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(54) **Device for heating and/or drying surfaces**

(57) A device (1; 20) for heating and/or drying surfaces (S) is disclosed, which comprises a pair of radiant electrodes (2, 3) mutually separated and turned towards said surface to be dried (S) and an oscillator (4) electri-

cally connected to said electrodes (2, 3). The electrodes (2, 3) and the oscillator (4) are supported by a driving structure (7; 21) for its movement above said surface to be dried and/or heated (S).

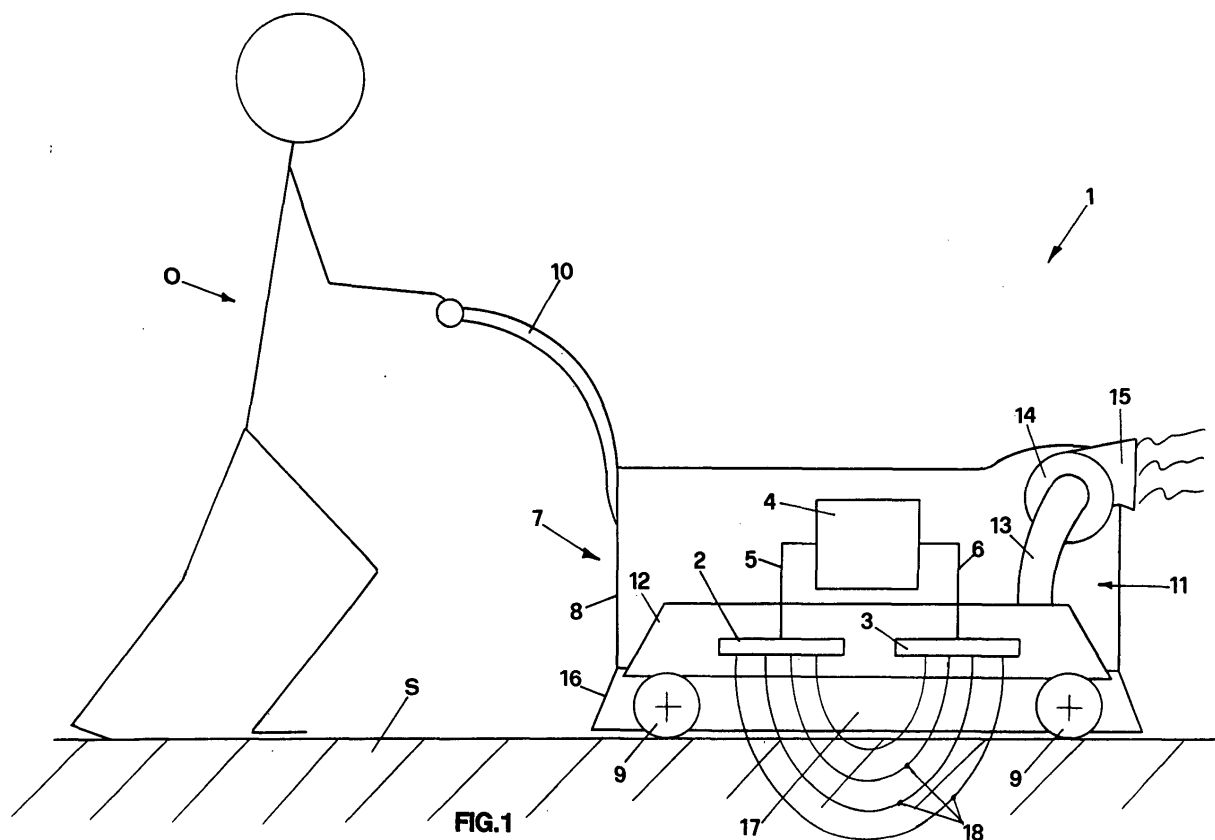


FIG.1

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Description

[0001] The invention is about a device for heating and/or drying surfaces such as, for example, concrete castings, plastered surfaces, grounds and other surfaces.

[0002] It is known that the drying of surfaces like for example buildings' plastered walls or steel concrete castings, usually takes place spontaneously with the natural evaporation of the water and thus requires a fairly long time.

