WATER CIRCULATION TREATMENT DEVICE FOR GARDEN LANDSCAPE DESIGN

Field of the Invention

The present invention relates to the field of landscape design technology, particularly to a water circulation treatment device for garden landscape design.

Background to the Invention

In landscape design, water features (such as ponds, fountains, artificial streams, etc.) are important elements to enhance environmental beauty and ecological value. However, outdoor landscape water bodies generally face water quality deterioration problems, including algae growth, turbidity, eutrophication, and even black hair and odor, which seriously affect the landscape effect and surrounding environment. Therefore, water circulation treatment devices are usually needed to maintain the cleanliness and health of water bodies.

At present, most common landscape water treatment methods rely on various filter materials for filtration and adsorption, while direct treatment through various filter materials is not convenient for self-cleaning, resulting in the need for staff to regularly replace the filter materials, increasing their labor intensity, and high treatment costs. Therefore, there are defects in the inconvenience of water circulation treatment, which cannot meet the needs of customers.

Therefore, technicians in this field have provided a water circulation treatment device for garden landscape design to solve the problems raised in the background technology mentioned above.

Statement of Invention

In order to improve the problem of inconvenient water circulation treatment, the present invention provides a water circulation treatment device for garden landscape design.

The present invention provides a water circulation treatment device for landscape design, which adopts the following technical solution:

A water circulation treatment device for garden landscape design, comprising a treatment box, the inner cavity of the treatment box is fixedly connected with a load-bearing orifice plate, and the opposite side of the load-bearing orifice plate and the treatment box is rotatably connected with a rotating shaft through a bearing, the top of the load-bearing orifice plate is placed with quartz sand filter material, and the left and right sides of the rotating shaft are fixedly connected with stirring plates used in conjunction with the quartz sand filter material, the bottom of the treatment box is connected with a first discharge pipe, and the bottom of the first discharge pipe is connected to a sewage storage cylinder, and the top of the treatment box is equipped with a drive component, an aeration pipe is fixedly connected to the bottom between the left and right sides of the inner cavity of the treatment box, a fan is fixedly installed at the rear position on the left side of the top of the treatment box, and an exhaust pipe is connected to the left side of the fan, one end of the exhaust pipe runs through the treatment box and is connected to the aeration pipe, a filter box is fixedly connected to the left side of the treatment box and located on the front of the exhaust pipe, an activated carbon filter screen is placed at the bottom of the inner cavity of the filter box, and an L-shaped conduit is connected to the bottom of the filter box, one end of the L-shaped conduit is connected to the treatment box.

By adopting the above technical solution, the treatment box, load-bearing orifice plate, rotating shaft, quartz sand filter material, stirring plate, first discharge pipe, sewage storage cylinder, and drive components can be set up to facilitate the filtration of water. At the same

time, the quartz sand filter material can be stirred and self-cleaning. By setting aeration pipes, fans, and exhaust pipes, the water can be easily oxygenated. By setting filter boxes, activated carbon filter screens, and L-shaped conduits, the water can be easily adsorbed and filtered.

Optionally, the drive component comprises a rotating motor, the bottom of the rotating motor is fixedly connected to the connection of the treatment box, the output end of the rotating motor is fixedly connected to a driving gear, the top of the rotating shaft penetrates the treatment box and is fixedly connected to a driven gear, and the driving gear meshes with the driven gear.

By adopting the above technical solution, the setting of the rotating motor, driving gear, and driven gear can facilitate the rotation of the driving shaft.

Optionally, a protective box is fixedly connected to the top of the treatment box and located outside the rotating motor, and a maintenance plate is fixedly installed on the front of the protective box through screws.

By adopting the above technical solution and setting up the protective box and maintenance plate, it is convenient to replace and maintain the parts inside the protective box.

Optionally, the outer surface of the L-shaped conduit is provided with a first valve, and the outer surface of the first discharge pipe is provided with a second valve.

By adopting the above technical solution, the setting of the first valve can facilitate the opening and closing of the L-shaped conduit, and the setting of the second valve can facilitate the opening and closing of the first discharge pipe.

Optionally, a second discharge pipe is connected to the right side of the treatment box and

located above the quartz sand filter material, and a third valve is provided on the outer surface of the second discharge pipe.

By adopting the above technical solution, the setting of the second discharge pipe and the third valve can facilitate the discharge of floating impurities that are stirred and cleaned by the quartz sand filter material.

Optionally, the right side of the top of the treatment box is connected with an inlet pipe, and the four corners of the bottom of the treatment box are fixedly connected with support legs.

By adopting the above technical solution, the setting of the inlet pipe can facilitate the entry of water into the inner cavity of the treatment box, and the setting of the support legs can facilitate the support of the device.

Optionally, the right end of the sewage storage cylinder is threaded with a cylinder cover, and the top of the filter box is clamped with a convex cover.

By adopting the above technical solution, the setting of the cylinder cover can facilitate the opening and closing of the sewage storage cylinder, and the setting of the convex cover can facilitate the opening and closing of the filter box.

