Steam and hot air generating apparatus for use in shower cubicles or the like

Apparatus for the production of steam and the delivery thereof into a closed environment for the purposes of a Turkish bath, of the type basically comprising a water tank (22) that is provided with heating means (36) and that is connected to a steam outlet head (26). The apparatus also comprises a station for the production of hot air that is connected, simultaneously with the steam delivery head (26), to the inside of the closed environment (10).
Description

The present invention relates to an apparatus for the simultaneous generation of steam and hot air that can be used especially in a shower cubicle for a Turkish bath.

To be more precise the present invention relates to an apparatus that is applicable especially, although not exclusively, to a shower cubicle for a sauna or Turkish bath, and by means of which there are generated and conveyed into the interior of the cubicle the steam for effecting a Turkish bath and hot air for suitably air-conditioning the entire internal volume of the cubicle, rendering the internal temperature uniform.

In the present description, purely for the sake of simplicity of explanation and illustration, reference will be made to the application of the apparatus according to the invention to a shower cubicle, but it will be appreciated that, typically, the apparatus in question can be used advantageously also inside any closed environment used for saunas or Turkish baths.

Various types of apparatus for the generation of steam for the purposes of a Turkish bath are known and naturally they all have in common the provision of means for heating the water contained in a tank which is in communication with or is connected to the inside of the cubicle when the water has reached vapourisation temperature.

It is also known that conventional apparatuses have in common, in addition to the obvious feature above, the not inconsiderable disadvantage that, especially in the first stage in which the steam is introduced into the cubicle, the environment is not at a temperature comfortable for the user, that is to say, in practice it is at a temperature that is substantially equal to or at any rate corresponds to that prevailing outside the cubicle, and therefore the discharge of steam, which is at a substantially higher temperature than the ambient temperature, creates a stratified temperature gradient which differs in the various regions of the cubicle.

The above disadvantage is also accentuated by the fact that the time necessary for the cubicle to reach operating temperature is generally rather long and therefore the user's discomfort is consequently increased.

A technical solution which remedies the above disadvantages efficiently and completely has not been provided hitherto and therefore it is still necessary to set the shower cubicle in operation and wait the required time for its internal environment to reach operating conditions, that is to say, an acceptable temperature, and, finally, the user can enter the cubicle in order to use it. In any case, under operating conditions, the above-mentioned disadvantage of the varying temperature in the various regions arises, although to a lesser extent.

An apparatus that is applicable especially to a shower cubicle for the purposes of a Turkish bath and that enables the disadvantages of traditional apparatuses to be eliminated has now been provided and therefore constitutes the subject-matter of the present invention.

One of the principal aims of the present invention is therefore to provide an apparatus of the type mentioned above by means of which it is possible to use the cubicle without the above disadvantages which are reduced to a minimum.

A further aim of the present invention is to provide an apparatus as indicated above which, in accordance with the above advantages, is provided with means that enable the internal environment of the cubicle or the like to be heated rapidly and uniformly.

The present invention therefore relates to an apparatus for the generation and admission of steam into a shower cubicle or the like, of the type comprising a water tank connected or connectable to the inside of the cubicle when heating means associated with the tank have heated the water to vapourisation temperature, characterised in that the portion of the tank with which the heating means are associated is accommodated inside a chamber or shell sealed with respect to said portion of the tank and communicates on the one hand with air-intake means and, on the other hand, with a nozzle for the delivery of hot air.

The features and advantages according to the present invention will become clear from the following detailed description of a non-limiting embodiment of the apparatus, which description will be given with reference to the appended drawings in which:

Figure 1 is a diagrammatic side view representing a shower cubicle provided with the apparatus according to the present invention;
Figure 2 is a diagrammatic plan view of the apparatus according to the invention;
Figure 3 is a diagrammatic side view in longitudinal section of the apparatus according to the invention;
Figure 4 is a side view of the apparatus forming the subject-matter of the invention viewed in the direction of arrow F of Figure 3; and
Figure 5 is a partly sectional diagrammatic plan view of the apparatus forming the subject-matter of the invention.

Referring first of all especially to Figure 1, the drawing shows a shower cubicle represented diagrammatically and generally indicated 10 which is provided in known manner, on its upper wall, with a shower delivery head 12 and, on one of its side walls, with shower delivery nozzles 14 which can be operated simultaneously or in alternation with the delivery head 12.

The apparatus according to the invention, which is not illustrated in detail in Figure 1 and which is represented diagrammatically by a rectangle marked with the reference 16, is associated with the shower cubicle 10, among other things known per se, and, as shown in the Figure, is connected to the inside of the cubicle 10 by
means of a pair of ducts 18, 20 of which the function will be explained and described in detail hereinafter.

Referring now to Figures 2 to 5, a detailed description will be given of the apparatus according to the present invention in one of its non-limiting embodiments to which, of course, structurally equivalent variants which naturally form part of the innovative concept of the present invention can be introduced.

Referring to the above-mentioned Figures, it can be seen that the apparatus according to the invention comprises, on a fixed frame that is to be arranged on a wall in a manner not shown, a water tank generally indicated by the reference 22, which may be in any desired form given that this feature in no way limits the invention. The tank 22 is connected, by means of a tube 24, a drain 28 which is provided with a discharge valve 30, and a cylindrical body 23, to a steam-conveying head 26 or delivery nozzle.

The steam-conveying head 26 is, in the illustrated embodiment, substantially cylindrical and its longitudinal axis is substantially vertical. The head is connected to the cylindrical body 23 which is surrounded over its entire height by a cylindrical wall 32 which delimits an annular shell or chamber 34 surrounding the body 23.

