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(54) **Title:** WATER SUPPLY DEVICE FOR SHOWERS AND THE LIKE

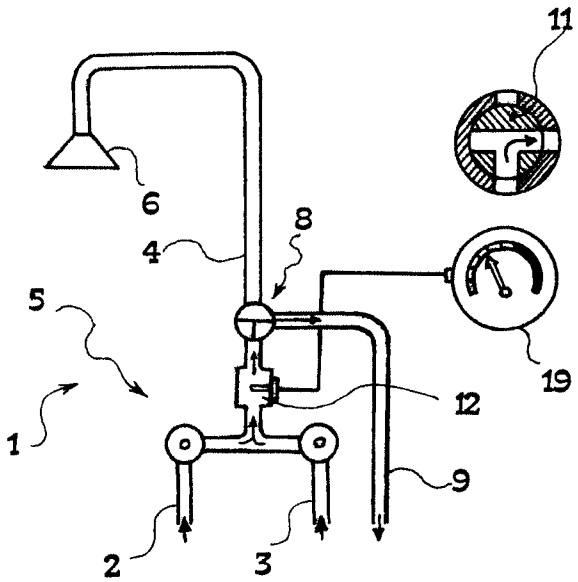

FIG.1

(57) **Abstract:** A water supply device (1) for showers and the like, allows an eased adjustment of the water temperature and an effective prevention of the formation of bacterial colonies, specifically of legionella, and to this purpose it comprises: a branched line (8), downstream said adjustment means (5) of the water flow, connecting the water supply device (1) and a drain to each other through a dedicated line (9); means for deviating (10) the water flow at said branched line (8), apt to deviate the water flow towards either the rose (6) or the drain; and temperature detection means (12), placed between said adjustment means (5) and said branched line (8) or on said dedicated line (9), connected to temperature display means (19).

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WATER SUPPLY DEVICE FOR SHOWERS AND THE LIKE

Description

The present invention is related to a water supply device for showers, bathtubs and the like, of the kind comprising at least one inlet line of a water flow, adjustment means of said water flow and at least one shower rose or nozzle for the water supply.

The problem of having the desired temperature of a water flow, e.g. in the operation of a shower, is someone's daily experience.

Usually, the user operates on said adjustment means for having a water flow which, through the shower rose, falls on the shower plate or in the bathtub and disperses through the bath drain until the flow temperature reaches the desired level, while the user checks it by partially wetting oneself before starting to have a shower.

Therefore, it is understood that such operation constitute a moment of discomfort for the user, especially in the winter months, when the room temperature is lower.

For mitigating such a discomfort, systems have been proposed not allowing the water supply until the water inside the boiler has not reached the desired temperature level. This expedient anyway only partially meets the goal thereof because, on one side, it is appropriate only in a situation with an independent water heating, wherein the boiler substantially works only for the outstanding user or for his habitation and, on the other side, in any case the problem of the cold water already contained in the lines is not got over, which forcedly is supplied through the shower before the heated water.

The technical problems underlying the present invention is to provide a water supply device allowing to obviate to the drawbacks mentioned with reference to the prior art.

Such a problem s solved by a water supply device as above specified, characterized in that it comprises:

* a branched line, downstream said adjustment means of the water flow, connecting the water supply device and

a drain to each other through a dedicated line;

* means for deviating the water flow at said branched line, apt to deviate the water flow towards either the rose or the drain; and
* temperature detection means, placed between said adjustment means and said branched line or on said dedicated line, connected to temperature display means.

The main advantage of the water supply device according to the present invention lies in allowing the achievement of the desired temperature level, checkable through said display means, while the water flow is deviated directly towards the drain, with the possibility of sending said water flow towards the shower rose when the achievement of the desired temperature is accomplished, thus eliminating the discomfort of the wait and of the direct check before having a shower.

According to a preferred embodiment of the invention, in the water supply device the means for deviating can link the rose to the drain, through said dedicated line, permitting to keep the rose dry, a precaution required by the guidelines for the prevention of legionella bacterial colony formation, a bacterium responsible for dangerous bacterial infections.

Such a prevention is absolutely needed, and required by in force or about to be approved standards, in communities like hospitals, hotels, barracks and the like.