[0003] In such cases the drying operation is accelerated by stirring with fans the air of the environment wherein the surface to be dried is found and if necessary also by heating the same environment, for example through hot air generators.

[0004] It is understood that the operation turns out to be long anyway as well as costly because the water evaporation times from inside of the structure can not be accelerated beyond a certain limit because the circulation of air and the heating involve only the outer part of the surface to be dried.

[0005] Furthermore, when the surface to be dried is found in an open room, like for example a concrete casting carried out outdoor or on the ground, it is not possible to speed up the drying by heating the ambient air and even the drying time is heavily affected by the environmental conditions wherein the surface to be treated is found.

[0006] The present invention intends to solve such inconveniences.

[0007] More specifically, it is one of the invention's objects that of making a drying device which would reduce the surface drying times.

[0008] It is another object that the device of the invention can be used both for horizontal and vertical or even slanted walls.

[0009] The last but not least object is that the drying device can be used in any environment and with any operative condition.

[0010] Said objects are achieved by a device for heating and/or drying surfaces that in line with the main claim is characterized by comprising:

- at least a pair of radiant electrodes mutually separated and turned towards said surface to be dried;
- at least an oscillator electrically connected to said electrodes,

said electrodes being at least supported by driving means fit to move them above said surface.

[0011] According to an operative preferred embodiment, the drying device is equipped also with suction means of the steam created by the heating operation.

[0012] According to a preferred embodiment, the invented device is equipped with a driving structure of the trailer-mounted kind in order to be easily moved onto horizontal surfaces such as floors, concrete castings and similar surfaces.

[0013] According to another preferred embodiment, the invented device is equipped with a driving structure, it too being trailer-mounted and equipped with vertical rods which allow their upwards and downwards movement in order to use it for drying vertical or slanted surfaces.

[0014] Advantageously the drying device of the invention, by using the radiofrequency, allows a drying which is even deeper than that achieved through the natural evaporation or accelerated by ventilation means.

[0015] Yet more advantageously, the drying quality which is carried out is considerably better and more homogeneous compared to the spontaneous natural drying.

[0016] Even more advantageously, the invented device allows to make immediately operative on the surfaces all those works that must be carried out with the drying already occurred and that otherwise should be moved forward in time.

[0017] Yet advantageously, the invented device can also be used for heating grounds in order to either sanitize them or reduce their bacterial load.

[0018] Said objects and advantages will be better highlighted in an explanatory but not limiting way during the description of a preferred embodiment of the invention with reference to the annexed drawings, wherein:

- Figure 1 is a longitudinal section of a preferred embodiment of the drying device of the invention;
- Figure 2 shows an operative preferred embodiment of the drying device of the invention;
- Figure 3 is a lateral view of the invented drying device of Figure 2.

[0019] The drying device of the invention is shown through an operative preferred embodiment in Figure 1 where is generally indicated with 1.

[0020] One can see that the device comprises radiant electrodes, in this case consisting of a pair of plates 2, 3 mutually separated and turned towards the surface to be dried S, and an oscillator 4 which is electronically connected to said plates through conducting means 5, 6.

[0021] It must be noticed that the radiant electrodes, instead of being made of plates, they can also be made of bars.

[0022] The plates 2, 3 and the generator 4 are supported by a driving structure, generally indicated with 7, which comprises a carter 8 resting on the ground through wheels 9 and equipped with a handle 10.

[0023] The drying device thus takes up a trailer shape which can be easily moved with a push onto the surface to be dried S by an operator O.

[0024] Inside the carter 8 a suction unit, generally indicated with 11, is also defined, which comprises a hood 12 placed for covering the plates 2, 3 that, through a conduit 13, is connected to a suction fan 14 whose delivery hole 15 is turned towards the outer environment.

[0025] The lower part of the carter 8 has flexible plates 16 along the perimeter turned to skim the surface to be dried S, having the double function of isolating the zone 17 comprised between the plates and the surface to be dried and also of preventing the dispersion into the outer environment of the radiofrequency.

[0026] Operatively, when the oscillator 4 is turned on, it feeds the plates 2, 3 with electrical power, preferably but not necessarily at a frequency of 27MHz.