Optionally, an overflow pipe is connected to the left side of the filter box, and the overflow pipe is located above the activated carbon filter screen.

By adopting the above technical solution and setting the overflow pipe, it is convenient to overflow and discharge the filtered water body.

In summary, the present invention has the following beneficial effects:

1. The present invention provides a treatment box, a load-bearing orifice plate, a rotating shaft, a quartz sand filter material, a stirring plate, a first discharge pipe, a sewage storage cylinder, and a drive component, which can facilitate the filtration of water bodies. At the

same time, the quartz sand filter material can be stirred and self-cleaning. By setting an aeration pipe, a fan, and an exhaust pipe, the water body can be easily oxygenated. By setting a filter box, an activated carbon filter screen, and an L-shaped conduit, the water body can be easily adsorbed and filtered. By setting the above structure, it can facilitate water circulation treatment and meet the needs of customers.

2. The present invention provides a rotating motor, a driving gear, and a driven gear to facilitate the rotation of the drive shaft. The setting of the protective box and the maintenance plate facilitates the replacement and maintenance of parts inside the protective box. The setting of the first valve facilitates the opening and closing of the L-shaped conduit, the setting of the second valve facilitates the opening and closing of the first discharge pipe, and the setting of the second discharge pipe and the third valve facilitates the discharge of floating impurities from the quartz sand filter material during mixing and cleaning, the setting of the inlet pipe can facilitate the entry of water into the inner cavity of the treatment box, the setting of the support legs can facilitate the support of the device, the setting of the cylinder cover can facilitate the opening and closing of the sewage storage cylinder, the setting of the convex cover can facilitate the opening and closing of the filter box, and the setting of the overflow pipe can facilitate the overflow discharge of filtered water.

Brief Description of the Drawings

FIG. 1 is a schematic diagram of the structure of the present invention;

FIG. 2 is a sectional view of the structure of the treatment box of the present invention;

FIG. 3 is an enlarged view of the structure A in Figure 2 of the present invention;

FIG. 4 is a perspective view of the load-bearing orifice plate structure of the present

invention.

Annotations on the accompanying drawings:

1. Treatment box; 2. Load-bearing orifice plate; 3. Rotating shaft; 4. Quartz sand filter material; 5. Stirring plate; 6. First discharge pipe; 7. Sewage storage cylinder; 8. Drive component; 801. Rotating motor; 802. Driving gear; 803. Driven gear; 9. Aeration pipe; 10. Fan; 11. Exhaust pipe; 12. Filter box; 13. Activated carbon filter screen; 14. L-shaped conduit; 15. Protective box; 16. Second discharge pipe; 17. Inlet pipe.

Detailed Description

Further detailed explanation of the present application will be provided in conjunction with Figures 1-4.

Embodiment 1:

Please refer to Figures 1-4, a water circulation treatment device for garden landscape design, comprising a treatment box 1, the inner cavity of the treatment box 1 is fixedly connected with a load-bearing orifice plate 2, and the opposite side of the load-bearing orifice plate 2 and the treatment box 1 is rotatably connected with a rotating shaft 3 through a bearing, the top of the load-bearing orifice plate 2 is placed with quartz sand filter material 4, and the left and right sides of the rotating shaft 3 are fixedly connected with stirring plates 5 used in conjunction with the quartz sand filter material 4, the bottom of the treatment box 1 is connected with a first discharge pipe 6, and the bottom of the first discharge pipe 6 is connected to a sewage storage cylinder 7, and the top of the treatment box 1 is equipped with a drive component 8, an aeration pipe 9 is fixedly connected to the bottom between the left and right sides of the inner cavity of the treatment box 1, a fan 10 is fixedly installed at the rear position on the left side of the top of the treatment box 1, and an

exhaust pipe 11 is connected to the left side of the fan 10, one end of the exhaust pipe 11 runs through the treatment box 1 and is connected to the aeration pipe 9, a filter box 12 is fixedly connected to the left side of the treatment box 1 and located on the front of the exhaust pipe 11, an activated carbon filter screen 13 is placed at the bottom of the inner cavity of the filter box 12, and an L-shaped conduit 14 is connected to the bottom of the filter box 12, one end of the L-shaped conduit 14 is connected to the treatment box 1. The outer surface of the L-shaped conduit 14 is provided with a first valve, and the outer surface of the first discharge pipe 6 is provided with a second valve. A second discharge pipe 16 is connected to the right side of the treatment box 1 and located above the quartz sand filter material 4, and a third valve is provided on the outer surface of the second discharge pipe 16. The right side of the top of the treatment box 1 is connected with an inlet pipe 17, and the four corners of the bottom of the treatment box 1 are fixedly connected with support legs. The right end of the sewage storage cylinder 7 is threaded with a cylinder cover, and the top of the filter box 12 is clamped with a convex cover. An overflow pipe is connected to the left side of the filter box 12, and the overflow pipe is located above the activated carbon filter screen 13.

