March 15, 1949. C. T. McGRAW 2,464,706

DRYING EQUIPMENT

Filed July 17, 1945 2 Sheets-Sheet 1

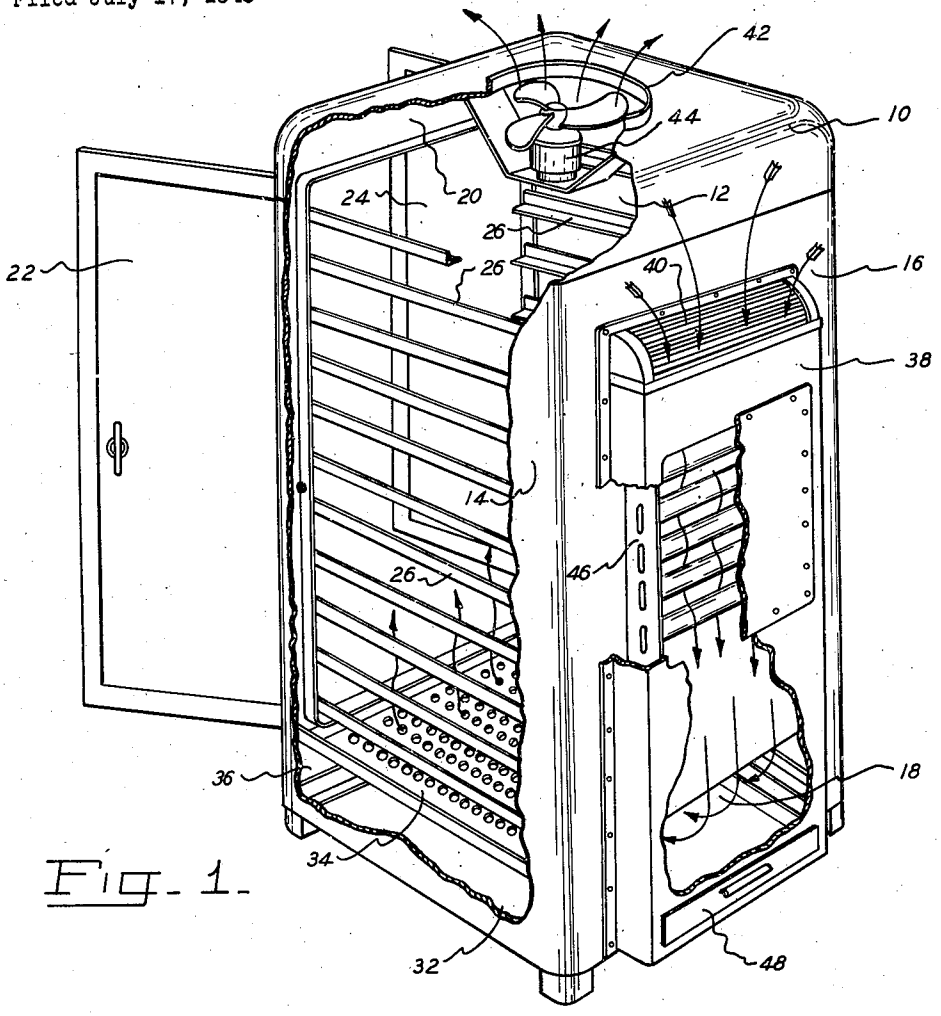


Fig. 1.

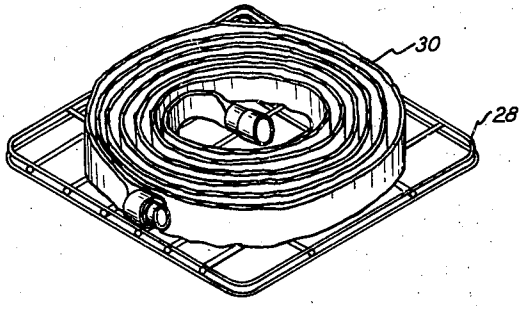


Fig. 2.

