

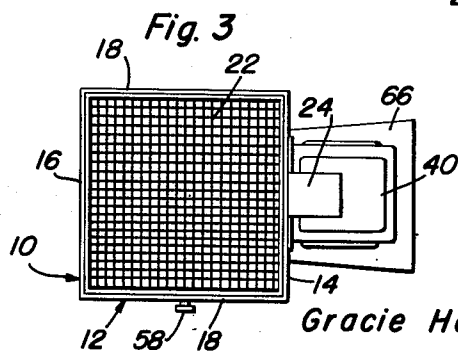
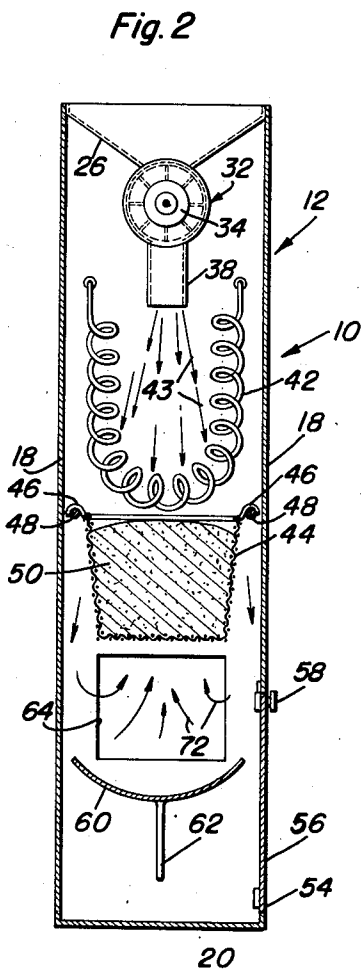
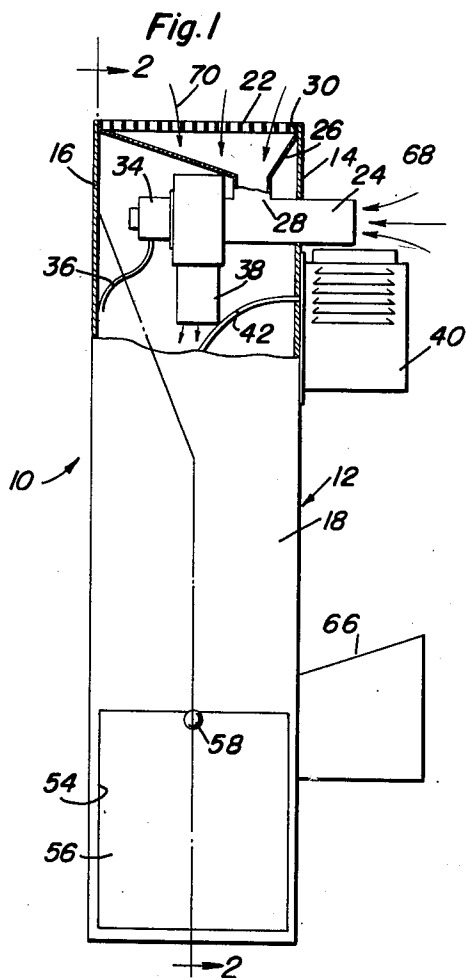
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DEHUMIDIFYING MACHINE

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DEHUMIDIFYING MACHINE

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1 Claim. (Cl. 62—140)

1

This invention relates to new and useful improvements in dehumidifying machines, and particularly to such machines wherein deliquescent materials and refrigeration are utilized for the removal of water vapor from air.

It is a fundamental purpose of this invention to afford means for treating the air within a beauty shop so that hair may be dried and curled faster, and so that fingernail polish may be dried more rapidly. The saving in time thus attained will not only greatly convenience the customers, but will also reduce very materially the beauty shop operating expenses. The instant invention pertains to an inexpensive air dehumidifying machine particularly well adapted to realize this purpose.

An important object of the present invention is to provide a dehumidifying machine capable of continuous operation for either drawing in outside air and releasing the same into a room in a substantially dry condition, or for recirculating the air in a room while removing water therefrom, or both.

Another important object of the present invention is to provide a machine of this character in which the water accumulated by the drying of the air may be readily disposed of, and since, at equal temperatures, moist air has a lesser density than dry air, it is an object of this invention to draw air into the machine from positions adjacent the ceiling of a room.

Yet another important object of this invention is to provide a novel cabinet and receptacle for deliquescent materials which will permit the receptacle to be readily removed from the cabinet so that exhausted deliquescent material may be replaced or rejuvenated expeditiously.

