"METHOD AND APPARATUS FOR PROGRAMABLY TREATING WATER IN A WATER COOLER"

CROSS-REFERENCE TO RELATED APPLICATIONS

Priority of US Provisional patent application number 60/564,178, filing date 21 April 2004, is hereby claimed.

US Provisional patent application number 60/564,178, filing date 21 April 2004, is incorporated herein by reference.

Patent Cooperation Treaty Application PCT/US02/19158, international filing date 17 June 2002, is incorporated herein by reference.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable

REFERENCE TO A "MICROFICHE APPENDIX"

Not applicable

BACKGROUND

The present invention relates to a method and apparatus for programably treating water (preferably refrigerated) in a water cooler and more particularly to an improved method and apparatus for sanitizing water that is to be dispensed from a water cooler of the type having a cabinet with one or more spigots from a reservoir water supply that is hidden inside the cabinet.

There are several types of cabinet type water dispensers in use today. One of the most common types of such water dispensers is a floor standing cabinet having an open top that receives a large inverted bottle. The bottle is typically of a plastic or glass material having a constricted neck. The bottle is turned upside down and placed on the top of the cabinet with the neck of the bottle extending into a water filled reservoir so

that the water seeks its own level in the reservoir during use. As a user draws water from a spigot dispenser, the liquid level in the reservoir drops until it falls below the neck of the bottle at which time water flows from the bottle and bubbles enter the bottle until pressure has equalized. Inverted bottle type water dispensers are sold by a number of companies in the United States and elsewhere. Many are refrigerated.

Other types of water dispensers have an outer cabinet that contains a reservoir or water supply. These other types of water dispensers having a cabinet include one type that stores a large bottle (such as three or five gallon) at the bottom of the cabinet. A pump transfers water from the large bottle to the reservoir. At the reservoir, the water is typically refrigerated.

Another type of water dispenser simply connects a water supply (e.g., city water, well water) directly to a reservoir that is hidden inside the cabinet. A float valve or other water level controller can be provided to insure that the reservoir is always filled with water but does not overflow. Water that is transferred from city water, well water or another source can be filtered or otherwise treated before being transmitted to the reservoir.

All of these types of water dispensers that employ cabinets typically have one or more water dispensing spigots on the outside of the cabinet. These spigots are typically manually operated, but can be automatically operated. For example, water vending machines dispense after a consumer pays for water. The water is automatically dispensed when coins are fed to the machine.

One of the problems with cabinet style water dispensers is that of cleansing the reservoir from time to time. Because the reservoir is not air tight, it breathes allowing bacteria to enter the reservoir over a period of time. The reservoirs are typically contained within the confines of the cabinet and are not easily accessed and cleaned by consumers or end users.

For inverted bottle type dispensers, in addition to the problem of an open top, the five gallon bottles are themselves a source of bacteria and germs. Most of these bottles are transported on trucks where the bottles are exposed to outside air. They are handled by operators that typically grab the bottle at the neck, the very part of the bottle that communicates with the open reservoir during use. Unfortunately, it is difficult to

convince every person that handles these bottles to wash their hands frequently enough. In order to properly sanitize such a water dispenser or cooler, the user must carefully clean the neck of the bottle prior to combining the bottle with the cabinet. Further, the user should drain and sanitize the reservoir from time to time. The cleansing of the reservoir in such a water dispenser is a time consuming project that is typically not performed at regular intervals.

The dispensing spigots that are provided on common cabinet type water dispensers can also be a source of contamination. These spigots are typically manually operated and are therefore a source of contamination from the users that operate them. Individuals have also been known to drink directly from the spigot. Therefore, sanitation of the spigots as well as the reservoir should be a part of routine maintenance.

Process ozone diffusion by bubble reactor method in small static volumes of water with abbreviated water columns to diffused ozone levels satisfactory to disinfect microorganisms in brief time periods can be difficult to achieve. An ozone generator can be used as the source of ozone. The ozone generator can include an air pump as a source of oxygen for generating ozone. The air pump preferably includes a microbial filter to filter contaminants. A diffuser can be used to diffuse the generated ozone into the water reservoir.

Various factors impact the effectiveness of bacterial removal from the water such as the microbial load, pH, temperature, conductivity, and cooler characteristics (e.g., whether an ice ring has formed which can act as a shield for microbes trapped in the ice ring). Furthermore, the variability of power supply (e.g., European power supplies versus US power supplies) can cause a generator's application to be geographically limited unless modified. Additionally, time constraints for operation of the ozone generator and diffuser can impact operation.

