

Shower Apparatus

Field of Invention

5 The present invention relates to a shower apparatus, more particularly, relates to a shower apparatus having filtering media in the shower tank and shower head for eliminating contaminants, removing chlorine and with energy conversion features.

Background of the Invention

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Chlorine has been identified as a disinfecting agent. There is growing concern of chlorine in tap water. Chlorine is a dangerous carcinogen and chlorine in tap water may cause cancer and many other diseases. Although concentrations of these carcinogens are low, but these low levels which cancer scientists believe are responsible for majority of human
15 cancers. Chlorine by itself is not believed to cause the problem but rather the group of chemicals that form as result of reactions between chlorine and natural substances and pollutants in the water. Chlorine reacts with organic matters like leaves, bark, twigs, sediment, etc to create the family of chemicals called trihalomethanes and other highly toxic substances which in turn are responsible for some cancers in humans.

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Surprisingly, humans consume chlorine while taking a shower. Typically, a person who takes shower will inhale chlorine gas which is equivalent to drinking 50 gallons of chlorinated tap water. Currently, known shower filters use various types of materials to filter out impurities in water. However, the performance of some water filters is restricted
25 by the high temperature of water.

US Patent Application No. 2005127004 by Lutich George discloses a water filter device containing copper media for effectively treating water and the method of use are disclosed. The water filter device has an outer housing having an inlet and an outlet; and an inner filter which has an inner filter housing, an inner filter housing inlet at one end, an inner filter housing outlet at an opposing end, and one uniform region of substantially pure copper media disposed within the inner filter housing; wherein the inner filter is situated within and in fluid communication with the outer housing. The inner filter further has a region of granulated activated carbon, and a filter pad separating the two regions. The water filter device is a shower filter which removes more than 90% of the chlorine when water passes through the water filter device at a high flow rate used for showering.

In a Japanese Patent No. 2000126759 by Kanai Hiroaki, for efficiently remove residual chlorine in tap water over a long period of time and to relatively inexpensively produce a filter material, a filter material is formed by fixing a calcium sulfite powder with a nonwoven fabric sheet in such a state that at least a part of the surface of the powder can come into contact with passing water so that powder content becomes 40-85% by using a binder resin having water resistance and chemical resistance.

In another US Patent No. US5545314 by Parise Michael, it discloses a shower water filter assembly which includes an elongated housing containing a cartridge of filter media, and which is connected to the water outlet in a shower. In order to permit the elongated housing to have sufficient length to efficiently perform a filtering function, a flexible hose is coupled to the bottom of the housing and extends through a tubular wand to the shower head. The wand and shower head are supported, for example, on the side of the cylindrical housing so as to provide sufficient elevation for the shower head for normal shower use. Alternatively,

the wand and shower head may be removed from the supporting bracket and used manually for the shower.

US Patent No. US5213688 by Robinson Dennis discloses a shower water filter assembly
5 includes a housing having a cavity for a filter element which is relatively large relative to the cross section of the water pipe to which the assembly is attached. A water inlet and a water outlet attached to the housing couple to a shower pipe and a shower nozzle, respectively. The cavity portion of the housing containing the filter element is laterally displaced from the inlet and outlet along the line of the shower pipe. When the filter
10 assembly is operatively connected to the shower pipe, the filter element can be located vertically above the water inlet and the water outlet, and the height of the shower head is not reduced by the interspersed filter assembly.

The present invention overcomes the drawbacks of the known system while maintaining its
15 advantages.

An object of the present invention is to provide a shower system which is relatively safe in use for long period of time.

20 Another object of the present invention is to provide a water shower head having water purification feature which is incorporated with filter tube to remove other substances from water and neutralizer agent for skin care.

Still another object of the present invention is to provide the shower system having the filter media which is easy to clean and replaceable for removing contaminants present in the shower system.

- 5 Yet another object of the present invention is to provide a shower system with the hand held shower head that meets the demanding filtering capacity and temperature requirements of the main water supply.

