

FILTER DEVICE FOR AQUARIUM TANK

This invention relates to a filter device for an aquarium tank for keeping or raising aquarium fish such as freshwater fish and tropical fish.

Various types of aquarium tanks have been developed. In the typical aquarium tanks, a filter device for filtering water is disposed on top of the tank body. Water in the tank is pumped up by a water pump and supplied to the filter device. The filtered water is returned to the tank. In this way, water is used in a circulative fashion. For enabling the water pumped up by the water pump to spread over a filter material in the filter device, a trough is provided above the filter material such that water discharged from the water pump first flows into the trough and thence is supplied through many holes formed in the bottom of the trough onto the filter material over a wide area thereof.

In the prior art filter device, a water supply duct connected to the water outlet of the water pump has an outlet disposed above the trough, and water falls downward from the outlet into the trough, thus generating the sound of falling water. This sound is irritatingly noisy in a quiet room. The noise is liable to sound particularly loud at night and may disturb those sleeping nearby.

An object of the invention is to provide a filter device for an aquarium tank, which can suppress

generation of such a noise.

According to the invention, there is provided a filter device for an aquarium tank, which comprises a filter bed filled with a filter material, a trough disposed above the filter material and extending in the longitudinal direction of the filter bed and a water supply duct connected to a water outlet of a water pump and having an outlet section extending into the trough such that water discharged from the outlet section flows into the trough and down through holes formed in the bottom of the trough onto the filter material, and in which a downwardly inclined guide surface is formed to guide water from the outlet section of the water supply duct to flow obliquely downward, the downwardly inclined guide inner surface having a lower end in contact with or in close proximity to the bottom of the trough.

With the filter device according to the invention, in which a downwardly inclined guide inner surface is provided at the outlet section of the water supply duct, water discharged from the outlet section is guided along the inclined guide inner surface until it flows down onto the bottom of the trough. Thus, it is possible to suppress the generation of the sound of falling water.

The above and other objects and features of the invention will become more apparent from the following detailed description with reference to the accompanying drawings, in which:

Figure 1 is an elevational view showing an aquarium tank provided with a filter device;

Figure 2 is an enlarged plan view showing the essential part of the filter device according to the invention;

Figure 3 is a side sectional view showing the filter device shown in Figure 2; and

Figure 4 is a side sectional view showing a different embodiment of the filter device according to the invention.

Referring now to Figure 1, there is shown an aquarium tank 1, which comprises a tank body 2 and a filter device 3 provided on top of the tank body 2.

The filter device 3 comprises an elongate base frame 5 set on an upper frame 4 of the tank body 2, an elongate filter bed 6 provided in an upper portion of the base frame 5, a trough 7 provided on top of the filter bed 6 and extending in the longitudinal direction thereof, a filter material 8 filling a space in the filter bed 6 beneath the trough 7, and a water pump 9 provided in a portion of the base frame 5 aside the filter bed 6. A water suction duct 10 is connected to the inlet of the water pump 9 and extends downward into the tank body 2. A water supply duct 11 is detachably connected to the outlet of the water pump 9 and has an upwardly extending portion terminating in an outlet section 12 which extends into the trough 7 from one side thereof.

As shown in Figures 2 and 3, the trough 7 has a substantially flat bottom 13 and side walls extending upright from the opposite sides of the bottom 13. It further has opposite end walls (only the left one thereof being shown) extending upright from the opposite ends of the bottom 13. The bottom 13 has a plurality of distribution holes 14.

As seen in Figure 3, the outlet section 12 of the water supply duct 11 for supplying water to the trough 7 has a downwardly inclined free end portion, forming an inclined guide inner surface 15. The outlet section 12 is set such that the lower end 15' of the downwardly inclined guide inner surface 15 is in contact with or in close proximity to the bottom 13 of the trough 7.

In the filter device 3 having the above

construction, by operating the water pump 9 water is pumped up from a water suction section 10' of the water suction duct 10 and pumped out through the water supply duct 11 to be supplied from the outlet section 12 into the trough 7. In this case, water flows from the outlet section 12 along the downwardly inclined guide inner surface 15 down onto the bottom 13 of the trough 7. Thus, water flows out from the outlet section 12 of the water supply duct 11 continuously, without interruption. This brings about an effect of suppressing the generation of noise resulting from falling water or water turbulence.

As water entering the trough 7 flows along the bottom 13 thereof, it flows down through the distribution holes 14 onto the filter material 8, and water that has been filtered through the filter material 8 is returned through a return duct 16 into the tank body 2.

The structure, for causing water to flow gently from the outlet section 12 of the water supply duct 11 to the bottom 13 of the trough 7 is not limited to the above structure in which the outlet section 12 itself is inclined downward, but may be modified so long as water can be guided gently down into the trough 7.

Figure 4 shows a different embodiment in which the bottom 13 of the trough 7 is provided with a raised portion having a downwardly inclined guide section 17. The outlet section 12 of the water supply duct 11 is set such that it is in contact with or in close proximity to the inclined guide section 17. In this embodiment, without any inclined surface of the outlet section 12 of the water supply duct 11, water can flow from the outlet section 12 along the downwardly inclined guide surface 17' of the guide section 17 down to the bottom 13 of the trough 7. It is thus possible to suppress generation of noise caused by water.

As has been described in the foregoing,

according to the invention water discharged from the outlet section of the water supply duct is guided along a downwardly inclined guide inner surface as it flows down, and thus it is possible to suppress generation of noise caused by water.

It is thus possible to provide an aquarium tank which does not product undesirable sound and which does not sound noisy even in a quiet room or at night.



Claims:

1. A filter device for an aquarium tank, comprising a filter bed filled with a filter material, a trough disposed above said filter material and extending in the longitudinal direction of said filter bed and a water supply duct connected to a water outlet of a water pump and having an outlet section extending into said trough such that water discharged from said outlet section flows into said trough and down through holes formed in the bottom of said trough onto said filter material, said filter device characterised in that a downwardly inclined guide inner surface is formed to guide water from said outlet section of said water supply duct to flow obliquely downward and that said downwardly inclined guide inner surface has a lower end in contact with or in close proximity to the bottom of said trough.

2. The filter device according to claim 1, wherein said downwardly inclined guide inner surface is constituted by a downwardly inclined end portion of said outlet section of said water supply duct.

3. The filter device according to claim 1, wherein said downwardly inclined guide inner surface is constituted by a raised portion of the bottom of said trough, said raised portion being raised up to the height level of said outlet section.



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4. A filter device for an aquarium tank substantially as hereinbefore described with reference to and as shown in the accompanying drawings.