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(54) **AUTOMATIC TOILET CLEANING SYSTEM**

(57) The invention relates to an automatic toilet cleaning system comprising an impermeable tent structure which can fold out automatically from a housing provided in the wall adjacent to the toilet, the floor or the ceiling, such as to cover same completely. The interior of the tent structure is equipped with a system of pressurised fluid sprinklers which are directed towards the toilet. The invention also comprises a suitable drain for draining the fluid along with any floating residues.

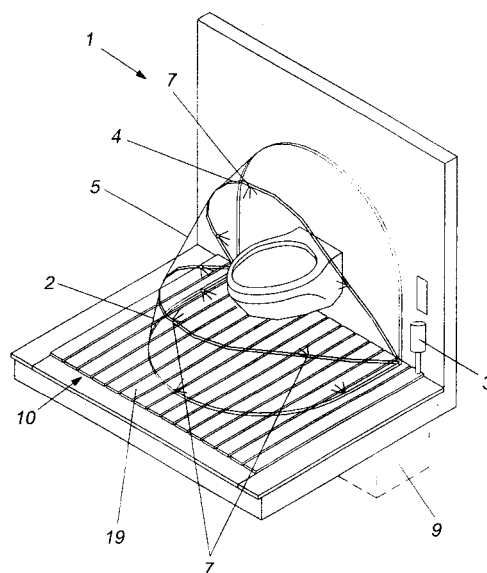


FIG. 1

## Description

### OBJECT OF THE INVENTION

[0001] The present invention refers to an automatic cleaning system for sanitary fittings.

### BACKGROUND OF THE INVENTION

[0002] At present, the cleaning of sanitary fittings such as lavatories, urinals and wash-basins installed in public bathrooms or changing-rooms frequently implies the unpleasant task of cleaning being carried out by hand or with the help of specific tools, but not automatically, which always means the participation of unwilling people.

[0003] Some systems exist in order to automatically carry out this cleaning, but all of them imply transferring or retracting the fitting to a technical zone where it is cleaned. This causes problems in drainage network and water supply connections, making leaks and smells more probable.

[0004] Besides, these systems only carry out the inner cleaning of the sanitary fitting, so the outer part stays unclean. Another additional disadvantage is that the sanitary fitting is not dried.

[0005] These problems are overcome by the use of the system referred to in the invention.

### DESCRIPTION OF THE INVENTION

[0006] The invented system has been designed in an optimum way to enable the cleaning and disinfection of the sanitary fitting in question with fluids such as water, alone or mixed with detergents or disinfectants, at ambient temperature or heated, also undertaking the drying of the fitting without needing to move it or fit flexible or quick-release connections to the drainage or water supply networks, and, of course, without people intervening.

[0007] In accordance with the invention, the system comprises an impermeable awning that retracts from and back to a position preferably hidden in a housing made in the floor, ceiling or wall adjacent to the sanitary fitting to which it may be fixed, in the case of urinals or wash-basins, for example, and also lavatories.

[0008] The awning automatically unfolds, totally covering the sanitary fitting externally. The unfolding of the awning will be 90° or 180°, depending on whether it is carried out from the floor or wall, whether the sanitary fitting rests on or is semi-attached to the floor or wall, or vertically unfolded if it is done from the ceiling.

[0009] Once the awning is unfolded, a pressurized fluid sprayer system, such as water, hot water or water with detergents, disinfectants or waxes, heated or not, is fitted inside. Likewise, the sprayers may eject steam to help cleaning and disinfection under extreme conditions.

[0010] These sprayers are logically internally and externally pointed at the sanitary fitting, and may be embodied in any way that carries out this function.

[0011] To drain these fluids and the waste flushed out during cleaning, suitable drainage means, preferably fitted in the bathroom floor, are included.

[0012] The system may optionally include at least one turbine that would direct a possibly heated airflow towards the sanitary fitting to dry it after the cleaning process.

