United States Patent [19]

Roberts

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[54] **SELF-CLEANING REST ROOM**

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[21] Appl. No.: **193,649**

[52] **U.S. Cl.** **4/1**

[51] **Int. Cl.** **A47k 17/00**, E03d 11/12

[58] **Field of Search** 4/1, 145–152, 4/2–5, 172.17; 52/69, 79; 134/167, 168

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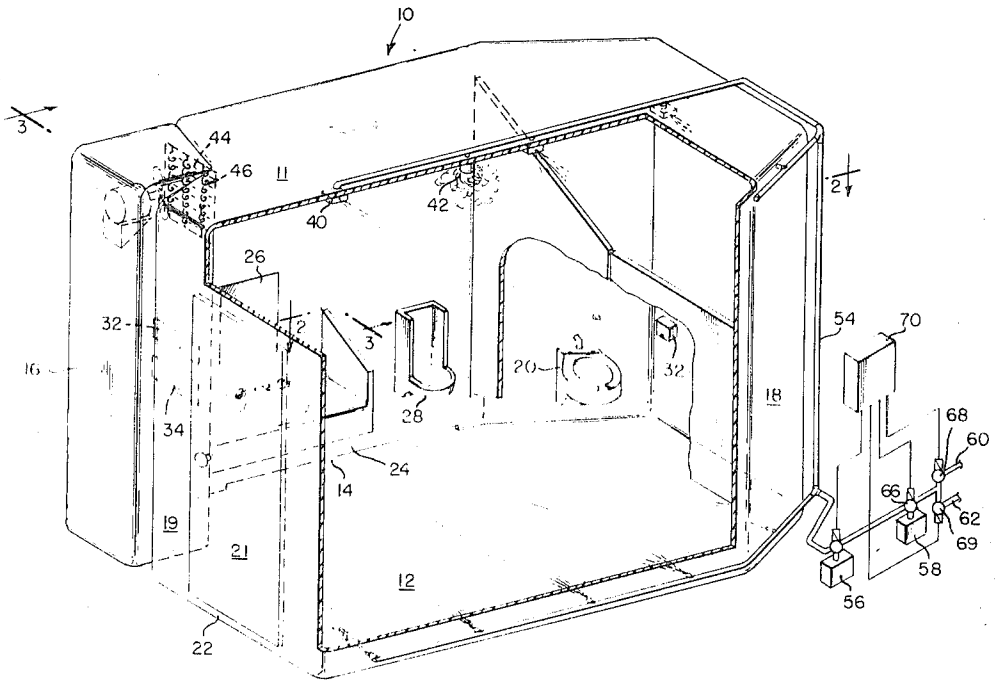
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[57] **ABSTRACT**

A molded unitary substantially watertight structure is provided with an entrance opening and an enlarged drain opening. Rest room fixture are provided within the structure with means for covering paper dispensers and waste receptacle. A plurality of various types of spray nozzles are provided within the structure to create a fog, a direct spray on the rest room fixtures and overlapping sprays throughout the structure, and floor flushing sprays for flushing debris through the drain opening. A combination heater-blower distributes the fog and dries the structure and fixtures. Various types of liquids are used to clean, sanitize and deodorize the structure. In one embodiment the heater-blower and nozzles are attached to a self-contained independent ceiling structure which may then be secured to a conventional rest room.