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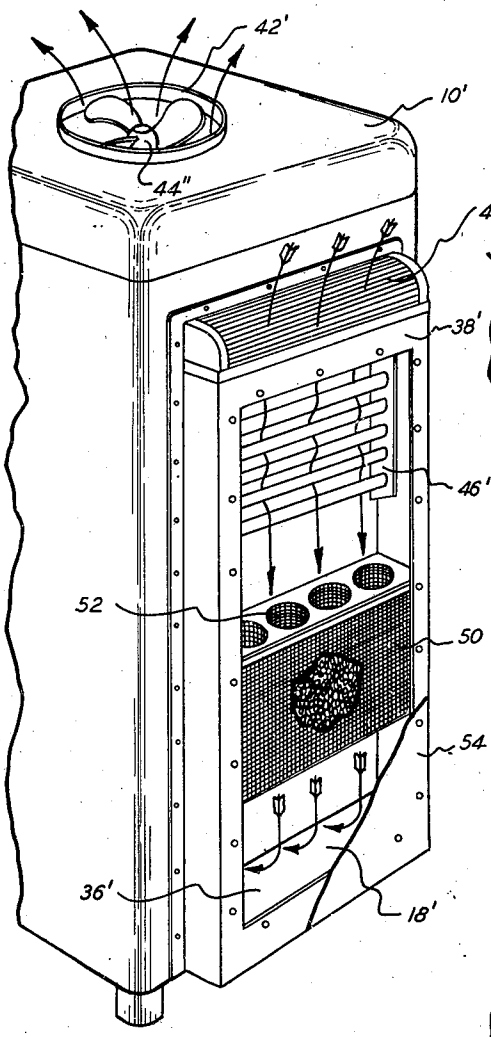


Fig. 3.

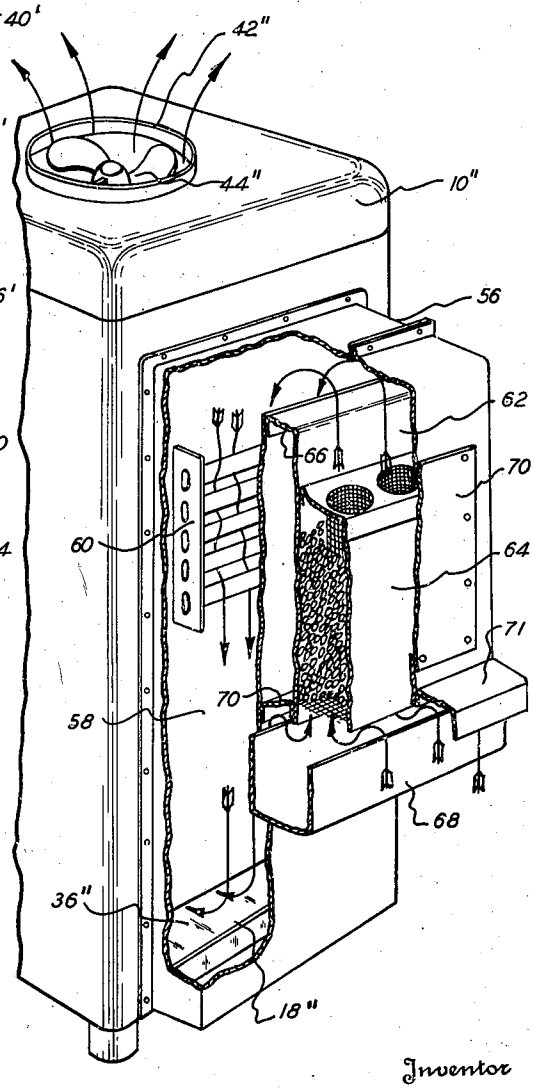


Fig. 4.

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DRYING EQUIPMENT

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2 Claims. (Cl. 34—80)

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The present invention relates to improvements in drying apparatus, being especially adapted to the drying of fire hose and articles which may be injured by direct radiant heat. It is to be understood, however, that the apparatus is not limited to any particular article in its operation and may function in many capacities as a simple, effective dehydrator.

In the drying of fire hose it is of particular advantage to be able to coil the hose and dry many lengths in a compact space quickly, economically and without injury to the hose structure. To this end, according to the principles of the present invention, a unitary cabinet is provided in which the air is preferably drawn in at a substantial distance above the floor, passes thru a duct in intimate relation with means for increasing the water absorption qualities of the air by heat or dehydration or both, without chance of short circuiting, and then is expanded into the drying chamber to reduce the velocity, and uniformly and efficiently dry the entire contents in the apparatus.