[0013] The cleaning process implies unfolding the awning, spraying with the fluids and optional drying, then retracting the awning, obtaining optimum cleaning and drying of the sanitary fitting.

[0014] A variation of the invention consists of making the awning or covering from a blind with impermeable, anticorrosive materials (PVC, aluminium, etc.), which retracts into a housing fitted inside the wall or floor, guided by means of fixed, lateral guides or guides inserted inside the walls, or lateral partitions facing each other that flank the sanitary fitting.

[0015] The sprayers are fitted in accordance with this embodiment, as much to the inner part of blind, as under the grating comprising the whole or a large part of the floor in the area covered by the blind when it is closed, under which the drainage as well as technical area in simple installations are also fitted. Some of these sprayers mainly clean the inside of the sanitary fitting and others, especially those located under the grating, its outer parts.

[0016] The sprayers may be pointed towards the inside of the awning or blind, and are intended to clean away the projected material from this area that may be produced during the cleaning of the sanitary fitting, since otherwise it would accumulate in this zone.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

Figure 1 shows a view of an individual installation according to the invention.

Figure 2 shows a view of figure 1 with a variation where the awning is made from sliding or telescopic elements.

Figure 3 shows a variation in which the spraying is carried out by means of sprayers fitted in an inner mobile pipe.

Figure 4 schematically shows the technical area according to the invention.

Figure 5 schematically shows a multiple installation according to the invention.

Figure 6 is a variation of the embodiment illustrated in figures 1 to 5.

### DESCRIPTION OF A PRACTICAL EMBODIMENT OF THE INVENTION

[0018] The invented system 1 comprises a retractable awning 2 made of impermeable material that automatically unfolds by means of a hydraulic piston 3, with a

double effect in this non-restrictive example of the invention, completely covering the sanitary fitting 3a to be cleaned and disinfected, including its inside, whereas in the opposite direction it stays folded up inside a double partition fitted to the wall that the sanitary fitting is attached or close to. Likewise, it could be vertically unfolded from the ceiling, or operated differently, for example, electrically.

[0019] The simplest embodiment of the awning would be by means of linked rods 4 and impermeable canvas 5, though other similar solutions are acceptable, such as impermeable, warped telescopic pieces 6 (metallic, plastic, etc.), as seen in figure 2.

[0020] The inside of the awning has a set of sprayers 7 that eject pressurized fluid, such as water, water mixed in a solution of disinfectants, detergents or waxes, heated water or even steam, and pointed at the sanitary fitting so that the fluid carries out its cleaning and disinfection.

[0021] The sprayers may be embodied in different ways, though it seems a logical solution to fit them in the linked rods 4, the rods therefore forming pipes.

[0022] Another possible embodiment, which may be seen in figure 3, would be by means of a semicircular or semi-elliptical pipe 8, unfolding automatically inside the awning, which, by the action of a piston for example, would carry out an upwards/downwards sweep, the sprayers 7 being fitted inside its pipe.

[0023] A hidden area, preferably in a hole 9 opened in the wall or floor 10, fitted with a cover, not shown, and easily accessible for maintenance, has a technical zone with at least one pump to spray the pressurized water, a water storage tank 12 fitted with an inner heater 13, and other additional tanks 14 for disinfectants or biodegradable detergents as well as brightening waxes, with the corresponding system, not shown, to automatically mix the water that flows from the tank and is going to be used in the cleaning of the sanitary fitting.

[0024] The technical area shall likewise include the valves 15 necessary to drive the pistons and system fluids. There is also a boiler 16 with a heater 16a to generate and accumulate steam for steam cleaning.

[0025] Optionally, a turbo-ventilator 17 may be fitted in the hole 9 with a heating resistance 18 to generate a hot air flow that will dry the sanitary fitting after washing and disinfection. This flow will be released through nozzles, not shown, suitably fitted inside the awning, in the walls, floor or ceiling delimiting the enclosure together with the awning housing the sanitary fitting.