10 Claims, 5 Drawing Figures

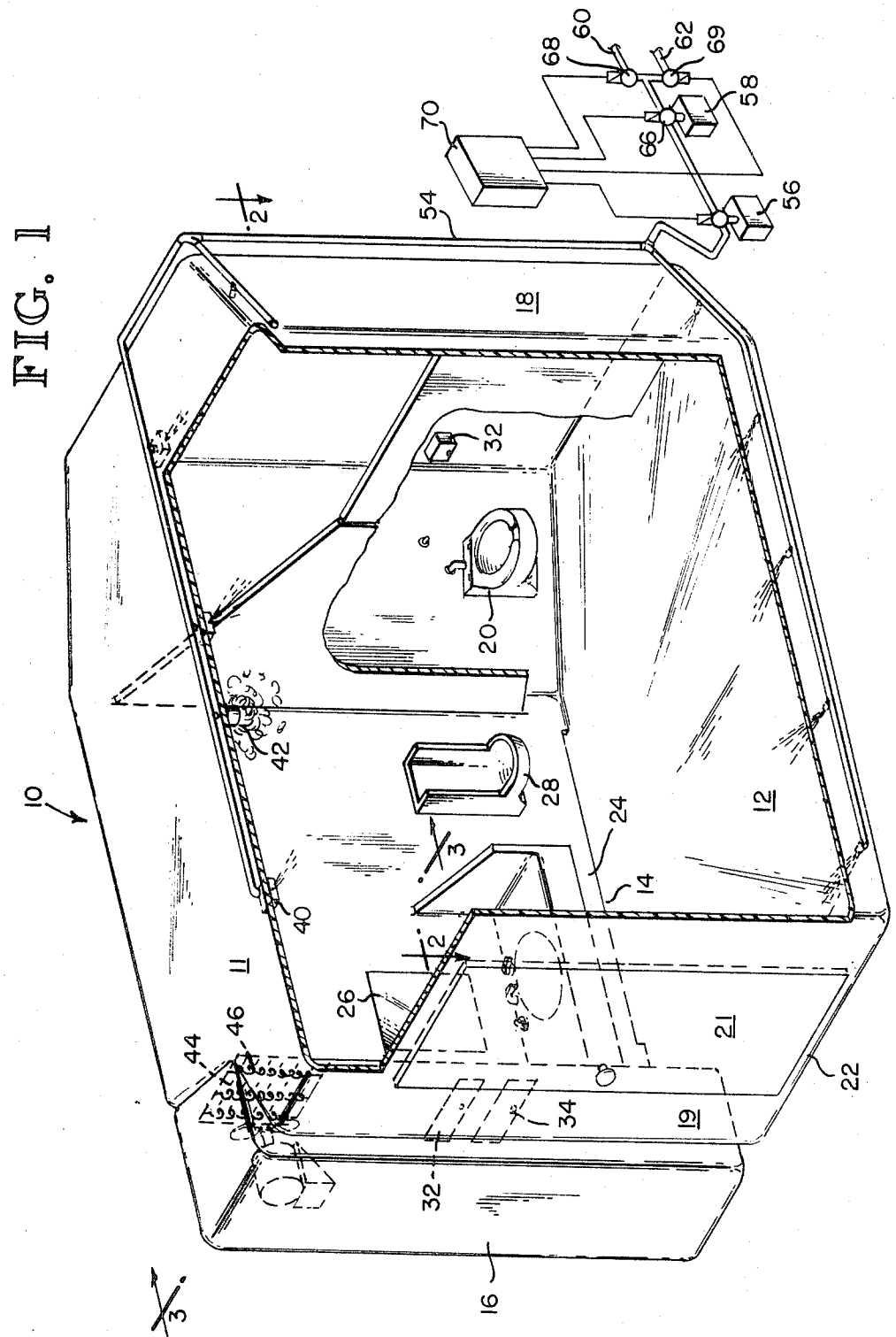


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SHEET 1 OF 3

FIG. 1



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