WATER COOLER AND DISPENSER HAVING A REPLACEABLE RESERVOIR

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ABSTRACT OF THE DISCLOSURE

An electrically refrigerated water cooler having a cabinet to receive a replaceable water-supply receptacle in the lower portion thereof, with an electrically operated pump energizable to circulate water from the supply receptacle, through a cooling reservoir, and thence outwardly from a valveless discharge nozzle, energization of the pump being controlled by a switch having a manually operable switch actuator arm pivotally secured to the discharge nozzle of the cooler.

This invention relates to a water cooler and dispenser having a replaceable reservoir. It has to do, more specifically, with a water cooler which includes means for controlling and dispensing water from a replaceable storage reservoir or receptacle which is located in a novel and desirable manner.

At the present time, it is customary to supply water to refrigerated coolers by means of relatively large and unwieldy containers usually in the form of large glass bottles. It has been proposed, in recent years, to replace the glass bottles with disposable type containers such as plastic bags enclosed in paper boxes. However, even this type of container package filled with water is heavy and difficult to handle. Most coolers and dispensers support these containers at elevated positions so that the dispensing of the water therefore results from a controlled gravity flow. It is difficult to lift these filled containers to the necessary high level in mounting them on the dispenser and cooler. Also, because the containers must be positioned at the high level for gravity feed, the overall height of the cooler and dispenser with the water reservoir or container therein is considerable.

It is the main object of this invention to provide a water cooler and dispenser of the general type indicated which is so designed and constructed that the water can be cooled and dispensed from a reservoir or container which is located at the lowest position possible so as to facilitate positioning and replacement of the container and to reduce the overall height of the cooler and dispenser with the water container mounted thereon.

Various other objects will be apparent.

The preferred embodiment of this invention is illustrated in the accompanying drawing but it is to be understood that specific details thereof may be varied.

In this drawing:
FIGURE 1 is a vertical sectional view through a water cooler and dispenser designed and constructed in accordance with the present invention.
FIGURE 2 is a fragmentary top plan view taken at the position indicated by line 2—2 of FIGURE 1.
FIGURE 3 is an enlarged, fragmentary front elevational view taken at the position indicated by line 3—3 of FIGURE 1.
FIGURE 4 is a schematic diagram illustrating an electric control circuit which may be used in the cooler and dispenser.

According to this invention, the water cooler and dispenser is designed as a very compact unit which includes an outer casing or cabinet indicated generally in the drawing by the numeral 10. This cabinet may be suitably formed of framework and panels, preferably metal, to provide the upstanding vertical cabinet which is of substantially square horizontal cross-section. The extreme lower end of this cabinet is provided with a compartment 11 for receiving the water reservoir 12. Access to the compartment 11 is provided by means of a closure panel 13 which may be a removable or hinged panel but is indicated as a removable panel. This panel covers an opening in the side of the cabinet which extends substantially throughout that side of the compartment so that the reservoir 12 can be slided into and out of the compartment while it is substantially upright. It is merely necessary to slide the bottom of the reservoir 12 onto and off the bottom wall 14 of the compartment which preferably also forms the base of the cabinet 10. The base or bottom wall 14 may be supported by buttons 15 which rest on the floor but the base is maintained as close to the level of the floor as possible to facilitate loading of the heavy filled reservoir 12 into the compartment.

In the example shown, the reservoir is illustrated as the disposable type but it need not necessarily be of this type and could well be a glass bottle. However, the type of reservoir indicated is preferred and comprises a protective outer box 16 of paperboard or similar material which encloses a flexible inner bag 17 of plastic or similar material. In this example, the plastic bag is provided with an outlet tube 18, also of plastic, connected to its bottom end leading upwardly through the box and outwardly through the top of the box. By means of a suitable coupling 19 of the quick-disconnect type, the upper end of the flexible tube 18 may be connected to a metal water intake tube 20. If a glass bottle is used, a stopper will be provided at its upper end with a vent and a tube leading downwardly therethrough (not shown) to a point adjacent the bottom of the bottle.

The cooler is so designed that the static condenser coil 21 of a conventional, electrically actuated refrigeration circuit is disposed in upright position substantially parallel with the rear wall of the cabinet and closely adjacent that wall opposite the closure or access panel 13. It will thus be out-of-the-way and will not interfere with the positioning of the packaged water container 12 in the compartment 11. This condenser 21 is connected by a tube 22 which runs vertically close to its plane to a point adjacent the upper end of the cabinet where it leads horizontally forwardly to a connection 23 with the capillary tube 23a of a cooling tank assembly which includes the heat exchanger 24, around which the evaporator coil 23b of the refrigerating circuit is wound, the tank assembly being embedded in a body of insulation 25. The tank assembly is supported by a horizontal shelf 26 in the cabinet and is provided with a drain outlet 27. An electric motor-driven compressor 30 of the usual type is also supported on the shelf 26 and is connected in the usual manner by a discharge tube 31 to the condenser 21 and by a suction line 32 to the evaporator coil of the tank assembly. Operation of the compressor 30 is controlled in the usual manner by means of a thermostatic switch 28 mounted in any convenient location within the cabinet and electrically connected in series circuit with the compressor motor by suitable lead lines, not shown. The switch 28 is provided with a remotely extending bulb-type thermal sensing element 29 disposed in adjacent, thermal proximity to the tank 24. The switch 28 is thus responsive to the temperatures of the tank 24 and its contents, and functions to control the energization and deenergization of the compressor motor in a manner therefore to maintain the water in the tank 24 at a predetermined cool temperature.
According to the present invention, the water intake tube 20 leads upwardly to the top of the cabinet where it connects to the inlet of a pump 35 which is supported by the rear walls 34a of the cabinet directly below that wall. This pump may be of any suitable type, but preferably comprises a self-priming, reciprocating piston type pump actuated by a solenoid 35a. The outlet line 36 of the pump leads downwardly to a connection with the upper end of the tank 24. An outlet line 37 leads from the bottom of the tank 24 and upwardly to a dispensing-nozzle 38 located on the front wall of the cabinet at a level substantially above the heat exchanger tank 24. The nozzle 38 and the line 37 connected thereto are open continuously for the dispensing of water but the water will not be discharged from the nozzle until the pump 35 is in operation. The nozzle 38 is provided with a downstream discharge outlet 39 which is disposed at a convenient level above the tank 24. Associated with this outlet 39 and closely adjacent thereto is a pivoted switch-actuating arm 40. This arm 40 is connected to the nozzle 38 by means of a bifurcated yoke portion 40a which is pivoted at 40b for in and out swinging movement relative to the adjacent front wall of the cabinet. Inside this wall adjacent the nozzle is a pump control switch 41 which has a spring-pressed plunger 42 that extends outwardly through the wall and the outer end of which engages the depending arm 40. Swinging the arm 40 inwardly from its normal dependent position will push the plunger 42 inwardly and close the normally open control switch 41.