Additionally, in certain refrigerated reservoirs an ice ring can form inside the reservoir adjacent to the cooling coils for the reservoir. Such an ice ring can serve as a form of protection for microbes contained in the ice ring when ozone is being diffused in the reservoir. After an ozone cycle, when the ice melts wholly or partially, the trapped microbes can enter the water and thus contaminate the reservoir.

Additionally, certain waters contain loadings of bromates which can cause

problems.

The above indicate a need for developing a generator and diffuser containing flexibility regarding the timing, amount, and duration of ozone generated; along with the timing, amount, and duration of air supplied. Additionally, there is a need for killing microbes which may be trapped in ice rings. Furthermore, there is a need for addressing water containing bromates. Additionally, there is a need for addressing different types of electrical supplies for various geographical areas.

In a preferred embodiment the method and apparatus is directed to an economical means of overcoming each of the factors that limit process ozone's potential disinfecting capacity. It is concerned with the optimization of each point in small automated ozonation systems both upstream and downstream from the ozonator. The object of this effort is to devise a single, economical, high longevity system capable of sanitizing many of the shapes and sizes of water dispensers in use today.

The present invention thus provides an improved self sanitizing water dispenser apparatus as well as a method for generating ozone for cleaning the reservoir and the water contained within it.

While certain novel features of this invention shown and described below are pointed out in the annexed claims, the invention is not intended to be limited to the details specified, since a person of ordinary skill in the relevant art will understand that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation may be made without departing in any way from the spirit of the present invention. No feature of the invention is critical or essential unless it is expressly stated as being "critical" or "essential."

BRIEF SUMMARY

The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms.

In a preferred embodiment the generator is programmable regarding the timing, amount, and/or duration of ozone generated and/or air supplied. In a preferred embodiment the generator is programmable regarding microbes which may be trapped in ice rings and/or water containing bromates. Furthermore in a preferred embodiment

the generator can automatically adjust for different types of electrical supplies for various geographical areas.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

For a further understanding of the nature, objects, and advantages of the present invention, reference should be had to the following detailed description, read in conjunction with the following drawings, wherein like reference numerals denote like elements and wherein:

Figure 1 is diagram of a water cooler incorporating one embodiment of a programmable controller;

Figure 2 is diagram of a programmable controller;

Figure 3 is a perspective view of a programmable controller;

Figure 4 is an end view of the controller of Figure 3;

Figure 5 is a top view of the controller of Figure 3 with a remote display;

Figure 6 is a perspective view of the controller of Figure 3 with the casing opened;

Figure 7 is a perspective view of a pump for an ozone generator;

Figure 8 is a perspective view of the pump in Figure 7 with the input filter removed;

Figure 9 is another perspective view of the controller of Figure 3 with the casing opened;

Figure 10 is a close up view of an ozone generation component in the controller of Figure 3;

Figure 11 is a circuit diagram for one embodiment of programmable controller;

Figure 12 is a diagram of a circuit board for the programmable controller of Figure 11;

Figure 13 is a diagram of the rear of the circuit board in Figure 11;

Figure 14 is a circuit diagram for an alternative embodiment of programmable controller;

Figure 15 is a diagram of a circuit board for the programmable controller of Figure 14;

Figure 16 is a diagram of the rear of the circuit board in Figure 15;

DETAILED DESCRIPTION

Detailed descriptions of one or more preferred embodiments are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in any appropriate system, structure or manner.

Figure 1 is diagram of a water cooler 10 incorporating one embodiment of a programmable controller 200. Water dispenser 10 provides an improved apparatus that sanitizes the open reservoir from time to time with ozone. The apparatus 10 includes a cabinet 20 having a lower end portion 30 and an upper end portion 40. The upper end portion 40 carries a cover 50 having an opening 60.

Opening 60 provides an annular flange 70 and a gasket 80 that define an interface between cabinet 20 and bottle 100. Bottle 100 can be any commercially available bottle, typically of a several gallon volume (e.g. five gallons). Bottle 100 can provide a constricted bottled neck 110 that is placed inside an open reservoir 15 during use. Bottle neck 110 has an opening for communicating with a reservoir 15 at the interior of cabinet 20 that holds the water product to be dispensed and consumed. When the water level 19 in reservoir 15 is lowered during use, air bubbles enter bottle 100 and water replenishes reservoir 15 until pressure equalizes.