In this embodiment, the present invention provides a treatment box 1, a load-bearing orifice plate 2, a rotating shaft 3, a quartz sand filter material 4, a stirring plate 5, a first discharge pipe 6, a sewage storage cylinder 7, and a drive component 8, which can facilitate the filtration of water bodies. At the same time, the quartz sand filter material 4 can be stirred and self-cleaning; By setting the aeration pipe 9, fan 10, and exhaust pipe 11, it is easy to aerate the water body. By setting the filter box 12, activated carbon filter screen 13, and L-shaped conduit 14, it is easy to adsorb and filter the water body. By setting the above structure, it is easy to use for water circulation treatment, thus meeting the needs of customers.

Embodiment 2:

Referring to Figures 1, 2, and 3, the drive component 8 comprises a rotating motor 801, the bottom of the rotating motor 801 is fixedly connected to the connection of the treatment box 1, the output end of the rotating motor 801 is fixedly connected to a driving gear 802, the top of the rotating shaft 3 penetrates the treatment box 1 and is fixedly connected to a driven gear 803, and the driving gear 802 meshes with the driven gear 803. A protective box 15 is fixedly connected to the top of the treatment box 1 and located outside the rotating motor 801, and a maintenance plate is fixedly installed on the front of the protective box 15 through screws.

In this embodiment, the present invention can conveniently drive the rotating shaft 3 by setting a rotating motor 801, a driving gear 802, and a driven gear 803.

The implementation principle of the present invention is as follows: when in use, the staff connects the device to the mains electricity. Then, the staff introduces the landscape water to be treated into the inner cavity of the treatment box 1 through the inlet pipe 17. At the same time, the landscape water in the inner cavity of the treatment box 1 penetrates the quartz sand filter material 4 on the load-bearing orifice plate 2 from top to bottom. During this process, the vast majority of suspended particles, algae, organic matter and other impurities in the water are effectively intercepted by the quartz sand filter material 4, achieving core physical purification and significantly reducing the turbidity of the effluent; At the same time, the staff activated the external controller of fan 10, causing it to deliver compressed air through exhaust pipe 11 to aeration pipe 9 at the bottom of treatment tank 1. This released a large number of fine bubbles from aeration pipe 9, which strongly aerated the clean water filtered by quartz sand filter material 4, significantly increasing the dissolved oxygen content in the water and promoting aerobic microbial activity. At the

same time, it oxidized some harmful substances; Next, the aerated water is introduced into the filtration box 12 through the L-shaped conduit 14, allowing its water flow to penetrate the activated carbon filter screen 13. With its huge specific surface area and adsorption capacity, the activated carbon filter screen 13 deeply removes color, odor, dissolved organic matter, and trace pollutants from the water, resulting in the final purification of the water quality. Finally, the purified high-quality water overflows from the overflow pipe of the filter box 12 and flows back into the landscape water body, completing a complete water circulation purification process;

When the quartz sand filter material 4 experiences an increase in filtration resistance due to excessive retention of impurities and requires self-cleaning, the staff temporarily stops the water inlet of the inlet pipe 17 and closes the first valve of the L-shaped conduit 14. Then, the staff starts the external controller of the rotating motor 801, which drives the output end of the rotating motor 801 to rotate the driving gear 802. The driving gear 802 drives the driven gear 803 to rotate, and the driven gear 803 drives the rotating shaft 3 to rotate. The rotating shaft 3 drives the stirring plate 5 to rotate, causing the stirring plate 5 to uniformly and slowly stir the quartz sand filter material 4, effectively peeling off the impurities attached to the surface of the quartz sand filter material 4; After the mixing is completed, the staff turns off the external controller of the rotating motor 801 to stop the mixing. Due to the fact that the specific gravity of the quartz sand filter material 4 is much higher than the organic impurities that are peeled off, the quartz sand filter material 4 will quickly settle, and the impurities will form suspended sludge in the water. After standing for a moment, the peeled sludge will naturally settle into the inner cavity of the sewage storage tank 7 through the load-bearing orifice plate 2, treatment tank 1, and first discharge pipe 6; Then, the staff opens the third valve of the second sewage pipe 16, allowing the light debris floating in the water to be discharged through the second sewage pipe 16. Then, the

staff opens the cylinder cover on the right side of the sewage storage cylinder 7, allowing the settled sludge impurities to be discharged through the sewage storage cylinder 7, thereby achieving self-cleaning of the quartz sand filter material 4. After the sewage discharge is completed, the staff can return to the conventional water circulation treatment mode by reversing the above operations. The principle is the same as above, and will not be repeated here. The device is simple to operate, easy to use for water circulation treatment, and can meet the needs of customers.

The above are the preferred embodiments of the present invention and do not limit the scope of protection of the present invention. Therefore, any equivalent changes made according to the structure, shape, and principle of the present invention should be included in the scope of protection of the present invention.