

WATER FILTRATION SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a water filtration system, and in particular, to a water filtration system that can be assembled and/or disassembled easily to facilitate the replacement of filter cartridge.

2. Description of Related Art

With the pollution of water resources, people pay more attention to the issue of water hygiene, so that they utilize a water filtration system to obtain clean water. The conventional water filtration system includes a base, a filter cartridge, and a casing. The filter cartridge and the casing are connected to the base. The casing covers outside the filter cartridge. The base is used to connect a water-incoming line and a water-outgoing line, so that non-filtered water flows through the filter cartridge via the base, and then the filtered water is delivered to the outside via the base for subsequent use.

The casing is usually made of plastic or stainless steel. The casing is connected to the base via screw elements. Taiwan Patent Publication

No.409626 discloses an improved water filtration system, which comprises a cover, a cylinder, a reinforcing sleeve, and an O-ring. The cylinder (casing) is connected to the cover (base) via screw elements. Since it takes more time to connect these components via screw elements, the assembling or disassembling process is not convenient.

Another design for a water filtration system available in the market lies in that the casing and the base are connected to each other by insertion. The base is provided with an insertion hole, and the casing is provided with a corresponding boss. The casing is rotated to allow the boss to be inserted into the insertion hole of the base. In this way, the assembling or disassembling process is more convenient. Taiwan Patent Publication No.M281701 discloses a water filtration system assembly, which comprises a cover and a main body. The main body (casing) is inserted into the insertion hole of the cover (base). Since the boss is mostly formed by means of a plastic injection molding process, the main body (casing) must also be formed by the same process. Thus, it is impossible to form the main body (casing) by stainless steel, so that the materials suitable for manufacturing the water filtration system are limited.

SUMMARY OF THE INVENTION

The objective of the present invention is to provide a water filtration system, which can be assembled or disassembled more easily so as to facilitate the

replacement of filter cartridge.

To achieve the above-mentioned objective, the present invention provides a water filtration system. The casing of the water filtration system is made of stainless steel. Thus, the casing does not damage easily and thus has a long product lifetime. Further, the water filtration system made of stainless steel can be recycled, which conforms to the requirements for environmental protection.

The present invention is to provide a water filtration system, which includes: a base with its top surface having at least one accommodating trough, the accommodating trough being provided with a connector, a fringe of the top of the accommodating trough being formed with a plurality of retaining plates and through-holes that are arranged at intervals; at least one filter cartridge connected to the connector of the base; and at least one casing with its bottom having an opening, the bottom of the casing extending outwards to form a plurality of insertion pieces that are arranged at intervals, the insertion pieces passing through the through-holes respectively, the insertion pieces being inserted into the underside of the retaining plates respectively, the casing being connected to the base via insertion, the filter cartridge being received in the casing.

The present invention has advantageous features as follows. The insertion pieces of the casing of the present invention are inserted into the underside of the retaining plates of the base respectively, so that the casing can be

connected to the base by insertion. Thus, the present invention can be assembled or disassembled more easily and conveniently to facilitate the replacement of filter cartridge.

Due to the design of insertion pieces, the casing can be made of stainless steel. Since the base and the casing are made of stainless steel, they can be assembled together to form a stainless steel body. Thus, the present invention does not suffer damage easily and has a long lifetime. Further, the present invention can be recycled.

In order to further understand the techniques, means, and effects that the present invention takes for achieving the prescribed objectives, the following detailed descriptions and appended drawings are hereby referred; such that, through which the purposes, features, and aspects of the present invention can be thoroughly and concretely appreciated; however, the appended drawings are merely provided for reference and illustration, without any intention to be used for limiting the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded perspective view showing a water filtration system of the present invention;

Fig. 2 is an assembled perspective view showing the water filtration system of

the present invention;

Fig. 3 is a perspective view showing the base of the present invention;

Fig. 4 is a perspective view showing the base of the present invention along another angle;

Fig. 5 is a cross-sectional view showing the water filtration system of the present invention;

Fig. 6 is a schematic view showing a pressure-released state of a gasket of the present invention; and

Fig. 7 is a schematic view showing a pressurized state of the gasket of the present invention

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please refer to Figs. 1 to 5. The present invention is to provide a water filtration system, which includes a base 1, at least one filter cartridge 3, and at least one casing 5. The base 1 is made of stainless steel. The shape of the base 1 is not limited to any specific form, but can be varied according to practical demands. The number and dimension of the filter cartridges 3 and the casings 5 can also be varied suitably. The top surface of the base 1 is provided with at least one accommodating trough 11. In the present

embodiment, three sets of filter cartridges 3 and casings 5 are provided. Accordingly, three accommodating troughs 11 are provided. The accommodating troughs 11 are each formed into a circular trough. The top of the accommodating trough 11 is formed into an opening. The center of each accommodating trough 11 is provided with a connector 12. The connector 12 is a circular hollow body with its inner edge having an inner thread 121 for connecting the filter cartridge 3.

