

WATER TREATMENT SYSTEM**BACKGROUND OF THE INVENTION**

The present invention relates generally to water treatment systems for removing contaminants from a water supply prior to delivery to an end user. More particularly, in one form the present invention relates to a water treatment system utilizing a venturi to draw air into a treatment tank independently of the passage of treated water to the end user.

It is well recognized that most well water contains many contaminants. Common naturally occurring contaminants in well water include iron, sulfur, and manganese. These mineral contaminants may cause stained plumbing fixtures and corroded pipes and in addition, may result in the presence of disagreeable odors and an unpleasant taste in the water.

Many different water treatment systems have been developed over the years in attempts to remove contaminants from water supplies. These water treatment systems have been utilized for municipal water systems and individual well systems. It is generally recognized that the three prominent water treatment system types for removal of contaminants from water include chlorination, ion exchange, and oxidation/filtration. In water treatment systems, it is known that many of the contaminants must first be oxidized to permit subsequent removal by filtration.

While many of the prior water treatment systems have been a step in the right direction, there remains a need for further technological development. The present invention provides a novel and non-obvious water treatment system applicable to all types of water supplies.

SUMMARY OF THE INVENTION

One form of the present invention contemplates a water treatment system, comprising: a tank having a top and a bottom; a control valve located at the top and in fluid communication with the tank, the control valve including a source water inlet adapted to be coupled to a source of water, a drain outlet, a treated water outlet and an air inlet, the air inlet is in fluid flow communication with a venturi disposed within the control valve, the control valve operable to control the passage of fluids between the inlets and outlets and the tank, the control valve controlling the flow of source water through the venturi to draw air through the air inlet and into the tank; and a one way valve in fluid communication with the air inlet, the one way valve allowing the introduction of air to the air inlet.

Another form of the present invention contemplates a water treatment system, comprising: a mechanical housing having an interior volume for holding fluids, the mechanical housing having a top and a bottom; and a valving mechanism coupled at the top of the mechanical housing and disposed in flow communication with the interior volume, the valving mechanism including a source water inlet adapted to be coupled to a source of water, a drain outlet, a treated water outlet for the passage of treated water therefrom and an air inlet, the air inlet is in flow communication with a venturi within the valving mechanism, the valving mechanism being operable to control the flow of source water through the venturi to draw air through the air inlet and into the tank independently of the passage of treated water from the treated water outlet.

Yet another form of the present invention contemplates a method of operating a water treatment system to treat a source water, comprising: treating a source water within a tank including air, the treating includes moving the source

water through a media in a first flow direction within the tank; backwashing the source water through the media in a second direction within the tank, wherein the backwashing expels at least a portion of the source water and the air through a drain; and drawing air into the tank by flowing source water by a venturi within a control valve coupled to the tank, the source water flows into the tank with the air in the first flow direction after passing through the venturi, wherein the air displaces the source water within the tank as the water in the tank empties.

Yet another form of the present invention contemplates a method of operating a water treatment system to treat a source water, comprising: treating a source water within a first tank including air, the treating includes moving the source water through a filtering media in a first flow direction within the first tank; filling a second tank with source water; backwashing the source water in the first tank through the filtering media in a second direction within the first tank, wherein the backwashing expels at least a portion of the source water and the air through a drain; drawing a fluid from the second tank into the first tank by flowing source water by a venturi within a control valve coupled to the first tank, the fluid flows into the first tank in the first flow direction after passing through the venturi; pulling air from the second tank into the first tank by flowing source water by a venturi within a control valve coupled to the first tank after the drawing, the source water flows into the first tank in the first flow direction after passing through the venturi, wherein the air displaces the source water within the tank as the tank is emptied of water.

One object of the present invention is to provide a unique water treatment system.

Related objects and advantages of the present invention will be apparent from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic representation of a single stage air induction water treatment system comprising one form of the present invention.

FIG. 2a is a schematic representation of one embodiment of the filtering cycle comprising a portion of the water treatment system of FIG. 1.

FIG. 2b is a schematic representation of one embodiment of the backwashing cycle comprising a portion of the water treatment system of FIG. 1.

FIG. 2c is a schematic representation of one embodiment of the air induction cycle comprising a portion of the water treatment system of FIG. 1.

FIG. 3 is a schematic representation of a dual stage air induction iron water treatment system comprising one form of the present invention.

FIG. 3a is a schematic representation of one embodiment of the filtering cycle within the air tank comprising a portion of the water treatment system of FIG. 3.

FIG. 3b is a schematic representation of one embodiment of the backwashing cycle within the air tank comprising a portion of the water treatment system of FIG. 3.

FIG. 3c is a schematic representation of one embodiment of the air induction cycle comprising a portion of the water treatment system of FIG. 3.

FIG. 4 is a schematic representation of a single stage air induction sulfur water treatment system comprising one form of the present invention.

FIG. 5a is a schematic representation of one embodiment of the filtering cycle comprising a portion of the water treatment system of FIG. 4.