Additional objects, advantages and novel features of the invention shall be set forth in part
10 in the description that follows and in part will become apparent to those skilled in the art upon examination of the following or may be learned by the practice of the invention. The objects and advantages may be realized and attained by means of the instrumentalities and in combinations particularly pointed out in the appended claims.

15 **Summary of the Invention**

The shower apparatus of the present invention comprising a first compartment tank having an inlet opening and an outlet opening, whereby the tank is formed hollow for accommodating a first filter element in rolled form to filter the water supplied to the first
20 compartment tank via the inlet opening; and a second compartment tank having an inlet opening and an outlet opening, whereby the tank is formed hollow for accommodating a second filter element having a plurality of filter segments containing filtering media which are vertically mounted together to filter the filtered water from the first compartment tank. The filtered water passes through the outlet opening of the first compartment tank into the
25 inlet opening of the second compartment tank by means of a conduit and the filtered water

from the second compartment tank is discharged from the outlet opening of the second compartment tank. The filtered water from the second compartment tank is discharge through a shower head connected to the outlet opening of the second compartment tank.

5 Preferably the shower head comprises of an elongate hollow body, a head detachably connected at the upper end of the body and an inner chamber having filtering media which is mounted within the body of the shower head. The filtering media used in the inner chamber is neutralizer which is a Vitamin C.

10 Preferably the filtered water from the second compartment tank can be discharged from the outlet opening to an inlet of a water heater.

Preferably the first and second compartment tanks could be integrally formed as a unitary piece tank or two separate individual tanks.

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Preferably the first filter element comprises of an elongate tube having mesh enclosed with a cloth and rolled up to be fitted within the first compartment tank. The elongate tube further comprises of a longitudinal opening for allowing water flows into the cloth and filter by the mesh.

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Preferably the plurality of filter segments include a first lower segment which is formed with an extended inlet at its lower end to be connected with the outlet opening of the first compartment tank via the first outlet connector of the casing. A last top segment having its top end covered with a netting to enable filtered water to pass therethrough.

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Brief Description of the Drawings

This invention will now be further described by way of non-limitative examples, with reference to the accompanying drawings, in which:

Figure 1 illustrates an exploded view of the shower apparatus of the present invention
5 showing the compartment tanks and the connection.

Figure 2 shows a perspective view of the shower head which is connected to the shower tank of the shower apparatus.

Figure 3a shows a side view of the elongate tube with mesh of the first filter element of the first compartment tank.

10 Figure 3b depicts a side view of the first filter element having the cloth enclosing the elongate tube with mesh.

Figure 4 is a side view of the second filter element showing the housing which is formed by vertically mounted filter segments.

15 Detailed Description of the Preferred Embodiments

The present invention is a shower apparatus (10) having replaceable filter units in a shower tank (11) and shower head (12) for removing chlorine, contaminants, fine sediment and other deposits from tap water. Figure 1 shows an exploded view of the shower apparatus (10) of the present invention. The shower tank (11) includes a first compartment tank (13) and a second
20 compartment tank (14) which is enclosed with a casing (15) for accommodating the filter units as shown in figure 1. These compartment tanks (13, 14) can be integrally formed as a unitary piece tank or two separate individual tanks. The casing (15) of the shower tank (11) is optionally split up into half for easy installation. The top portion of the casing (15) is provided with a cover (16) to enable user to change the filter elements easily. The casing (15)
25 of the shower tank (11) can be constructed in any conventional or known manner from suitable material, such as high strength plastic or the like.

At the bottom portion of the casing (15) of shower tank (11), it is provided with at least one inlet connector (17) and an outlet connector (18) which are connected to the respective water inlets and outlets of each compartment tank (13, 14) via the bottom portion of the casing (15). For instance, in the preferred embodiment of the present invention, the first compartment tank (13) having its water inlet and water outlet connected with a first inlet connector (17a) and a first outlet connector (18a) of the shower tank (11) respectively while for the second compartment tank (14) having its water inlet and water outlet connected with a second inlet connector (17b) and a second outlet connector (18b) of the shower tank (11) respectively. The first outlet connector (18a) of the first compartment tank (13) is connected to the second inlet connector (17b) of the second compartment tank (14) via conduit (21). The first inlet connector (17a) is secured to one end of a flexible conduit (not shown) by means of snap fit with resilient means or any other suitable fastening means. The other end of the flexible conduit is secured to a water supply, faucet or an outlet of a water heater in a known manner. The shower tank (11) is connected to the shower head (12) at the second outlet connector (18b).

