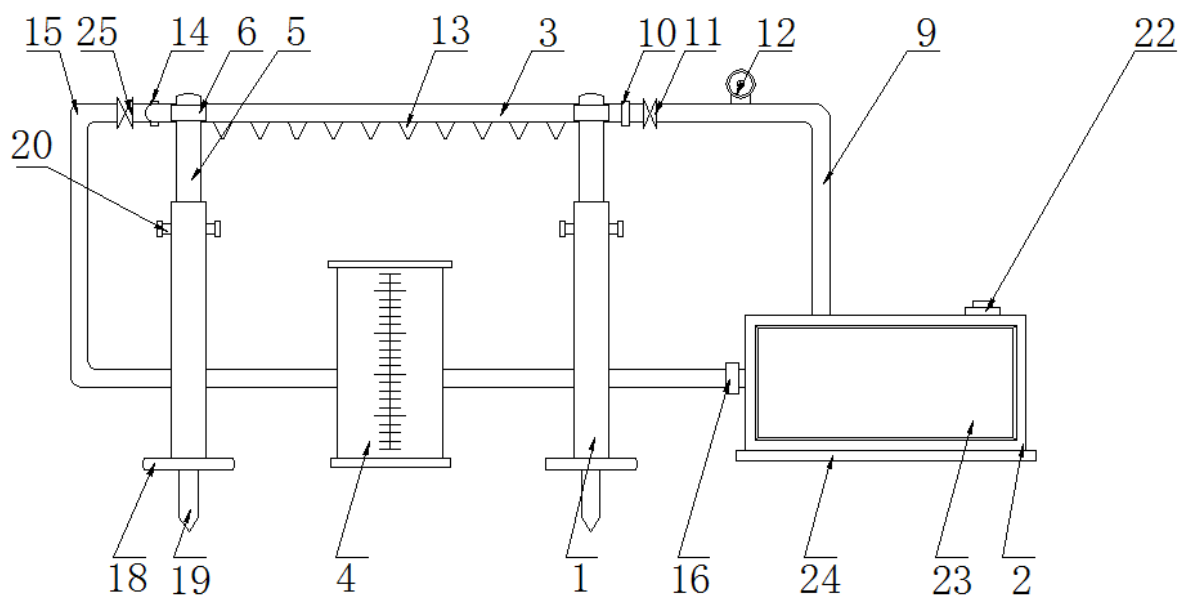


Figure 1

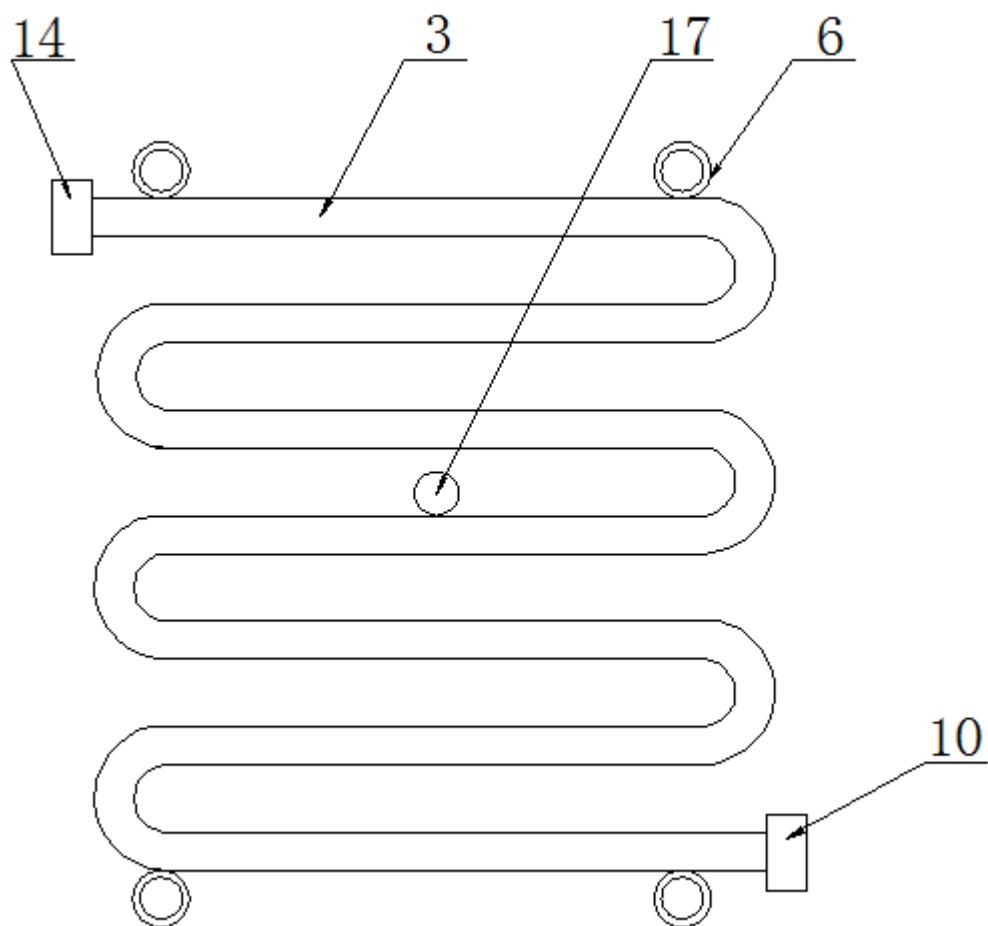


Figure 2