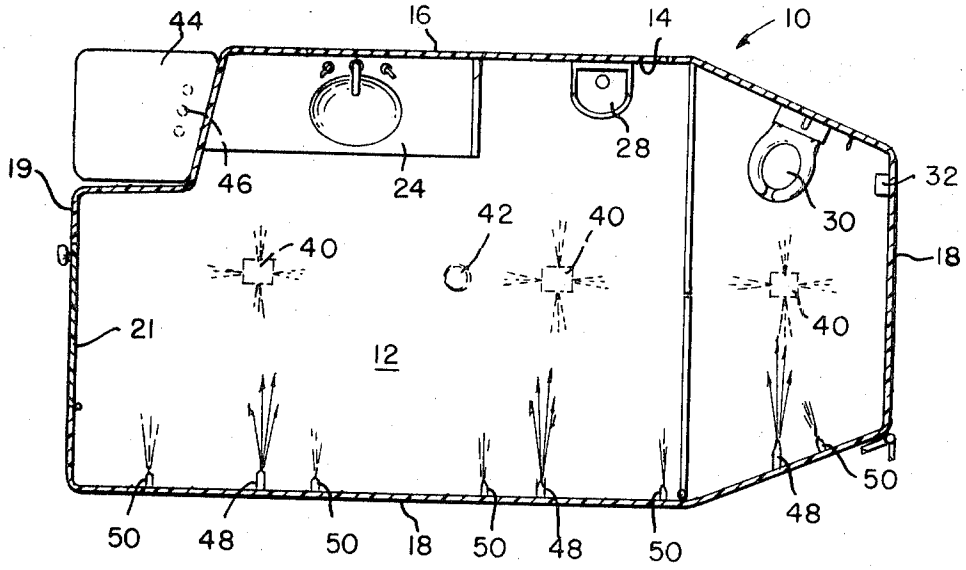


FIG. 2

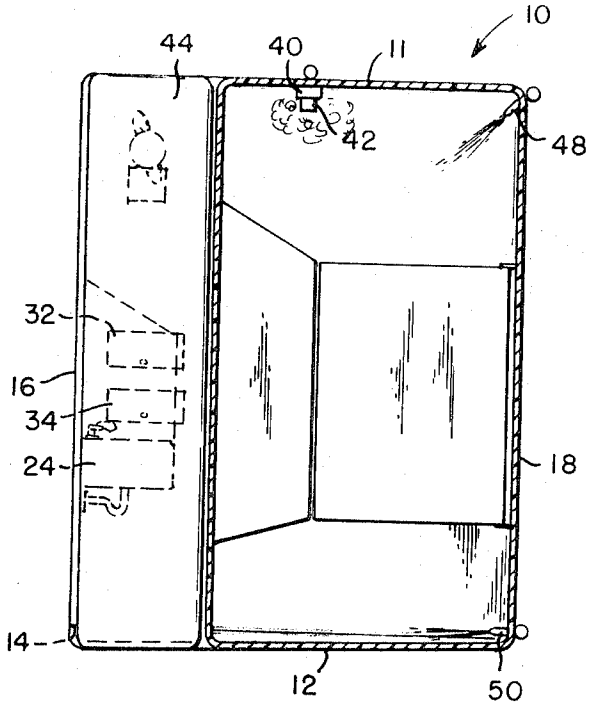


FIG. 3

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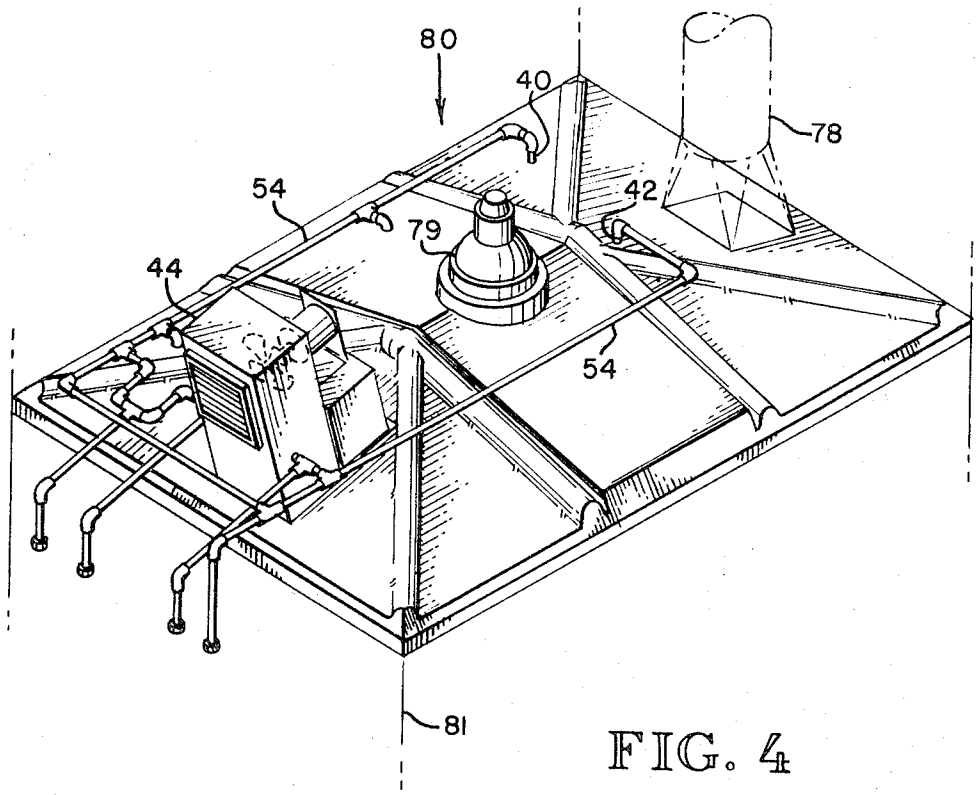