Fitted on the cylinder 23 are water-heating means which, in the embodiment in question, are constituted by an electrical resistive element 36 which is wound substantially in the form of a cylindrical helix on the cylinder 23 and which is connected in known manner (not shown) to a source of electrical power (also not shown) which is activated each time the cubicile 10 is to be used.

According to one of the principal features of the apparatus forming the subject-matter of the invention, the annular chamber 34 is connected to means, generally indicated 38, for sucking in air and conveying it to its interior. In the embodiment under consideration, those means comprise a rotor 40 which is connected at the outside to the atmosphere by means of an opening 42 through which it sucks in air. The rotor 40 is actuated by an electrical motor 44 as can be seen in detail, also as regards the previous particulars, by studying Figure 5.

The rotor 40 is connected by means of a pipe 46 to the inside of the annular chamber 34 into which air is therefore conveyed. An air-purifying filter, which is very useful in this particular application, is optionally provided on the opening 42 of the rotor 40 or on the air-inlet duct 46.

As is shown especially in Figure 3, the tank 22 is supplied by a duct for conveying water, marked by the reference 48, which is connected in any desired conventional manner (not shown) to a solenoid valve (not shown) for supplying water.

The tank 22 is also provided with a float war-level regulator 50 of a type known per se which controls the opening and closing of the solenoid valve for supplying water.

Finally, the tank 22 is provided with an overflow tube 52 which constitutes a safety device ensuring that water is conveyed away in the case of breakdown of or damage to the control system that is to say, especially the float device 50 or the above-mentioned solenoid valve of the duct 48.

As is shown especially in Figures 4 and 5, the apparatus forming the subject-matter of the invention also comprises a safety thermostat 54 which is connected in any desired known manner to the resistive element 36 and which has the function of intervening if a breakdown or defective operation causes the temperature of the resistive element to rise excessively with consequent risk to the components of the apparatus which, preferably, are produced from plastics material.

Referring now to Figure 3, it can be seen that the steam outlet from the head 26 has a cap 56 having the function of preventing any splashes of boiling water or at any rate a rush of steam incorporating water from being discharged suddenly from the head 26 and striking the user.

As is shown especially in Figures 3 and 4, the steam outlet 19A is connected by means of the duct 18 to the inside of the shower cubicile 10 and the outlet 20A for the air coming from the chamber 34 is also connected to the inside of the cubicile 10 by means of the duct 20 so that the hot air is caused to pass into the interior of the cubicile 10.

Figure 3, in particular, shows the extreme compactness of the apparatus, especially owing to the position of the rotor 40 which is arranged at a recessed portion of the tank 22 and the overall space requirement of the apparatus is consequently reduced thereby.

In addition, the apparatus can be rapidly and readily cleaned of any calcareous residues owing to the fact that it is possible to dismount the drain 28 and the discharge valve 30 because they are connected by a bayonet coupling to an attachment element 53 secured to the body 23 and also owing to the fact that the tube 24 is produced from flexible material, for example rubber, which is readily removable to leave free access to the inside of the duct in order to clean it.

The above description makes clear the advantages deriving from the use of the apparatus according to the invention, the principal of which can be summarised as indicated below:

1) substantial reduction in the time necessary to heat the inside of the cubicile 10 or in any case to beat the internal environment of the cubicile rapidly and uniformly;
2) structural simplicity of the apparatus and therefore modest costs for its production;
3) extreme compactness of the apparatus, especially owing to the position of the rotor 40 which, as is shown in Figure 3 especially, is arranged at a recessed portion of the tank 22 and the overall space requirement of the apparatus is consequently reduced thereby;
4) cleaning and/or disinfection of the apparatus at the end of each use owing to the opening of the discharge valve 30 at the end of the cycle;
5) ease of cleaning the apparatus because it is possible to dismount the drain 28 and the discharge valve 30.

Finally, it will be appreciated that variants and/or modifications that are equivalent in terms of structure and design could be introduced to the apparatus according to the present invention without thereby departing from its scope of protection.

Claims

1. Apparatus for the production of steam and the delivery thereof into a closed environment for the purposes of a Turkish bath, of the type basically comprising a water tank (22) that is connected to a steam outlet head (26) and that is provided with heating means (36), characterised in that it also comprises a station for the production of hot air that is associated with the portion of the tank (22) provided with said heating means (36) and that is likewise connected to the inside of the closed environment (10).

2. Apparatus according to claim 1, characterised in that the air-heating station comprises a shell (32) surrounding the steam delivery head (26) which is connected on one side to the outside of the closed environment (10) by means of a circuit comprising air-intake means (40) which are connected to the inside of the shell (34) which is in turn connected to the inside of the closed environment (10).

3. Apparatus according to claim 2, characterised in that the means for sucking in air from outside the closed environment (10) comprise a rotor (40), the outlet of which is connected substantially in the region of the lower end of the steam delivery head (26).

4. Apparatus according to claim 3, characterised in that the air-intake means (40) are arranged between a recessed portion of the water tank (22) and the steam delivery head (26).

5. Apparatus according to claim 3, characterised in that at least one filter for the air sucked in is inserted on the inlet duct of the intake means (40).

6. Apparatus according to claim 2, characterised in that the means (36) for heating water and air are arranged outside the steam delivery head (26) and inside the associated shell (34) for the passage of air.

7. Apparatus according to claim 1, characterised in that at least one of the ends of a duct (24) connecting the water tank (22) to the steam delivery head (26) is releasably connected to the lower end of the latter.