The present invention will be hereinafter disclosed according to two embodiments thereof, together with some modalities of employment thereof, provided to an exemplificative and non limitative purpose with reference to the following examples and to the attached drawings wherein:

* Figures 1 to 3 schematically show a first embodiment of the water supply device according to the present invention, illustrating different operational conditions;
* Figure 4 schematically shows a second embodiment of the

water supply device according to the present invention; and
* Figures 5A and 5B respectively show two examples of shower cabin incorporating said embodiments of the water supply device.

With reference to figures 1 to 3, a first embodiment of water supply device according to the invention is hereinafter disclosed, globally indicated as 1.

It comprises at least one inlet line of a water flow which, in the present embodiment, is composed by a cold water inlet line 2 and by a hot water inlet line 3. They converge in a sole supply line 4 at adjustment means of said flow, globally indicated as 5, said supply line 4 being connected to a shower rose 6 of a shower or to any other kind of nozzle for the water supply.

Specifically, the present device may be applied to any supply system of tap water: showers, bathtubs, washbasins etc. or any other system employing hot water at a certain temperature, as for domestic equipments like washing machines, dishwashers and machines also of the industrial types.

In the present embodiment, the adjustment means 5 comprises a pair of taps 7, but t is apparent that any regulator and/or mixer may be considered comprised in said adjustment means.

At the supply line, 4 the device 1 comprises a branched line 8, placed downstream with respect to said adjustment means 5 of the flow.

Hence, it receives the water already mixed and connects said supply line 4 to a drain (not shown), through a dedicated line 9.

As drain, it is understood e.g. the piping connecting the shower or the bathtub to the grey waters.

Therefore, the dedicated line 9 may be connected to said piping immediately downstream the water collection well, or even it may be open into the bathtub or into the shower plate.

At said branched line 8, the device 1 comprises means for

deviating said water flow, indicated as 10, arranged to deviate the already mixed water flow towards the rose 6, through the supply line 4, or towards the drain, through the dedicated line.

The means for deviating 10 is suitable to connect said at least one rose or nozzle 6 to the drain through said dedicated line 9 (Figure 3), so as to allow the safe draining of the supply line 4 and of the rose 6 at the end of the shower use.

Such draining allows the rose to be kept dry, preventing the formation of moulds and of bacterial colonies, e.g. legionella carrier bacteria proliferating in wet environments and in air at temperatures varying from 25°C to 50°C.

According to a preferred variant, said means for deviating can be arranged in a configuration deviating the water flow towards the drain, which can coincide with the configuration wherein the rose 6 is connected to said drain, so as to relieve the user from the duty of selecting such a configuration after having had a shower.

In the present embodiment, the means for deviating comprises a three-way valve, easily maneuverable by a knob 21 (Figure 5A). Thank to the latter, it is possible to select the configurations wherein: (Figure 1) the supply line 4 is connected to the drain; (Figure 2) the supply line 4 is connected to the rose 6; and (Figure 3) the rose is directly connected to the drain and the supply line is shut.

According to the invention, the device 1 therefore comprises means for the detection of temperature, e.g. comprising a thermocouple sensor 12 arranged upstream the branched line 5 (Figures 1 to 3) or, according to an embodiment not shown in the drawings, between said adjustment means 5 and said branched line 8 or onto said dedicated line 9 as well.

In the present embodiment, the position of the sensor 12 allows to check the water temperature even through the

supply as such.

The sensor 12 is connected to temperature display means, globally indicated as 19, which can comprise e.g. an acoustic alarm, a light alarm 13 8Figure 5A) or even a display (Figures 4 ad 5B) indicating, in a Celsius or Fahrenheit scale, the temperature level of the water flow.

At said display means, the water supply device comprises means for the input of a certain desired temperature value, e.g. a small alphanumeric keyboard 15 or a pair of keys +/.

With reference to figure 4, a second embodiment of the device 1, for which the same reference numerals are used, is of the automatic operation type, wherein said means for deviating 10 are slaved to said means for the detection of temperature 12 by an actuator.