The compartment tanks (13, 14) may be constructed in closed end tanks or opened end tanks as shown in figure 1. In the preferred embodiment of the present invention, the top end of the compartment tanks (13, 14) are opened for receiving tank caps (22). The tank caps (22) can be snap-fitted to the tanks (13, 14) or threaded to secure to the tanks. The tanks (13, 14) are formed hollow for accommodating the filter units therein. The opened ends of the compartment tanks (13, 14) at the top allow user to change the filter units easily. Openings for outlets and inlets (not shown) are formed at the bottom end of the compartment tanks (13, 14) to be connected with conduits via the connectors. Additional

holder covers (23) which conform the outer shape of the compartment tanks (13, 14) may be added to fix the tanks in place within the casing (15) of the shower tank (11).

The shower apparatus (10) is provided with filter units for filtering bacteria from water
5 supplied to the shower tank (11) and shower head (12). In a preferred embodiment of the present invention, the first compartment tank (13) is coupled with a first filter element (24) for filtering the supplied water entered the shower apparatus (10). The first filter element (24) is basically comprises an elongate tube (25) having a mesh (35) enclosed by an enclosed cloth (26) which is made of fabric fiber and rolled up to be fitted within the first compartment tank
10 (13) of the shower tank (11) as shown in figures 3a and 3b. The fabric fiber cloth (26) is preferably having pore size approximately $10\mu\text{m}$ for removing sediment and suspended solid. The elongate tube (25) is secured and extended from the water inlet of the first compartment tank (13). This first filter element (24) serves for filtering bacteria from shower water supplied to the shower apparatus (10). The elongate tube (25) of the first filter element (24) is formed
15 hollow with one end closed and the opposing end is opened to be connected with the water inlet of the first compartment tank (13). The elongate tube (25) further provided with a plurality of openings (36) along the tube (25) for allowing water flows into the enclosed cloth (26) and filters by the mesh (35). The rolled cloth (26) with mesh (35) then filters the bacteria from the shower water. Thus, the bacteria and any other contaminants remain behind in the
20 filter unit of the shower tank.

Under the influence of water pressure, the filtered water which accumulated in the first compartment tank (13) then flows into the second compartment tank (14) from the outlet of the first compartment tank (13) via the conduit (21). The second compartment tank (14) is
25 coupled to a second filter element (27) to remove chlorine and to add water softener to provide clean and energized shower water to the user. The second filter element (27) comprises a housing (28) formed by a plurality of filter segments (29) which can be

vertically mounted together as shown in figure 4. The filter segments (29) are formed with threaded ends to enable the filter segments to be mounted together. Each segment (29) is preferably contains different filtering media for different filtering effects. The first lower segment (29a) of the second filter element (27) is preferably formed with an extended inlet (30) at its lower end. The extended inlet (30) is fixed into the opening of the second inlet connector (17b) of the second compartment tank (14). The last top segment (29b) of the second filter element (27) is preferably covered with a netting (37) to enable filtered water to pass therethrough but to keep the filtering media within the second filter unit. The filter units of the first and second compartment tank (13, 14) can be removed therefrom in a proper and safe manner.