[0026] The invention likewise comprises the floor installation of drainage means to collect the water used in the cleaning. In this non-restrictive example of the invention, the drainage means consist of a drain hidden by a large-sized grating 19. This water may be accumulated and treated, or emptied into the drainage network.

[0027] The invention likewise considers multiple sanitary installations for cleaning several bathrooms, for example, in stations, gyms, concert halls, military installations and suchlike. In this case, as seen in figure 5, the

technical area is shared by several sanitary fittings, simplifying space and equipment requirements.

[0028] With regard to figure 6, the awning 2 is made up of a blind-type cover 2', whose plates are obviously made from impermeable, anticorrosive material, such as PVC or aluminium.

[0029] This blind is guided by means of guides 20 embedded in the side walls 21 that are opposite and close to each other, extendable, depending on the distance between these walls and resistance of the plates, to take in or cover several sanitary fittings.

[0030] The blind, by means of a motor 26, automatically retracts into a housing 22 fitted in the wall.

[0031] In accordance with the covered area and taking in the whole floor space in this part, a grating 27 is fitted, under which the drain 28 that drains the water is installed, as well as the technical area with the tanks for liquid, water, waxes and detergents, etc., not shown. This area likewise contains sprayers 29 pointed towards the outside of the sanitary fitting 30, cleaning its outer part.

[0032] Sprayers 31 that clean the inside of the sanitary fitting are fitted inside the blind.

[0033] Sprayers may also be fitted under the floor or blind, or in any suitable inner part of the cover, and pointed towards the awning or blind in order to eliminate any waste that might be washed out during cleaning, which will flow towards the drain.

[0034] This variation of the embodiment shown in figure 6 may obviously be combined with all the elements described in the embodiment seen in figures 1 to 5, that is to say, the inner, folding/retracting bar fitted with the sprayers instead of these being fitted inside the blind; also, the centralization of the technical area for several sanitary fittings, etc.

[0035] Having sufficiently described the nature of the invention, as well as the way to embody it in practice, it must be emphasized that the previously indicated layouts, shown in the attached drawings, may be modified in detail as long as they do not alter the fundamental principle.

## Claims

1. - Automatic sanitary appliance cleaning system; **characterized by** comprising an impermeable awning that automatically unfolds from a housing fitted in the wall adjacent to the sanitary fitting, in the floor or ceiling, that totally covers it, containing a pressurized fluid sprayer system inside pointed at the sanitary fitting, as well as a suitable drainage system to drain off the fluid and waste washed out by it.
2. - System according to claim 1, **characterized by** the awning being made up of a flexible, impermeable, laminated part, such as canvas, reinforced by linked rods in order to enable its unfolding or retracting.

3. - System according to claim 1, **characterized by** the awning being made up of suitable, rigid, non-folding parts and opening up telescopically or sliding between each another. 5
4. - System according to claim 1, **characterized by** the awning unfolding by means of a hydraulic, double effect piston. 10
5. - System according to claim 2, **characterized by** the sprayers being fitted in the linked rods of the awning, in this case making up a network of pipes through which the pressurized fluid flows towards the sprayers. 15
6. - System according to claim 1, **characterized by** the sprayers being occasionally fitted in a mobile pipe inside the awning that carries out a preferably hydraulically-driven sweep. 20
7. - System according to claim 1, **characterized by** the pressurized fluid being supplied by a pump. 25
8. - System according to claim 7, **characterized by** the pump being fed from a storage tank. 30
9. - System according to claim 7, **characterized by** the pump being directly fed from the water supply network. 35
10. - System according to claim 8, **characterized by** the tank including one or more water heaters and an isothermal covering. 40
11. - System according to claim 1, **characterized by** having a technical area made up of a housing where at least the following are installed: fluid storage tank, where appropriate, heated or not, the pump that pumps the pressurized water, a steam storage and generating boiler, as well as the valves to work the different elements in the system. 45
12. - System according to claim 11, **characterized by** the technical area in simple installations being preferably fitted underground or under the floor. 50
13. - System according to claim 11, **characterized by** allowing multiple installations with centralized technical areas used for the awnings of several sanitary fittings. 55
14. - System according to claim 1, **characterized by** optionally including a drying turbine preferably fitted with an air-heating resistance, in order to dry the sanitary fitting after cleaning.
15. - System according to any of the previous claims, **characterized by** the awning being made up of a covering based on a blind made of impermeable, anticorrosive plates, unfolding from and retracting into a housing fitted in the wall or floor, and guided by lateral guides placed in the walls or side partitions facing each other that flank the sanitary fitting; a grating is fitted in the floor that takes in the whole or a large part of the covered area, under which is installed the technical area as well as sprayers pointed at the outer part of the sanitary fitting; sprayers pointed at the awning or cover in order to eliminate any waste that might be projected onto it during cleaning are installed inside the covered area in the same way.
16. - System according to claim 15, **characterized by** the unfolding and retracting of the blind being automatically driven by means of a motor.