The edge of the top opening of each accommodating trough 11 is formed with an annular groove 14 for receiving a gasket 13. The cross section of the gasket 13 is formed into a U shape. The outer edge of the gasket 13 abuts the inner edge of the annular groove 14 of the base 1 and the bottom of the casing 5, thereby increasing the tightness between the base 1 and the casing 5. The edge of the opening of each accommodating trough 11 is formed with a plurality of retaining plates 15 and the through-holes 16 that are arranged at intervals. The retaining plates 15 and the through-holes 16 are located above the annular trough 14. The retaining plates 15 are integrally formed with the base 1 and are arranged at intervals. The through-holes 16 are formed respectively between each retaining plate 15. That is, the retaining plates 15 and the through-holes 16 are alternately provided on the edge of the opening of the accommodating trough 11.

The base 1 is provided with a water inlet 17 and at least one water outlet 18 for connecting to a water-incoming line and a water-outgoing line. The water

inlet 17 and the water outlet 18 are provided on proper positions of the base 1. A plurality of water outlets 18 may be provided, and these water outlets 18 can be distributed in different orientations. The user can select one of the water outlets and block the unselected water outlets, so that a plurality of water circulating paths can be formed in the base 1. The water inlet 17 is in communication with the closest accommodating trough 11. The water outlet 18 is in communication with the connector 12 that is located in the center of the closest accommodating trough 11. In the present embodiment, the water inlet 17 is in communication with the accommodating trough 11 on the right side, and the water outlet 18 is in communication with the connector 12 that is located in the center of the accommodating trough 11 on the left side. Pipes 19 and 20 are provided in the base 1 for connecting to the accommodating troughs 11 and the connector 12. Thus, via the pipes 19 and 20, the filter cartridges 3 can be connected in series.

The pipes 19 and 20 are provided on the bottom surface of the base 1. Further, a gasket 21 surrounds the pipes 19 and 20. The bottom surface of the base 1 is further provided with a positioning trough 22. A sealing plate 23 is fitted within the positioning trough 22. The sealing plate 23 is disposed on the gasket 21 and fixed to the base 1 via screws 24. The gasket 21 and the sealing plate 23 are used to seal the pipes 19 and 20, so that the interior of the base 1 forms water circulating paths for connecting to the filter cartridges 3.

The interior of the filter cartridge 3 has a suitable filtering material 31. The filtering material 31 is not limited to any specific forms. The center of the lower end of the filter cartridge 3 has a water-exiting portion 32. The outer edge of the water-exiting portion 32 is provided with an outer thread 32. The filter cartridge 3 is connected to the inner thread 121 of the connector 12 of the base 1 via the outer thread 321 of the water-exiting portion 32, so that the filter cartridge 3 can be connected to the corresponding connector 12 of the base 1 via the threads.

The casing 5 is made of stainless steel. The casing 5 is formed into one body via a rotating and pressing process. The casing 5 is a hollow cylinder. The bottom of the casing 5 is formed with an opening 51. The bottom of the casing 5 extends horizontally and outwards to form a protrusion and extends further outwards to form a plurality of insertion pieces 52 that are arranged at intervals. The top of the casing 5 is mounted with an automatic exhaust valve 7, thereby achieving an automatic exhausting effect.

The casing 5 is assembled on the base 1 with the insertion pieces 52 on the bottom of the casing 5 passing through the corresponding through-holes 16 respectively. After rotating the base 1 to a suitable angle, the insertion pieces 52 are inserted into the underside of the corresponding retaining plates 15 respectively. In this way, the casing 5 is connected to the corresponding accommodating trough 11 of the base 1 via insertion. The filter cartridge 3 is received in the casing 5. The bottom of the casing 5 abuts the gasket 13 to

sandwich the gasket 13 between the base 1 and the casing 5, thereby increasing the tightness between the base 1 and the casing 5. When water is filled in the casing 5, as shown in Fig. 7, the water pressure seals the gasket 13 between the base 1 and the casing 5 sufficiently, so that the casing 5 will not rotate easily. When water is not filled in the casing 5, the water pressure is released as shown in Fig. 6, so that the casing 5 is rotatable. Via the above arrangement, the water filtration system of the present invention can be obtained.