In this embodiment, it is possible that the configuration of the means for deviating 10 is automatically varied by said actuator, on the basis of the temperature reached by the water flow as detected by the sensor 12.

In the present embodiment, the actuating system comprises one or more electrovalves, specifically a first electrovalve 16 on said dedicated line 10 and a second electrovalve 17 placed between said adjustment means 5 of the water flow and the rose 6.

In this way, instead of the manual control of the preceding embodiment, it is possible that the flow is deviated, opening said first electrovalve 16, while the flow reaches the requested temperature and when it is occurred, the first electrovalve 16 is shut while the second one is opened, arranging the water supply.

The simultaneous opening of both the electrovalves 16, 17 allows to connect the rose 6 to the drain, with the already explained advantages.

The means for deviating, in this case substantially overlapped to said adjustment means, can comprise electrically driven regulators 18, arranged on the inlet lines 2, 3 of the cold and hot water.

In such a way, the user is required only to input the

desired temperature: while the flow is deviated into the drain, it is also adjusted to the requested temperature.

The position of the sensor 12 detecting the temperature allows to stop the flow in case of a sudden temperature drop.

The present invention is also referred to integrated structures like shower cabins 20 (Figure 5A and 5B), wherein the device is integrated into the structure connected to the water distribution system.

A first version (Figure 5A) can provide the use of a manual regulation system with said taps 7 and an additional knob 21 for driving said valve 11.

A second version (Figure 5B) is completely automated and has a keyboard, which may be remotely arranged with respect to the shower, for inputting the desired temperature and for controlling the start of the water flowing and the start of the supply.

Of course, intermediate versions are possible, between the solutions herein shown.

Besides the showers, the device can be used also for the automatic filling up of a bathtub structure. In the automatic version, the supply in the bathtub may automatically occur having reached the desired temperature. In such a case, flow breaking means may be provided, linked to a level switch inside the bathtub.

Alternatively, said means can be operated after a certain length of time, by a timer, or after the supply of a certain amount of water, e.g. detected by a flow meter applied to the supply line.

In such a way, the user should neither be worried to break the flow after the filling up of the bathtub.

To the above disclosed water supply device a man skilled in the art, to meet further and contingent needing, can achieve several additional modifications and variants, however all falling within the protection scope of the present invention, as defined by the annexed claims.

CLAIMS

1. Water supply device (1) for showers and the like, comprising at least one inlet line (2, 3) of a water flow, adjustment means (5) of said water flow and at least one shower rose (6) or nozzle for the water supply, characterized in that it comprises
   * a branched line (8), downstream said adjustment means (5) of the water flow, connecting the water supply device and a drain to each other through a dedicated line (9);
   * means for deviating (10) the water flow at said branched line (8), apt to deviate the water flow towards either the rose (6) or the drain; and
   * temperature detection means (12), placed between said adjustment means (5) and said branched line (8) or on said dedicated line (9), connected to temperature display means (19).

2. Water supply device (1) according to claim 1, wherein said means for deviating (19) is suitable to connect said at least one rose (6) or nozzle to said drain through said dedicated line (9).

3. Water supply device (1) according to claim 2, wherein, in said means for deviating (19), the configuration deviating the water flow towards the drain coincides with the configuration wherein said at least one rose (6) or nozzle is connected to the drain.

4. Water supply device (1) according to any of the preceding claims, wherein said adjustment means (5) comprises a mixer of hot and cold water, said at least one inlet line comprising a cold water inlet line (2) and a hot water inlet line (3).

5. Water supply device (1) according to any of the preceding claims, wherein said means for deviating 810) are slaved to said temperature detection means (12) by an actuator (16, 17).

6. Water supply device (1) according to claim 5, wherein the configuration of the means for deviating (10) is

automatically varied by said actuator (16, 17) on the basis of the temperature reached by the water flow.

7. Water supply device (1) according to claim 5 or 6, wherein said actuator comprises one or more electrovalves (16, 17).

8. Water supply device (1) according to claims 4 and 7, comprising an electrovalve (16) on said dedicated line () and another electrovalve (17) between the adjustment means (5) of the water flow and the rose (6) or equivalent nozzle.