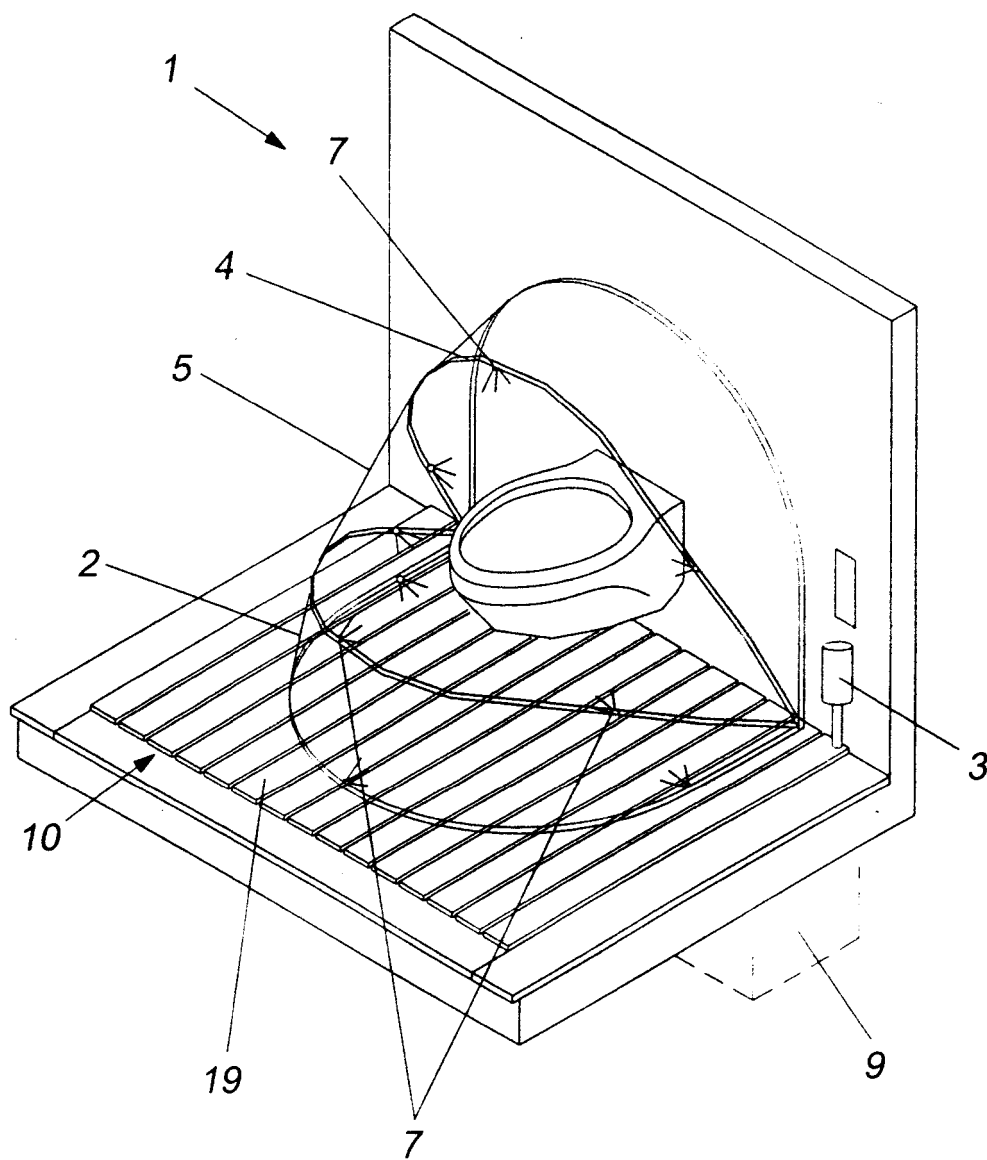


FIG. 1

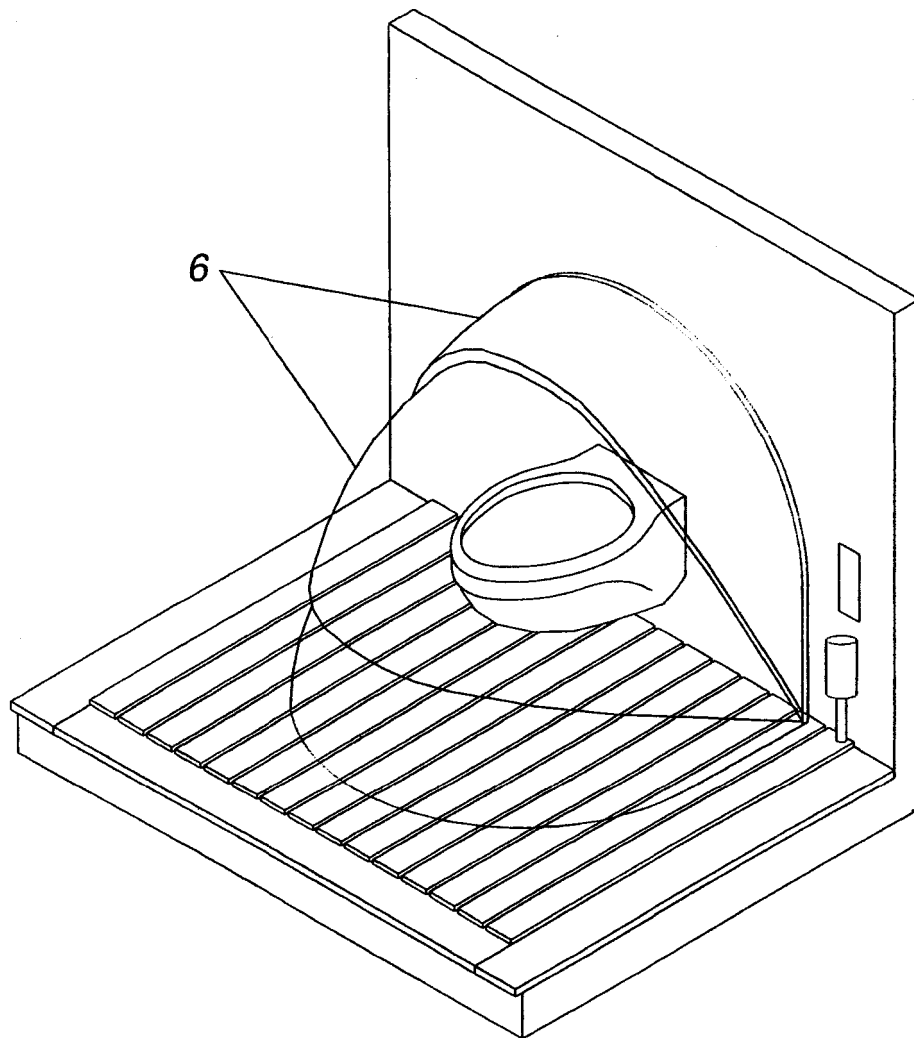


FIG. 2

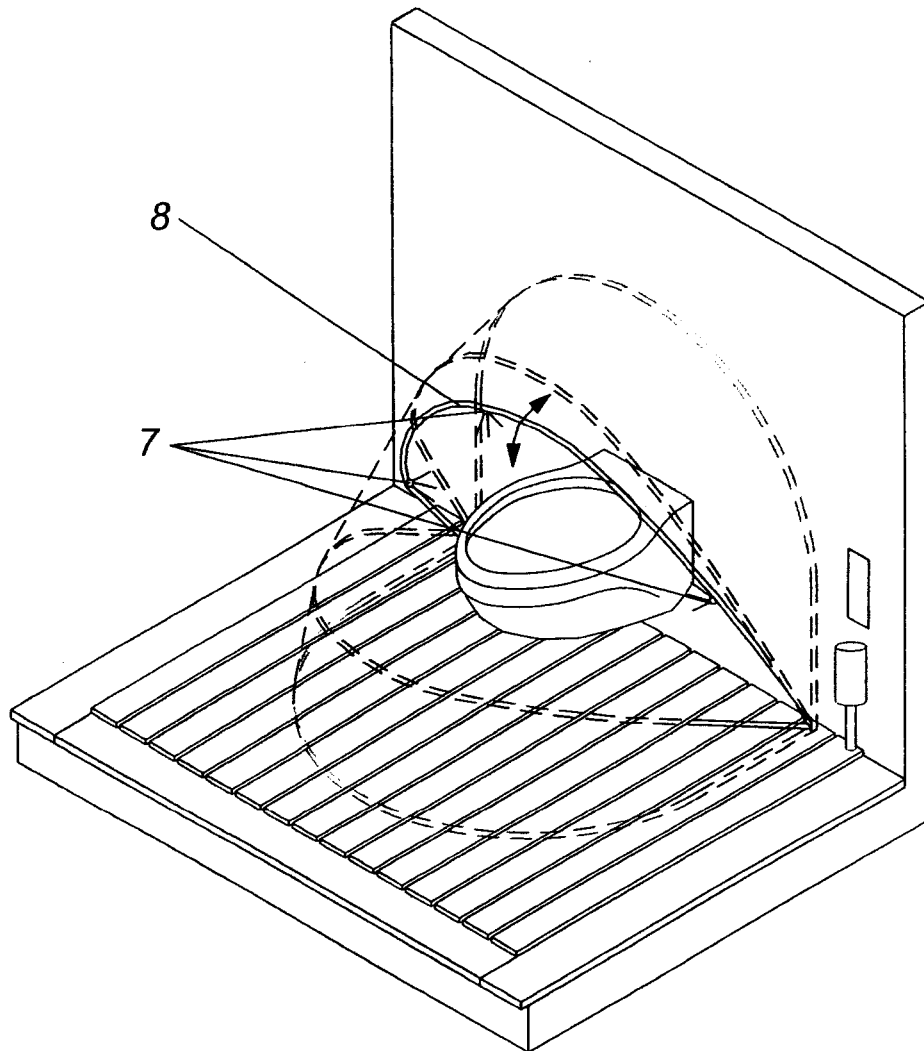


FIG. 3

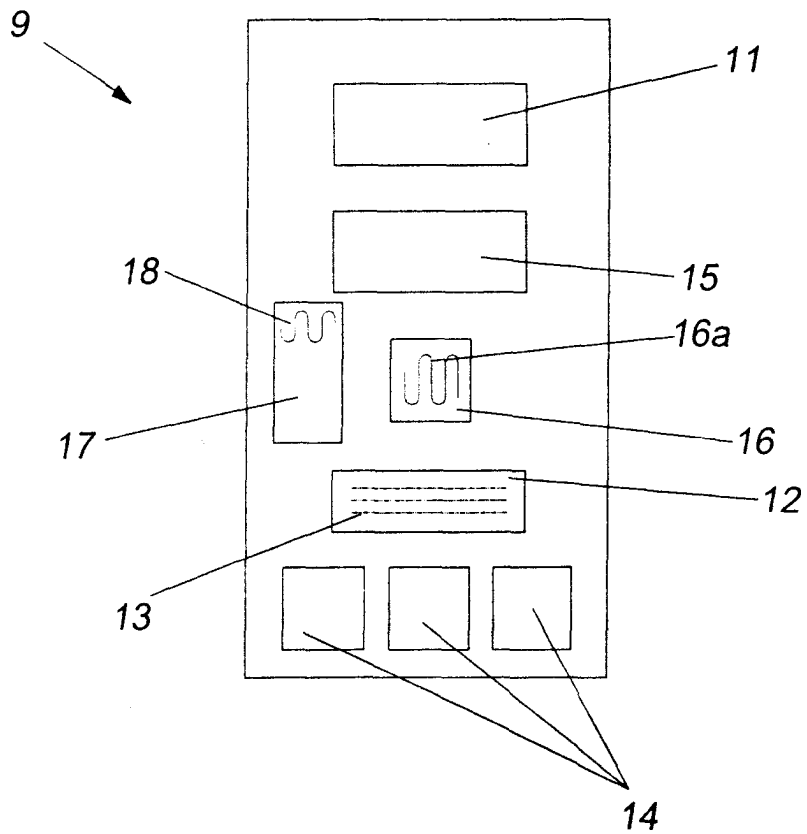


FIG. 4

