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(54) **Ozonization system in closed environment**

(57) System for the controlled introduction of ozone into a shower cubicle constituting a closed, or substantially closed, environment (10) equipped with assisted ventilation able to prevent saturation thereof.

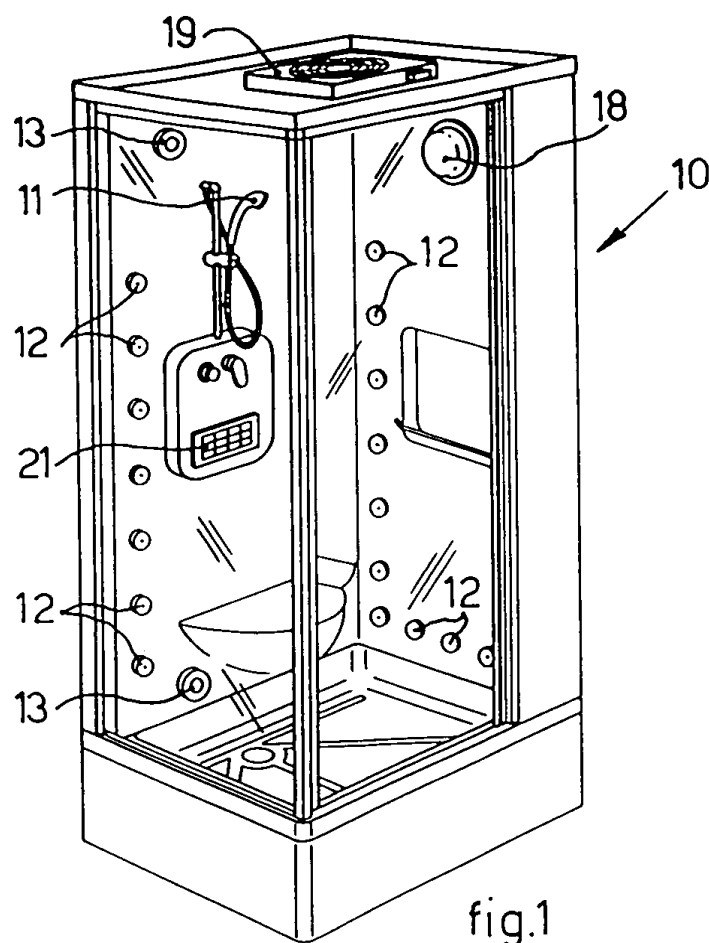


fig.1

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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a system for the controlled introduction of ozone into a closed or substantially closed environment, such as a shower cubicle, which provides assisted ventilation connected thereto, able to prevent the saturation of the environment itself.

[0002] The ozone is introduced when the shower is being used by the user both continuously, and also at pre-set intervals of time.

BACKGROUND OF THE INVENTION

[0003] The state of the art includes the use of ozone associated with oxygen, air and water, both for therapeutic functions and also to sterilize water.

[0004] With therapeutic functions, the ozone is used for dermatological purposes.

[0005] The state of the art also includes the use of ozone with vaporized water, for health purposes.

[0006] The state of the art also includes the use of ozone in baths, such as hydromassage baths. Unlike normal bath tubs, in hydromassage baths the continuous delivery of air allows to release the ozone during use, that is, after the bath has been filled.

[0007] The state of the art includes the use of ozone both in equipped centers such as aesthetic centers or health centers, but also in the domestic field when it is used for all the sterilizing functions known today, such as for example to make water drinkable, to clean also bath tubs located outside, etc.

[0008] In addition, the state of the art also includes the use of ozone in agriculture and in other industrial applications.

[0009] In fact, ozone is used both in rinsing fruit and/or vegetables which have been picked, in fish farming and in farms for other marine animals.

[0010] Due to its properties, when ozone is applied, the products are cleaned, the presence of bacteria is reduced, infections diminish and the development of the products is increased.

[0011] So that ozone can be applied to the water continuously, it must be transported therein in some way.

[0012] There are substantially two conventional solutions: one provides to introduce the ozone - also in the form of an ozone-oxygen or ozone-air mix - when the water is flowing ("Venturi effect"), the other when air is added to the water.

[0013] Conventional applications, however, have always had one disadvantage which has greatly limited the use of ozone.

[0014] Beyond certain limits fixed by national and international laws, ozone, being a noxious gas, cannot be used in closed or substantially closed environments due to its high level of toxicity.

[0015] Its use, therefore, has always been limited to

open spaces.

[0016] The present Applicant has devised, tested and embodied this invention which solves the problem of introducing ozone into closed environments and also entails other advantages.

SUMMARY OF THE INVENTION

[0017] The invention is set forth and characterized in the main claim, while the secondary claims describe variants of the invention.

[0018] The invention embodies a system for the controlled introduction of ozone into closed or substantially closed environments, such as a shower cubicle, which provides an assisted ventilation able to prevent the environment from becoming saturated, the environment being equipped with at least a ventilator.