Both ends of each filter segment (29) are preferably formed with additional netting or having covers which are provided with plurality of holes or slits to enable water to flow therethrough. In a preferred embodiment, the first lower segment (29a) which contains filtering media such as ceramic balls (not shown) is connected with a middle segment (29c) which contains resins (not shown) and connected with the top segment (29b) which contains chlorine removing balls (not shown) to filter the filtered water from the first compartment tank (13). The ceramic balls filtering media is used to emit far-infrared energy, improve water taste and for deodorization. The ceramic balls filtering media is also preferably having max ion to emit negative ion into the water. The resin used for the middle segment (29c) is an ion exchange resin which is insoluble matrix formed in the form of small beads having the diameter of approximately 1-2 mm. It is used to reduce the hardness level contain in water by replacing the magnesium and calcium ions found in hard water with sodium ions. While the chlorine removing balls in the top segment (29b) is used to reduce chlorine contain in water. The filtered water from the second filter element (27) then fills the second compartment tank

(14) and flows out via the second outlet connector (18b) to the shower head (12) connected thereto.

The shower head (12) of the shower apparatus (10) comprises an elongate hollow body (31) forms a handle portion for holding the shower head (12) and a head (32) connected at the upper end of the body (31) as a spraying unit as shown in figure 2. The head (32) is preferably an angled head which is secured to the body (31) by means of a conduit (not shown). The lower end of the body (31) includes a head connector (33). This head connector (33) is connected to an inlet of an inner chamber (34) mounted within the body (31) of the shower head (12). An outlet at the other end of the inner chamber (34) is connected to the conduit of the shower head (12). Water entering from the inlet via the head connector (33) will therefore flow into the interior filtering media of the inner chamber (34). The filtering media used in the inner chamber (34) is neutralizer. In the preferred embodiment, the neutralizer used in the inner chamber is Vitamin C which is also known as L-ascorbate which is an antioxidant that protects user body against oxidative stress and is a cofactor in several vital enzymatic reactions. Beside, it also neutralizing chlorine contain in water. The body (31) is detachable from the head (32) to enable user to change and replace a new filtering media.

The present invention provides considerable advantages in ease and flexibility of use for filtering chlorine or other unwanted substances from hot shower heater. In use, when supplied water comes from flexible conduit (not shown) into water inlet of the first compartment tank (13) via the first inlet connector (17a), the water will pass through the filter media in the first filter element (24) into the compartment tank (13) to the water outlet of the first compartment tank (13) via the first outlet connector (18a). The filtered water will then flow into the inlet of the second filter element (27) via the second inlet connector (17b), then pass through the filtering media of the second filter element (27) and exit from the netting of the second filter element (27) into the second compartment tank (14). The filtered water will then pass through the outlet of the second compartment tank (14) via the second outlet connector (18b) before exiting the shower tank (11). The filtered water from the shower tank (11) is then transferred to the shower head (12) via conduit (not shown) to pass through the filtering media in the inner chamber (34) before discharging from the head (32) of the shower head (12). During use, filtered shower water supplied to the shower head (12) flows from the outlet of the second compartment tank (14).

The shower apparatus (10) of the present invention can be installed directly from a water supply and discharge water from the shower head (12) as described. Other possible installations are not limited to install the shower apparatus before and after the water heater to provide hot or cold shower water. If the shower apparatus (10) is installed before the water heater, the inlet of the shower apparatus (10) is connected to the water supply and the outlet of the shower apparatus is connected to the inlet of the water heater. While for shower apparatus (10) to be installed after the water heater, the water will be supplied to the water heater and the hot water from the outlet of the water heater will be connected to the

inlet of the shower apparatus (10). The hot filtered water will be discharged directly from the shower head (12).

The invention is not limited to the exemplary embodiment described. It is clear to the skilled person that various modifications are possible within the framework of the invention as set forth. For instance, the filter units, shower tank (11) and shower head (12) can be designed in various manners, in various shapes and of various materials. The filtering media held within the filter units and inner chamber (34) may consist of any other type of filter media which is used alone or mixed with different material.

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As will be readily apparent to those skilled in the art, the present invention may easily be produced in other specific forms without departing from its spirit or essential characteristics. The present embodiments is, therefore, to be considered as merely illustrative and not restrictive, the scope of the invention being indicated by the claims rather than the foregoing description, and all changes which come within therefore intended to be embraced therein.