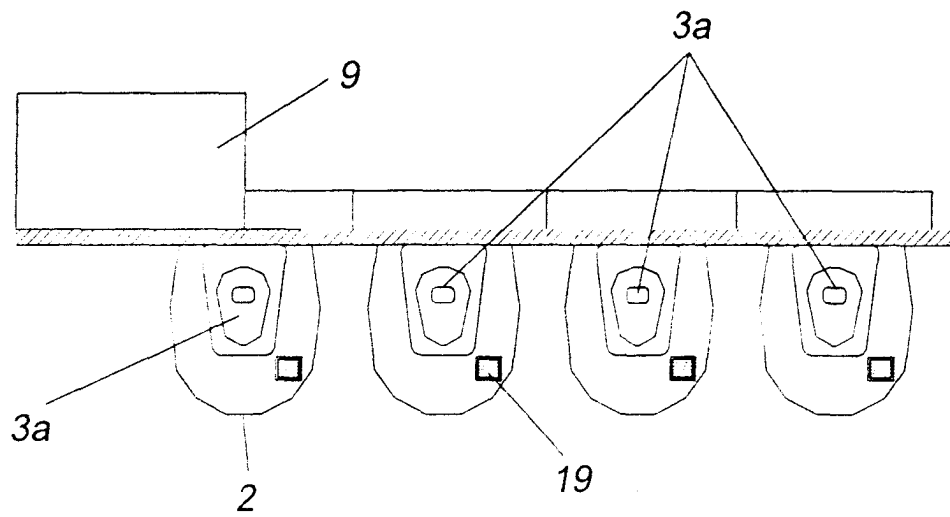


FIG. 5



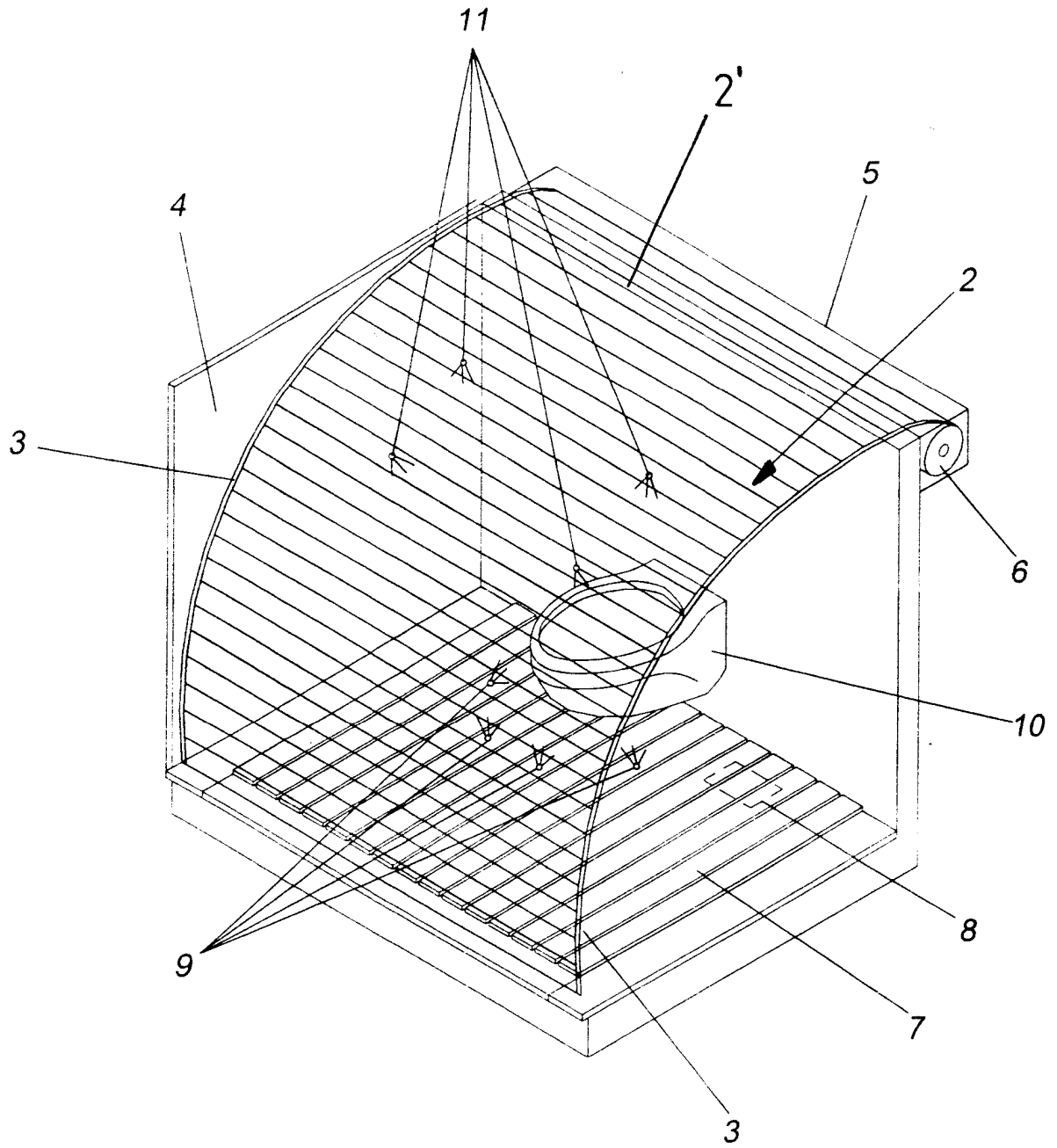


FIG. 6

## INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER		
See additional sheet		
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)		
E03D9/+,E03D11/+, A47K13/+,A47K17/00; EC: E03D11/00D,A47K13/+,		
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 practicable, search terms used)		
CIBEPAT,EPODOC, WPIL		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
31 January 2006 (31.01.2006)		22 February 2006 (22.02.2006)
Name and mailing address of the ISA/ SPTO		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

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Information on patent family members

International Application No

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