Thus one of the objects of the invention is to provide an improved drying cabinet of the type described in which the air is drawn into a duct located at one side of the drying chamber, treated in the duct to increase its water absorption, expanded in the drying chamber through a distributor located at a low level and drawn uniformly upward for discharge at a high level.

Another object is to provide a drying apparatus having a chamber into which air is drawn in at a lower level and discharged at an upper level, there being a duct on the outside of the chamber in which the air is treated before entering the chamber.

A further object is to provide an improved drying apparatus in which air is effectively heated and dehydrated before being discharged into the drying chamber.

A still further object is to provide an improved fire hose drying cabinet in which the air is heated, there being special provisions to protect the hose from radiant heat.

These and other objects and advantages residing in the specific construction and arrangements and combination of parts of the cabinet will become apparent from a consideration of the following specification and appended claims:

In the drawings:

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Fig. 1 is a perspective view of the cabinet with portions broken away to show the interior, the drying trays being removed.

Fig. 2 is a perspective view of one of the drying trays showing a hose length supported in a position to be dried.

Fig. 3 is a view similar to Fig. 1 of the modified form of the invention showing both heating and dehydrating structure located in the exterior duct, and

Fig. 4 is a view similar to Fig. 1 of a still further modified form of the invention showing a different arrangement of the heating and dehydrating structure.

The drying cabinet 10 is preferably of unitary construction complete in itself and readily portable. It is preferably of sheet metal exterior construction having fully closed side portions 12 and 14, a back portion 16 fully inclosed except for an opening at and a front portion 20 having an opening regulated by hinged doors 22 and 24. Where the cabinet is to be used for drying fire hose and similar articles, horizontal supports 26 are provided to slidably receive the drying trays 28 upon which the coiled lengths of the hose 30 may be placed.

Spaced upwardly from the bottom of 32 is a distributing perforated baffle 34 the spacing of the baffle 34 from the bottom 32 provides a distributor chamber 36 throughout the entire lower level of the cabinet 10.

Preferably attached to the back 16 of the cabinet 10 is an exterior duct 38 having a grilled entrance 40 and communicating at its lower end with the opening 18 discharging into the distributor chamber 36. The entrance 40 to the duct 38 for best performance should be a substantial distance above the floor to draw in drier air, but should not be so located that the discharge of air through the discharge opening 42 in the cabinet 10 will not be materially returned directly to the duct 38.

Under certain climatic conditions, the cabinet 10 is capable as functioning as an effective drying apparatus solely through the use of the circulating fan 44 supported in the upper level of the cabinet 10 and functioning to draw air in through the duct 38, into the distributor chamber 36 and discharging through the opening 42 after uniformly distributing the incoming air throughout the entire cabinet. However, under

most climatic conditions, especially where it is desired to effect rapid drying, it would be advantageous to treat the air coming through the duct 38 to increase its water absorption. According to the principles of the present invention, this treatment may be effectively and economically carried out by locating a heating or dehydrating structure, or both, directly in duct 38 bringing the circulated air into intimate contact therewith.

In the form of the invention shown in Fig. 1, a suitable electric heating unit 46 is shown supported in the duct 38 in such a manner that the entering air is brought into intimate contact with the same and passes through the opening 18 to the distributing chamber 36. If desired, a pull-out tray 46 extending into the distributor chamber 36 may be provided for holding a suitable hydroscopic material such as silica jell or calcium chloride.

Referring to Fig. 3 the cabinet 10' may correspond in construction with that shown in Fig. 1 as may the duct 38' through which the air passes to the opening 18'. In addition to the heating unit 46', a dehydrating unit 50 is shown providing below the heating unit 46' in a vertical passage 52 through which the air after being heated, is drawn in intimate contact with a suitable hydroscopic material which may be replenished from time to time by removing the suitable closure 54 from the duct 38'. It will be understood that the air is drawn in through the grilled entrance 40' through the heating unit 46' into intimate contact with the dehydrating unit 50, and is discharged into the distributor chamber 36' through the opening 18' in the rear wall of the cabinet 10'.