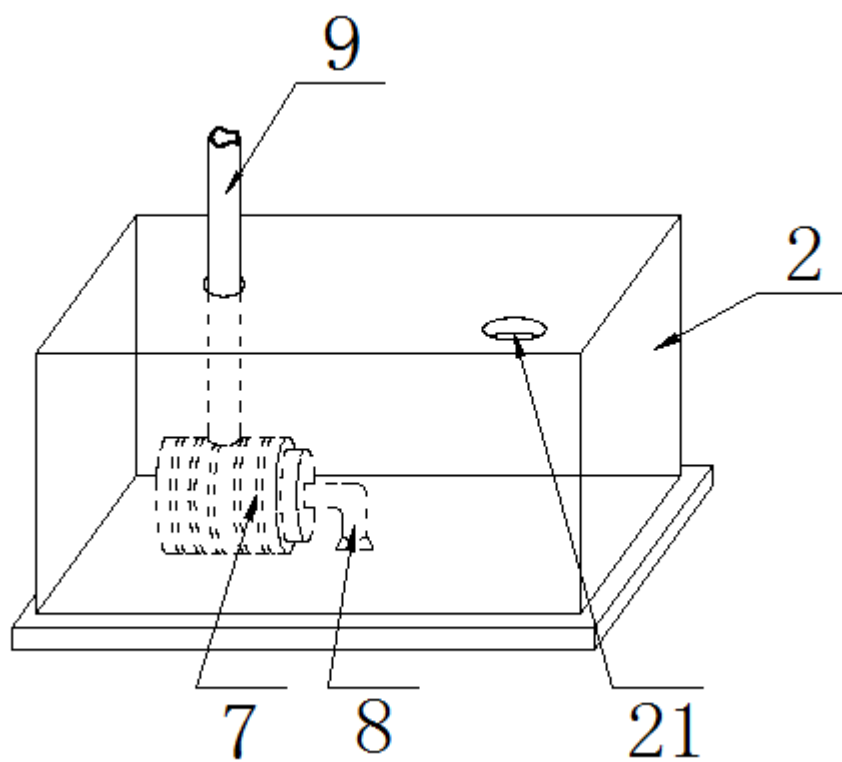


Figure 3

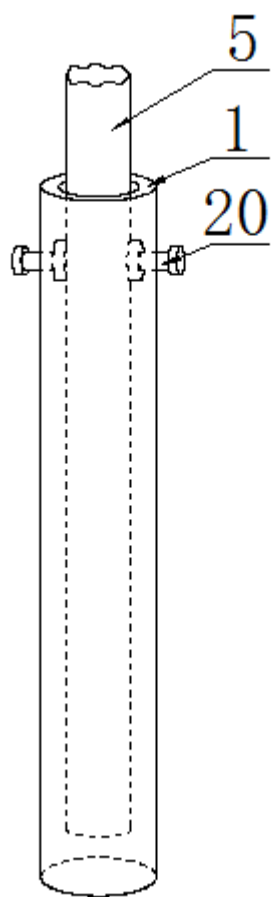


Figure 4