FIG. 4

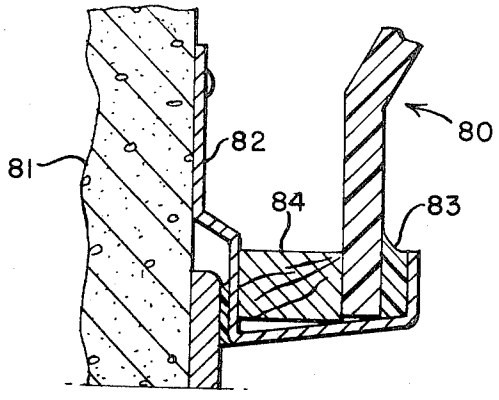


FIG. 5

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SELF-CLEANING REST ROOM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This application pertains to rest room structures and ceilings therefor and, more particularly, to molded unitary substantially watertight rest room structures.

2. Description of the Prior Art

One of the most difficult problems facing gasoline service station owners and managers today is to maintain a clean, pleasant smelling rest room. The problem is compounded by the fact that patrons are highly conscious of and insistent upon a clean rest room; however, service station employees find the task of cleaning the rest room distasteful and thus tend to do an inadequate job or ignore the task completely. Experience has indicated that one of the most poorly accomplished tasks is in removing solid debris, such as discarded towels and the like from the floor of the rest room.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a self-cleaning rest room which requires little if any manual cleaning.

It is another object of this invention to provide a unitary substantially watertight structure which includes sutomatic equipment which will clean, sanitize and deodorize the interior thereof.

Still another object of this invention is to provide a self-cleaning rest room in which the interior and rest room fixtures therein will be automatically subjected to various forms of sprayed cleaning solutions and will be sanitized, deodorized and dried automatically and have solid debris washed from the floor.

Another object is to provide an independent self-contained ceiling structure for a conventional rest room with the ceiling structure having a heater-blower and nozzles attached.

In its broadest form these objects are carried out by the provision of a substantially watertight structure having an entrance opening and a drain opening. Preferably the structure is a molded unitary watertight structure having rest room fixtures therein. The structure could be embodied, however, as a watertight room built into a building using conventional on-site construction techniques or an existing room could be connected to a watertight structure. For example, a molded ceiling fabricated to include all necessary piping, a heater-blower and spray nozzles could be substituted for the conventional ceiling to convert an existing rest room. Likewise the fixtures need not be limited to rest room fixtures but may be of any type requiring constant cleaning and sanitizing. In the preferred form the unitary structure is cleaned by various sprays and is later sanitized and deodorized. The cycling of these various operations may be varied to suit the particular needs of the user.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric of a unitary watertight rest room structure embodying the principles of the invention.

