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Irrigation Rainwater Harvester

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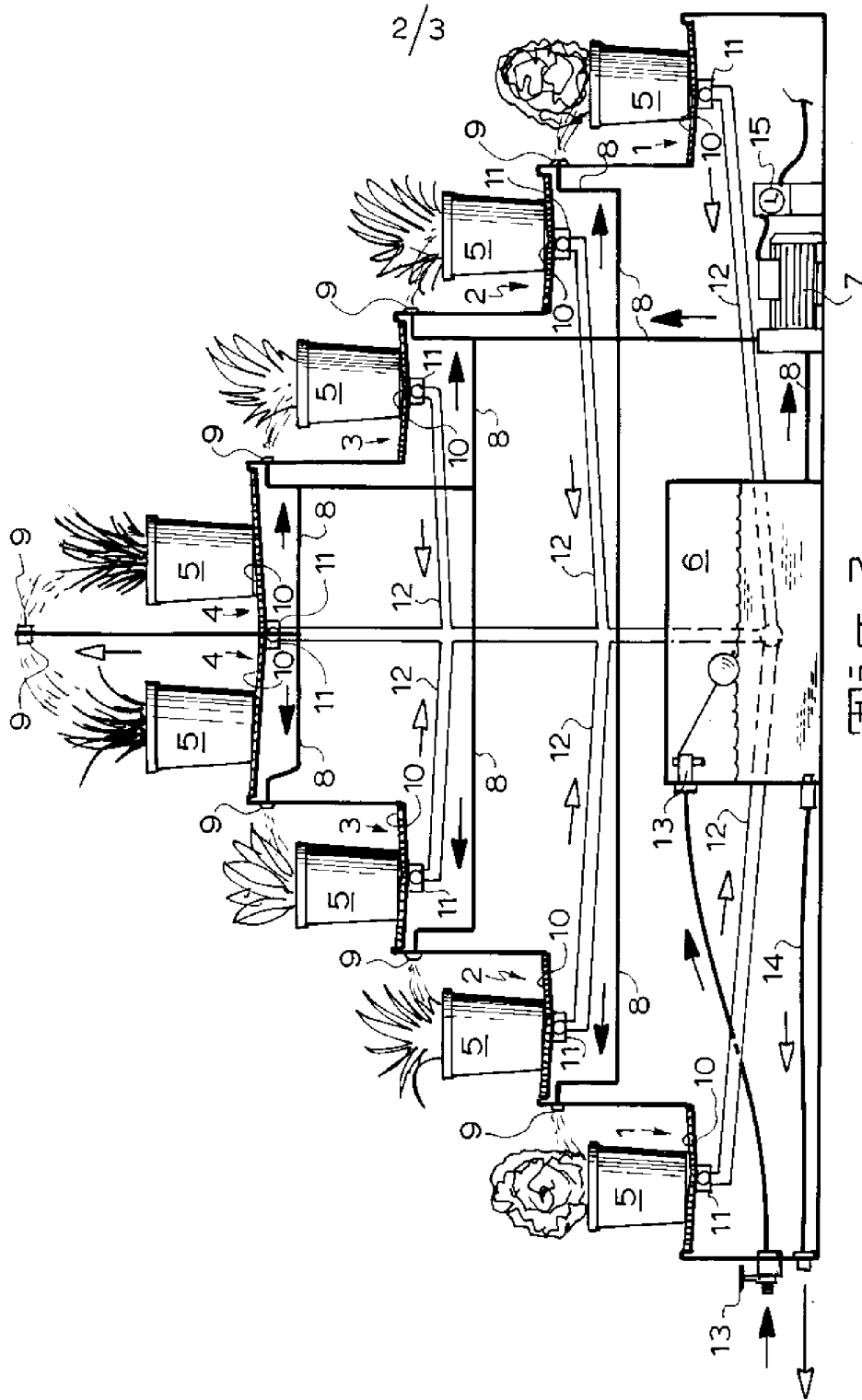
ABSTRACT

IRRIGATION RAINWATER HARVESTER

An irrigation rainwater harvester comprises a stand with one or more shelves configured as a stepped pyramid to accommodate potted plants, a reservoir for storing water, a pump for circulating water from the reservoir to one or more sprinklers located above the plants and one or more drains to drain excess water from the shelves back to the reservoir. The shelves are concave to maximize the collection of excess water both from the sprinklers and also from rainfall and are ribbed to facilitate aeration at the base of the plants.

