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(71) Applicant and

(72) Inventor: **BARRO, Giovanni** [IT/TT]; Via B. Croce, 70/A,
I-31040 Conegliano (IT).

(74) Agent: **DA RIVA, Ermanno**; B.D.R. Agenzia Brevetti
"Pordenone" S.r.l., Viale Grigoletti, 90/B, I-33170 Porde-
none (IT).

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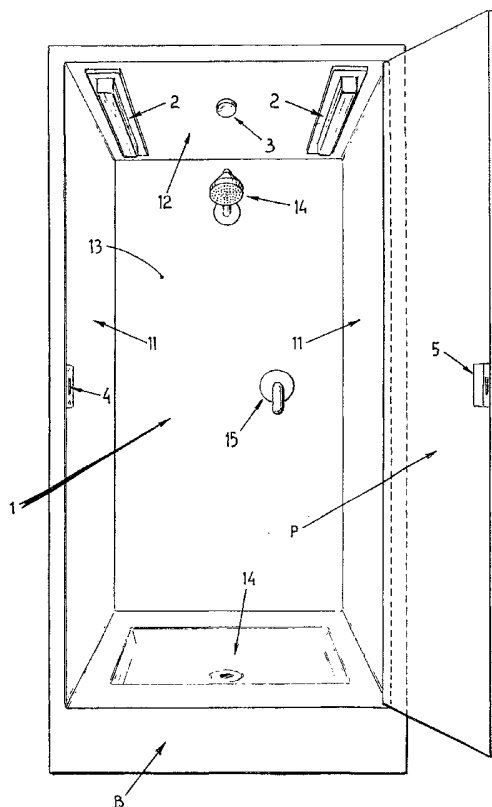
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(54) Title: SYSTEM FOR SANITIZING ENVIRONMENTS, APPLICABLE IN PARTICULAR FOR SANITIZING SMALL EN-
VIRONMENTS AS SHOWER CUBICLES AND THE LIKE



(57) Abstract: System for sanitizing environments, applicable in particular for sanitizing small environments as shower cubicles (1). Sterilizing means (2) or germicidal/bactericidal means, which are substantially constituted by suitable UV lamps (2) commonly called "germicidal lamps", are applied in said environments. Said sterilizing means are provided with control means (3-4-5) which permit the activation of the lamp only when said environments are not occupied by persons and/or when the entrance door of said environments is closed.

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- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*
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System for sanitizing environments, applicable in particular for sanitizing small environments as shower cubicles and the like.

Description

The present invention pertains to a system for sanitizing small and mixed use environments, as shower cubicles, baths, toilets, dressing boxes and the like, which is substantially constituted by the application of electromagnetic waves at a suitable ultraviolet radiation frequency (practically the so called "germicidal lamps") in order to destroy the bacterial load in the above mentioned environments.

10 Devices for sanitizing environments are well known and widely used. For example, current techniques for sanitizing environments include the use of chemical agents or the use of steam generators with directional jet nozzles.

Said known devices generate a nearly perfect hygiene in the environments until they are used.

15 Therefore, the action of the above mentioned devices becomes ineffective when the environment is subsequently exposed to the microbial contamination during the first subsequent use of the sanitized area, which may be either a shower cubicles, a W.C. cab, a dressing box and the like.

Any person is a conscious or a casual carrier of bacteria, viruses and microorganisms.

20 Therefore, any user leaves traces of contaminants during the use of these sanitary fixtures.

The application of traditional disinfecting or cleansing solutions to the sanitary fixture does not assure the reduction or the elimination of the bacterial load.

25 In fact, the efficiency of the sanitizing and disinfecting action of the sterilizing

steam generators or of the cleansers, or of the hygienic components which can be applied alone or work in conjunction with the cleansers, decreases immediately after their application.

Moreover, the use of chemical agents causes the environmental pollution. Consequently, as a result of environmental pollution, humans are more frequently exposed to a much wider variety of harmful and also lethal diseases.

Nevertheless, the use of the traditional solutions normally increases the costs of the sanitizing operation.

More particularly, the chemical agents require a continuous change of the ambient air.

The others traditional solutions, as the steam jets ecc., require expensive personnel for their accurately, opportunely, as well as continuously, manual application.

As a consequence, the cost of said workers increases considerably the cost of the sanitizing operations.

It is the aim of the present invention to overcome the above stated drawbacks by providing a system for sanitizing an environment which provides a practical, economical device which may be easily applicable and easily usable in any kind of environments, either in a shower cubicle, or in a W.C. cab, or in a dressing box for shops, swimming pools, toilets for bathing establishments, and the like.

In order to better understand the features and the advantages attainable by the present invention, a possible embodiment of this invention is hereinafter described, by way of a not limitative example only, and with reference to the accompanying drawing, wherein it is illustrated a frontal perspective view of a shower cubicle which is provided with the sanitizing device according to the present invention.

In order to better understand the object of the present invention, the operational components of a device according to the present invention will now be described. Successively, it will be described the practical utilization of the above mentioned components.

