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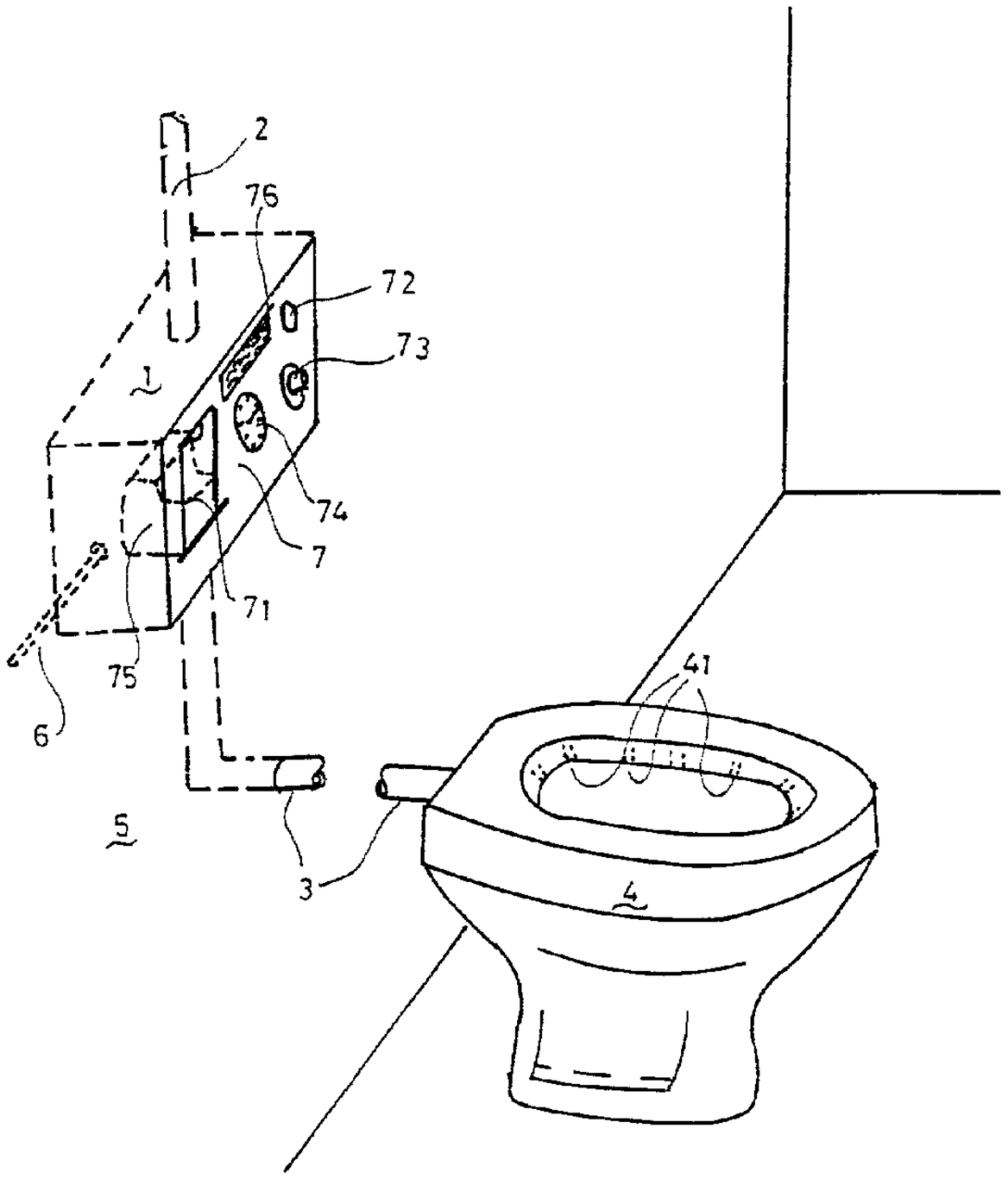


(57) Abrégé/Abstract:
A device for flushing, cleaning and servicing sanitary fixtures including an apparatus capable of heating and draining under control a pressurized fluid containing deterging, disinfecting, deodorizing substances and agents for dissolving calcareous deposits mixed with a suitable fluid which is conveyed to the sanitary fixture through pipes ending in spray nozzles which are placed around the upper edge of the sanitary fixture so as to direct the flush of the cleansing fluid to the inner surface thereof.

