

[54] DEHUMIDIFIER

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[58] Field of Search 62/96, 406, 430, 435, 98,
62/99, 93, 317, 272

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[57]

ABSTRACT

An improved dehumidifier which is of very simple type for removing moisture out of a room's air; the device consisting of a tank filled with water that is mixed with a commercially prepared anti-freeze solution such as Prestone, a tubular coil made of aluminum being submerged in the tank liquid, one end of the coil being connected to an external air outlet box, whereby the liquid is maintained cool so that room air moving through the coil is cooled so that its moisture content is dropped; the moisture running out of a drain pipe connected to the coil.

8 Claims, 5 Drawing Figures

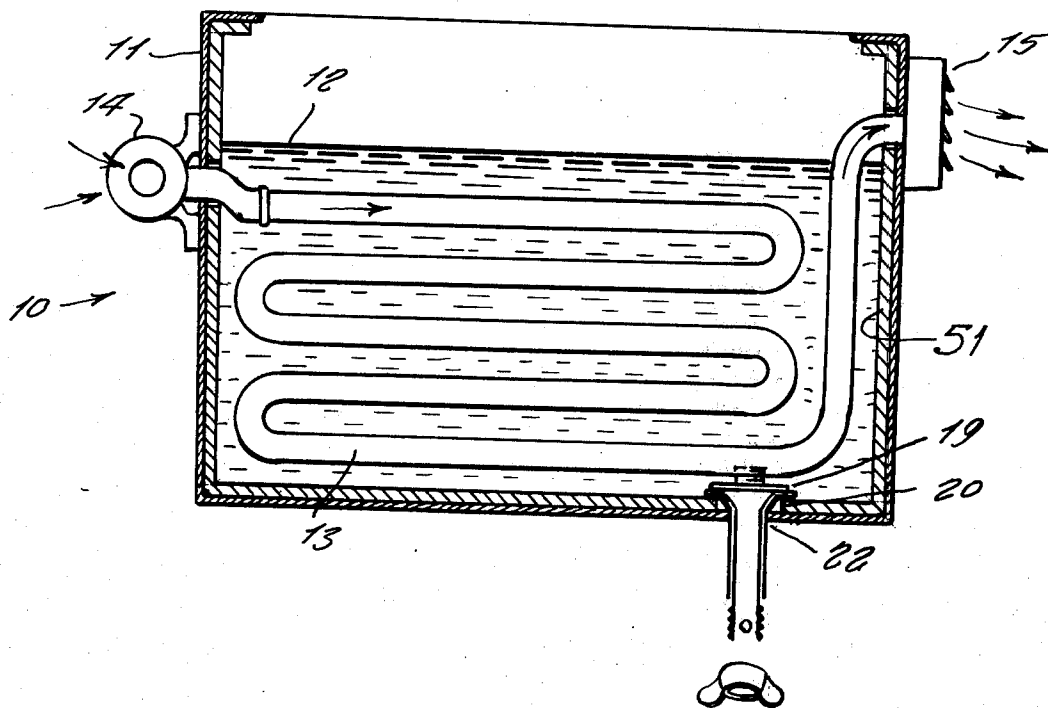


Fig. 1

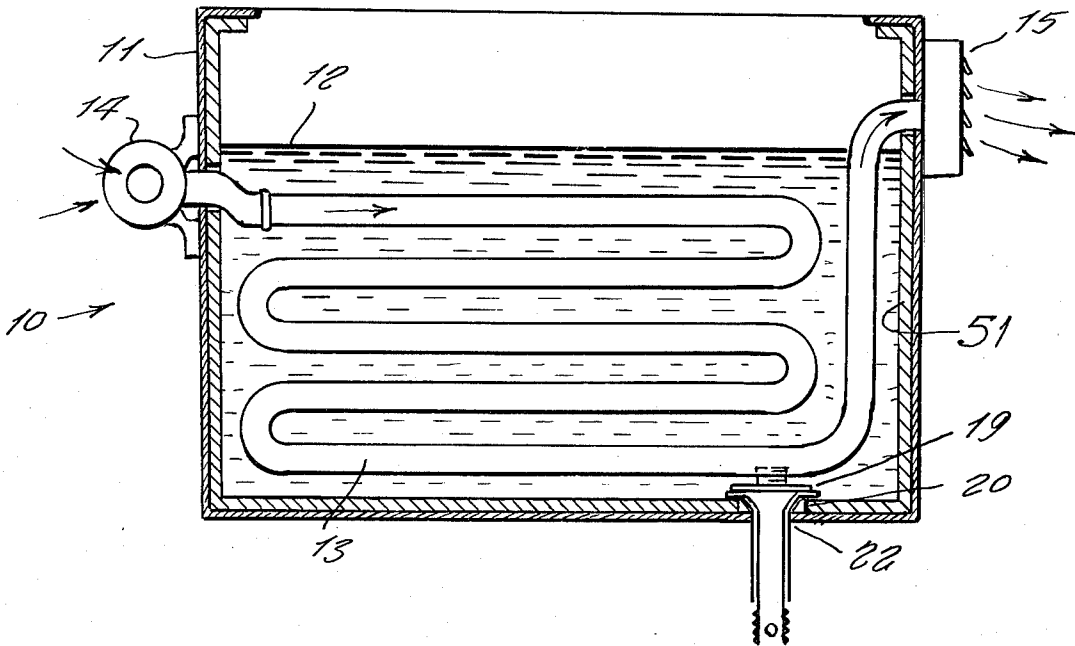
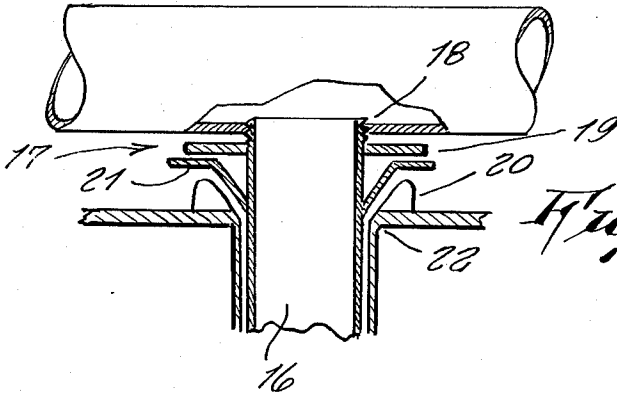


Fig. 2

Fig. 4

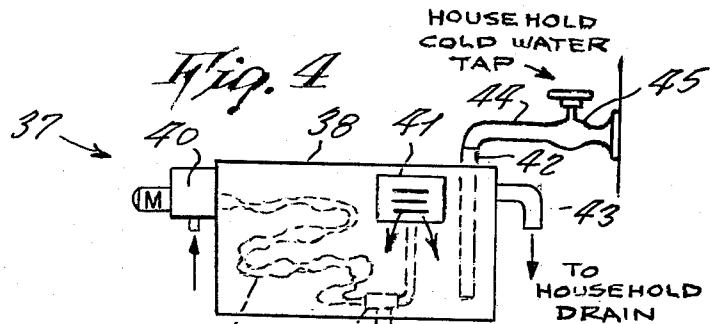


Fig. 5

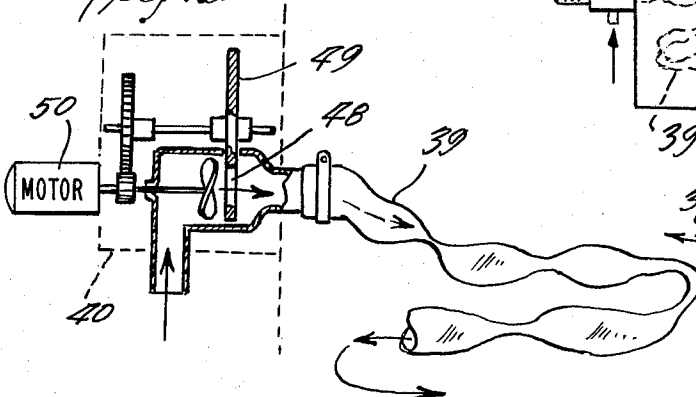
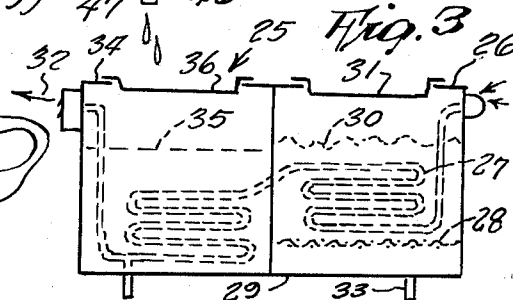


