May 23, 1950 G. S. MORRIS 2,508,530

HUMIDIFIER

Filed Jan. 3, 1945 2 Sheets-Sheet 1

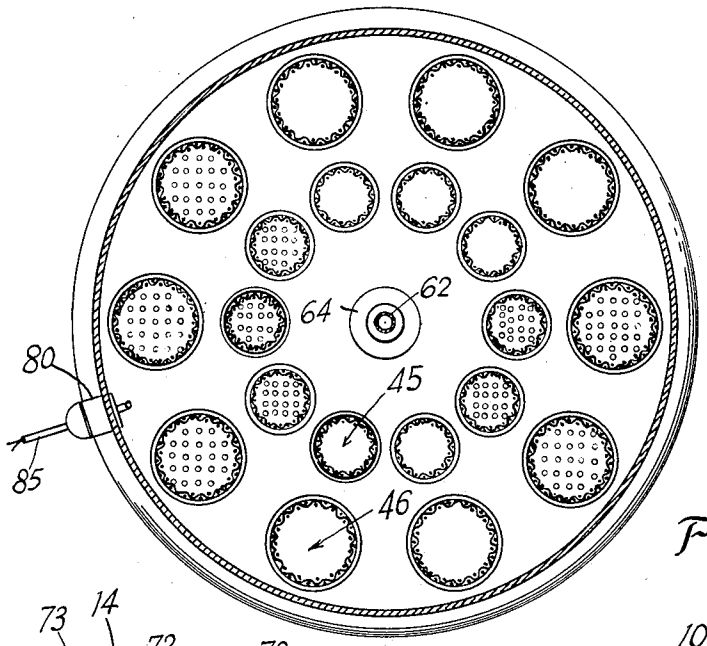


Fig. 2

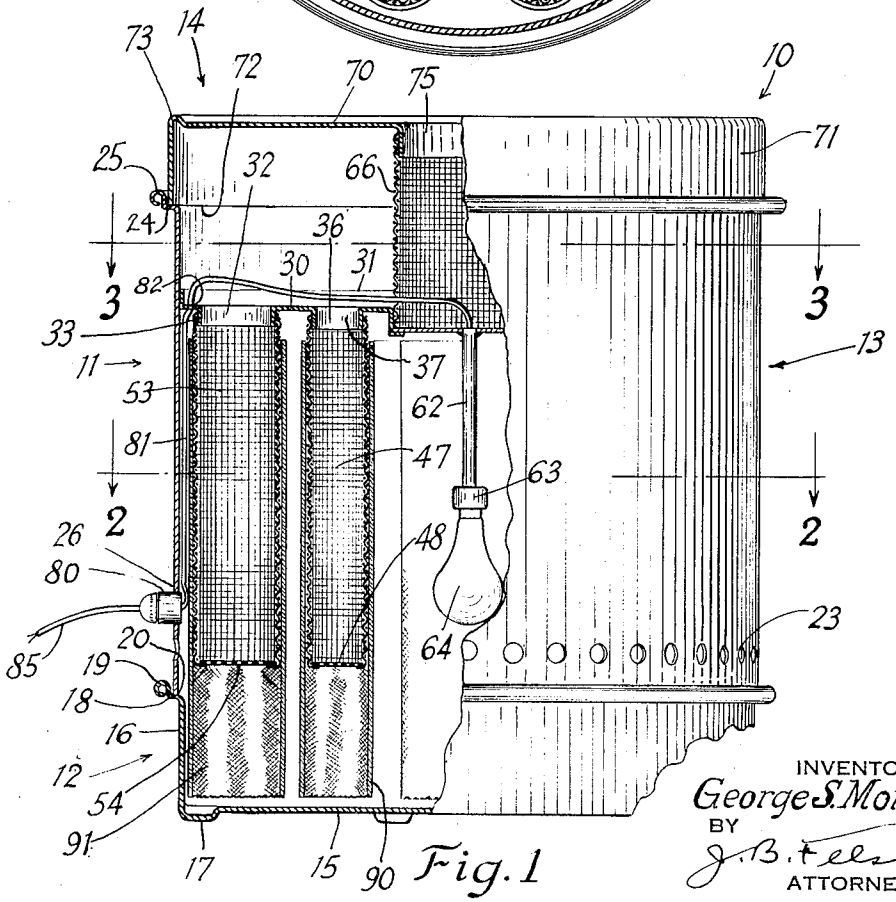


Fig. 1

INVENTOR
George S. Morris
BY
J. B. Fellows
ATTORNEY

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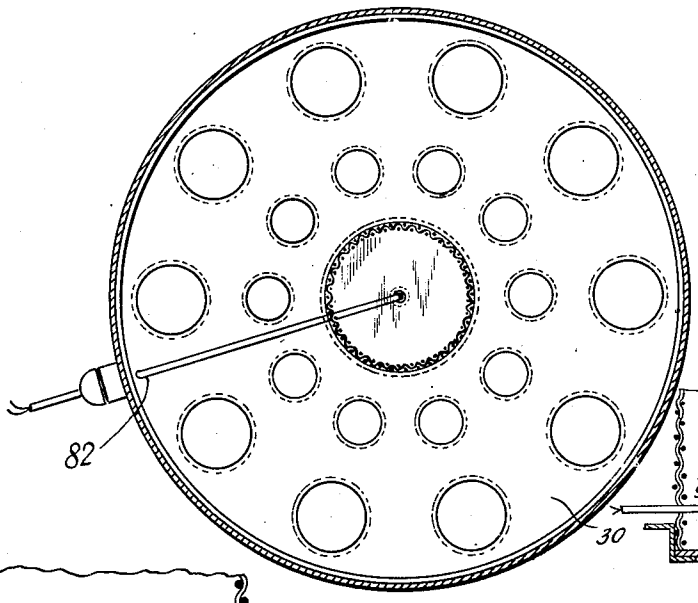


Fig. 3

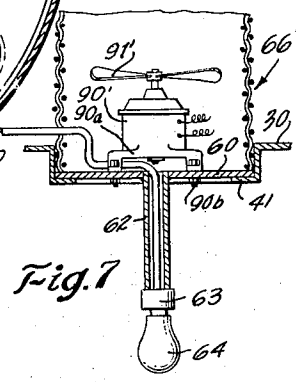


Fig. 7

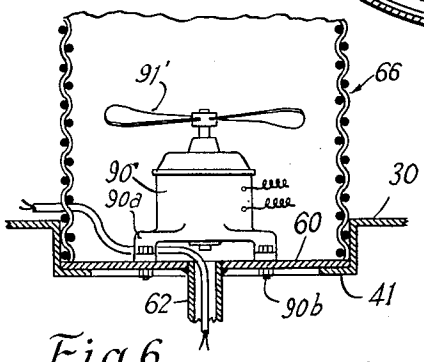


Fig. 6

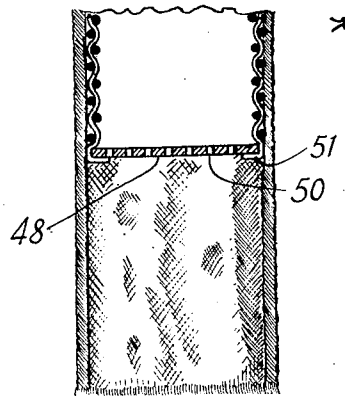


Fig. 4

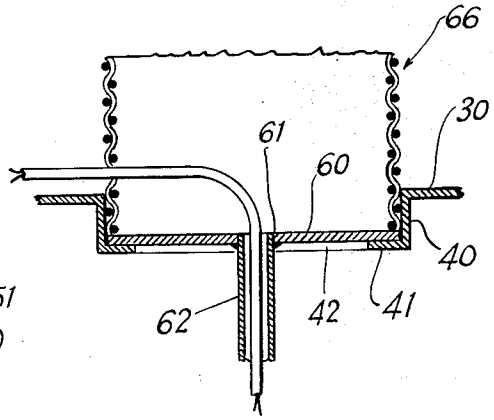


Fig. 5

INVENTOR
George S. Morris
BY
J. B. Fellin
ATTORNEY

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UNITED STATES PATENT OFFICE

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HUMIDIFIER

George S. Morris, New York, N. Y.

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6 Claims. (Cl. 261—107)

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This invention relates to devices for controlling moisture conditions in a room.

An object of this invention is to provide a device of the character described having means for absorbing excess moisture from the atmosphere and thereby reduce dampness.

A further object of this invention is to provide a device of the character described having improved means for adding moisture to the atmosphere.

A still further object of this invention is to provide a device of the character described comprising a container and a plurality of foraminous chambers within said container adapted to receive moisture absorbing substance, and means to induce a circulation of air through said chambers to accelerate the absorption of moisture.

Yet a further object of this invention is to provide a device of the character described which in summer may be used to absorb moisture from the air and which in winter can easily be converted for use in adding moisture to the air.

A still further object of this invention is to provide a unit of the character described comprising a container, chambers within the container to carry moisture absorbing substance, means at the bottom of the container to catch the water absorbed from the air, a vent at the top to allow air to pass out of the unit, and openings spaced above the bottom of the container to allow air to enter the unit whereby to permit circulation of air through the container, the arrangement being such that air passing through the unit must go through said chambers.