In the modification as shown in Fig. 4, the cabinet 10'', which may correspond to the construction shown in Fig. 1, has a discharge opening 42' in an upper level through which air is forced by the circulating fan 44' to be distributed upwardly through the cabinet from the distributor chamber 36'' upon entering the opening 18''.

In closed communication with the opening 18'' is a tortuous duct 56 having a vertical passage 58 in which the electrical heating unit 60 is located for heating the air as it passes to the opening 18'' communicating with the distributor chamber 36'. A second vertical chamber 62 has located therein a suitable dehydrated unit 64; the passages 58 and 62 being separated by a wall 66.

If calcium chloride is to be used in the dehydrating unit 64, a drain pan 68 is preferably provided beneath the unit 64 with a baffle 70 provided to bring the entering air over the liquified salt and up through the unit 64. With this arrangement the salt will liquify from the bottom of the unit 64 and will feed down by gravity permitting the salt to be conveniently replenished from the top by removing the closure plate 70.

It will be understood that climatic conditions will determine the necessity of operating either or both of the means provided in the exterior duct modification shown in Figs. 1, 3 and 4 for increasing the water absorption capacity of the circulated air.

The air passing through the duct 38 for example will have a relatively high velocity affording little opportunity of overheating the air to the extent that the same would be detrimental to the article being dried.

In view of the convenience of electrical heat, it is preferably used. By locating the heating unit 46 in the duct 38, the articles being dried are not subjected to direct radiant heat and at the same time the entering air is brought into intimate contact with the heating element with no possibility of short circuiting the air. As the air flows through the opening 18 it expands into the distributor chamber 36 and is uniformly distributed through the perforated baffle distributor 34 to pass upwardly through the articles being dried towards the discharge 42. It will be appreciated that the velocity in the air flowing through the cabinet 10 will be materially less than the velocity of the air flowing into the duct 38, the results that ample opportunity is afforded for the absorption of moisture. By insulating the duct 38, substantially all heat losses may be avoided. Whether or not it is necessary to provide insulation between the common wall 16 of the duct 38 and cabinet 10 depends upon the capacity of the heating unit 46 and the article to be dried in the cabinet 10. If no insulation is provided, a certain amount of heat will be transferred through the wall 16 into the cabinet 10.

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

1. A portable drying cabinet for fire hose and the like in which the hose is adapted to be coiled into a flat form and edgewise supported upon a shelf within the cabinet, said cabinet having exterior vertical walls upon three sides and a door in the fourth side to complete a vertical enclosure, a perforated air diffusion baffle horizontally disposed in the lower portion of said cabinet, a bottom enclosure for said cabinet spaced below said baffle and defining therewith a distributor chamber, a drying chamber above said baffle and defined by said door and said exterior vertical walls, a series of vertically spaced and horizontally disposed supports in said drying chamber for receiving a shelf supporting the flat coil of fire hose to be dried, a top closure for said cabinet including a central opening having an air circulating fan disposed therein for drawing uniformly distributed air from said distributor chamber upwardly to said drying chamber, an opening to the distributor chamber defined in one of said vertical walls at a point below said perforated air diffusion baffle, an exterior vertical air duct defined in part by the exterior wall in which said opening is defined and supported therefrom, the duct being defined by spaced apart opposite edge walls and a wall parallel to and spaced from the adjacent exterior wall of the cabinet and said edge walls being inwardly spaced from the front and back walls of the cabinet, the lower end of said air duct overlapping said opening with the upper end of said air duct being open to the atmosphere at a point substantially above said baffle, and a heater located in the air flow passage of said air duct, said heater being in heat exchange relation with the interior of said cabinet only through the opening in the exterior wall of the cabinet and being spaced from said exterior wall so as to form an air space between the heater and the wall of the cabinet.

2. A portable drying cabinet for fire hose and the like as defined in claim 1 wherein a chemical dehydrator is located in said duct in series with said heater for increasing the water absorption properties of the air being drawn through the cabinet, and means providing access to said dehydrator through a wall of said duct.

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