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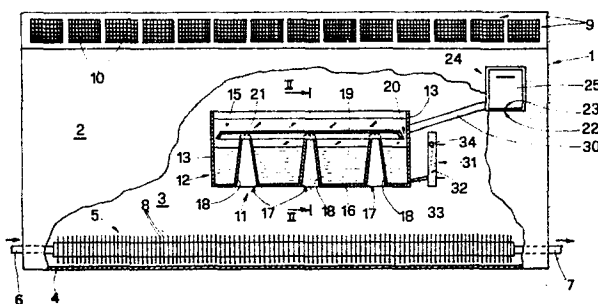
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Device for humidifying the air in plants for heating the environment.

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The air humidifier device 11 is designed to be placed inside groups that deliver hot air, such as convectors 1, unit heaters and the like, and it comprises a container 12 for water crossed, at least in part, by tubular elements 18 through the inside of which hot air can pass.

The inner surface of the container 12 is partially faced with panels 21 of a porous absorbing material. The said tubular elements 18 have overhead a concave cover 19, the concavity of which faces downwards and this is designed to direct the hot air towards the surface of the water in the container 12.



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Device for humidifying the air in plants for heating the environment

The invention relates to a device for humidifying the air in plants for heating the environment which can, in particular, be advantageously used in plants wherein the heating elements are constituted by convectors or unit heaters.

As is known, provision is not generally made by the manufacturers, in plants of the said type, for any device able to cause the humidification of the heated air which, not infrequently, is of a relative humidity such as to give the persons present in the area heated, excessive dryness in their respiratory organs.

A method frequently adopted to overcome the problem described consists in periodically opening the windows in the said area in order to recreate comfortable ambient conditions. The said solution is obviously not trouble free and is one that causes an increase in the running costs.

Another method that is used quite extensively is to place on the heating element, inside the metal box shaped body by which it is covered, a container filled with water.

This type of solution is not devoid of problems since the said container smothers the circulation of the air between the upper part of the heating element and the apertures through which the hot air is admitted into the environment, thereby decreasing the output of the plant. Furthermore, the checking of the amount of water present and the topping up of this necessitates removing one of the panels that encloses the convector, that is to say, performing operations that are none too easy since they are not foreseen as being customary by manufacturers of heating plants

of this type.

Ambient humidifiers for heating plants that have electrical resistances for causing the water contained in special
5 vessels to evaporate, are also known. The said devices give rise to a consumption of electricity that is not inconsiderable and, in addition, are somewhat costly because of their complexity.

10 The object of the invention is, therefore, to make available an ordinary non-costly device for humidifying the air that is able to be fitted easily to any convector or unit heater, or to be incorporated therein at the time the convector or unit heater is being manufactured.

15 A further object of the invention is to make available a device of the aforementioned type in which it is particularly easy both to check the amount of humidification water present and to top it up.

20 These and other objects too are all attained by the device according to the invention for humidifying the air in plants for heating the environment that comprise groups that deliver hot air, each of which incorporating the said
25 device in a position located, with reference to the path followed by the heated air prior to its being admitted into the environment, downstream of a corresponding heating element; the said device comprising at least one container connected to a water intake element accessible from the
30 outside of the group, and at least one tubular element that crosses the said container at least partially, placed in peripheral contact with the water present therein, through the inside of which hot air coming from the said heating element is able to pass; at least part of the inner sur-
35 faces of the said container being faced, at least partially,

with panels of porous absorbing material.

Further characteristics and advantages of the invention will become more apparent from the description that follows
5 of one preferred embodiment, given purely as an unlimited example on the accompanying drawings, in which :

- 10 - Figure 1 shows, diagrammatically and partially in sectional form, a convector provided with the device according to the invention for humidifying the air;
- Figure 2 shows, in a sectional view along a plane 11-11, the device depicted in Figure 1;
- Figures 3 and 4 show, in a lateral diagrammatic view partially in sectional form, one detail in Figure 1 depicted in two different operating conditions.
15

In Figure 1 is shown globally at 1 a convector, hereinafter also referred to as a group for the delivery of hot air, delimited at the front by a covering wall or front panel
20 2, and at the rear by a back panel 3.

A base wall 4 in the convector 1 supports, in a way not shown, a horizontal heating element 5, through which passes internally hot water taken thereto and there from via pipes
25 6 and 7, respectively, the former shown on the left and the latter on the right in Figure 1, terminating at a non illustrated boiler.

The actual heat exchanging surface of the heating element
30 5 is constituted by a plurality of vertical metal strips 8, placed side by side perpendicularly to the panels 2 and 3.

A plurality of apertures 9, one at the side of the other
35 and virtually rectangular, delimited by grids 10 and spread

at regular intervals over the full width of the said panel 2, are provided in the region of the upper part of the panel 2. Above the heating element 5 is provided a humidifier device 11, supported in a way that is not shown by
5 the panel 3.