Abstract

A device for flushing, cleaning and servicing sanitary fixtures including an apparatus capable of heating and draining under control a pressurized fluid containing deterging, disinfecting, deodorizing substances and agents for dissolving calcareous deposits mixed with a suitable fluid which is conveyed to the sanitary fixture through pipes ending in spray nozzles which are placed around the upper edge of the sanitary fixture so as to direct the flush of the cleansing fluid to the inner surface thereof.

FLUSHING, CLEANING DEVICE FOR SERVICING SANITARY FIXTURES

The present invention relates to the field of the devices for flushing and cleaning sanitary fixtures, particularly the toilet bowl.

As well-known to everybody a lot of different products or accessories such as brushes, sponges, sprayers and the like are employed at the present state of art for cleaning sanitary fixtures. Such a lot of accessories make the cleaning of the sanitary facilities particularly lengthy, tiresome and expensive because of the cost and the quantity of specific products to be used. In addition, it should also be appreciated that water shortage in particular environments or areas makes it necessary to wisely use the available resources. It is enough to think to the little water available in boats and trailers for holidays or, more seriously, in some geographic areas where water shortage is one of the most severe problems.

A further serious drawback directly influencing the hygiene of people is the difficulty and the insufficiency of some public bodies such as schools, colleges, camping, hospitals, where the sanitary facilities are often in a critical situation due to the high number of users, thus causing a risk for the health of the people.

DE-A-2826094 discloses an apparatus with a separated conduit for the cleaning fluid, suitable to be operated after the flushing operation.

FR-A-2603054 discloses an apparatus for the cleaning of the toilet bowl seat suitable to be fitted to all types of toylet bowls.

Said solutions only partially solve the problems of the cleaning of the toilet bowls, and show a plurality of technical difficulties related to the installation of the additional devices that are not fully integrated with the toilet bowls structure.

To solve such problems, in the hitherto installed sanitary facilities, particularly the toilet bowl, an additional supply of water is drained together with deodorizing soap, whereupon further cleaning and servicing interventions are needed such as the use of products for dissolving calcareous deposits in the pipes as well as cleansing agents and disinfectants along with their application means.

The present invention seeks to overcome such problems by providing a device of easy use and little overall dimensions which can be installed both in old and new facilities in order to allow the sanitary fixtures to be cleaned and deodorized in a little time with low consumption of water and cleansing agents and, at the same time, also operates as descaling and disinfectant agent for pipes.

The present invention is based on the inventive concept of providing a new electric appliance capable of doing without the usual flush tank and the auxiliary cleaning means such as the long-handled scrubbing brush as it is provided with means for heating and pressurizing water

from the domestic water supply and for mixing the water flush under pressure with cleansing agents.

To this end, a device for cleaning and servicing sanitary fixtures according to the invention includes means for heating and draining under control into the sanitary fixture to be cleaned a pressurized flush of detergents, disinfectants, agents for dissolving calcareous deposits mixed with a suitable fluid which is supplied through pipes ending in spray nozzles placed along the edge of the sanitary fixture so as to flush the inner surface thereof until the draining pipe.

The advantages essentially consist in that such a device can allow the flow rate of the cleansing fluid to be varied according to the amount necessary to clean the sanitary fixture, thus saving water and cleansing agents. Moreover, the hitherto requested interventions to clean, deodorize and disinfect the sanitary fixtures and to prevent scales from being formed in the pipes are drastically curtailed. It should be further appreciated that such features are particularly important in the already mentioned public installation where the general use of the present invention easily and effectively solves the problem of the hygiene both of the sanitary facilities and the connected sewer line in which, if it is the case, appropriate rat disinfestation substances may be periodically poured.

Further advantages of the invention are the versatility and easiness of use, the noiselessness of operation, and

the capability of being installed both in old and new facilities as it may be connected to the water pipe network or to a flush tank and be positioned above or below, outside or inside the masonry.

Finally, the device of the invention allows the desired admixture of the substances to be added to the main fluid and the suitable selection of those having the lowest environmental pollution available on the market.

