

NOISELESS WATER DRAINING DEVICE OF AIR CONDITIONER**BACKGROUND OF THE INVENTION**

The present invention relates to an improved noiseless water draining device for use in an air conditioner, which is made up of a water collecting tank, a pump, a float, a push rod; an upper cover; and an abutment switch. The water collecting tank is made in a two-stage form including an upper stage and a lower stage with a partition board disposed therebetween so as to form a sediment chamber at the upper stage for filtering waste water. A C-shaped float chamber is disposed in the lower stage with a float movably housed therein. A push rod fixed to the top of the float is separably engaged with an abutment rod which can actuate a switch of a pump so that when water is collected in the tank to a certain level, the float is lifted up to actuate the pump to drain water automatically and a siphon effect can be established to noiselessly drain water for a long period of time. Moreover, the sediment chamber can filter waste water in such a manner that impurities and sediment can be prevented from damaging the pump and draining pipe.

Referring to Fig. 1, a conventional water collecting tank 1 is provided with a draining pipe 2 which extends externally downwardly and is led along a wall 3 to the exterior of a room via an opening 4. The end of the draining pipe 2 is located at a lower position than the water collecting tank 1 whereby water can be naturally discharged out of the tank as a result of a siphon effect.

Such a prior art water collecting tank 1 has the following disadvantages:

1. The water in the draining pipe 2 discharged by way of a siphon effect can be easily interrupted if water is not constantly discharged in the pipe, resulting in the water in the water collecting tank 1 overflowing due to the poor discharge of the draining pipe 2.
2. After a long time of use, the draining hole or draining pipe 2 of the water collecting tank 1 can be easily clogged by sediments or impurities A in water in the water collecting tank 1, causing the draining pipe 2 out of function and the water collecting tank 1 to overflow in operation.

Referring to Fig. 2, a second prior art water collecting tank 1 is equipped with a pump 5 which has a pipe 6 in communication with the water collecting tank 1 at one end and is connected to a draining pipe 2 at the other end. The draining pipe 2 is led out of a room via an opening 4 on a wall 3. Once an air conditioner is started, the motor 5 is actuated simultaneously so as to drain water in the water collecting tank 1 via the draining pipe 2 and the pipe 6 out of the room.

There are following disadvantages associated with the second prior art water collecting tank 1:

1. The pump 5 dispels water faster than the water collection in the water collecting tank 1, so the pump 5 is frequently operated in vain, resulting in the waste of electric energy and the reduction of operation life thereof.
2. Sediments and impurities A in the water collecting tank 1 can easily get the draining pipe 2 and the pipe 6 clogged.

SUMMARY OF THE INVENTION

The primary object of the present invention is to provide a noiseless water draining device which is equipped with a float actuated abutment switch to automatically start a water pump to discharge water in a water collecting tank.

Another object of the present invention is to provide a noiseless water draining device equipped with a pump which is only started at the installation thereof or on a siphon state in the water draining device being lost. Once waste water flows into a float chamber to push a float moving upwardly to actuate an abutment switch to start the pump, a siphon state is constantly kept whereby the pump is not constantly in operation to dispel water, making the operation of the water draining device noiseless and power saving and the life of the pump being prolonged effectively.

One further object of the present invention is to provide a noiseless water draining device equipped with a sediment chamber which filter impurities in waste water collected so as to protect the pump from being damaged in operation.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagram showing the operation mode of a first prior art;

Fig. 2 is a diagram showing the operation mode of a second prior art;

Fig. 3 is a perspective and partially sectional diagram showing the structure of the present invention;

Fig. 4 is a perspective diagram showing the assembly of the present invention;

Fig. 5 is a diagram showing the operation mode thereof.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Fig. 3, the noiseless water draining device of the present invention applied to an air conditioner comprises a water collecting tank 10, a pump 20, a float 30, a push rod 40, an upper cover 50 and an abutting switch 60.

The water collecting tank 10 is made in a two-stage form including an upper stage and a lower stage with a partition board 11 disposed therebetween so as to form a sediment chamber 12 at the upper stage. At a lower stage a C-shaped float chamber 13 of proper height is provided with a drain hole 14 at the bottom thereof. A conducting tube 15 is disposed at a raised portion of the lower stage. The drain hole 14 communicates with a pump seat 16. At the side of pump seat 16 is disposed a draining pipe 17 which is led through the conducting tube 15 to extend to the exterior of the tank 10. A pump 20 is located in the pump seat 16. The float 30 of a cylindrical form is provided with a push rod 31 at the top thereof. A short abutment rod 40 has an enlarged head 40. The upper cover 50 of a rectangular box form having an opened top is provided with a retaining seat 51 and a pivot through hole 52 is disposed adjacent to the retaining seat 51. At the center of the upper cover 50 is disposed a drain hole 53; at the other corner of the upper cover 50 is disposed a water inlet 54 with which a drain pipe of an air conditioner is coupled.

