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[54] **SANITARY CLOSET**  
**12 Claims, 2 Drawing Figs.**

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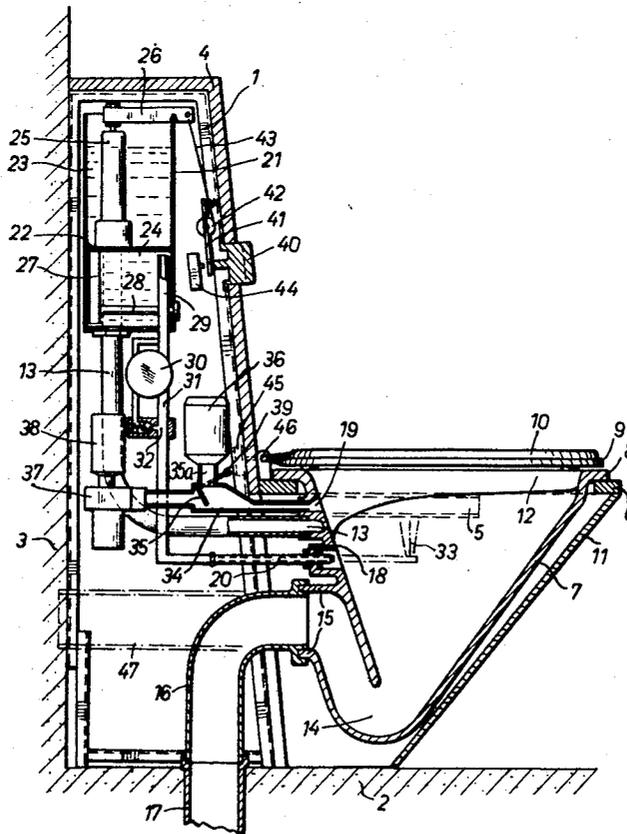
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**ABSTRACT:** The invention relates to a sanitary closet in which the closet bowl, the flushing water tank and all operating mechanisms are mounted in and supported by an encased frame structure. The flushing water tank is divided into upper and lower compartments, the upper compartment containing the flushing water, and the lower compartment containing a thermostat controlled heating device for preparation of a supply of warm body washing water which is delivered by a pump to a telescoped nozzle tube movable by water pressure into operating position within the bowl. Suction ventilator means are connected to the bowl for removing odors and blower means are provided for delivering warm drying air into the bowl.