Fig. 3



DEHUMIDIFIER

This invention relates generally to dehumidifiers.

A principle object of the present invention is to provide a dehumidifier of very elementary type so to remove moisture from a room air so that a person is more comfortable without the necessity of purchasing an air conditioner.

Another object is to provide a dehumidifier which is readily portable and can be made in any of various sizes.

Other objects are to provide a dehumidifier which is simple in design, inexpensive to manufacture, rugged in construction, easy to use and efficient in operation.

These and other objects will be readily evident upon a study of the following specification and the accompanying drawing wherein:

FIG. 1 is a side cross sectional view showing one design of the present invention.

FIG. 2 is an enlarged cross sectional view of a drain outlet connection thereof.

FIG. 3 is a side cross sectional view of a modified design of the invention.

FIG. 4 is a side view of still another modified design of the invention that employs cold water from a faucet as a cooling agent.

FIG. 5 shows a mechanism thereof.

Referring now to the drawing in greater detail, and more particularly to FIGS. 1 and 2 at this time, the reference numeral 10 represents a dehumidifier according to the present invention wherein there is a tank 11 that contains a solution 12 of water and anti-freeze such as Prestone, or the like.

A tubular coil 13 is submerged in the solution, one end of the coil being connected to an external air blower 14. The other end of the coil is connected to an external air outlet box 15.

In using the device, the solution is made to have a cool temperature of approximately 45° for the summer months. The Prestone in this device serves as a coolant compound that prevents the water to evaporate. Thus when room air is circulated through the device it will come out considerably more cool and less humid than when going in; it being well known that as air is cooled its moisture content condenses, leaving it more dry.

A drain pipe 16 is connected to the coil 13 so that condensed moisture removed from the air is allowed to run out.

A needle valve 17 is provided at the junction of the drain pipe and the coil. The pipe is screw threaded at 18 into the coil. A metal washer 19 and rubber seal 20 are fitted around a flared end 21 of the pipe, and the pipe is soldered at 22 to the tank. The pipe forms a needle tube.

The lower end of the pipe has a thread 23, for being fitted with a winged nut 24.

By tightening the nut, the needle valve will close and prevent tank water to escape through the tube. Moisture condensation from the coil is always accessible to drain outward through the pipe.

The tank may be lined with aluminum liner 51. The tank may be mounted upon four legs having caster wheels at their lower end so it can be readily mounted between rooms.

In FIG. 3, a modified design of dehumidifier 25 includes a tank 26 containing aluminum coil 27 over a false bottom mesh screen 28 spaced about an inch

above a tank bottom wall 29. This tank is filled with solid calcium chloride 30 broken into lumps. A lid 31 on top hermetically seals the tank interior.

The calcium chloride over the coil accomplishes the condensation of moisture from air 32 that flows through the coil. A drain outlet 33 in the tank bottom allows dissolved calcium chloride to be drained away into a collection container.

In a tank 34, a solution of ethylene glycol (such as Prestone anti freeze) is in proportions of two gallons of cold water or ice cubes and one quart of the ethylene glycol. This solution 35 thus formed, keeps the water in tank 34 from quick evaporating and the ice cube from fast melting. The solution should thus easily be maintained cool for about a week, with only a small addition of ice cubes occasionally. The tank 34 is also hermetically sealed by a lid 36 to keep out heat.