Reservoir 15 has an interior 16 surrounded by reservoir sidewall 17 and reservoir bottom wall 18. Reservoir 15 can be, for example, generally cylindrically shaped and of a stainless steel or plastic material. Reservoir 15 can provide an open top for communicating with neck 110 of bottle 100.

During use, reservoir 15 has water level 19 that fluctuates slightly as water is dispensed and then replenished by bottle 100. One or more spigots 90,92 can be provided for withdrawing water contained in reservoir 15. For example, a left hand spigot 90 can have a flow line that extends up to and near water level 19, thus removing ambient temperature water from reservoir 15 that is not in close proximity to the

cooling coils 34 of cooling system which includes a compressor 32. Spigot 92 can provides a port for communicating with water contained in reservoir 15. Because the refrigeration coils 34 are positioned at the lower end of reservoir 15, spigot 92 withdraws cool water. As a practical matter, a water dispenser apparatus 10 could provide either ambient temperature water, cold water or heated water if, for example, a flow line 96 were to be provided with a heating element.

For cooling the water at the lower end portion of the reservoir 15, a cooling system that includes a compressor 32 can be provided. The refrigeration system includes flow lines 35, 36 in combination with compressor 32 to transmit cooling fluid to coils 34 and then to heat exchanger 37 as part of a system for cooling water in reservoir 15. Power can be provided by electrical lines, including an electrical line 22 provided with plug 24.

Water in reservoir 15 can be disinfected by ozone supplied by controller 200 operably connected to ozone generator 600.

Figure 2 is diagram of a programmable ozone generator controller 200. Figure 3 is a perspective view of programmable controller 200. Figure 4 is an end view of controller 200. Figure 5 is a top view of controller 200 with a remote display 250. Figure 6 is a perspective view of controller 200 with casing 210 opened. Figure 7 is a perspective view of a pump 400 for ozone generator 600. Figure 8 is a perspective view of pump 400 with input filter 420 removed. Figure 9 is another perspective view of controller 200 with casing 210 opened. Figure 10 is a close up view of ozone generation component 600 which can be located in controller 200.

Generally, programmable controller 200 can comprise casing 210, display 240, programmable input 220, ozone generator 600, pump 600, and power input 280. Controller 200 can incorporated a digital computer. In one embodiment ozone generated from generator 600 can controlled by controller 200 can be injected into reservoir 15 through a diffuser 530. Alternatively, programmable controller can include clock 280. To assist in programming ozonation, air, and compressor cycles, controller display 240 can include ozone indicator 242, gas or air flow indicator 244, and power or compressor indicator 246.

In one embodiment, a low permeability filter 510 is placed between ozone

generator 600 and diffuser 530. Filter 510 is preferably of a permeability which will allow gas to flow through but resist flow of liquid (e.g., liquid water) up to a head of 10 feet of water. Alternatively, between 3 to 10 feet of water. Filter 510 can prevent liquid from forming inside of ozone generator 600 and causing a failure of generator 600. Check valves were preferred in prior embodiments, however, check valves had a tendency to stick or remain in an open position allowing liquid to pass through and accumulate in ozone generator 600. Filter 510 is preferably made from an expanded PTFE manufactured by W.L. Gore material having an average pore size of one micron. More preferably, the permeability includes a range of average pore sizes between about 0.2 microns to about 3 microns. Most preferably, the permeability includes a range of average pore sizes between about .5 microns to about 1.5 microns. Other materials can work where they have permeabilities preventing the formation of liquid in ozone generator 600. That is the materials generally restrict liquid flow, but allow gaseous flow. Moisture in gas (e.g., humidity) flowing through ozone generator 600 will not cause failure of ozone generator 600.

In a preferred embodiment programmable controller 200 can control the timing and/or duration and/or amount of ozone generated. In a preferred embodiment the amount of ozone generated can be set at levels of 25%, 50%, 75%, and 100%. It is anticipated that for higher microbial loads higher percentages of ozone generation will be set. Additionally, it is anticipated that the level of ozone generated during any one time period can also be changes - - for example, from higher to lower or from lower to higher or sinusoidal. In one embodiment the time ozone is generated can be programmed to occur only on certain days of the week or at certain time periods (e.g., on Wednesday and Fridays at 1300 hours) during any calendar period.