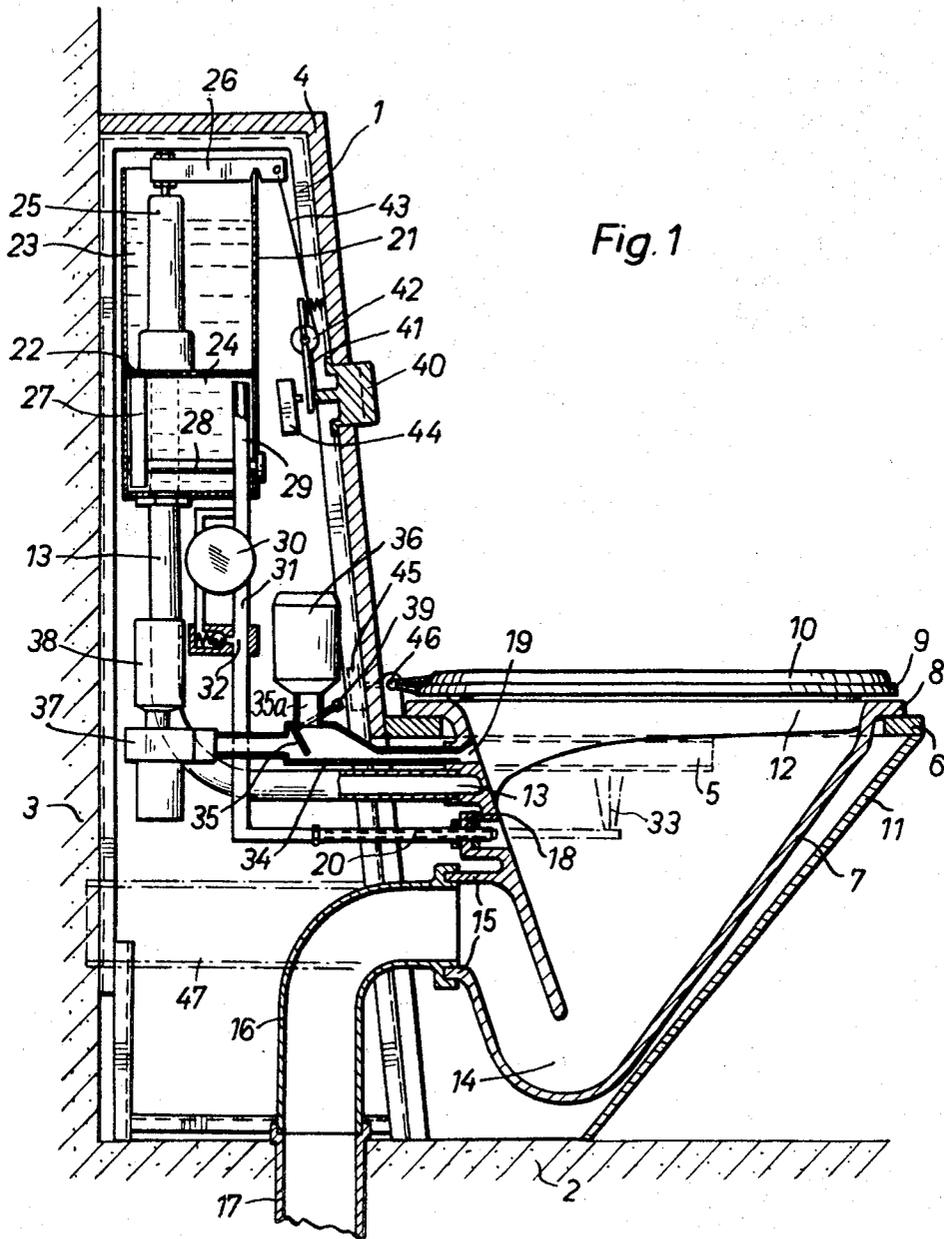
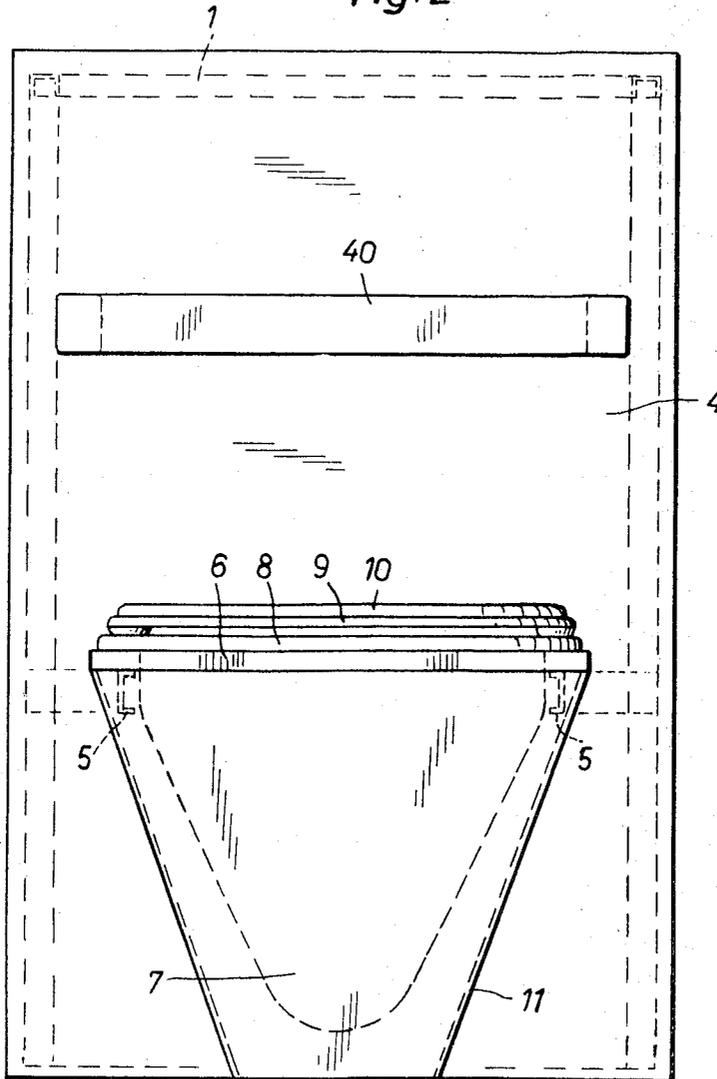