FIG. 2 is a horizontal section taken along the line 2—2 of FIG. 1.

FIG. 3 is a vertical section taken along the line 3—3 of FIG. 1.

FIG. 4 is an isometric of a self-contained ceiling for a rest room.

FIG. 5 is a fragmentary section of the ceiling structure shown in FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The unitary watertight structure **10** includes a top wall **11**, a floor **12** sloped in all directions toward a drain opening **14** provided in one of two side walls **16** and **18**. The drain opening is elongated, large enough in height to pass discarded paper towels and the like, and terminates at its lower edge adjacent the sloped floor **12**. Should it be unnecessary to remove large objects by flushing, a suitable smaller drain opening would be substituted to remove only the liquids. The structure is also provided with a rear end wall **18** and a forward end wall **19** provided with a door **21**. A slight lip **22** is provided below the door **21** to maintain a watertight seal below the door; however, any suitable sealing means could be provided.

The structure is provided with conventional rest room fixtures, such as a sink **24**, a mirror **26**, a urinal **28** and a toilet **30**. It is also provided with closable paper containers **32** and a paper receptacle **34**. The closures for containers and receptacle may be either an integral part thereof or detachable and thus placed on the containers and receptacle prior to cleaning the rest room.

For the purpose of cleaning the rest room the ceiling is provided with four spray nozzles **40** providing overlapping generally square spray patterns which cover substantially all the interior and a fogging nozzle **42**. The fogging nozzle is of a conventional type which emits a fog of liquid droplets. The fog is distributed throughout the structure including the undersides of the fixtures by a blower **44**. The blower **44** is also provided with conventional heating coils **46** to heat the air when desired.

Spaced along the upper edge of the side wall **12** are a plurality of directional spray nozzles **48** preferably emitting forceful 30° conical spray patterns of liquid directly on each of the rest room fixtures. The sprays are sufficiently forceful to wash dirt accumulations from these fixtures as well as the walls surrounding them. Spaced along the bottom edge of the side wall **12** are a plurality of flushing nozzles **50** which direct forceful fanshape sprays along the floor toward the drain opening **14**. The sprays from the flushing nozzles are sufficiently forceful to wash paper and other debris from the floor out through the drain opening.

As is readily understood, a proper cycle of cleaning, sanitizing and deodorizing solutions will leave the rest room in a clean, pleasantly scented condition. In order to provide these operations the nozzles are connected to a system of pipes **54** which connect to a tank **56** containing a supply of cleaning solution, such as detergent, mild caustic and wetting agent; a sanitizing and deodorizing tank **58** which contains a solution of germicide, pleasant scent and wetting agent; and a cold water inlet **60** and a hot water inlet **62**. Flow from the tank **58** is controlled by a solenoid operated valve **64**, flow from the tank **58** is controlled by a solenoid operated valve **66**, and flow through the hot or cold water pipes is controlled by solenoid operated valves **68** and **69**. A programmed cycling mechanism **70** is provided to properly cycle the sequence of the valves and the operation of

the blower and heater to provide the desired functional cycle of operation. In the preferred form a typical cycle is as follows:

Time (Min.)	Function
0/00	Start square pattern sprays 40
	Start fog nozzle 42 (Both spraying hot water solution of detergent, mild caustic and wetting agent)
	Start blower 44
0/20	Stop square pattern sprays
	Stop fog nozzle
	Stop blower
	Start 30° conical sprays 48 aimed at principal fixtures (same solution)
0/40	Stop 30° conical sprays
4/40	Start cross-floor flush 50 (cold water)
5/00	Stop cross-floor flush
	Start square pattern sprays 40
	Start fog nozzle 42
	Start blower 44
	Start air heater boost 46 (Spray and fog material is solution of germicide, perfume and wetting agent)
5/20	Stop square pattern sprays
	Stop fog nozzle
15/00	All off

The room is then ready for immediate use.