In accordance with a first aspect of the present invention, there is provided a sanitary bowl for flushing, cleaning and servicing a sanitary fixture, including an apparatus capable of heating and draining under control a pressurized fluid containing deterging, disinfecting, deodorizing substances to the sanitary fixture, characterized in that said apparatus is an electrically operated water flush box connected to a water inlet pipe of a domestic system and provided with means for regulating a water outlet pressure, electrical resistances for heating the water, and means for supplying the water with the substances from an inner tank only when a water flush is under pressure in order to heat and supply under control for an adjustable time

a flush of the substances mixed with said water for deterging, disinfecting, and removing calcareous deposits from the sanitary fixture, to which said fluid is conveyed by pipes ending in spray nozzles which are located within the sanitary fixture so as to direct the flush of the cleansing fluid to the inner walls of the sanitary fixture, the design of said inner walls of the sanitary fixture and the arrangement of the nozzles being combined so as to direct the flush without dispersions tangentially to the surface of the inner walls of the sanitary fixture, thus optimizing the cleansing efficiency.

These and further advantages will be better intended by anyone skilled in the art from the following description with reference to the annexed drawing given as not limiting example and in which:

Fig. 1 shows schematically a preferred embodiment of a device for cleaning sanitary fixtures according to the invention.

In a preferred embodiment of the invention the construction of a device for flushing and cleaning

domestic sanitary fixtures can be combined with the waterworks and the electric system generally existing in the buildings. More particularly, with reference to Fig. 1, such a conceived device consists of a water flush box 1 which is provided with an electromotor and heating elements, housed in the wall 5, connected to water inlet pipe 2, and supplied by wires 6 connected to the electric system. The front side of the water flush box 1 is provided with a control panel 7 including: a door 71 of an inner tank 75 containing the substances to be added to the water; a pilot light 72; and

operation push button 73; a setting thermostat 74; an air intake 76 for the electromotor.

Provided at the output of the water flush box 1 is a conduit 3 which is connected at the other end to the gasket type union of a toilet bowl 4 connected in turn to nozzles 41 placed around the whole upper edge of the bowl 4 and directed to the inner surface thereof.

In operation, the water flush box receives water from pipe 2 and heats it by means of electric resistances controlled by thermostat 74. At the same time, the desired cleansing fluid is obtained by taking from tank 75 the deodorizing, deterging, disinfecting substances and the agent for dissolving the calcareous deposits.

To sum up, unlike what is known, the device of the present invention allows the deodorizing liquid and the deterging liquid to be added only when the water is pressurized, thus avoiding a tank for water emulsion mixture of such liquids. This is very important in view of the overall dimension and the water consumption. In addition, it is well known that the cleaning action of the emulsions, decreases with time.

In use, the user pushes the operation button 73 and holds it until the desired degree of cleanliness is reached. Advantageously, only a few seconds are needed to reach the cleanliness of the bowl because of the simultaneous action of detergents, heat, and intensity of flushing. Further, the design of the inner walls of the bowl 4 and the arrangement of the nozzles 41 are combined so as to direct

the flush without dispersions, thus optimizing the cleansing efficiency.

In fact, as can be seen from the figure, the direction of holes 41 illustrated with broken lines is tangential to the inner surface of the toilet bowl so as to provide a strong cleaning action in combination with the pressure and the speed of the cleansing agent.

Advantageously, as a comparison with the water flushes of the market and their necessary adaptations, the device according to the invention may be installed in a very restricted room of the order of a couple of 20x20 cm tiles, and may request a maximum electrical input of about 2 kW which involves a negligible consumption due to the limited operation time.

As can be seen from the above-described exemplified embodiment, the pressure of the cleansing agent flowing from the flush box cannot adjusted directly by the user, even if this could be made by controlling the flush box itself. However, it is preferred to disclose the easiest device which can be used where a number of different pressures for different cleaning steps can be programmed according to as long time as button 73 is pressed by the user.

The detail of the preferred embodiment may be varied in the form, dimension, nature and arrangement of the components without parting from the scope of the inventive

spirit and then remaining within the limits of protection of the present industrial invention.

We Claim:

1. A sanitary bowl for flushing, cleaning and servicing a sanitary fixture, including an apparatus capable of heating and draining under control a pressurized fluid containing deterging, disinfecting, deodorizing substances to the sanitary fixture, characterized in that said apparatus is an electrically operated water flush box connected to a water inlet pipe of a domestic system and provided with means for regulating a water outlet pressure, electrical resistances for heating the water, and means for supplying the water with the substances from an inner tank only when a water flush is under pressure in order to heat and supply under control for an adjustable time a flush of the substances mixed with said water for deterging, disinfecting, and removing calcareous deposits from the sanitary fixture, to which said fluid is conveyed by pipes ending in spray nozzles which are located within the sanitary fixture so as to direct the flush of the cleansing fluid to the inner walls of the sanitary fixture, the design of said inner walls of the sanitary fixture and the arrangement of the nozzles being combined so as to direct the flush without dispersions tangentially to the surface of the

inner walls of the sanitary fixture, thus optimizing the cleansing efficiency.