Fig. 1

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Fig. 2



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## SANITARY CLOSET

This invention relates to a sanitary closet of the kind having a flushing device for the closet bowl and a water spraying device movable between a position of rest and a position of operation for delivering a spray of preheated water to wash the lower body parts of the user of the closet.

A known closet of the mentioned kind comprises a flushing water tank of ceramics, for example porcelain, supported by its bottom on a bracket formed by the base portion of a closet bowl also consisting of ceramic material. The flushing water tank, or which the larger portion as usual serves as a container for the flushing water is provided with a water supply, a float valve, a discharge valve, and with actuating members. A portion of the flushing water tank and the portion of the base at the rear of the bowl contain mechanisms for operating the spraying device, such as a device for preparation of warm water, a water pressure generator having a pump and motor therefor, and a blower delivering heated air for drying the washed lower body parts.

This known sanitary closet has different inconveniences. First, the flushing water tank as well as the base containing the closet bowl are of complicated shape and have to be provided with a number of partition walls, projecting portions, perforations and openings, and their manufacture in ceramic material is expensive and results in a considerable weight of the entire structure. A further drawback is the fact, that owing to the reduced space available in the rear portion of the base, a very compact arrangement of the mechanisms and structural parts will be required, so that attendance and repair work are rendered difficult. Also the connection of the drain conduit which forms a passage within the bowl structure bent downwards at right angles for connection to an existing sewage pipe is cumbersome owing to the missing accessibility. Furthermore, the closet structure, owing to the drain conduit forming an integral part of the bowl, must be located on the floor at a precise place which is predetermined by the position of the sewage pipe and cannot be mounted at any desired convenient location independent of the positions of the sewage pipe.

It is an object of this invention to provide a sanitary closet structure which avoids the mentioned inconveniences. According to the invention, the sanitary closet of the kind referred to comprises an encased carrying frame structure supported by a wall and/or by the floor of the room, the closet bowl being supported by said frame structure in which is also mounted a flushing water tank, means for generating water pressure, for heating a supply of washing water and of warm air, and at least one actuating member for said flushing device and said spraying device.

The invention is described in detail in the following specification, reference being had to the accompanying drawings, in which:

FIG. 1 shows a sanitary water closet according to the invention, partly drawn in vertical section and partly in elevation,

FIG. 2 is a front view of the water closet according to FIG. 1.

Referring to the drawings, the sanitary closet comprises a metal frame 1 assembled for example of L-profiles and/or U-profiles to form a cabinetlike structure, supported on the floor 2 and fixed to a wall 3. The frame 1 is encased on the visible front and lateral sides with wooden or plastic panels 4 which partly at least are removable. Two horizontally extending overhung supporting beams formed by channel irons 5 are secured to the frame 1. The beams 5 carry an annular frame 6 which may be formed by wood. The frame 6 has inserted therein a closet bowl 7 which is supported on the frame by the intermediary of a flange 8 forming the upper edge of the bowl. The bowl 7 further is provided in conventional manner with an annular seat 9 and a cover member 10, both being hingedly connected to be turned up or down. The frame 6 also carries an encasing 11 for the bowl 7; this encasing consists of wood

or plastic and extends downwardly in inwardly inclined direction from the frame 6 until the floor 2.