A meritorious feature of the present invention resides in the air inlet means for the cabinet which will permit air to be drawn into the machine through the top thereof adjacent the ceiling of the room in which the machine is disposed, and which will also permit air to be drawn into the cabinet through a conduit which may be extended through the wall of the room to the outside air.

Another important feature of the present invention resides in the receptacle for the deliquescent material and the basket liner therefor, together with the removable cover plate on the cabinet whereby the deliquescent material receptacle may be readily removed from within the cabinet for either replacing the deliquescent material or for rejuvenating the same.

Final important features of the present inven-

2

tion to be specifically enumerated herein reside in the provision of the air cooling coil in such a position that the air circulating means will direct the stream of incoming moist air directly thereagainst, together with the means for collecting water condensate formed on the air cooling coil for the removal of the same.

These, together with various ancillary features and objects of the invention which will later become apparent as the following description proceeds, are attained by the present invention, a preferred embodiment of which has been illustrated by way of example only in the accompanying drawings, wherein:

Figure 1 is a side elevational view of the machine, with portions thereof broken away and shown in section so as to illustrate the internal construction of the same;

Figure 2 is a sectional view of the machine shown in Figure 1, this view being taken upon the plane of the broken section line 2—2 of Figure 1; and

Figure 3 is a top plan view of the dehumidifying machine.

Reference is now made more specifically to the accompanying drawings, wherein like numerals designate similar parts throughout the various views, and in which the improved dehumidifying machine is designated generally at 10.

The dehumidifying machine 10 comprises an upstanding cabinet 12, such cabinet including front and rear walls 14 and 16, side walls 18, and a bottom wall 20. As clearly shown in the drawings, the upper end of the cabinet 12 is open and has fitted thereinto a grill 22.

An air inlet conduit 24 extends into the cabinet 12 through the front wall 14 adjacent the upper end of the latter, and a flared air duct 26 is disposed within the cabinet 12 with its minor end connected to the conduit 24, as at 28, while its open major end embraces the periphery of the grill 22, as at 30. A conventional centrifugal blower 32 is provided, and is mounted on the inner end of the conduit 24 in such a manner that air moving into the cabinet 12 through the conduit 24 enters the inlet of the blower 32, as will be readily understood. Included in the blower assembly 32 is an electric motor 34 for driving the same, electrical conduit means 36 being provided for energizing the electric motor 34, it being understood that the conduit means 36 may be extended through any suitable aperture in the cabinet 12 to be connected to a source of electrical energy, not shown. The arrangement thus far described is of such a character that the

3

blower 32, as well as the electric motor 34 therefor, are supported by the duct 26 and the conduit 24, however, additional support for the blower 32 and the electric motor 34 may be provided in the form of brackets, not shown, disposed within the cabinet 12 as will be evident. For a purpose to be explained presently, the blower 32 includes a discharge nozzle 38 directed downwardly in the cabinet 12.

Suitably mounted upon the exterior of the cabinet 12 is a housing 40 for a mechanical refrigeration unit of conventional character, the latter not being shown in detail in the drawings as the construction of the same is well known in the art. However, the mechanical refrigeration unit disposed within the housing 40 includes a refrigerating or air cooling coil 42 which extends through the front wall 14 of the cabinet 12 and is disposed within the central portion of the cabinet 12 in the form of a depending loop as shown in the drawings. In order to increase the effective cooling surface area, of the coil or loop 42, it will be noted that convolutions are formed in the loop 42. It will thus be seen that during the operation of the refrigeration unit disposed in the housing 40, a cold fluid is circulated through the loop 42 so that the stream of air discharged by the blower 32 will be directed against the loop 42 and cooled thereby as illustrated by the arrows 43 in Figure 2. Inasmuch as the air passing through the blower 32 is moist, and since the coil 42 is maintained at a relatively cold temperature, the water vapor in the air will condense to a large extent upon the surface of the loop 42 so as to dry the air to a substantial degree.

Means operative independent of the coil 42 is provided for drying air passing downwardly through the cabinet. Such means includes a basket 44 of foraminous construction having arms 46 thereon for removably supporting the basket 44 on supports 48 mounted within the cabinet. The basket 44 is disposed below the coil 42 and also below the air nozzle 38 so that air will be forced downwardly therethrough, the basket being adapted to contain hygroscopic or deliquescent materials such as calcium chloride, silica gel, etc. 50 in lump or broken up form that will permit the downward passage of air there-through so as to dry the latter. It will be noted that water condensed upon the coil 42 will drip therefrom into the hygroscopic contents 50 of the basket 44. The basket 44 may be of wire mesh of corrosion resistant material, and if necessary may be coated with chemical resistant enamel or porcelain to avoid the deleterious effects of the chemical 50.