In a preferred embodiment programmable controller 200 can control the timing and/or duration and/or amount of gas (e.g., ambient air) pumped through controller 200 (e.g., for ozone generator 600 or merely for air flow to diffuser 530). For example air can be pumped through diffuser 530 before any ozone is generated. Such activity can help to remove potentially deleterious items in the water, such as bromates. Additionally, compressor 32 on the water dispenser 10 can be cut off by the controller 200 while air is being pumped. Such an event would assist in melting an ice ring in

reservoir 15 (e.g., being roughly analogous to a defrost cycle in a freezer). After the ice ring was melted, controller 200 could then send ozone though diffuser 530 killing a substantial portion of the microbes in the water. Following ozone being sent through diffuser 530 programmable controller 200 could then send air through diffuser 530 removing ozone which was previously diffused through diffuser 530. Each of these events could be controlled by the programmable controller 200 and individually programmed by a user.

In a preferred embodiment programmable controller 200 can also control power to compressor 32. Some water coolers 10 make ice inside their reservoirs 15 to make sure that customers get a very cold drink of water. Before ozonation takes place, controller 200 can shut off compressor 32 to insure that all of the ice melts either before or during the ozonation cycle. Even though frozen water can be unfriendly to bacteriological growth, this option addresses the risk that an ice ring would shield certain microbes from the ozonation process. For example, compressor 32 can be shut off one or two hours before the ozonation process begins. Alternatively, compressor 32 can be shut off only during the ozonation process. Alternatively, compressor 32 is not shut off.

In an alternative embodiment programmable controller 200 can automatically adjust for different types of electrical supplies (e.g., input voltages) for various geographical areas. For example, different voltages are used in the United States and Europe. Controller 200 can include a voltage control circuit 620 which senses the supply voltage and adjusts same to power controller 200 and the items operably connected to controller 200, such as ozone generator 600, pump 400, and compressor 32.

In an alternative embodiment programmable controller 200 can be programmable on a calender. For example, programmable controller 200 can be programmed on a 999 hour repeatable calender. That is, a user can program ozonation, air pumping, and/or compressor operation individually and separately for specific start and ending periods during the 999 hour repeat cycle. Alternatively, programmable controller 200 can use a 24 hour repeat cycle and a user can program ozonation, air pumping, and/or compressor operation individually and separately for specific start and

ending periods during the 24 hour cycle. Alternatively, programming ozone generation can automatically require that air be pumped during the time of ozonation regardless of whether air pumping was individually programmed to overlap with the ozonation cycle. Alternatively, more than one cycle can be programmed for ozonation, air, refrigeration in any one programming period.

In an alternative embodiment pump 400 can be separated from programmable controller 200. Pump 400 can be fluidly connected to inlet 330 of controller 200 through tube 440. Air pumped from outlet 430 will tend to be at an elevated temperature from ambient air because of the pumping action of pump 400. Ozone generator 600 will tend to generate less ozone when the incoming air is at higher temperatures. Preferably, tube 440 is long enough to allow the air to cool down before entering ozone generator 600. It has been found that seventeen or eighteen inches (43 or 46 centimeters) for tube 440 allows the air to cool sufficiently before entering ozone generator 600. Preferably, pump 400 can pump about 2 liters per minute of air.

In one embodiment, programmable controller 200 can issue a warning signal where pump 400 has not been programmed to operate at least during the entire time that ozone generator 600 has been programmed to operate. This can increase the life of ozone generator 600, as ozone generator 600 may overheat where it is operated without air flow.

Figure 4 is an end view of controller 200. Casing 200 can include power output 290 and power input 280. Standard receptacles for output 290 and input 280 are shown. To accommodate individual receptacle types (e.g., United States versus European) different lines can be used having the appropriate plugs or receptacles. Also shown is fuse 300 which can be a standard fuse and is designed to address excessively high current or high voltage situations. Power for pump receptacle 310 is shown as being specially formatted to restrict the ability to use a pump 400 that is not properly configured with controller 200. Output 260 is shown for remote display 250.