- 5 With reference to the drawing, it should be noted an example of a shower cubicle 1 which substantially consists of a pair of lateral walls 11, a top wall 12, a rear wall 13, a bottom wall B supporting a common shower basin 14 and a closure door P.

As noted, a suitable mixer 15 and an upper shower head or nozzle 14, which is
10 provided with a plurality of holes for generating the jet of water, are applied, at a suitable height, on the rear wall 13.

Obviously, the shower cubicle 1 is completely formed of opaque materials which impede the transmission of UV radiation.

On the top wall 12 is applied a suitable number, in this case two elements 2, of
15 UV lamps at a suitable frequency (germicidal lamps) which are capable of destroying or at least reducing the bacterial load of the environment in question.

A suitable detector 3, which is able to detect the presence of a person in the shower cubicle 1, is applied on the top wall 12 together with the UV lamps 2.

Moreover, the shower basin 14 on the bottom B is equipped with additional safety
20 detectors which are designed to detect the live load on the basin 14.

Another safety element 5 is incorporated into the lock of the door P and is designed to couple with an hooking element 5 located on a inner wall 11 of the shower cubicle thus forming a sensor to detect the closed position of said door P.

After the description of all the operational components, reference will now be
25 made to the operational mode of the present invention.

The shower cubicle 1 is exposed to a bacterial contamination while the user is taking a shower.

When the user requires no more shower, he exits the shower cubicle 1 and closes the door P.

- 5 The closure of the door P closes the power circuit and activates the UV lamps 2 in order to destroy the bacterial load present in the shower cubicle 1.

Clearly, the ultraviolet radiation emitted by UV lamps 2 will be dangerous for the human body. Therefore, if the user left accidentally open the door P, the safety switch formed by the element 5 and the hooking element 4 will prevent the acti-

- 10 vation of the lamps 2 .

Moreover, the sensor/s 3 for detecting the presence of a person in the shower cubicle 1 and the sensor/s for detecting the live load on the basin 14 prevent the accidental irradiation of the user present in the shower cubicle 1 because the activation of the above mentioned sensor/s interrupts the power supply to the UV lamps

- 15 causing the UV lamps 2 to immediately cease emitting radiation.

At the end, the elements 4 and 5 permit the activation of the UV lamps 2 only when the door is properly closed.

Practically, when the door is open or when a person occupies the shower cubicle 1 the safety switches interrupt power to the UV lamps 2.

- 20 Moreover, said lamps 2 do not provide ultraviolet radiation even when the user leaves the door P ajar.

Practically, the UV lamps 2 can only be activated when the sensor/s does/do not detect the presence of a occupant in the shower cubicle 1 and/or when the door P is properly closed, that is to say, when the element 5 of the door-lock engages the

- 25 element 4 and closes the power circuit of said UV lamps 2.

Clearly, the door-lock element 5 and the corresponding coupling element 4 could be replaced by safety micro-switches and/or similar devices and/or alternative means which are able to ensure the same safety action of the described door.

Moreover, the number, the position and the kind of the sensors 3 for detecting the
5 presence of a person in the shower cubicle 1 and of the sensors for detecting the live load on the basin 14 as well as the number, the power and the position of the UV lamps 2 can vary in accordance with the condition of the environment to be treated.

Although the invention has been described and illustrated with reference to a spe-
10 cific illustrative embodiment of a shower cubicle, it is understood that the embodiment according to the present invention may be advantageously used in other various environments such as for example, dressing-boxes of shops or W.C.-cab for indoor public facilities.

It should be noted that suitable protective casings, made of transparent material
15 for the transmission of the UV radiation, can be mounted on the lamps 2 in order to avoid damages of the lamps caused by accidental bumps.

Said casings, in particular for protecting the UV lamps in the shower cubicles and, in a more general sense, for protecting the UV lamps in other moist or wet environments, are preferably made in such a way as to provide a water tight con-
20 nection between the bodies of the lamps and the moist or wet environments.

It is well understood that the preferred embodiment of the invention described herein is exemplary and that modifications and variations may be made to the object of the present invention without departing however from the scope defined by the following claims with reference to the accompanying drawing and thence
25 from the protection extent of the present industrial invention.