In FIGS. 4 and 5, another modified design 37 of the invention consists of tank 38 in which a thin polyethylene tube 39 is placed and is connected at one end to air blower 40 and connected at its other end to outlet box 41. The tank is closed except for water intake pipe 42 and water overflow pipe 43. Pipe 42 is connected by flexible hose 44 to a cold water faucet 45.

In use, as air is blown through the tube 39, the cold water cools the tube and air inside so that cool air is blown on back into a room. Drain pipe 46 connected to intermediate pipe 47 along a central portion of tube 39 allows condensed moisture from the air to be drained out.

In order to completely cool every portion of the air passing through the tube 39, the tube is made to squirm in the cold water so that every air portion contacts the cold tube surface. This tube squirming is accomplished by pumping the air at intermittent intervals into the tube. This is done by entering air passing through spaced apart openings 48 on a wheel 49 rotated by the blower motor 50 that interrupts the steady air flow. Thus the intermittent air causes a pulsation in the tube as intermittent amounts of air pass therethrough.

Thus different forms of a simple dehumidifier are provided.

While various changes may be made in the detail construction, it is understood that such changes will be within the spirit and scope of the present invention as is defined by the appended claims.

What is claimed is:

1. A dehumidifier device comprising in combination: a liquid containable vessel having an aperture in a lower portion thereof and having an opening in an upper portion thereof adapted to have liquid and ice introduced therethrough into the liquid containable vessel; a tubular conduit structure having an air inlet at one end thereof and an air outlet at an opposite end thereof, mounted with the inlet and outlet substantially exterior to inner space defined within the liquid containable vessel and having a predetermined major proportion of the tubular conduit structure extending through the inner space positioned to be below liquid level when liquid is within the liquid containable vessel, a drain hole being defined in a lower wall of a portion of the tubular conduit structure positioned at a substantially lowest level relative to other portions of the tubular conduit structure such that condensed water within the tubular conduit structure is gravity-drainable through the drain hole; a drain conduit means for sealably mating at an upper open end thereof within said

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drain hole and the drain conduit means being further for extending sealably through said aperture of the liquid containable vessel such that condensed water is drainable therethrough to an exterior of the liquid containable vessel from within the tubular conduit structure; and an aluminum lining within said inner space lining said liquid containable vessel.

2. A dehumidifier device of claim 1, including a coolant media within said inner space at a level such that the tubular conduit structure is immersed with said major proportion below liquid level of the coolant media.

3. A dehumidifier device of claim 2, in which said drain conduit means includes threaded structure defining said upper open end, the threaded structure being threadedly mateable to structure of and defining said drain hole and being in a mated state, the drain conduit means further including an enlarged portion located within said inner space and being of predetermined largeness larger than outer dimensions of said aperture such that the enlarged portion is sealably seatable within said aperture when drawn downwardly thereinto, and the drain conduit means further including a clamping structure and element for tightening downwardly the enlarged portion sealably to seat within said aperture.

4. A dehumidifier device of claim 2 in which the

clamping structure and element include respectively male threads on a portion of drain outlet structure defining a drain outlet of the drain conduit means, and a threaded nut element tightened onto said male threads such that the enlarged portion is drawn sealably against vessel structure defining said aperture.

5. A dehumidifier device of claim 4, in which said coolant media includes ice in ethylene glycol and water.

6. A dehumidifier device of claim 5, including a blower means for pumping air to be dehumidified into the air inlet of the tubular conduit structure.

7. A dehumidifier device of claim 1, in which said tubular conduit means comprises as a major proportion thereof a thin polyethylene tube and pulsating means for the polyethylene tube to squirm within said inner space.

8. A dehumidifier device of claim 7, including an adjacent tank compartment containing a raised screen mesh upon which a continuation portion of said tubular conduit means extends, and a quantity of solid calcium chloride upon said screen mesh, and a drain outlet port defined in a bottom of the adjacent tank compartment positioned for drainage of liquid and dissolved calcium chloride.

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