The said device 11 comprises a container 12 that extends parallel to the base wall 4 with the flat part thereof perpendicular to the panels 2 and 3, and this is open at the
10 top and is defined on the four sides by two lateral walls 13 perpendicular to the panels 2 and 3, and by two walls 14 and 15 parallel to the latter and each facing one of the said two panels 2 and 3.

15 In a base wall shown at 16, the container 12 is provided with three circular apertures 17 spread uniformly there over. Above each aperture 17, as can also be seen in Figure 2, is placed a vertical tubular element 18 of truncated cone shape. The periphery of the widest end of this mates
20 with the edge of the corresponding aperture 17, to which it is imperviously connected. The upper extremity of each of the tubular elements 18 is located beneath the apex of the container 12, and is topped by a concave cover or deviation element 19 that is supported in a way not shown, with the
25 concavity pointing downwards. The dimensions of the cover 19 are such as to leave, between it and the lateral walls 13, 14 and 15 of the container 12, a virtually annular passage shown at 20.

30 Two panels 21 of felt, sponge or some other porous absorbing material are firmly attached to the inner surfaces of the container 12 on the walls 14 and 15, over the full transverse extension thereof, stretching from the base of the latter up to a level higher than that of the cover 19.

The righthand upper part of the panel 2 is provided with a virtually square opening 22, to one of the lower horizontal sides of which is pivoted, in a way not shown, a lower corner edge 23 of a water intake element 24, comprising a box 25 whose shape is virtually prismatic (see in this connection Figures 3 and 4). The said box 25 is delimited on two sides by two triangular walls 26 and 27 perpendicular to the panel 2, the sides of which converging towards the said corner edge 23 are jointed by the wall 28 (shown on the left in Figure 3) and by the wall 29 (shown on the right in Figure 4). In proximity of the corner edge 23, the wall 28 is provided with a non-illustrated hole, to which is connected one extremity of a tube 30 whose other extremity is connected to the container 12.

A level indicator 31, constituted by a vertical cylindrical container 32 that is closed at the bottom and is made of transparent material, is connected, low down, to the bottom part of the container 12 via a connecting pipe 33, and is housed inside the convector 1 in the region of a vertical display slit that is not shown but is made in the panel 2. The surface of the cylindrical container 32 is provided with a non-illustrated graduated scale, and internally with a float 34 designed to indicate on the said graduated scale the amount of water present in the container 12.

In use, the intake of water into the container 12 is effected through the box 25, once it has been made to rotate around the corner edge 23 in order to carry it from the position shown in Figure 3 to that shown in Figure 4. During the operation of the convector 1, part of the air heated by the heating element 5 passes, while moving upwards towards the apertures 9, inside the tubular elements 18 and is deviated by the cover 19 towards the surface of the water present in the container 12 and towards the panels

21 which, due to capillarity phenomena, are damp even in the areas over which the water does not glide. The hot air, thus humidified, then reaches the environment, passing through the apertures 9.

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Naturally, leaving unchanged the principles of the invention, numerous are the modifications it would be possible to make to the device as described without in any way deviating from the framework of protection afforded to the invention.

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For example, in order to increase the evaporation surface of the panels 21, the container 12 can be of any shape, or be substituted by a number of smaller containers, side by side and interconnected, all having the inner lateral walls
15 faced with absorbing material. Furthermore, the number and the shape of the tubular elements 18 can differ from what has been stated by way of an example, and the said porous absorbing material facing can be placed, additionally
20 or alternatively to that provided on the inner surface of the container 12, on the periphery of the said tubular elements 18.

Claims:

1. Device for humidifying the air in plants for heating the environment that comprise groups that deliver hot air, each of which incorporating the said device in a position located, with reference to the path followed by the heated
5 air prior to its being admitted into the environment, downstream of a corresponding heating element; the said device being characterized by the fact that it comprises at least one container 12 connected to a water intake element 24 accessible from the outside of the said group, and at least
10 one tubular element 18 that crosses the said container at least partially, placed in peripheral contact with the water therein, through the inside of which hot air coming from the said heating element is able to pass; at least part of the inner surfaces of the said container being faced, at least
15 partially, with panels 21 of porous absorbing material.
2. Device according to Claim 1, characterized by the fact that the said tubular element crosses the said container between two areas at a different level.
20
3. Device according to Claim 2, characterized by the fact that it comprises, furthermore, at least one hot air deviation device placed facing an upper extremity of the said tubular element, defining for the said hot air an obligatory path that flanks the said panels and the surface
25 of the water present in the said container.
4. Device according to any one of the preceding claims, characterized by the fact that the said water intake element is placed on a covering wall of each of the said groups
30 that deliver hot air, and comprises a box connected to the said container.

5. Device according to any one of the preceding claims,
characterized by the fact that it comprises in each of the
said groups that deliver hot air, a water level indicator
connected to the said container and mounted so that it is
5 visible from the outside of the said group.