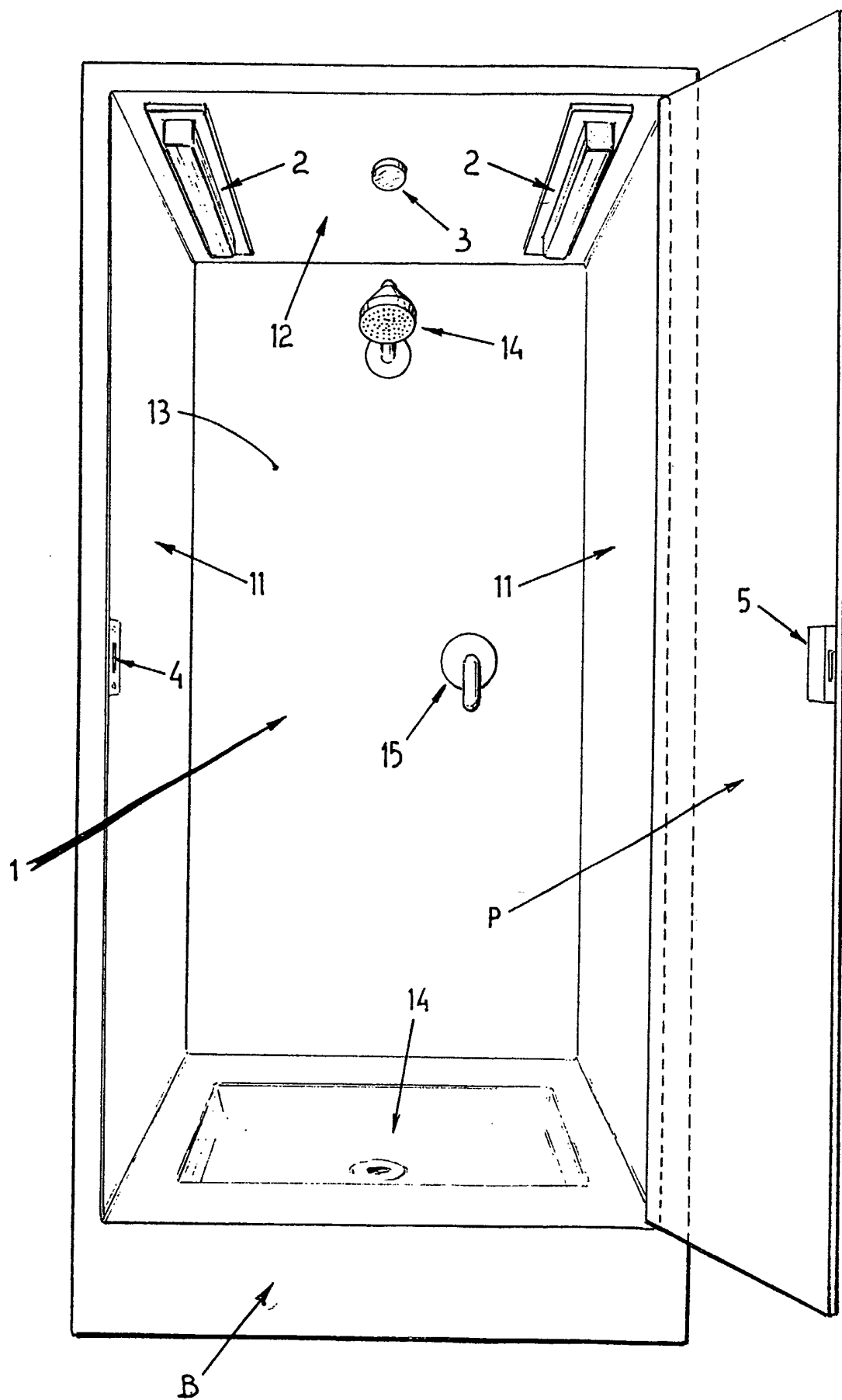
Claims

- 1) System for sanitizing environments, applicable in particular for sanitizing small environments as shower cubicles (1) and the like, characterized in that sterilizing means (2) or germicidal/bactericidal means, which are substantially constituted by suitable UV lamps (2) commonly called "germicidal lamps", are applied in said environments and that said sterilizing means are provided with control means (3-4-5) which permit the activation of the lamps only when said environments are not occupied by persons and/or when the entrance door of said environments is closed.
- 2) System for sanitizing environments, applicable in particular for sanitizing small environments as shower cubicles (1) according to the claim 1, characterized in that the lamps (2) are protected by suitable protective casings, made of transparent material for the transmission of the UV radiation, in order to avoid accidental damages of the lamps.
- 3) System for sanitizing environments, applicable in particular for sanitizing small environments as shower cubicles (1) according to the claim 1, characterized in that the means (3-4-5) are sensors (3) which detect the presence of a person in the shower cubicle 1, switches or micro switches applied to the element (5) of the door lock and/or to its hooking device (4), or sensors which are applied to the shower basin (14) located on the bottom wall (B) of the shower cubicle (1) in order to detect the live load on the basin (14).

On behalf of Giovanni Barro

for AGENZIA BREVETTI "PORDENONE"

Da Riva Ermanno



INTERNATIONAL SEARCH REPORT

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 23 19 269 A (JODQUELLEN AG) 31 October 1974 (1974-10-31) the whole document	1-3
X	EP 0 456 944 A (JACQUEMIN ROLAND) 21 November 1991 (1991-11-21) column 1, line 3-22 column 2, line 3 -column 5, line 23; figure 2	1-3
X	DE 34 28 079 A (GOLF GMBH & CO KG) 13 February 1986 (1986-02-13) the whole document	1-3
X	DE 849 741 C (SIEMENS AG) 18 September 1952 (1952-09-18) the whole document	1-3
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Maremonti, M

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 20, 10 July 2001 (2001-07-10) & JP 2001 065035 A (INAX CORP), 13 March 2001 (2001-03-13) abstract ---	1-3
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