Figure 5 is a top view of ozone generator controller 200 with a remote display 250. Remote display 250 can include an ozone indicator 252, power indicator 254, and error indicator 256. Remote display 250 preferably can be placed at a position where a user of water dispenser 10 can readily view the display 250. In many situations this

will be spaced apart from controller 200. For example, remote display can be positioned on the front or side of water dispenser 10 where controller 200 is positioned at the rear or inside of water dispenser 10. Ozone indicator 252 will preferably light up when ozone is being generated by ozone generator 600. This can serve as a warning signal for a user to not dispense water while ozone indicator is lighted. Alternatively, ozone indicator 252 can light up not only when ozone is being generated, but for a set period of time after ozone has been generated, such as 5, 10, 15, 20, 25, or 30 minutes, or longer, which will allow time for ozone to be removed from water dispenser 10. Ozone indicator 252 can be a red light to indicate a warning or to stop. Power indicator 254 can be lighted when power is being received by controller 200. Power indicator 254 can be green to indicate a good power situation. Error indicator 256 can be lighted when a failure or error situation has occurred with controller 200. Error indicator 256 can be a yellow light to indicate caution. For example, where there has been a power interruption or where the ozone generator did not come on during a cycle, error indicator 256 can be lighted.

Alternatively, ozone indicator 252 can remain lighted where a successful ozonation cycle has occurred within a set period of time, such as within the last 24 hour period. In this case ozone indicator 252 can be a green light.

In an alternative embodiment a test button can be provided to test the ozonation cycle. Where test button is activated, the ozonation cycle will be run for a set period of time, for example, thirty seconds. Alternatively, during the test ozone indicator 252 can be lighted where the ozonation cycle is being operated.

In an alternative embodiment a remote programming input unit 230 for programmable controller 200 can be provided. A remote programming input 230 could allow controller 200 to be located in the rear of water dispenser 10 while programming input 230 located on the front or one of the sides of dispenser 10.

Figure 6 is a perspective view of controller 200 with casing 210 opened. Figure 9 is another perspective view of ozone generator controller 200 with casing 210 opened. Figure 10 is a close up view of ozone generation component 600 in ozone generator controller 200. Controller 200 can include a digital computer which includes control circuit 640 for ozone generation, control circuit 650 for air generation, and control

circuit 650 for compressor 32 power. Controller 200 can also include control circuit 620 for voltage converter. The individual circuits are shown in the diagrams attached to this disclosure.

Figure 7 is a perspective view of a pump 400 for ozone generator controller 200. Figure 8 is a perspective view of pump 400 with input filter 420 removed. Pump 400 can include input 410, filter 420, filter cap 422, and output 430. Pump 400 can be spaced apart from or included in casing 210 for controller 200.

Figure 11 is a circuit diagram 202 for one embodiment of programmable controller 200. Figure 12 is a diagram of a circuit board 204 and various components for programmable controller 200. Figure 13 is a diagram of the rear of the circuit board 204.

Figure 14 is a circuit diagram 202' for an alternative embodiment of programmable controller 200'. Figure 15 is a diagram of a circuit board 204' and various components for programmable controller 200'. Figure 16 is a diagram of the rear of circuit board 204'.

Table 1 lists possible items which can be used in programmable controller 200. SIP 1000 is an operation and programming manual for programmable controller 200. Each of these items is part of the disclosure of this application and all are incorporated herein by reference.

Table 2 lists possible items which can be used in an alternative programmable controller 200. SIP 2000 is an operation and programming manual for alternative programmable controller 200. Each of these items is part of the disclosure of this application and all are incorporated herein by reference.

It is preferred that components approved by United Laboratories (UL approved) be used for as many components as possible.

The following is a list of reference numerals:

LIST FOR REFERENCE NUMERALS

(Part No.)	(Description)
10	water dispenser

15	reservoir
16	interior
17	reservoir sidewall
18	reservoir bottom wall
19	water level
20	cabinet
22	electrical line
24	plug
30	lower end portion
32	compressor
34	cooling coils
35	flow line
36	flow line
40	upper end portion
50	cover
60	opening
70	annular flange
80	gasket
90	spigot
92	spigot
96	flow line
100	bottle
102	water level in bottle
110	bottle neck
200	controller
202	circuit diagram
204	circuit board
210	casing
212	mounting bracket
220	programmable input

230	remote programmable input
240	display
242	ozone indicator
244	gas flow indicator
246	compressor indicator
248	clock
250	remote display
252	ozone indicator
254	power indicator
256	error indicator
260	output for remote display
270	support connectors
280	power input
282	plug
290	power output
300	electrical fuse
310	power for pump
330	gas input
340	gas output
400	pump
410	input for pump
420	filter
422	cap
430	output for pump
440	tubing
500	first output tubing
510	low permeability filter
520	second output tubing
530	diffuser

600	ozone generator
610	heat sink for ozone generator
620	control circuit for universal voltage converter
630	backup battery
640	control circuit for ozone generation
650	control circuit for air generation
660	control circuit for compressor power

All measurements disclosed herein are at standard temperature and pressure, at sea level on Earth, unless indicated otherwise. All materials used or intended to be used in a human being are biocompatible, unless indicated otherwise.