The upper edge of the closet bowl 7 is provided with a bead 12 forming a channel which is open towards the interior of the bowl for discharging the flushing water into the bowl. The flushing water channel (not represented) is connected with a flushing pipe 13 at the rear of the bowl which is inserted into a corresponding opening of the bowl 7. The lower portion of the bowl 7 is formed as a siphon 14 ending in a short horizontal pipe connection 15. This latter is connected to a pipe elbow 16 forming the drain pipe communicating by its outer end with a vertical pipe 17 in the floor 2 leading to the sewage. The rear side of the bowl 7 is provided with two further openings 18 and 19, the opening 18 serving for the introduction of a horizontally extensible nozzle tube 20, and the opening 19 serving for blowing warm air into the bowl.

In the interior of the frame 1 above the discharge pipe 16, there are arranged several mechanisms shown diagrammatically only, which are operative to effect flushing of the bowl, to actuate a spraying device for washing the lower body parts, to dry the washed body parts, and to remove disagreeable odors. The uppermost part of the frame 1 contains a flushing water tank 21 which is divided by a horizontal partition wall 22 in two containers 23 and 24. The upper, larger container 23 receives the flushing water for the closet bowl 7 and is connected by means of a conventional float valve to a water supply conduit (not shown). An overflow pipe 25 contains a discharge valve (not shown) for the flushing water, which valve is operated by a pivotally mounted lever 26. When the valve is opened, the flushing water discharges from the tank 23 through the flush pipe 13 into the bowl 7.

The lower container 24 of the tank 21 is filled from the upper container 23 by a vertical pipe 27 which opens downwardly close to the bottom of the lower container 24. A heating rod 28 is arranged in the lower portion of the containers 24 and serves to heat the water contained therein to about body temperature. The open upper end of a further vertical pipe 29 is situated near the top of the container 24. This pipe 29 is connected with a motor-driven pump 30 which draws water through the pipe 29 from the container 24 and discharges it into the delivery conduit 31. A pressure relief valve 32 controls the pressure in the conduit 31 and limits this pressure to a predetermined maximum value. The lower end of the conduit 31 is bent over to extend in horizontal direction into the nozzle tube 20 which is arranged as a conventional telescope tube. Owing to the pressure of the water delivered into the conduit 31 by the pump 30 the movable front portion of the tube 20 slides forwardly in the bowl 7 against the action of a retracting spring (not shown), into the position drawn in dash-and-dot lines in FIG. 1. At the same time a water jet 33 discharges upwardly through one or several nozzle openings provided at the free end of the tube 20.

A tube 34 has its forward end inserted into the opening 19 in the bowl 7 and has an upwardly extending branch tube 35a connected to a suction ventilator 36 which contains an air filter, for example a charcoal filter for neutralizing odors. The entrance to the branch tube 35a can be closed by a flap 35. An air blower 37 provided with a heating device is connected to the rear end of the tube 34. The intake of the blower 37 comprises an air filter 38 which may contain a deodorizing substance. The flap 35 is provided with an arm 39 acting as counterweight which normally holds the flap 35 in a position in which the section of the conduit 34 leading to the ventilator 37 is substantially closed.

For actuating the described flushing, washing and drying devices a pusher bar 40 is inserted in the front side of the frame encasing 4 and is slidably carried by the frame 1. The length of the pusher bar substantially corresponds to the width of the closet seat; it is arranged at such a level in the encasing that a person using the closet and seated on the seat 9 can actuate the rod 40 by pushing it with the back or the shoulders.

The pusher bar 40 is acting on a spring loaded lever 41 which is provided with an element 42, such as a roll secured to

the lever, to which a steel string 43 is attached. The other end of the string is connected to one arm of the lever 26 for actuating the discharge valve in the overflow pipe 26. The pushbar 40 further actuates a switch 44 by the intermediary of the lever 41 for operation of the pump 30.