[0019] The ozone is introduced into the closed or substantially closed environments such as for example a shower cubicle, sauna, etc. both while the user is using the environment and also before or after such use in order to sterilize the environment. The ozone can be introduced both continuously and at pre-set intervals of time, during the delivery of the water, since water is an aggregating element and transports the ozone inside the closed or substantially closed environment.

[0020] The environment inside which the ozone is introduced also has at least a point of light which signals that ozone is being introduced.

[0021] In a further variant of the invention there is at least a sensor inside the closed environment to detect the presence of the ozone.

[0022] The sensor, suitably programmed to detect the saturation level of the environment, automatically commands the delivery of ozone to be deactivated once the pre-set maximum level of ozone has been reached.

[0023] According to a variant, the sensor is connected to the intake system, so that the latter is driven proportionally to the quantity of ozone in the environment.

[0024] According to another variant, the functioning of the intake system is coordinated to the quantity of ozone present in the environment and programmed to maintain a pre-set or pre-fixed value.

[0025] The ozone can be introduced into the closed environment at any point whatsoever where water is delivered, also in nebulized or vaporized form, as nebulizers or vaporizers are provided inside the environment concerned.

[0026] In a further variant of the invention there is a command inside the environment concerned which allows the user to program, on each occasion, the introduction of the ozone, indicating the quantity, time and zone.

[0027] According to a variant, the user can program the level, or maximum and/or minimum quantity of ozone in the environment.

[0028] In a further variant, said functions can be programmed in combination with each other.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The characteristics of the present invention will be apparent from the following description of a preferential form of embodiment, given as a non-restrictive example, with reference to the attached drawings wherein:

- fig. 1 shows a shower cubicle according to the invention;
- fig. 2 shows a detail of the ozone introduction system;
- fig. 3 shows a detail of the roof of the shower cubicle according to the invention.

DETAILED DESCRIPTION OF PREFERENTIAL FORM OF EMBODIMENT OF THE INVENTION

[0030] Fig. 1 shows an ordinary shower cubicle 10 inside which delivery of water is provided either by means of at least a tap 11, or by means of at least a nebulizer or vaporizer 12.

[0031] The possibility of delivering water inside the shower cubicle 10 allows to introduce the ozone.

[0032] The delivery is obtained by making the particles of ozone aggregate with those of the water as shown in fig. 2.

[0033] In a preferential place, a conventional ozone generator 17 is connected to the water pipe 14 which supplies the shower cubicle 10, by means of a Venturi connection 16.

[0034] The ozone generator 17 is commanded by the function command 21 provided inside the shower cubicle 10.

[0035] The function command 21 is able to at least program the quantity of ozone to be introduced into the environment, the introduction time, which can also be divided into several temporal spaces, and the introduction zone inside the shower cubicle 10, being equipped with the elements necessary to command the programmed functions of a shower cubicle. All these functions can be operating in combination together.

[0036] In addition to the above, the shower cubicle 10 is equipped with at least a sensor 13, while in this case two sensors 13a and 13b are shown, able to detect the quantity of ozone present in the environment.

[0037] The sensors 13 are programmed to activate, that is, to modulate the delivery of ozone in the water, directly commanding the ozone generator 17.

[0038] As shown in fig. 3, the shower cubicle 10 is also equipped with at least a ventilator 19, in this case installed on the roof 20, and at least a point of light 18.

[0039] The ventilator 19 is programmed to be activated in combination with the introduction of the ozone into the environment, that is, when it reaches a minimum and maximum threshold value, and hence allows to control the quantity of ozone present in the environment.

[0040] The speed of the ventilator 19 can be controlled for example by the sensors 13, so as to cancel its

intake capacity according to the level of ozone present inside the environment.

[0041] The point of light 18, on the contrary, allows the user to understand that ozone is aggregated to the water delivered.

[0042] The point of light 18, which is automatically activated when ozone is introduced into the water, allows the user to visually understand that ozone is introduced, and its intensity varies as the quantity of ozone present in the water varies.

Claims

1. System for the controlled introduction of ozone, **characterized in that** said introduction occurs in a shower cubicle constituting a closed, or substantially closed, environment (10), said environment (10) providing an assisted ventilation able to prevent saturation of the environment.
2. System as in claim 1, **characterized in that** said introduction occurs continuously.
3. System as in claim 1, **characterized in that** said introduction occurs at pre-set intervals of time.
4. System as in any claim hereinbefore, **characterized in that** at least a ventilator (19) is automatically started when the ozone is introduced, or when a minimum level is reached.
5. System as in any claim hereinbefore, **characterized in that** it provides sensors (13) able to detect the presence of ozone in said environment (10).
6. System as in claim 4, **characterized in that** said ventilator (19) is associated with the sensors (13) which condition its extraction capacity as the quantity of ozone present in the environment (10) varies.
7. System as in any claim hereinbefore, **characterized in that** at least a point of light (18) lights up automatically when the ozone is introduced, or when a minimum level is reached.
8. System as in claim 7, **characterized in that** said point of light (18) is associated and varies in intensity with the variation in the quantity of ozone present in the environment (10).
9. System as in any claim from 5 to 8 inclusive, **characterized in that** said sensors (13) are programmed to interrupt the introduction of ozone when the pre-set maximum value is reached.
10. System as in any claim hereinbefore, **characterized in that** it is equipped with means to program

on each occasion the quantity of ozone to be introduced.

