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(54) Title: HUMIDIFIER WITH ULTRAVIOLET DISINFECTION

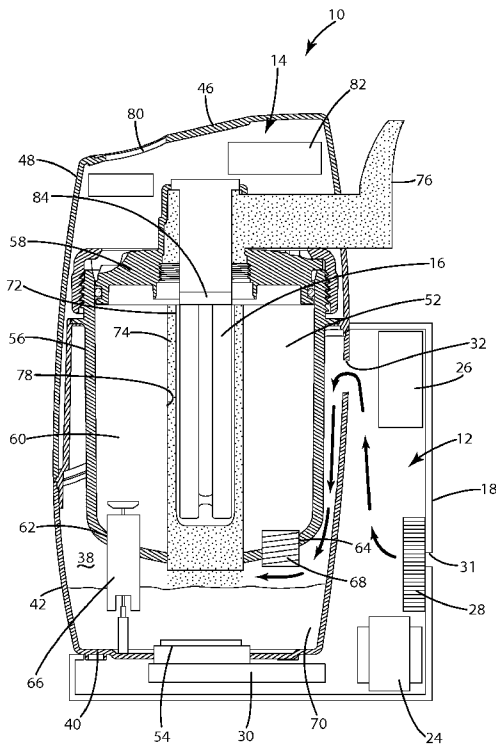


Fig. 2

(57) Abstract: A humidifier for treating humidified air with germicidal light is provided. The humidifier includes a water reservoir, an atomizer to atomize a supply of water, and an ultraviolet light source to expose the atomized water to germicidal light. The ultraviolet light source extends vertically within a cylindrical channel to irradiate the atomized water dissipating upwardly from the atomizer. The water reservoir can include a carbon filter and a hardness-removing module for removing contaminants and metal oxides from the water supply. A control panel indicates the remaining useful life of the ultraviolet light source, the carbon filter and the hardness-removing module based on historical humidifier usage and water quality levels.

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**AMENDED CLAIMS****received by the International Bureau on 12 September 2012 (12.09.2012)**

1. A humidifier system comprising:  
a humidifier housing defining an air inlet, and air outlet, and a fluid flow path therebetween, the fluid flow path being adapted to direct air through the humidifier housing;  
an atomizing chamber at a first portion of the fluid flow path, the atomizing chamber being adapted to increase the moisture content of a volume of air circulating through the fluid flow path; and  
an ultraviolet light source at a second portion of the fluid flow path, the ultraviolet light source being adapted to expose the volume of humidified air from the atomizing chamber with germicidal light prior to its release from the humidifier housing at the air outlet.
2. The humidifier system of claim 1 wherein the atomizing chamber includes one of an ultrasonic nebulizer, a wick filter, and a steam vaporizer.
3. The humidifier system of claim 1 wherein the fluid flow path includes a sidewall spaced apart from the ultraviolet light source.
4. The humidifier system of claim 3 wherein the sidewall is substantially cylindrical.
5. The humidifier system of claim 1 further including a water reservoir in fluid communication with the atomizing chamber.
6. The humidifier system of claim 5 wherein the water reservoir includes at least one of a carbon cartridge filter and a hardness removing module.
7. The humidifier system of claim 1 further including a base station having a blower to draw ambient air into the humidifier housing.
8. A method for humidifying air, comprising:  
providing a fluid flow path in communication with the ambient environment, the fluid flow path including an inlet, an atomizing chamber, an ultraviolet light source, and an outlet;

increasing the moisture content of ambient air circulating through the atomizing chamber in the fluid flow path;

exposing the resulting humidified air escaping from the atomizing chamber with ultraviolet light from the ultraviolet light source to inactivate microorganisms in the humidified air, the ultraviolet light source being in the fluid flow path downstream of the atomizing chamber; and

discharging the humidified air from the fluid flow path outlet and into the ambient environment.

9. The method according to claim 8 wherein increasing the moisture content includes introducing atomized water into the fluid flow path.

10. The method according to claim 8 further including filtering ambient air circulating through the fluid flow path.

11. The method according to claim 8 wherein the fluid flow path is partially defined by a cylindrical sidewall spaced apart from an ultraviolet light source.

12. The method according to claim 8 wherein the water vapor originates from a water supply within a water reservoir.

13. The method according to claim 12 wherein the water reservoir includes at least one of a carbon cartridge filter and a hardness removing module.

14. A humidifier system comprising:

a humidifier housing defining an air inlet, and air outlet, and a fluid flow path therebetween, the fluid flow path being adapted to direct air through the humidifier housing;

a water reservoir within the humidifier housing and including a water reservoir outlet;

an atomizing chamber in fluid communication with the water reservoir outlet, the atomizing chamber being adapted to atomize water from the water reservoir to humidify ambient air circulating through the fluid flow path; and

an ultraviolet light source adapted to treat the humidified air escaping from the atomizing chamber with germicidal radiation prior to its dispersal into the ambient environment, wherein the atomizing chamber is at a first portion of the fluid flow path and wherein the ultraviolet light source is at a second portion of the fluid flow path.

15. The humidifier system of claim 14 further wherein the ultraviolet light source is housed within a channel including a sidewall spaced apart from the ultraviolet light source for defining a fluid flow path therebetween.

16. The humidifier system of claim 15 wherein the channel is cylindrical and includes an inner surface substantially reflective of ultraviolet light.

17. The humidifier system of claim 15 wherein the ultraviolet light source is oriented substantially vertically within the channel.

18. The humidifier system of claim 14 wherein the atomizing chamber includes one of an ultrasonic nebulizer, a wick filter, and a steam vaporizer.

19. The humidifier system of claim 14 wherein the water reservoir includes at least one of a carbon cartridge filter and a hardness removing module.

20. The humidifier system of claim 14 wherein the water reservoir defines a toroidal core, the ultraviolet light source extending vertically through the toroidal core.

21. The humidifier system of claim 5 wherein the fluid reservoir defines a toroidal core, the fluid flow path extending upwardly through the toroidal core and including the ultraviolet light source at least partially therein.

22. The method according to claim 12 wherein the water reservoir defines a toroidal core, the fluid flow path extending vertically through the toroidal core.