A further switch 45 is operatively connected with the seat cover 10, for example by means of the hinge member 46 for the cover 10 and the annular seat 9. This switch is actuated when the cover 10 is lifted. A switch could also be provided which would be actuated when the seat 9 is loaded. The electrical connections for the operation of the described sanitary closet, as well as the conventional switching and safety devices are not shown in FIG. 1, for facility of inspection. The electrical connections can be established by example as follows:

The drive for the pump 30 feeding water to the nozzle tube 20 is connected to the electric power supply plug socket by means of closing contacts of the switch 44, which are series connected with closing contacts of the switch 45, this latter being operatively connected with the pivoting cover 10 or seat 9. By means of a thermostat (not shown) switching-in at about 30° C. and switching-off at about 38° C., the heating rod 28 is also connected with the power supply. The air blower 37 with its heating device is connected in parallel with the heating rod 28 and switched-in and out of circuit by means of a thermostat and an opening contact of the switch 44, actuated by the pushbar 40, as well as a closing contact of the switch 45 connected to the cover 10 or seat 9. The suction ventilator 36 is connected to the power supply by means of a closing contact of the switch 45.

The operation of the represented and described sanitary closet is as follows: In the position of rest, when the cover 10 is closed or the seat 9 not loaded, only the heating rod 28 is connected to the electric current supply by its thermostat, since the closing contact of the switch 45 is open when the cover 10 is closed or the seat 9 is not loaded. The two containers 23 and 24 of the flush tank 21 are filled with water, the water in the container 24 being heated by the heating rod 28 connected in circuit by its thermostat, to a temperature situated between 30° and 38° C.

When the cover 10 is lifted or the seat 9 loaded by a person, the closing contact of the switch 45 is actuated, thereby causing operation of the suction ventilator 36. This latter evacuates air from the closet bowl 7 and delivers it through the charcoal filter which removes disagreeable odors, to the surrounding air. The flap 35, due to the weight of the arm 39, closes the portion of the conduit 34 leading to the blower 37.

When now the pushbar 40 is permanently actuated by the back of the person using the bowl, the pivoting lever 26 is actuated by the intermediary of the spring loaded lever 41, the roll 42 and the string 43, the lever 26 in turn causing the discharge valve in the overflow 25 to open, so that the water contained in the upper container 23 flows through the flush pipe 13 into the bowl 7. When the pushbar 40 is actuated also the switch 43 is operated, the closing contact of which causes operation of the pump 30. This latter draws warm water from the upper portion of the lower container 24 and delivers it into the pressure conduit 31, whereby the nozzle tube 20 is pushed forwardly into the closet bowl and warm water is sprayed through the nozzle openings towards the lower body parts of the person. Dirt and impurities resulting from such washing are taken along with the flushing water entering into the bowl 7 at the same time, and are evacuated into the siphon 14 and the drainpipe 16. The warm water drawn off by the pump 30 through the pipe 29 is continuously replaced by cold water supplied through the pipe 27 from the upper container 23, so that the thermostat situated close to the heating rod 28 and to the bottom of the container 24 rapidly cools down to a temperature of below 30° C. for example, and causes the heating rod to be connected to the supply net. The warm water in the container 24 is caused to rise by the cold water supplied to bottom of the container, so that the temperature of the water discharged through the nozzle tube 20 will drop only after a certain time.

As soon as pressure on the pushbar 40 is relieved, when washing is terminated, or when the washing water discharged through the nozzle tube 20 becomes disagreeably cool, the discharge valve for the flushing water will be closed and the pump 30 is switched-off. Thereby also the nozzle tube 20 is retracted by spring action into its position of rest. Since the thermostat in the container 24 is connected in circuit owing to the cooling down of the water in the container, and the opening contact of the switch 44 is closed when the pushbar 40 is released, the air blower 37 with its heating device starts to operate and blows warm air mixed with a deodorant into the closet bowl 7 for drying the cleaned body portions. Due to the pressure of the air blown through the conduit 34, the flap 35 is pushed to its position closing the branch conduit 35a leading to the suction ventilator 36.