In order that the basket 44 and its contents may be readily removed from the cabinet 12, the latter is provided with an opening 54 in one of the side walls 13 through which the basket 44 may be removed. The opening 54 is normally closed by a removable cover plate 56 that is detachably secured in position by a suitable latch 58.

In order to catch any excess moisture in the basket 44 that may drip therethrough, a tray 60 is below the basket 44, such tray 60 being supported on an arm 62 from the wall 13. A removable drip pan, not shown, may be placed on the tray 60, or if desired, the tray 60 may be provided with a drain line, not shown, to drain moisture therefrom to the exterior of the machine as will be evident. Obviously, access to the tray 60 may be had through the opening 54.

4

The cabinet 12 is provided with an outlet opening 64 through the front wall 14 thereof, with the opening 64 being spaced below the basket 44 and above the tray 60, as clearly shown in Figure 2. In the preferred construction, an outwardly flaring discharge conduit 66 is secured to the front wall 14 of the cabinet 12 so as to surround the discharge or outlet opening 64 therein.

It is thought that the operation of the dehumidifying machine will be readily understood. During the operation of the blower 32, air is drawn into the cabinet 12 through the inlet conduit 24 as indicated by the flow arrows 68, and is also drawn into the cabinet 12 through the grill 22 as indicated by the flow arrows 70. The air drawn into the cabinet 12 through the conduit 24 and the grill 22 is discharged through the nozzle 38 against the air cooling coil 42, so that a portion of the water vapor in the moist air is condensed upon the coil 42 to drip in the basket 44 as described above, while the air continues on downwardly through the cabinet 12 to pass through the basket 44 and the hygroscopic material 50 disposed within the basket 44. The air passing through the deliquescent or hygroscopic material 50 then passes outwardly in a dehydrated condition through the opening 64 and into the room in which the machine 10 is disposed as indicated by the flow arrows 72.

It is one of the advantages of the present invention that the use or even the inclusion of the refrigerator and coil 40 and 42 may be dispensed with entirely. However, the use of the same is recommended to counteract the heating effect of the taking up of water by the material 50 and to increase the efficiency of the latter. Although not shown, it will be evident that if desired the condenser associated with the refrigerator 40 may be disposed outside the room in which the machine 10 is situated.

It is to be expressly noted that the air drawn into the machine 10 is drawn from a position considerably higher than that at which the dried air is exhausted from the machine 10, so that the relatively less dense humid air is drawn into the top of the machine while the relatively dense dry air is discharged from the bottom of the machine. It is contemplated that the outer end of the inlet conduit 24 may be connected to a conduit extending through the wall of the room, so that by virtue of the construction of the conduit 24 and the duct 26, air may be drawn into the machine simultaneously from within the interior of the room as well as from the outside. Furthermore, it will be evident that while not shown, valve means could be incorporated in the machine to control the flow of air entering the machine through the inlet end of the conduit 24 and the grill 22.

Upon the deliquescent material 50 losing its effectiveness, due to the taking up of water, the basket 44 may be removed from the cabinet 12 and the deliquescent material 50 either replaced by dry material or dried itself, at which time the moisture collected upon the tray 60 may be disposed of.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifica-

5

tions and equivalents may be resorted to, falling within the scope of the appended claim.

Having described the invention, what is claimed as new is:

A dehumidifying machine comprising an upright cabinet, an air inlet conduit extending horizontally into the cabinet adjacent its upper end for drawing in outside air, an air inlet in the top of said cabinet for receiving air from a room in which said cabinet is mounted, a single blower for drawing air in through said air inlet conduit and said air inlet and forcing the same downwardly through said cabinet and out of a horizontal air outlet, said blower being connected to said air inlet conduit and said air inlet being connected to said air inlet conduit, said air outlet being spaced vertically from the bottom of said cabinet, a cooling coil disposed below said blower in the path of air circulated thereby, a

6

heat exchange unit carried by said cabinet externally thereof, said heat exchange unit being operatively connected to said cooling coil, a removable foraminous basket for deliquescent material disposed in the cabinet below said cooling coil and above said air outlet, a drip tray in said cabinet below said foraminous basket, said drip tray being disposed below said air outlet.

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