A still further object of this invention is to provide in a device of the character described a plurality of tubular members made of screen or perforated material, wicks fitted over said tubular members, and a water pan at the bottom into which the lower ends of the wicks project whereby water from the pan will seep upwardly through the wick to provide a relatively large moisture evaporating surface for adding moisture to the atmosphere.

Still another object of this invention is to provide a neat, compact and durable unit of the character described which shall be relatively inexpensive to manufacture, easy to assemble and manipulate, attractive in appearance, and yet practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

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In the accompanying drawing, in which is shown one of the various possible illustrative embodiments of this invention,

Fig. 1 is a side elevational view of a unit embodying the invention;

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is a detailed view of a portion of a tubular container and a wick thereon;

Fig. 5 is a partial cross-sectional view of a detail;

Fig. 6 is a view similar to Fig. 5 but illustrating a modified construction; and

Fig. 7 is a partial perspective view of a modification.

Referring now in detail to the drawing, 10 designates a moisture controlling device embodying the invention. The same comprises a container 11 which may be made of sheet metal. Said container comprises generally a bottom member or pan 12, a cylindrical member 13 mounted thereon, and a cover member 14 mounted on the upper end of the cylindrical member 13. The pan 13 has a bottom wall 15 and a cylindrical annular wall 16. Downwardly pressed legs 17 may be formed on the bottom wall to keep the bottom off the floor, table or other support on which the device is mounted.

At the upper end of the cylindrical wall 16 is an outwardly extending annular shoulder 18 provided with a rolled upwardly extending rim 19. The cylindrical member 13 has a lower edge 20 contacting the shoulder 18 and disposed within the bead 19. Said cylindrical member 13 is furthermore formed adjacent its lower edge with an annular horizontal row of spaced openings 23. At its upper end cylindrical member 13 is formed with an annular outwardly extending seat or shoulder 24 formed with an upwardly and outwardly rolled annular rim 25. At one side of cylindrical member 13 and just above the row of openings 23 is an opening 26 for the purpose hereinafter appearing.

Soldered or otherwise attached to the inside of cylindrical member 13 below the upper end thereof, is a circular plate, wall, or diaphragm 30. The wall 30 may have a peripheral cylindrical flange 31 contacting the inner surface of wall 13. The wall 30 is furthermore formed with an outer circular row of equiangularly spaced openings

32, and with downwardly extending rim flanges 33 at said openings. Said top plate 30 is also formed with an inner annular row of equiangularly spaced openings 36 and with annular downwardly extending flanges 37 at said openings. The openings 36 may be smaller than the openings 32. The openings 36 are spaced from the openings 32 as shown in the drawing. At the center of plate 30 is a downwardly extending annular flange 40 formed with an inwardly extending annular rim flange 41 forming a central opening 42. If desired, plate 30 instead of being soldered, riveted or otherwise fixed to member 13 may be removably supported on pins, rivets, or inwardly pressed lugs formed on cylindrical wall 13 to permit the plate to be lifted off said lugs.

Fixed to the flanges 37 and 33 are vertical tubular receptacles or chambers 45 and 46, respectively. The chambers 45 each comprise a cylindrical wall 47 made of wire screening material, or other foraminous or perforated material. The upper end of tubular walls 47 may be soldered or otherwise attached to flanges 37. At the lower end of each tubular wall 37 is a bottom plate 48 made of brass, copper, or other material which will resist moisture absorbing materials. Plate 48 is formed with a number of apertures or holes 50. The lower end of each tubular wall 47 may be crimped around plate 48, as at 51, to prevent movement of the plate.

The tubular members 46 likewise each comprise a cylindrical wall 53 of screening, foraminous or perforated material, attached by any suitable means to the upper end of the flange 33.

At the lower end of each cylindrical wall 53 is a bottom plate 54 similar to plate 48 and likewise formed with a plurality of small openings. The lower end of each cylindrical wall 53 is likewise crimped around the peripheral edge of a bottom wall 54. The lower ends of the tubular walls 45 and 46 are located above the lower edge of cylindrical wall 13, as shown in Fig. 1 of the drawing.

Within flange 40 and resting on flange 41 is a bottom plate 60, closing the central opening in plate 30. The same is formed with a central opening 61. Soldered or otherwise attached to plate 60 at said opening is a vertical, downwardly extending tubular member 62. Attached to the lower end of tubular member 62 is a socket 63 for an electric bulb 64. Mounted on plate 60 and fitted within flange 40 is a vertical upwardly extending tubular member 66 likewise made of screening or foraminous or apertured material.