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Claims:

1. A shower apparatus comprising:

a first compartment tank having an inlet opening and an outlet opening, whereby said tank
5 is formed hollow for accommodating a first filter element to filter the water supplied to said
first compartment tank via said inlet opening; and

a second compartment tank having an inlet opening and an outlet opening, whereby said
tank is formed hollow for accommodating a second filter element having a plurality of filter
segments containing filtering media which are vertically mounted together to filter the
10 filtered water from said first compartment tank, wherein said filtered water passes through
said outlet opening of said first compartment tank into said inlet opening of said second
compartment tank by means of a conduit and the filtered water from said second
compartment tank is discharged from said outlet opening of said second compartment tank;
characterized in that

15 said first and second compartment tanks are enclosed within a casing to form a shower tank
for said shower apparatus; and

said first filter element of the first compartment tank comprises an elongate tube having a
plurality of longitudinal openings, whereby said elongate tube is attached with a mesh
which is enclosed with a cloth in a roll form, said elongate tube having one end closed and
20 the opposing end opened to be connected to the inlet opening of said first compartment
tank.

2. The shower apparatus as claimed in claim 1, wherein said first and second compartment
tanks are formed with the top end opened for receiving said filter elements and secured by
25 tank caps.

3. The shower apparatus as claimed in claim 1, wherein said casing comprises of an openable cover provided at the top portion of said casing and a plurality of connectors formed at the bottom portion of said casing.

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4. The shower apparatus as claimed in claim 3, wherein said casing includes a first inlet connector and a first outlet connector which are connected to said inlet opening and outlet opening of said first compartment tank respectively.

10 5. The shower apparatus as claimed in claim 3, wherein said casing includes a second inlet connector and a second outlet connector which are connected to said inlet opening and outlet opening of said second compartment tank respectively.

15 6. The shower apparatus as claimed in claim 3, wherein said first and second compartment tanks may be integrally formed as a unitary piece tank or two separate individual tanks.

20 7. The shower apparatus as claimed in claim 6, wherein said compartment tanks further comprising of holder covers which conform the outer shape of said compartment tanks are added at the side of said tanks to hold said tanks in place within said casing of the shower tank.

8. The shower apparatus as claimed in claim 1, wherein both ends of said each filter segment are covered with a netting or cover which is provided with plurality of openings to enable filtered water to pass therethrough.

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9. The shower apparatus as claimed in claim 1, wherein said first and second filter elements can be removed from the compartment tanks and said filter elements are interchangeable between said first and second compartment tanks.

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10. The shower apparatus as claimed in claim 1, wherein said filtered water from said second compartment tank is discharged through a shower head connected to said outlet opening of the second compartment tank via said second outlet connector of the casing.

10 11. The shower apparatus as claimed in claim 10, wherein said shower head comprises of an elongate hollow body, a head detachably connected at the upper end of said body and an inner chamber having filtering media which is mounted within said body of the shower head.

15 12. The shower apparatus as claimed in claim 11, wherein said inner chamber is replaceable and can be taken out from said elongate hollow body of the shower head.

13. The shower apparatus as claimed in claim 11, wherein said filtering media used in said inner chamber is neutralizer.

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14. The shower apparatus as claimed in claim 13, wherein said neutralizer is Vitamin C.

15. The shower apparatus as claimed in claim 11, wherein said hollow body includes a head connector at its lower end to be connected to an inlet formed at the bottom end of said inner
25 chamber.

16. The shower apparatus as claimed in claim 1, wherein said filtered water from said second compartment tank is discharged from said outlet opening to an inlet of a water heater.

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17. The shower apparatus as claimed in claim 1, wherein said inlet opening of said first compartment tank is connected to a water supply or a faucet via said first inlet connector of the casing.

10 18. The shower apparatus as claimed in claim 1, wherein said inlet opening of said first compartment tank is connected to an outlet of said water heater via said first inlet connector of the casing.

15 19. The shower apparatus as claimed in claim 1, wherein said filtering media of the second filter can be the water softener.