[0027] The plates 2, 3 act like a capacitor's plates and generate an electric field diagrammed by the flow lines 18. The field closes itself through the surface to be dried S, by heating it and thus causing the evaporation of the humidity therein.

[0028] Advantageously, the use of radiofrequency and more specifically of frequency ranges of 27 MHz allows the deep heating of various thicknesses according to the power used.

[0029] As a result, a quick and deep heating is accomplished and the surface can thus be made immediately available for further works even a short time after the completion of its installation. This involves a considerable advantage, mostly regarding the total operating time that is thus shortened.

[0030] An operative embodiment of the invention is shown in figure 2 where the drying device is generally indicated with 20 and differs from the just described drying device because the driving structure, generally indicated with 21, in this case consists of a base 22, equipped with wheels 23, from which vertical rods 24 depart that support a carter 25. Inside the carter 25 the radiant electrodes are comprised, also in this case made of conducting plates 2, 3, the oscillator 4 and the suction unit 11.

[0031] The upward or downward movement according to the opposed directions indicated by the arrow 26 of the carter 25 along the vertical rods 24 could take place, for example, through state of the art driving means.

[0032] Also the horizontal movement according to both directions indicated by the arrow 27 could take place through state of the art driving means or even manually with a push by an operator.

[0033] In the previously described embodiment, the drying device of the invention can be usefully employed for drying plastered surfaces or panelled walls or laid by other coverings, for example through resins.

[0034] As an alternative, the invented device can also be used in order to carry out the simple heating, for example of a ground in order either to sanitize it or to eliminate its bacterial load.

[0035] Similarly, the device of the invention can be used for any other kind of use that would require the heating or drying of a common surface.

[0036] The drying device of the invention can also be made according to other embodiments that can provide for different driving structures, particularly fit to make it available to other applications like for example the dry-

ing of either slanted walls or ceilings.

[0037] Similarly, the device of the invention can also be supported by other driving structures fit to move it onto differently shaped surfaces.

[0038] Obviously, no matter through what embodiment the device is carried out, it can be equipped with whatever number of conductive plates. Furthermore the oscillator will have variable power according to the use which is doomed.

[0039] Further embodiments of the device of the invention, different from those previously described, and other possible ones, should be all considered protected by the present patent if falling within the scope of the following claims.

Claims

1. A device (1; 20) for heating and/or drying surfaces (S), **characterized by** comprising:

- at least a pair of radiant electrodes (2, 3) mutually separated and turned towards said surface to be dried (S);
- at least an oscillator (4) electrically connected to said electrodes (2, 3);

said electrodes (2, 3) being at least supported by a driving structure (7; 21) fit to move them above said surface (S).

2. The device (1; 20) according to claim 1), **characterized in that** said driving structure (7; 21) also supports said oscillator (4).

3. The device (1; 20) according to claim 1) or 2), **characterized by** also comprising a suction unit (11) of the steam from the drying zone (17) comprised between said electrodes (2, 3) and said surface to be dried (S).

4. The device (1; 20) according to claim 3), **characterized in that** said suction unit (11) comprises a hood (12) placed above said electrodes (2, 3) and connected to a conduit (13) through a suction fan (14) whose delivery hole (15) communicates with the outer environment.

5. The device (1) according to any of claims 1) to 3), **characterized in that** said driving structure (7) comprises a carter (8) equipped with wheels (9) and of an actuation handle (10).

6. The device (1) according to claim 5), **characterized in that** on the perimeter of said carter (8) shielding plates (16) are placed, turned towards said surface to be dried (S), and are arranged to skim such surface.