In assembly, as shown in Fig. 4, the float 30 is placed in the float chamber 13 of the water collecting tank 10, the abutment rod 40 is inserted into the through hole 52 of the upper cover 50 with the bulged top thereof retained in place at the opening of the through hole 52. The abutment switch 60 has a number of retaining legs 61 that are disposed at both sides thereof and engaged with the corresponding recesses on a seat of

an upper cover 50 which is then positioned on top of the water collecting tank 10. The draining pipe 17 extended from the pump 20 and led through a conducting tube 15 of the tank 10 is led through a through hole 53 disposed at the center of one side of the upper cover 50 and extends out of a room. Waste water of an air conditioner is directed to the water inlet 54 disposed at one corner of the upper cover 50.

Referring to Fig. 5, in practical operation, waste water is led through the inlet hole 54 of the upper cover 50 into the sediment chamber 12 of the water collecting tank 10 with impurities and sediment A collected at the bottom of the chamber 12. Clean water at the upper portion of the chamber 12 flows into the C-shaped float chamber 13. The draining pipe 17 can be extended along a wall to make the pipe arrangement orderly. In the first operation, no siphon effect exists between the draining pipe 17 and the water collecting tank 10, so water in the float chamber 13 can not be drained out of the water collecting tank 10 naturally and water continuously flows into the float chamber 13 to cause the float 30 to move upwardly to a certain level, the push rod 31 fixed to the top of the float 30 will come into contact against the abutment rod 40. Thus, the abutment switch 60 is actuated to get the pump 20 operated for a very short period of time to drain waste water from the tank 10 via the drain hole 14 of the tank and the draining pipe 17 out of a room. In such a short time, a siphon effect is established between the tank 10 and the draining pipe 17 and it is constantly maintained in the tank 10. Afterwards, the float 30 moves downwardly as a result of the level of the water dropping down to block the drain hole 14. Then waste water will be collected once more in the float chamber 13 to get the float 30 buoyant. In the meanwhile, waste water will be automatically drained out of the tank 10 by way of a siphon effect without use of the pump 20. It makes the

operation of draining water noiseless and energy saving.

If an air conditioner is not operated for a long period of time, the siphon effect between the tank 10 and the draining pipe 17 will vanish and water is not drained at all. As a result, water will be accumulated in the float chamber 13 and makes the float 30 lifted up to actuate the abutment switch 60 again as described previously. So, a siphon effect is established between the water tank 10 and the draining pipe 17 again to get water drained.

The following advantages can be obtained in the above embodiment of the present invention:

1. As the water level in the tank 10 reaches a certain point, the push rod 31 of the float 30 will urge the abutment rod 40 to actuate the abutment switch 60 of a pump 20 to create a siphon effect between the tank 10 and the draining pipe 17 to smoothly and effectively drain water out of the tank 10.
2. The pump 20 is not necessarily in constant operation all the time and only is actuated as the siphon effect in the tank 10 vanishes so as to make water in the tank 10 drained in a noiseless manner with less electric energy; and the operation life of the pump 20 prolonged.
3. Impurities and sediments A of waste water can be first filtered in the sediment chamber 13 so as to prevent pump 20 and draining pipe 17 from being clogged, resulting in protection of the pump 20 from damage.

NOISELESS WATER DRAINING DEVICE OF AIR CONDITIONER**CLAIMS**

I claim:

1. A noiseless water draining device for use in an air conditioner, comprising:

a water collecting tank; a pump; a float; a push rod; an upper cover; and an abutting switch;

wherein said water collecting tank is made in a two-stage form including an upper stage and a lower stage which is provided with a drain hole;

said drain hole is in communication with a motor mount in which said pump is housed; a water discharge duct in connection to an externally extended tube is placed at one side of said water collecting tank;

said upper cover is placed at the top of said water collecting tank and has a through hole for the passage of said extended tube of said pump; a water inlet hole is disposed at one corner of said upper cover;

wherein said water draining device is characterized by that:

near one end of said lower section of said water collecting tank is disposed a C-shaped float chamber of proper height in which a cylindrical float is movably housed; at a top end of said cylindrical float is disposed a push rod having an enlarged top end; at one corner of said upper cover is disposed a retaining seat; a pivot through hole is located adjacent to said retaining seat for receiving an abutment rod having an enlarged end; said abutment switch has a plurality of retaining legs that are engaged with said retaining seat whereby said float can be lifted up in said float chamber when waste water is collected in said water collecting tank to a level to make said push rod disposed at the top of said float



contact with said abutment rod which in turn actuate said abutment switch of said pump, resulting in drain waste water from said water collecting tank.

2. The noiseless water draining device for use in an air conditioner wherein said water collecting tank is provided with a partition board disposed between said upper stage and said lower stage thereof so as to define a sediment chamber which can filter and collect impurities of waste water in said sediment chamber.