The cover 14 comprises a top wall 70 and an annular cylindrical wall 71. The lower edge 72 of wall 71 rests on shoulder 24 and within the bead 25. The top wall 70 is formed with a peripheral upwardly extending ridge 73, if desired. At the center of the top walls 70 is a downwardly extending annular flange 75 forming a central opening. The upper end of the tubular screening member 66 receives said flange 75. It will now be understood that the cover 14 may be lifted off the cylindrical member 13 and that the cylindrical member may be lifted off the pan or bottom member 12.

Within the opening 26 and attached to the cylindrical wall 13 is an electric socket member 80. Connected to the socket 80 is wiring 81 extending upwardly within cylindrical member 13 and through a suitable opening 82 in the top wall 30. The wiring 81 extends along the upper side of the top wall 30 and through a suitable opening in the screening tube 66 and then passes through tube 62 for connection to the terminals of the socket 63. An electric connector 85 serves to supply house current for illuminating the bulb 64.

The method of using the improved device 10 will now be described:

Anhydrous calcium chloride or calcium chloride flake or other moisture absorbing material may be placed in the bottom of the tubular members 45 and 46. It will be noted that the wicks 90 and 91 fitted on the tubes 45 and 46 are not used when the device is being operated as a unit for removing moisture from the atmosphere. Air enters the unit through the openings 23 and passes through the screen chambers 45 and 46 coming in contact with the moisture absorbing material in the bottom of said tubes. The air then circulates upwardly through the openings 32 and 36 and through tube 66 passing outwardly through the opening in the cover. When the bulb 64 is illuminated, the heat created will cause an upwardly draft to accelerate the circulation of air through the unit.

Excess absorbed moisture will drop down into the bottom of pan 12. The pan may be emptied from time to time.

It will be noted that the device may be used in the house and when placed on the floor or a table it may serve as a support, since articles may be placed on the top wall 70 of the cover which is flat and serves in itself as a table top.

In winter the device may be used for adding moisture to the atmosphere. When used in such manner, of course, no moisture absorbing material is placed in the tubular members 45, 46. Instead, tubular wicks 90, 91 are fitted over said tubular members. The wicks are longer than the tubular members and project downwardly into the pan 12. Water may be placed in the pan and said water will seep upwardly through the wicks. The wicks will thus supply a considerable evaporation surface, and air circulated through the device will remove moisture from the wicks. The moisture will thus pass into the atmosphere. The bulb 64 may be used to increase the draft when the device is used either for absorbing moisture or adding moisture.

Any air passing through the unit must go through the chambers 45, 46.

In Fig. 6 there is shown a modified construction. It is similar to that shown in Fig. 5 with the exception that on bottom plate 60 is mounted a blower or fan comprising a motor 90' having a base 90*a* fixed to plate 60 by bolts 90*b*. The motor rotates the fan blades 91' to create an upward flow of air to increase the draft through the unit 10. It will now be understood that the draft may be increased both by the fan 90 as well as the lamp 64 which is connected to the wiring in tube 62.

In Figure 7, there is shown a partial view of a modification in which both the fan 91' and the heating lamp 64 are employed.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A device of the character described comprising a container, a transverse wall within said container, a water pan at the bottom of the container, said transverse wall being formed with one or more openings, a foraminous receptacle attached to the transverse wall at each opening, and projecting downwardly therefrom, and said container being formed with an opening below said transverse wall, and with an opening above said transverse wall whereby air passing into the container through the opening below the transverse wall will pass through said receptacles and through the openings in the transverse wall and out through the opening in the container located above the transverse wall, heating means within said container and below said transverse wall for aiding circulation of draft through said container, and wicks on said receptacles and projecting downwardly therefrom.

2. A device of the character described comprising a container, a transverse wall within said container, a water pan at the bottom of the container, said transverse wall being formed with one or more openings, a foraminous receptacle attached to the transverse wall at each opening, and projecting downwardly therefrom, and said container being formed with an opening below said transverse wall, and with an opening above said transverse wall whereby air passing into the container through the opening below the transverse wall will pass through said receptacles and through the openings in the transverse wall and out through the opening in the container located above the transverse wall, heating means within said container and below said transverse wall for aiding circulation of draft through said container, and a blower within said container and above said transverse wall for blowing air upwardly.