9. Water supply device (1) according to any of the preceding claims, wherein said display means (19) comprises acoustic and/or light alarms (13) and/or a display (14) on which the water flow temperature is represented.

10. Water supply device (1) according to any of the preceding claims, comprising means for the input (15) of the desired temperature value.

11. Shower structure (20), comprising a water supply device (1) as defined in one of any preceding claims.

12. Bathtub structure, comprising a water supply device (1) as defined in one of any of claims 1 to 10.

13. Bathtub structure according to claim 12, wherein means for breaking the water flow are provided, comprising a level switch, a timer or a flow meter applied to the supply line.

14. Use of a water supply device (1) according to any of claims 1 to 10, for supplying any domestic or industrial equipment with hot water.

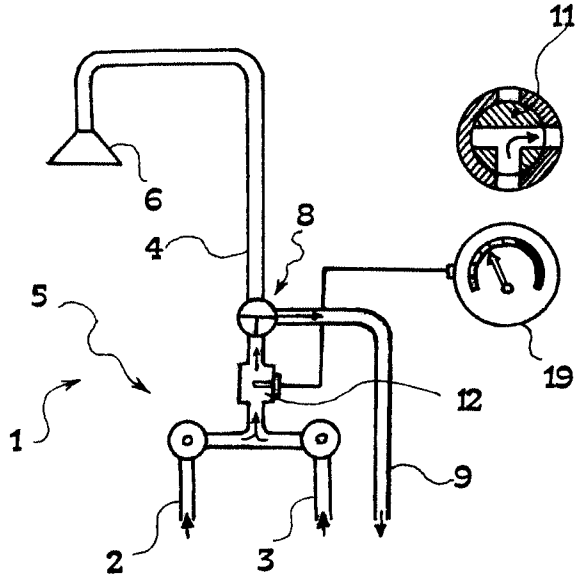

FIG.1

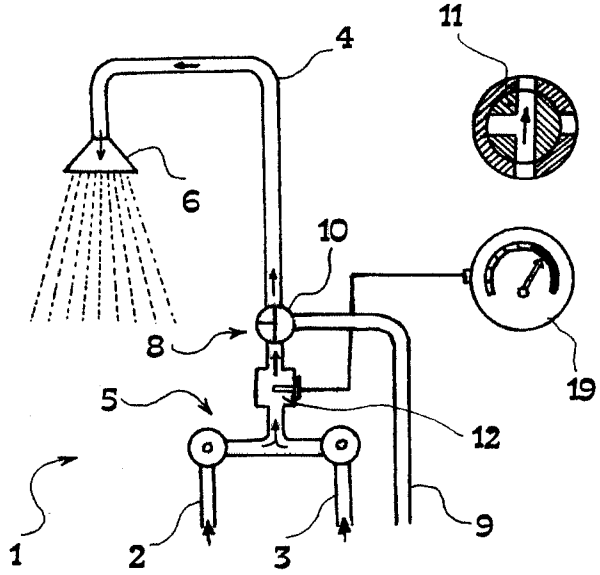