11. System as in any claim hereinbefore, **characterized in that** it is equipped with means to program the minimum and/or maximum level of ozone in the environment (10). 5
12. System as in any claim hereinbefore, **characterized in that** it is equipped with a command which allows to program on each occasion the time for which the ozone is introduced. 10
13. System as in any claim hereinbefore, **characterized in that** it is equipped with a command which allows to program on each occasion the zone in which the ozone is introduced 15
14. System as in claims 10, 11, 12 and 13, **characterized in that** said functions can be coordinated to be operating in combination with each other. 20

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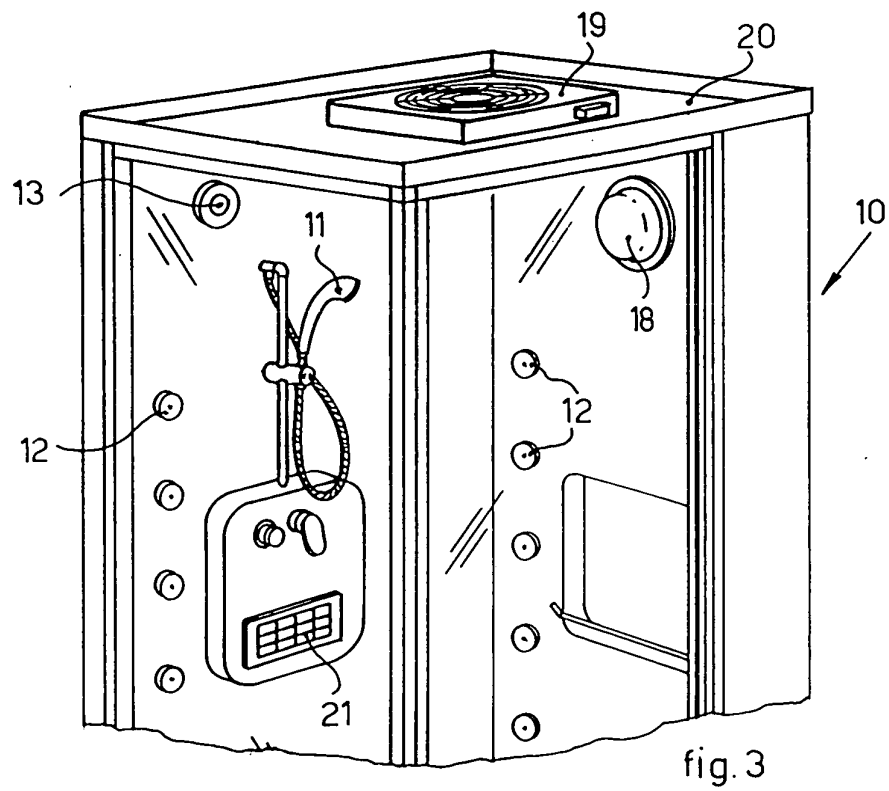
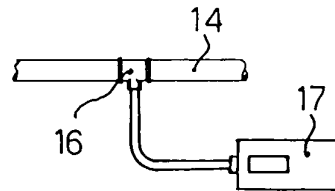
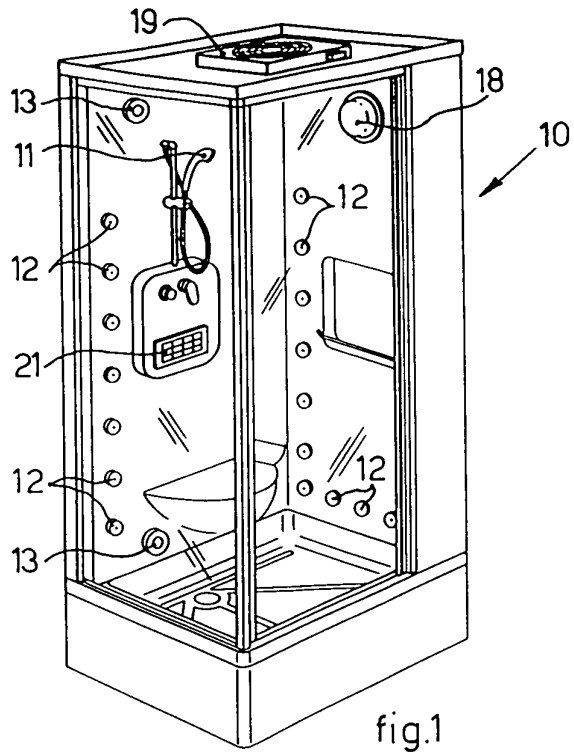
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EUROPEAN SEARCH REPORT

Application Number
EP 03 00 2442

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	DE 199 02 003 A (WEYERGANS) 5 August 1999 (1999-08-05) * the whole document *	1	A47K3/30 A61H33/14
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24 April 2003	Examiner Clasing, M
CATEGORY OF CITED DOCUMENTS 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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 00 2442

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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24-04-2003

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