7. The device (20) according to any of claim 1, **characterized in that** said driving structure (21) comprises a base (22) resting on the ground through wheels (23), equipped with vertical rods (24) along which a carter (25) slides wherein said pair of electrodes (2, 3), said oscillator (4) and said suction unit (11) are comprised. 5
8. The device (1; 20) according to any of the previous claims, **characterized in that** said radiant electrodes are made of plates (2, 3). 10
9. The device (1; 20) according to any of claims 1 to 7, **characterized in that** said radiant electrodes are made of radiant bars. 15

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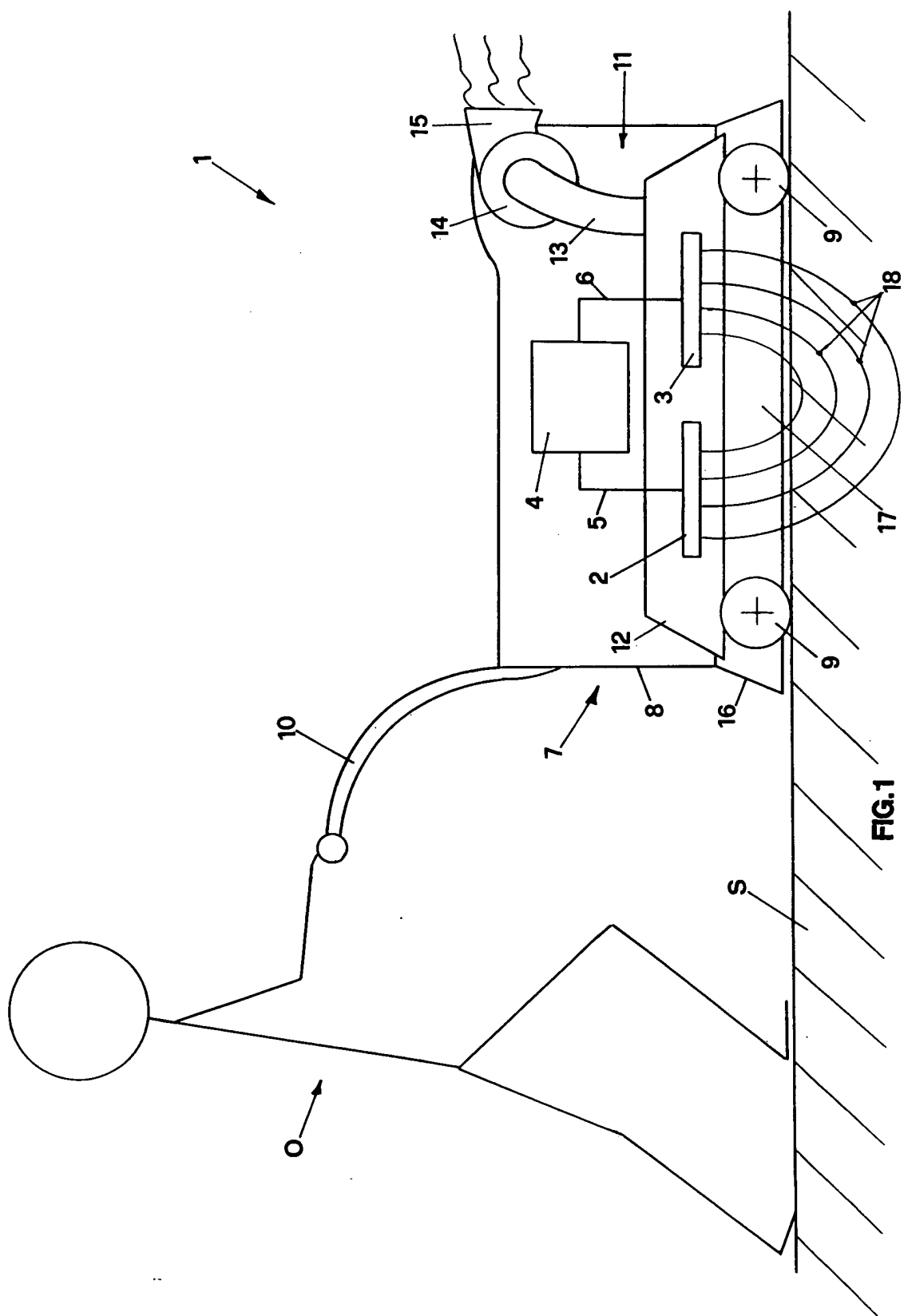
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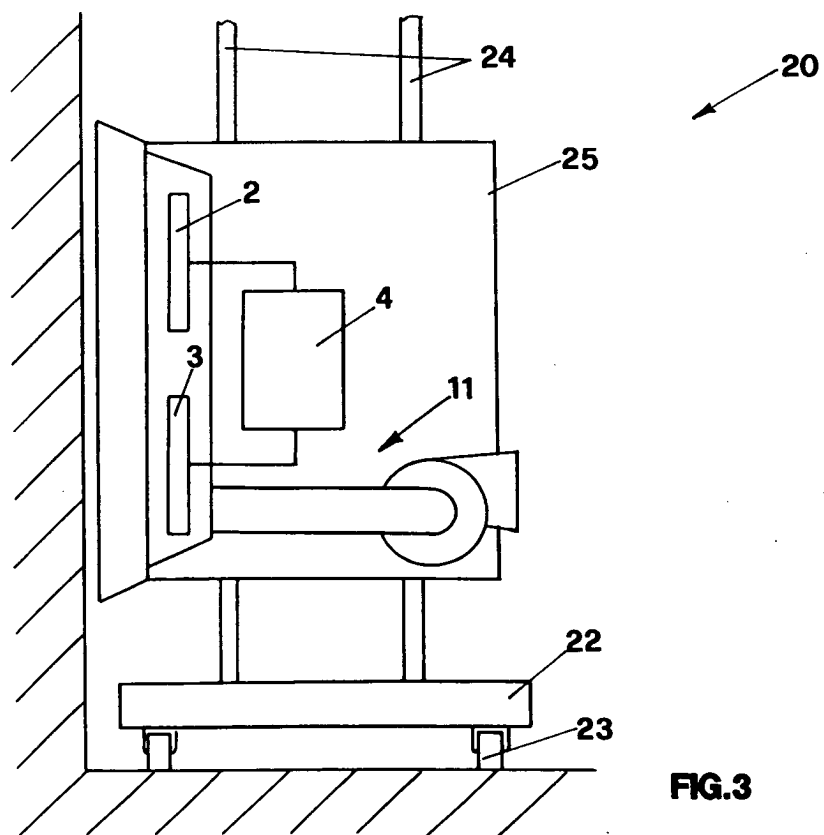
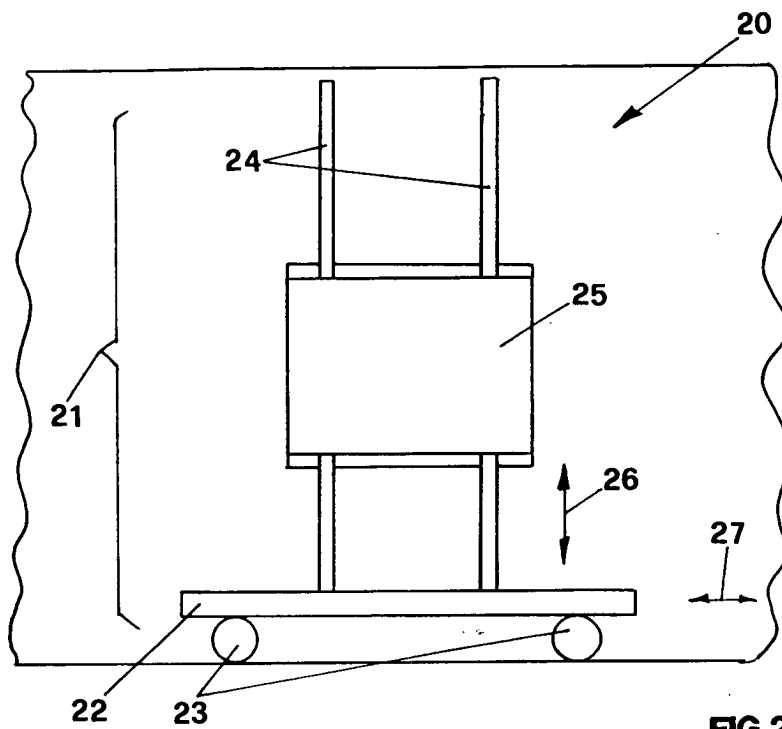
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Place of search		Date of completion of the search	Examiner
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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