2. A sanitary bowl for flushing, cleaning and servicing a sanitary fixture according to claim 1, characterized in that said sanitary fixture is a toilet bowl provided with spray nozzles placed around the upper inner edge of the toilet bowl.

3. A sanitary bowl for flushing, cleaning and servicing a sanitary fixture according to claim 1 or claim 2, characterized in that said water flush box is provided with a control panel including: a door for supplying the substances to be added to the fluid; a thermostat for regulating a temperature of the fluid, a pilot light, and an operation push button.

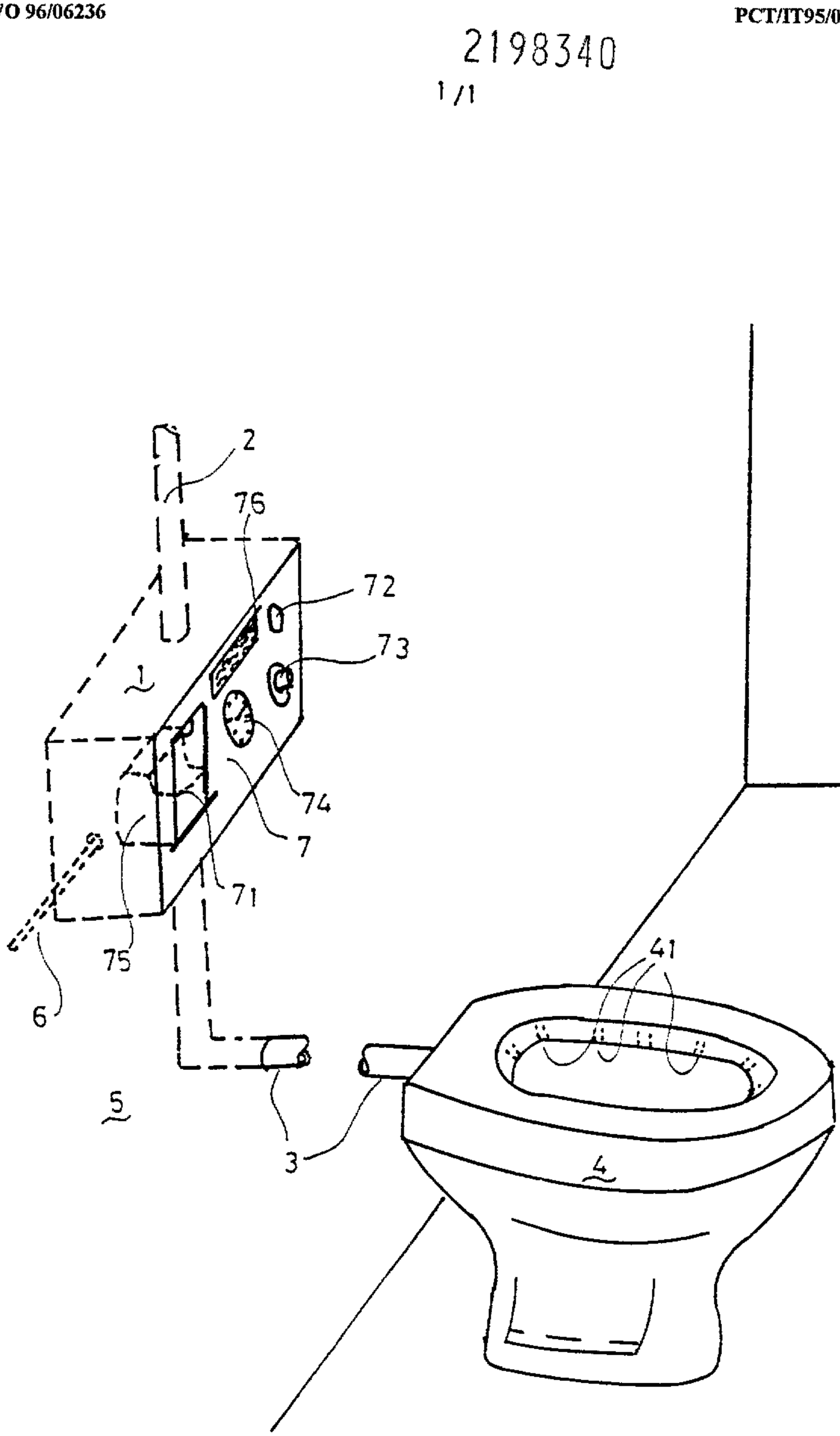
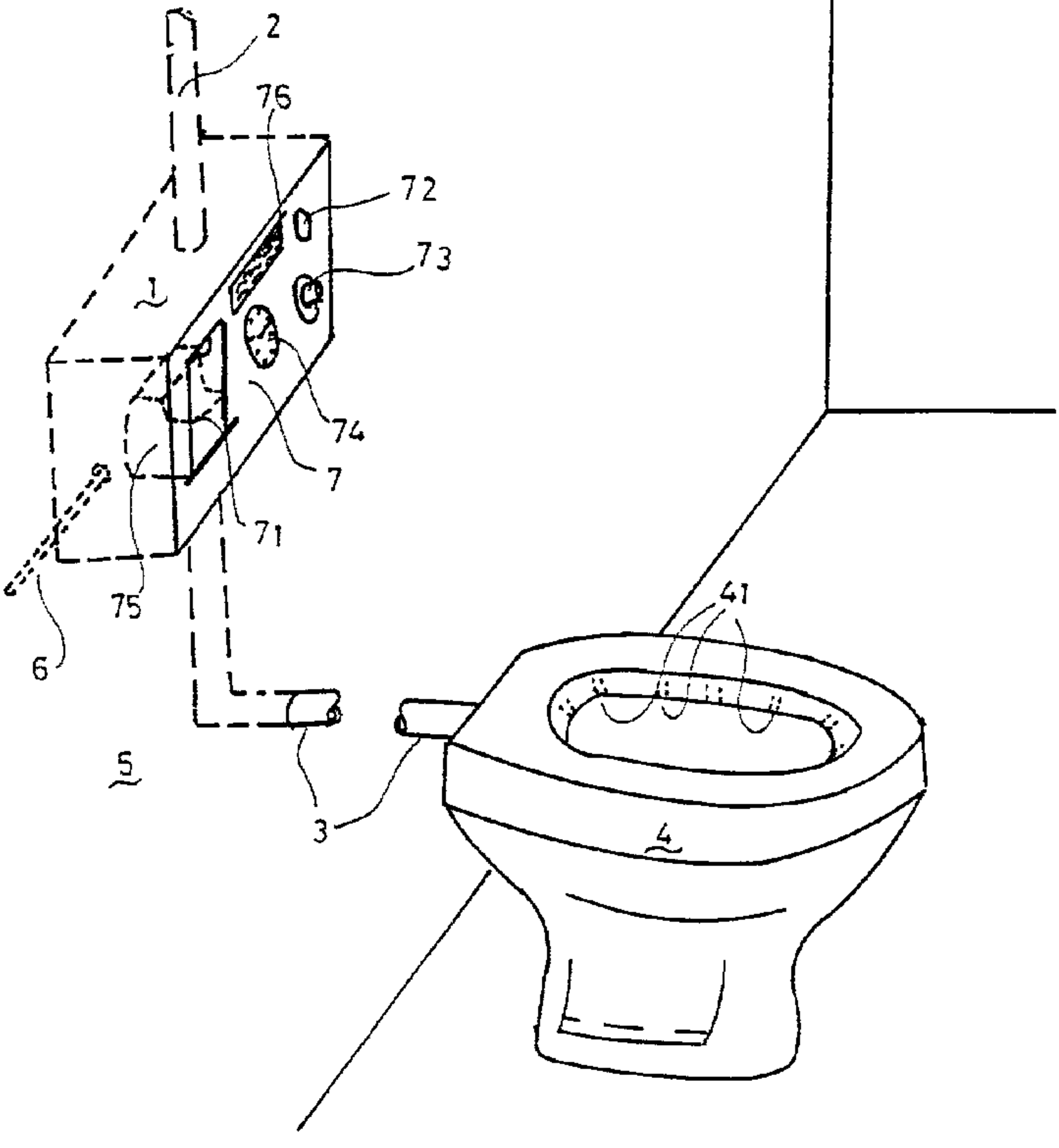


FIG.1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