The pump control circuit is illustrated diagrammatically in FIG. 4 as comprising the solenoid 35a of the pump 35, a rectifier 43, connected in series therewith, and the normally open switch 41 also connected in series therewith. Directly below the discharge outlet 39 of the nozzle on the front wall of the cabinet is a drip receptor 45. This receptor may be provided with the usual drain outlet which is not shown.

In order to obtain cooled water from this unit, it is merely necessary to push inwardly on the actuating arm 40. This can be done either by pushing a cup in association with the nozzle outlet 39 and applying pressure on the arm with the cup or by applying pressure directly with the fingers. This will close the switch 41 which will energize the pump 35. The pump will quickly create pressure in the tank 24 through the line 37 and cause the liquid to flow upwardly through the line 37 and then outwardly through the nozzle 38. The nozzle will not be provided with a valve and will normally be open but water will not flow therefrom until the pump 35 is actuated. Thus, the need for a valve associated with the nozzle is eliminated.

The water reservoir 12 may be positioned in the lower end of the cabinet with ease, as previously indicated, even though it is quite heavy when filled with water. It is merely necessary to slide the reservoir in and out of the compartment 11 when the panel 13 is removed or moved to a noninterfering position. The coupling 19 may be readily reached through the opening provided by the removable panel to connect or disconnect the discharge tube 18 with the line 20. The various parts of the unit are so located as to not to interfere with the compartment 11. Since gravity feed is not necessary, the reservoir 12 can be located at the bottom of the cabinet where it can be handled easily. Also, since it is not necessary to have the reservoir on top of the cabinet, the overall height of the entire unit may be reduced and the unit will be of a more compact, pleasing appearance.

Various advantages of this unit have been discussed and others will be apparent. Having thus described this invention, what is claimed is:

1. A refrigerated water cooler comprising a generally vertically arranged cabinet having a front wall and divided internally into an upper, machinery-containing compartment and a lower receptacle compartment; electrically-actuated refrigeration means disposed in the upper compartment of said cabinet and including a heat exchanger; a water supply receptacle removably positioned in the lower compartment of said cabinet and provided with an outlet extending above said receptacle; conduit means having an inlet end detachably connected with the outlet of said receptacle, an intermediate portion connected with the heat exchanger of said refrigeration means and an outlet end extending through the front wall of said cabinet and terminating in a valveless discharge nozzle disposed at a level substantially above said heat exchanger; electrically-actuated pump means connected with said conduit means and operable upon energization to circulate water from said receptacle, through said heat exchanger and thence through the outlet end of said conduit means and said nozzle; a normally open switch electrically connected with said pump means and operable to control the energization thereof; and a manually operable switch actuator arm movably carried by said discharge nozzle externally of the front wall of said cabinet and engageable with said switch for closing the same.

2. A water cooler as defined in claim 1, wherein said cabinet is provided with an access opening communicating with the lower compartment of said cabinet and through which said receptacle may be moved.

3. A refrigerated water cooler comprising an upright, generally rectangular cabinet having a front wall and divided internally into an upper, machinery-containing compartment and a lower receptacle compartment; a valveless water discharge outlet mounted on the front wall of said cabinet adjacent the upper compartment thereof; electrically-actuated refrigeration means disposed mainly in the upper compartment of said cabinet and including a water-cooling reservoir disposed at a level below said discharge outlet; a water supply receptacle removably positioned in the lower compartment of said cabinet and provided with an outlet extending above said receptacle; first conduit means detachably connected with the outlet of said receptacle and communicating with the water cooling reservoir of said refrigeration means; an electrically actuated pump connected with said first conduit means and operable to circulate water from said receptacle to said reservoir; second conduit means connected between said reservoir and said water discharge outlet and arranged to conduct water from said reservoir to said discharge outlet upon energization of said pump; and normally open switch means mounted on the front wall of said cabinet in close proximity to said discharge outlet and electrically connected with said pump for controlling the energization thereof, said switch means including a manually operable actuator arm pivotally carried on said discharge outlet and movable to close said switch means.

4. A refrigerated water cooler as defined in claim 3, wherein the front wall of said cabinet is provided with an access opening leading to the lower compartment of said cabinet and through which said receptacle may be removed.

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