FIG.2

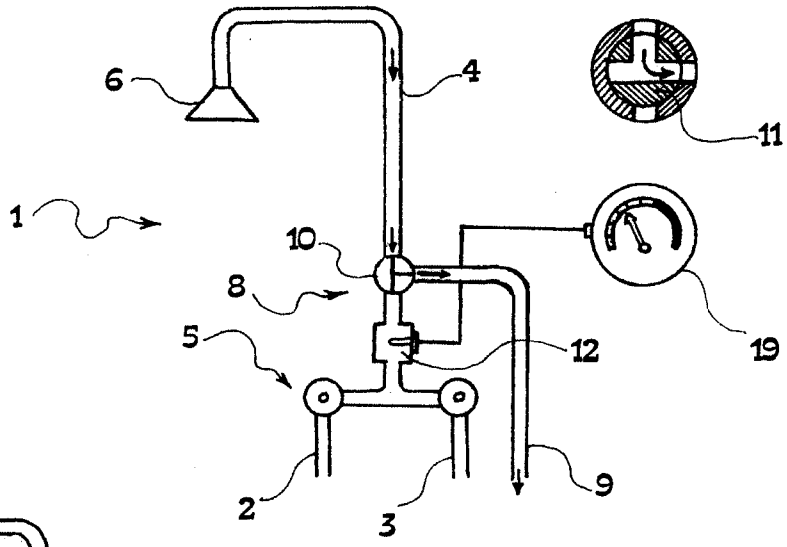

FIG.3

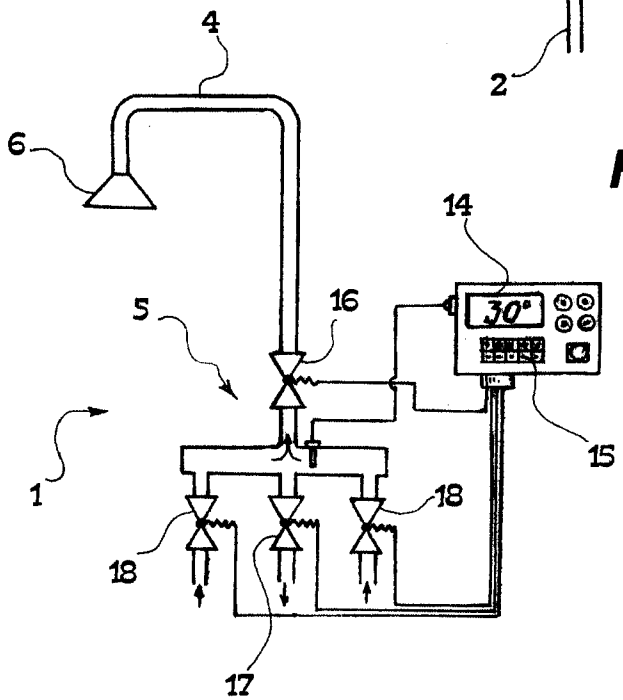

FIG.4

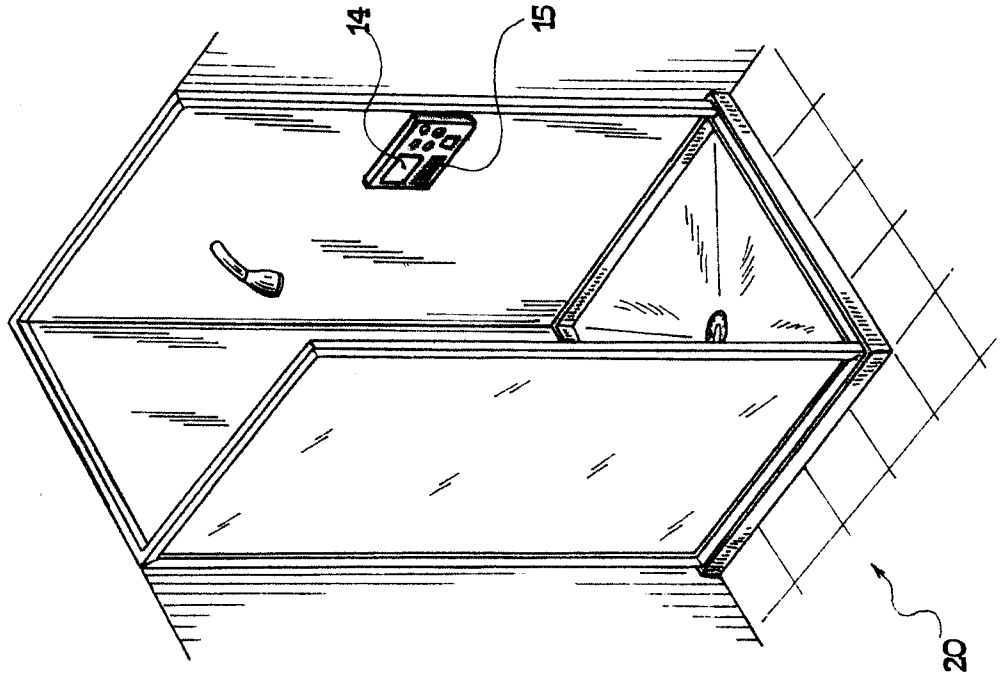

FIG.5B

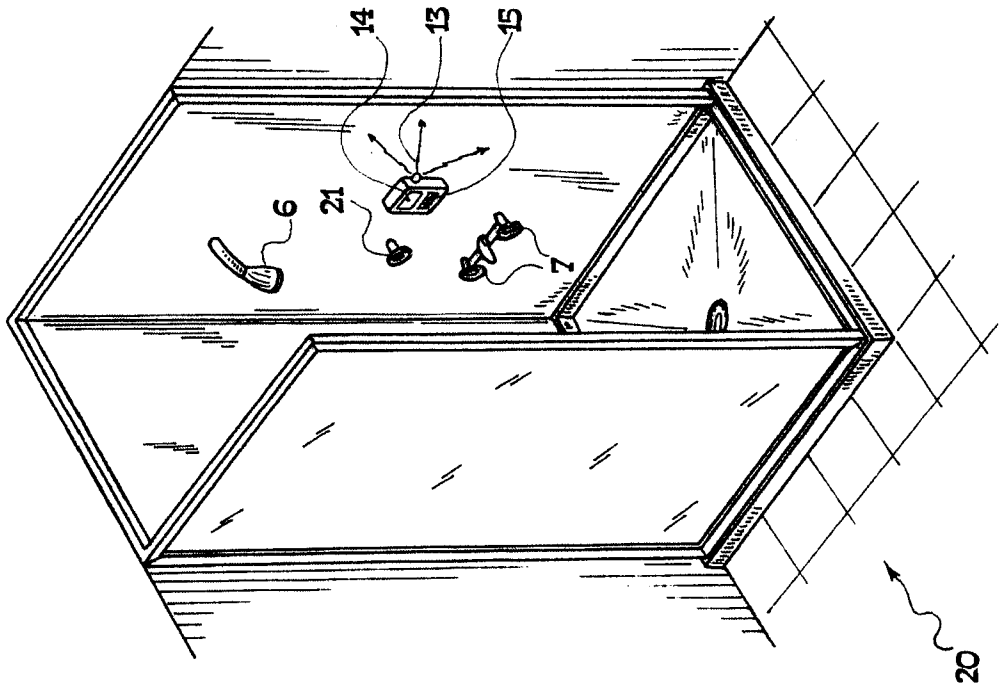

FIG.5A

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/054129

A. CLASSIFICATION OF SUBJECT MATTER
INV. E03C1/00

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)
E03C

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 5 564 462 A (STORCH PAUL [US]) 15 October 1996 (1996-10-15) column 3, line 25 - column 4, line 42; figure 1	1,4-7, 10,11,14 9,12
X A	CA 2 252 350 A1 (KARMEL ISRAEL [CA]; KARMEL MICHAEL [IL]) 4 May 2000 (2000-05-04) page 4; figure 1 page 12, lines 28-32	1,5-7,14 10
X	GB 2 435 490 A (ATURELIYA SENAKE [GB]) 29 August 2007 (2007-08-29) page 1, paragraphs 5,6; figures 3,4 page 2, paragraphs 2,4	1,5-7,14

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 April 2008	02/05/2008

Name and mailing address of the ISA/	Authorized officer
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	Leher, Valentina

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/054129

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2005/205680 A1 (VALENTE GREGORY M [US]) 22 September 2005 (2005-09-22)	12
A	paragraph [0012]; claim 5; figure 2	1-6,14
Y	DE 43 08 782 A1 (GROHE KG HANS [DE]) 22 September 1994 (1994-09-22)	9
A	column 2, lines 15-38; claims 1,7-9	13
A	GB 2 309 731 A (EAVES TREVOR GRAHAM [GB]) 6 August 1997 (1997-08-06) page 4; figures 2-4	1,4,6
A	DE 91 11 942 U1 (MEKKIOU, FERHAT, DIPL.-ING., 1000 BERLIN, DE) 7 November 1991 (1991-11-07) the whole document	1,4

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2007/054129

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CA 2252350	A1	04-05-2000	NONE	
GB 2435490	A	29-08-2007	NONE	
US 2005205680	A1	22-09-2005	NONE	
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GB 2309731	A	06-08-1997	NONE	
DE 9111942	U1	07-11-1991	NONE	