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DESCRIPTION

IRRIGATION RAINWATER HARVESTER

FIELD OF THE INVENTION

This invention relates to pot plant stands for use in nurseries and garden centers which use water efficiently and also harvest rainwater.

BACKGROUND OF THE INVENTION

Traditionally nurseries place pot plants underneath overhead sprinklers which are used to water the growing plants. However this arrangement is not efficient since water falls on the ground and drains away before the plant can absorb it. Sometimes the plants are placed on trays but the excess water often pools in areas where it is not available to the plant's capillary action.

A number of irrigation systems have been developed in an attempt to use water efficiently. GB 2 293 531 discloses a bench system in which pots are supported in rows and watered individually from above by pressure controlled jets of water. This system requires adjustment of the water jet pressure to control lateral projection of the jet which is time consuming and inefficient.

JP 6284820 discloses a more complex system of vertical shelves with rotating irrigating nozzles which spray variable amounts of water on shelves at different heights. The nozzles can also be used to spray a jet of air to dry the plants under cultivation. US 5,673, 511 teaches a stack of self watering trays which have a reservoir in the bottom of the tray. The potted plants are supported on the walls of the tray at the surface of the water and the plants absorb the water by capillary action. Although these arrangements make more efficient use of water they still require considerable regulation of water flows and do not facilitate the changing of pots.

OBJECT OF THE INVENTION

It is therefore an object of the present invention to provide a system which accommodates large numbers of potted plants efficiently and saves water or at least provides a useful alternative.

STATEMENT OF THE INVENTION

According to the present invention an irrigation rainwater harvester comprises a stand with one or more shelves configured as a stepped pyramid to accommodate potted plants, a reservoir for storing water, a pump for circulating water from the reservoir to one or more sprinklers located above the plants and one or more drains to drain excess water from the shelves back to the reservoir.

Preferably the shelves are concave to maximize the collection of excess water both from the sprinklers and also from rainfall.

Preferably the shelves are ribbed to allow aeration at the base of the plant.

Alternatively the plants stand on geo matting placed on the shelves.

Preferably the pump has a timer which operates the sprinklers at predetermined intervals.

Preferably the drains have closing valves operated remotely by a controller.

Preferably the reservoir is connected to a top up supply of water.

Preferably the water level in the reservoir is maintained by valves regulating the top up supply line.

Preferably the reservoir has a drain for emptying its contents.

Preferably rain sensors are connected to the controller which disables the pump when it rains.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention is now described by way of example only with reference to the accompanying drawings in which:

Fig 1 is a plan of an irrigation stand accommodating a vertical stack of potted plants

Fig 2 is a cross section through AA of Fig 1

Fig 3 is a plan of an irrigation stand with a retractable awning and

Fig 4 is an end elevation of Fig 3.

DETAILED DESCRIPTION OF THE INVENTION

Fig 1 is a plan view of an integral irrigation stand having four levels of shelves 1, 2, 3 and 4 arranged in a stepped pyramid configuration for supporting potted plants 5. Fig 2 is a cross section through AA of Fig 1 showing the irrigation system comprising reservoir 6, circulation pump 7 and hose lines 8 feeding sprinklers 9 each one of which waters several plants 5.

Shelves 1, 2, 3 and 4 are slightly concave and excess water from sprinklers 9 pools on shelves 1, 2, 3 and 4 where ribs 10 make it available to the plant by capillary action. Drains 11 are located at regular intervals along shelves 1, 2, 3 and 4 and have solenoid valves which are remotely controlled to close drains 11 during sprinkling periods and to open drains 11 to allow pooled water to flow through pipes 12 back to reservoir 6 after watering.

A hose connection 13 below shelf 1 provides a top up supply of water to reservoir 6 via a float valve 18 and pipe 14 allows reservoir 6 to be drained of dirty water periodically by remote controller. Circulation pump 7 has timer 15 which operates sprinklers 9 at predetermined times. Shelves 1, 2, 3 and 4 also collect rainwater which is detected by sensors connected to a controller which disables circulation pump 7 and allows rainwater to drain to reservoir 6.