It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above. Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention set forth in the appended claims. The foregoing embodiments are presented by way of example only; the scope of the present invention is to be limited only by the following claims.

CLAIMS

1. A water dispenser, comprising:

a) a cabinet having upper and lower end portions and an interior;

b) reservoir contained within the cabinet, the reservoir being capable of holding water;

d) at least one spigot in fluid communication with the reservoir for dispensing water;

e) a refrigeration system for cooling water within the reservoir;

f) a diffuser contained within the reservoir for emitting bubbles into the reservoir;

g) an ozone generator being operably connected to the diffuser;

h) a digital computer operably connected to the ozone generator; and

i) the computer being programmable regarding the timing and duration of ozone generated by the ozone generator and sent to the diffuser.

2. The water dispenser of claim 1, wherein the dispenser includes a pump, the pump being operably connected to the diffuser and the computer being programmable regarding the timing and duration of air to be sent to the diffuser from the pump.

3. The water dispenser of claim 2, wherein the pump is spaced apart from the ozone generator.

4. The water dispenser of claim 3, wherein the pump is spaced sufficiently to allow air pumped by the pump to cool down closed to ambient temperature before reaching the ozone generator.

5. The water dispenser of claim 1, wherein the digital computer is programmable regarding the amount of ozone generated, the amounts being chosen from 25 percent, 50 percent, 75 percent, and 100 percent ozone generation.

6. The water dispenser of claim 2, wherein the digital computer is programmed to have air pumped through the diffuser for a set period of time before ozone is generated.

7. The water dispenser of claim 2, wherein the digital computer is programmed to have air pumped through the diffuser for a set period of time before

ozone is sent through the diffuser and a set period of time after ozone is generated.

8. The water dispenser of claim 2, wherein the digital computer is programmed to have air pumped through the diffuser for a set period of time after ozone is generated.

9. The water dispenser of claim 1, wherein the digital computer is operably connected to the refrigeration system and programmable regarding the timing and duration of operation of the refrigeration system.

10. The water dispenser of claim 9, wherein the digital computer is programmed to shut off the refrigeration system a set period of time before ozone is generated.

11. The water dispenser of claim 10, wherein the refrigeration is shut off one hour before ozone is generated.

12. The water dispenser of claim 1, wherein the dispenser includes a voltage supply regulator circuit, the voltage supply regulator circuit automatically adjusting input voltage to the digital computer based on different electrical supply voltages .

13. The water dispenser of claim 17, wherein the voltage supply regulator, ozone generator, and digital computer are encased in a single case.

14. The water dispenser of claim 1, wherein the digital computer automatically adjusts for different electrical supply voltages.

15. The water dispenser of claim 1, wherein the computer can be programmed regarding the day of the week.

16. The water dispenser of claim 1, wherein the computer can be programmed for a 24 hour period.

17. The water dispenser of claim 1, further comprising a remote display operable connected to the digital computer but spaced apart from the digital computer, the remote display having at least one indicator regarding operation of the digital computer.

18. The water dispenser of claim 17, wherein the indicator is for ozone operation.

19. The water dispenser of claim 17, wherein the remote display includes three indicators, one for ozone, a second for power, and a third for a warning signal.

20. The water dispenser of claim 19, wherein the ozone indicator is red, power indicator is green, and warning signal is yellow.

21. A method of sanitizing a water dispenser having a cabinet with water supply that includes a reservoir which is cooled by a refrigeration unit including a compressor and has formed an ice ring, and an operable spigot on the cabinet enables water to be dispensed from the cabinet and its water supply comprising the steps of:

a) a programmable ozone generator turning off power to the compressor;

b) the programmable ozone generator injecting air into the reservoir to at least partially melt the ice ring;

c) the programmable ozone generator generating and injecting ozone into the reservoir; and

d) wherein in step "c" the ozone enters the reservoir via at least one diffuser element.

22. The method of claim 21, further comprising the step of having the programmable ozone generator injecting air into the reservoir after step "c."

23. The method of claim 21, wherein in step "a" the programmable ozone generator includes a digital computer.

24. The invention substantially as shown and described herein.