When the drying operation is ended, and the seat 9 is relieved from its load or the cover 10 is closed, the contacts of the switch 45 open whereby the air blower 37 and the suction ventilator 36 are switched-off. The heating rod 28, however, remains connected to the power supply net, until the upper temperature limit of 38° C. is reached and the thermostat cuts off the current. As a modification, a time-switch, for example a time-delay relay can be provided, which disconnects the air blower after a predetermined period of time, for example after one-half or 1 minute operation time.

A further time switch with an adjustable timelag can be provided for cooperation with the pushbar 40. For operation of the spray of the nozzle tube 20, the pushbar would then have to be actuated only with a short single push to energize the time-switch whereby the pump 30 starts to operate. After expiration of the timelag of 10 seconds, for example, the pump 30 is automatically switched-off.

The pushbar 40 can also be arranged to be brought into two different positions obtained by successively exerting two different pressures on the bar. In the first position of the bar only the lever 41 is actuated, causing opening of the discharge valve of the flushing water without simultaneous operation of the nozzle tube spray 33. Only a further actuation of the pushbar 40 causes the switch 44 to be actuated to operate the spray 33. In this manner the water closet can be used like a conventional sanitary closet provided only with a flushing device for the bowl.

In the described sanitary closet all devices and actuating members can be arranged above the drain pipe 16 in the frame 1 situated at the rear of the closet bowl 7 and placed against a wall. Since the length of the frame is not limited by the width of the closet bowl, the frame can be chosen of sufficient size, so that when the lateral or front encasing panels are removed, all parts of the interior mechanism are easily accessible. Since the lower portion of the frame does not contain any elements of the flushing and spraying devices, the connection of the drain pipe 16 with the bowl 7 and the sewage pipe 17 can be effected in simple manner.

Due to the fact that the bowl 7 of the described sanitary closet is not placed on the floor and does not form a supporting base, but is itself suspended in supporting beams 5, it can be of substantially more simple shape and can be made with a smaller wall thickness than conventional closet bowls. This enables an easier cleaning of the wall surfaces of the bowl, and a reduction of production costs. In addition, fixing of the bowl to the floor is no longer required.

A further advantage of the described closet is that the bowl 7 requires only a short horizontal drainpipe connection 15. This particular structure enables to effect the connection of the bowl to an already existing sewage pipe by means of any suitably shaped drainpipe, for example of plastics, so that the position of the sanitary closet is not dependent on the location of the sewage pipe. For example, a horizontal drainpipe 47, drawn in dash-and-dot lines in FIG. 1 can be used when the sewage pipe to which the bowl is to be connected would be situated in the floor 2 beyond the wall 3.

A further advantage is the fact that the water heating container 24 in the frame 1 with the heating rod 28 is arranged im-

mediately below the container 23 for the flushing water and the container 24 is supplied with water from the container 23 by gravity owing to difference in level. This arrangement avoids to build the water heater container 24 as a pressure resisting compartment, thus increasing the safety of operation.

It is a further advantage that the actuating member for operation of the spray 33 can be released by a slight movement of the back and that no pressure by the foot must be exerted, which is difficult or impossible for invalids or old persons. In addition, a soiling of a foot operated pedal or button, which can prejudice its operation, is entirely avoided by the fact that the pushbar is placed far away from the floor. With the pushbar in the represented position, it can also be actuated without any difficulty by hand or by the elbow. Further, there are no mechanical or electrical connections from the floor to mechanisms arranged behind the closet bowl, whereby the mounting and attendance of the sanitary closet is simplified.

The encasing 11 for the bowl 7 can be formed in a single piece; it can also be integral with the frame 6 of the bowl. Such an encasing offers the advantage to be of lightweight, shockproof, simple to clean, and it can be produced in any desired color.