Figs 3 & 4 illustrate an irrigation stand with shade cloth canopy 22 supported by beams 21 mounted on posts 20. Canopy 22 provides shade for plants 5 during the heat of the day thus reducing evaporation and protects them from heavy rain and hail. Canopy 22 also retracts onto motorized drums 23 by remote control when direct

sunlight and when rain harvesting is required. Lights 24 are mounted on beams 21 to illuminate plants 5 and also advertising material supported by posts 20.

It will be obvious that the circular flow system of the present invention combined with rainwater harvesting makes for exceptional water conservation. It has been calculated that the system requires up to 80 percent less water input than conventional irrigation systems. Also nutrients and pest and disease control agents can be added to the reservoir as required and circulated with the water supply for maximum effect.

It will also be obvious that the system can be applied to stands of different sizes, different shapes and with more or less shelves. Further, domestic models can be designed using the circular flow and rainwater harvesting principles to become architectural features in the home or garden.

VARIATIONS

It will be realized that the foregoing has been given by way of illustrative example only and that all other modifications and variations as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of the invention as herein set forth. Throughout the description and claims of this specification the words "comprise" and variations of that word such as "comprises" and "comprising" are not intended to exclude other additives components integers or steps.

CLAIMS

1. An irrigation rainwater harvester comprises a stand with one or more shelves configured as a stepped pyramid to accommodate potted plants, a reservoir for storing water, a pump for circulating water from the reservoir to one or more sprinklers located above the plants and one or more drains to drain excess water from the shelves back to the reservoir.
2. The harvester of claim 1 in which the shelves are concave to maximize the collection of excess water both from the sprinklers and rainwater and are ribbed to facilitate aeration at the base of the plants.
3. The harvester of claim 1 in which the pump has a timer which operates the sprinklers at predetermined intervals.
4. The harvester of claim 1 in which the drains have valves operated remotely by a controller.
5. The harvester of claim 1 in which rain sensors are connected to the controller which disables the pump when it rains.