3. A device of the character described comprising a container, said container comprising a bottom pan having a bottom wall, a wall upstanding from said bottom wall, an outwardly extending shoulder at the upper end of said upstanding wall, and an upstanding flange at the outer periphery of the shoulder, a tubular member mounted on the pan and having its lower edge seated on said shoulder and within said flange, said tubular member being formed at its upper end with an outwardly extending shoulder, and an upstanding flange at the outer periphery of said last-mentioned shoulder, a cover having a top wall, and a skirted wall extending downwardly from the top wall, the lower edge of said skirted wall resting on the shoulder of said tubular member and within the flange of said last-mentioned shoulder, said cover, tubular member and pan being separable one from the other, a transverse wall fixed within said tubular member and below the upper end thereof, said transverse wall being formed with one or more openings, an apertured receptacle attached to the transverse wall at each opening and projecting downwardly therefrom, said tubular member being formed with one or more openings adjacent its lower end, the top wall of said cover being formed with an opening, and an apertured member extending from said transverse wall to the opening.

4. A device of the character described comprising a container, said container comprising a bottom pan having a bottom wall, a wall upstanding from said bottom wall, an outwardly extending shoulder at the upper end of said upstanding wall, and an upstanding flange at the outer periphery of the shoulder, a tubular member mounted on the pan and having its lower edge seated on said shoulder and within said flange, said tubular member being formed at its upper end with an outwardly extending shoulder, and an upstanding flange at the outer periphery of said last-mentioned shoulder, a cover having a top wall, and a skirted wall extending downwardly from the top wall, the lower edge of said skirted wall resting on the shoulder of said tubular member and within the flange of said last-mentioned shoulder, said cover, tubular member and pan being separable one from the other, a transverse wall fixed within said tubular member and below the upper end thereof, said transverse wall being formed with one or more openings, an apertured receptacle attached to the transverse wall at each opening and projecting downwardly therefrom, said tubular member being formed with one or more openings adjacent its lower end, the top wall of said cover being formed with an opening, and an apertured member extending from said transverse wall to the opening, said receptacles being tubular and having apertured lower end walls located adjacent the openings in said tubular member.

5. A device of the character described comprising a container, said container comprising a bottom pan having a bottom wall, a wall upstanding from said bottom wall, an outwardly extending shoulder at the upper end of said upstanding wall, and an upstanding flange at the outer periphery of the shoulder, a tubular member mounted on the pan and having its lower edge seated on said shoulder and within said flange, said tubular member being formed at its upper end with an outwardly extending shoulder, and an upstanding flange at the outer periphery of said last-mentioned shoulder, a cover having a top wall, and a skirted wall extending downwardly from the top wall, the lower edge of said skirted wall resting on the shoulder of said tubular member and within the flange of said last-mentioned shoulder, said cover, tubular member and pan being separable one from the other, a transverse wall fixed within said tubular member and below the upper end thereof, said transverse wall being formed with one or more openings, an apertured receptacle attached to the transverse wall at each opening and projecting downwardly therefrom, said tubular member being formed with one or more openings adjacent its lower end, the top wall of said cover being formed with an opening, and an apertured member extending from said transverse wall to the opening, said receptacles being tubular and having apertured lower end walls located adjacent the openings in said tubular member, the apertured tubular member which extends from the transverse wall to the cover being fixed to the transverse wall of said cover, and said cover having a flange at its opening telescoping with said tubular apertured member.

6. A device of the character described comprising a container, said container comprising a bottom pan having a bottom wall, a wall upstanding from said bottom wall, an outwardly extending shoulder at the upper end of said upstanding wall, and an upstanding flange at the outer periphery of the shoulder, a tubular member mounted on the pan and having its lower edge seated on said shoulder and within said flange, said tubular member being formed at its

upper end with an outwardly extending shoulder, and an upstanding flange at the outer periphery of said last-mentioned shoulder, a cover having a top wall, and a skirted wall extending downwardly from the top wall, the lower edge of said skirted wall resting on the shoulder of said tubular member and within the flange of said last-mentioned shoulder, said cover, tubular member and pan being separable one from the other, a transverse wall fixed within said tubular member and below the upper end thereof, said transverse wall being formed with one or more openings, an apertured receptacle attached to the transverse wall at each opening and projecting downwardly therefrom, said tubular member being formed with one or more openings adjacent its lower end, the top wall of said cover being formed with an opening, and an apertured member extending from said transverse wall to the opening, said receptacles being tubular and having apertured lower end walls located adjacent the openings in said tubular member, the apertured tubular member which extends from the transverse wall to the cover being fixed to the transverse wall of said cover, and said cover having a flange at its opening telescoping with said tubular apertured member, an electric lamp mounted on said transverse wall and projecting downwardly therefrom, and said receptacles surrounding said electric lamp.

GEORGE S. MORRIS.

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