When the present invention is in use, the non-filtered water is delivered in the base 1 via the water inlet 17. The non-filtered water is delivered to the filter cartridge 3 via the accommodating trough 11. After being filtered by the filtering material 31 of the filter cartridge 3, the filtered water is outputted via the water-exiting portion 32 of the filter cartridge 3. The water is filtered sequentially by a plurality of filter cartridges 3. Finally, the filtered clean water is delivered to the outside via the water outlet 18 of the base 1 for subsequent use.

According to the above, the present invention has advantageous features as follows.

(I) The insertion pieces 52 of the casing 5 are inserted into the underside of the retaining plates 15 of the base 1 respectively, so that the casing 5 is connected to the base 1 via insertion. The user only needs to rotate the

casing 5 to a suitable angle so as to complete the assembling or disassembling process of the base 1 and the casing 5. Thus, the present invention can be assembled or disassembled more easily and rapidly to facilitate the replacement of filter cartridges 3. Since the filter cartridge 3 can be replaced easily, the filter cartridge 3 may not be overdue, and bacteria or mold may not propagate therein to endanger the user's health.

(II) The insertion pieces 52 and the retaining plates 15 are engaged with each other, so that the casing 5 can be firmly connected with the base 1 via insertion. Further, the gasket 13 is provided between the base 1 and the casing 5. When water is filled in the casing 5, the water pressure causes the gasket 13 to be sealed between the base 1 and the casing 5 sufficiently. As a result, the casing 5 may not be rotated easily, thereby generating a water-proof effect. When no water is filled in the casing 5, the pressure is released, so that the casing 5 becomes rotatable.

(III) Due to the design of insertion pieces 52, the casing 5 can be made of stainless steel. Thus, the base 1 and the casing 5 are both made of stainless steel to form a stainless steel body. Therefore, the present invention does not suffer damage easily and has a long lifetime. Further, the present invention can be recycled and conforms to the requirements for environmental protection.

(IV) Since water circulating paths can be designed in the base 1, no additional

pipes have to be provided between the filter cartridges 3. Thus, the inconvenience in connecting pipes can be eliminated, and the installation of the whole water filtration system is facilitated.

(V) The present invention has an effect of a water-proof hammer, so that cracks caused by pressure can be prevented.

The above-mentioned descriptions represent merely the preferred embodiment of the present invention, without any intention to limit the scope of the present invention thereto. Various equivalent changes, alternations, or modifications based on the claims of present invention are all consequently viewed as being embraced by the scope of the present invention.

WHAT IS CLAIMED IS:

1. A water filtration system, comprising:

a base with its top surface having at least one accommodating trough, the accommodating trough being provided with a connector, a fringe of the top of the accommodating trough being formed with a plurality of retaining plates and through-holes that are arranged at intervals;

at least one filter cartridge connected to the connector of the base; and

at least one casing with its bottom having an opening, the bottom of the casing extending outwards to form a plurality of insertion pieces that are arranged at intervals, the insertion pieces passing through the through-holes, the insertion pieces being inserted into the underside of the retaining plates, the casing being connected to the base via insertion, the filter cartridge being received in the casing.

2. The water filtration system according to claim 1, wherein a gasket is provided in the accommodating trough, the cross section of the gasket is a U shape, and the gasket is sandwiched between the base and the bottom of the casing.

3. The water filtration system according to claim 2, wherein the fringe of the

top of the accommodating trough is formed with an annular groove, the gasket is received in the annular groove, and the outer edge of the gasket abuts the inner edge of the annular groove and the bottom of the casing.

4. The water filtration system according to claim 1 or 2, wherein the bottom of the casing extends outwards to form a protrusion, and extends further outwards to form the insertion pieces.

5. The water filtration system according to claim 1 or 2, wherein the base and the casing are made of stainless steel.

6. The water filtration system according to claim 1, wherein the base is provided with a water inlet and at least one water outlet, the number of the accommodating troughs, the filter cartridges and the casings is plural, the water inlet is in communication with the closest accommodating trough, the water outlet is in communication with the connector of the closest accommodating trough, pipes are provided in the base for connecting to the accommodating troughs and the connectors.

7. The water filtration system according to claim 6, wherein the pipes are provided in the bottom surface of the base, a gasket is further provided to surround the pipes, the bottom surface of the base is provided with a positioning trough, a sealing plate is fitted in the positioning trough, the sealing plate is disposed on the gasket, the sealing plate is fixed to the base

via a plurality of screws.

8. The water filtration system according to claim 1, wherein the filter cartridge is provided with a filtering material, the lower end of the filter cartridge has a water-exiting portion, the water-exiting portion of the filter cartridge is connected to the connector of the base.

9. The water filtration system according to claim 8, wherein the water-exiting portion of the filter cartridge is connected to the connector of the base via threads.

10. The water filtration system according to claim 1, wherein the top of the casing is mounted with an automatic exhaust valve.