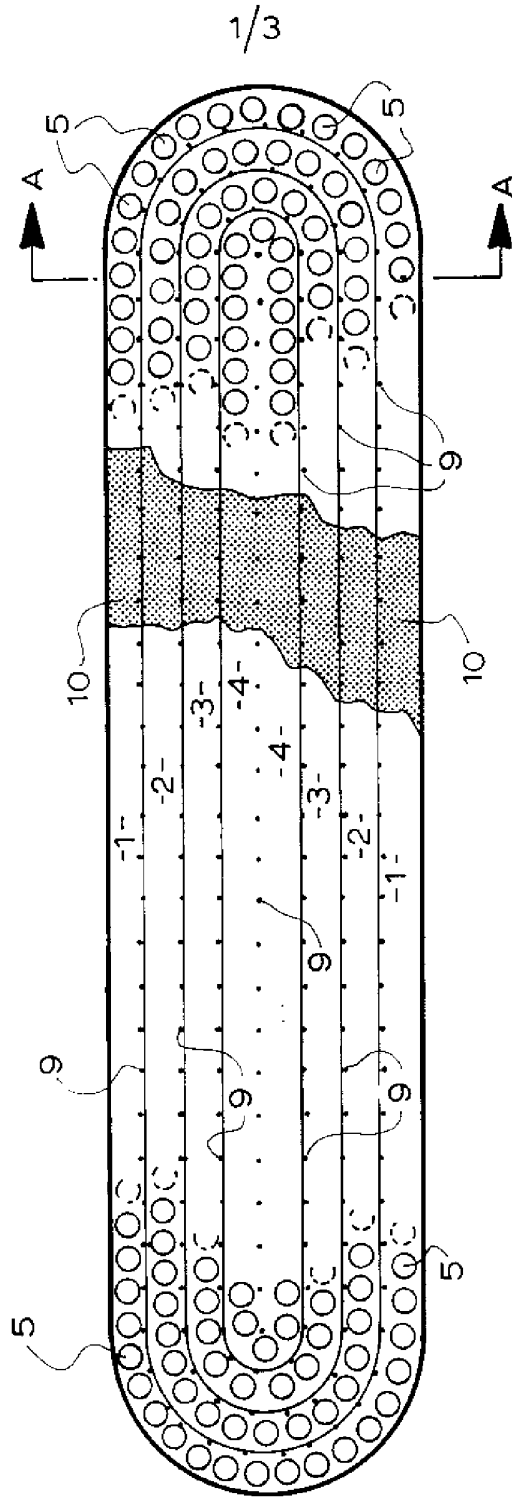
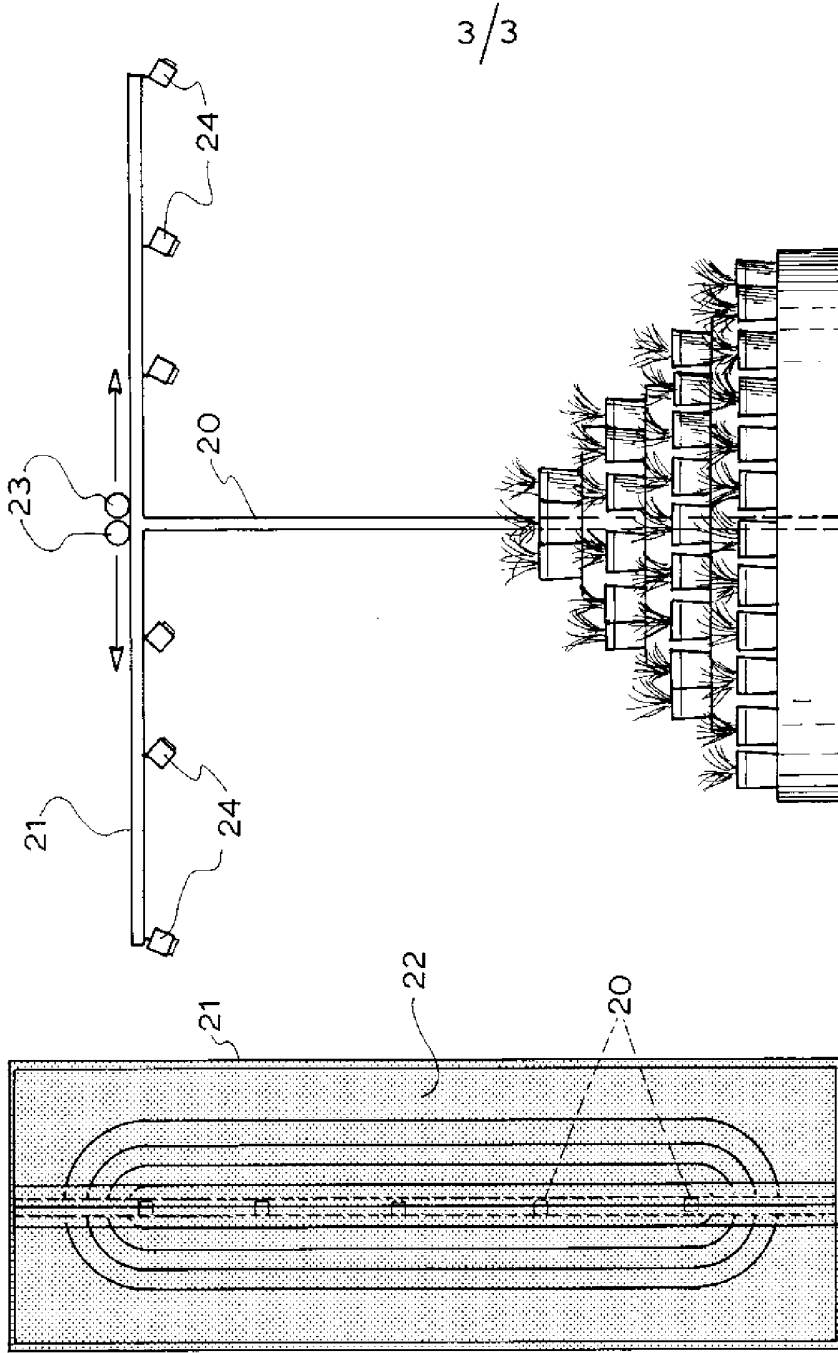


Fig. 1



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Fig. 4

Fig. 3