In the embodiment illustrated in FIGS. 4 and 5 the heater-blower 44, nozzles 40 and 42 and sections of pipes 54 are secured to a watertight ceiling structure 80 of molded fiberglass or the like. A vent 78 and light 79 may be employed. The sections of pipes 54 terminate a short distance from the ceiling structure and are conveniently located to be connected to the plumbing of a conventionally constructed rest room. The ceiling structure is thus a self-contained structure adapted for use in replacing a conventionally constructed ceiling in existing or new construction. In this structure the nozzle spray pattern is selected to fit the location and types of fixtures in the rest room and the nozzles positioned during manufacture of the ceiling structure.

The ceiling structure 80 is preferably secured to the walls 81 of a conventionally constructed rest room in the manner best shown in FIG. 5. An aluminum channel 82 is first secured to the side walls 81 with a suitable sealant therebetween. The ceiling structure 80 is then set in the four channels and sealed with a conventional sealant 83, such as room-temperature-curing silicon rubber, and a spacer 84 placed against the ceiling structure to hold it tightly against the sealant.

While the preferred form of the invention has been illustrated and described, it should be understood that the principles of the invention may be embodied in other and equivalent forms. The invention is thus not to be limited by the preferred embodiment described but only by a literal interpretation of the claims appended hereto.

The embodiment of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A watertight rest room structure having an entrance, and rest room fixtures such as a toilet, sink and the like, a plurality of spray nozzles within said structure directed at the rest room fixtures, a drain opening, means located outside of said fixtures for distributing finely divided droplets of liquid throughout said structure, blowing means, means for forcefully directing larger droplets of liquid throughout said structure, heating means associated with said blowing means for drying the structure, means for delivering liquids to said liquid distributing and directing means, and means for automatically actuating the liquid distributing and directing means and the, blowing and heating means for cleaning and drying the structure.

2. The structure of claim 1, said larger droplet directing means including overlapping general directed spray nozzles, specifically directed spray nozzles aimed to cover the rest room fixtures, and said finely divided droplet distributing means including said blowing means.

3. The structure of claim 2, said liquid delivering means including separate cleaning liquids, flushing liquids, and germicide, deodorizing and wetting liquids, said actuating means including automatic cycling means for introducing a predetermined order of said liquids and actuation of said blowing and heating means.

4. The structure of claim 1, said drain opening being enlarged to pass paper towels and the like and in a side wall of the structure and terminating adjacent the floor thereof, and a plurality of flushing nozzles directed along said floor toward the enlarged drain opening.

5. A self-cleaning molded unitary generally watertight structure having cleanable fixtures therein, means outside of said fixtures for distributing liquids throughout said structure for covering the inside of said structure and the fixtures, drying means, a drain for removing the liquids, and means for automatically cycling the operation of the liquid distributing means and said drying means for automatically cleaning said structure and fixtures.

6. The self-cleaning structure of claim 5, said drain including an enlarged opening for allowing the discharge of solid waste materials from within the structure.

7. The self-cleaning structure of claim 6, said liquid distributing means including directional spray nozzles directed at said fixtures, generally directed nozzles for providing overlapping spray patterns throughout the structure, and a nozzle for directing finely divided droplets into said structure, said drying means including a blower for distributing the droplets over the entire surface of each fixture.

8. The self-cleaning structure of claim 6, said liquids including cleaning, sanitizing and scenting solutions.

9. A self-contained ceiling structure for use with conventionally constructed waterproofed rest rooms or the like comprising a unitized watertight ceiling surface exposed to the interior of the room and having a heater-blower, a plurality of nozzles secured thereto for directing cleaning liquids throughout the room and ceiling surface and sections of pipes secured to said nozzles and terminating a short distance from the ceiling surface for easy connection to the plumbing of the conventional rest room.

10. The self-cleaning structure of claim 5 said liquid distributing means including directional spray nozzles directed at said fixtures, generally directed nozzles for providing overlapping spray patterns throughout said structure, and a nozzle for directing finely divided droplets into said structure, said drying means including a blower for distributing the droplets over the entire structure of each fixture.

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