From the foregoing specification it results that the described sanitary closet is of particular usefulness and advantage in feminine hygiene.

I claim:

1. A sanitary closet of the kind having a flushing device for the closet bowl and a water spraying device movable between a position of rest and a position of operation for delivering a spray of preheated water to wash the lower body parts of the user, wherein the improvement comprises an encased carrying frame structure supported by a wall and/or the floor, said encased frame structure supporting the closet bowl, a flushing water tank, means for heating a supply of washing water, pressure generating means for delivering washing water to said water spraying device, blower means for delivering warm air into the closet bowl, and actuating means for the operation of said flushing device and said water spraying device, in which the rear side of the bowl is provided with openings for the passage of a movable nozzle tube of said spraying device, and for the connection of a flushing pipe, an air delivery and suction conduit and a drainpipe, in which said air delivery and suction conduit is connected with an air blower provided with an air heating device, and in which an intake of the air blower is combined with an air filter containing a deodorizing agent.

2. A sanitary closet of the kind having a flushing device for the closet bowl and a water spraying device movable between a position of rest and a position of operation for delivering a spray of preheated water to wash the lower body parts of the user, wherein the improvement comprises an encased carrying frame structure supported by a wall and/or the floor, said encased frame structure supporting the closet bowl, a flushing water tank, means for heating a supply of washing water, pressure generating means for delivering washing water to said water spraying device, blower means for delivering warm air into the closet bowl, and actuating means for the operation of said flushing device and said water spraying device, in which the rear side of the bowl is provided with opening for the passage of a movable nozzle tube of said spraying device, and for the connection of a flushing pipe, an air delivery and suction conduit and a drainpipe, in which said air delivery and suction conduit is connected with an air blower provided with an air heating device, and in which said air delivery and suction conduit is provided with a branch conduit leading to a section ventilator provided with an odor absorbing filter.

3. A sanitary closet of the kind having a flushing device for the closet bowl and a water spraying device movable between a position of rest and a position of operation for delivering a spray of preheated water to wash the lower body parts of the user, wherein the improvement comprises an encased carrying frame structure supported by a wall and/or the floor, said encased frame structure supporting the closet bowl, a flushing water tank, means for heating a supply of washing water, pres-

sure generating means for delivering washing water to said water spraying device, blower means for delivering warm air into the closet bowl, and actuating means for the operation of said flushing device and said water spraying device, in which said actuating means for the flushing device and the spraying device comprises a pushbar arranged at the front side of the frame structure on the level of the back of a person using the closet.

4. A sanitary closet according to claim 3 in which the pushbar operates mechanical actuating members for the discharge valve of the flushing water, such as a lever and a string transmission, and an electrical switch for controlling the pump.

5. A sanitary closet according to claim 4, in which said pushbar comprises two positions of operation, the pushbar in the first position operating the mechanical actuating members for the discharge valve of the flushing member, and in the second position the pushbar additionally actuates the electrical switch for controlling the pump.

6. A sanitary closet of the kind having a flushing device for a closet bowl and a water spraying device movable between a retracted rest position and an extended operative position for delivering a spray of preheated water to wash lower body parts of a user, comprising: a base frame, a closet bowl connected forwardly on the frame, a flushing water tank connected on the frame rearward of the bowl, the water tank comprising first and second superposed compartments, a mechanically actuated discharge valve connected to the first compartment and a flushing water inlet pipe connected to the discharge valve and to the closet bowl for delivering flushing water from the first compartment to the bowl upon opening of the valve, a tube positioned in the first and second compartments and communicating the first compartment with the second compartment, the tube having an opening close to a bottom of the second compartment, a thermostatically controlled heating device mounted in the second compartment close to the bottom thereof, and a suction tube connected to the second compartment and having an opening submerged near an upper portion of the second compartment, water pressure generating means connected to the suction tube, a spray tube connected to the water pressure generating means, an opening in a rear side of the bowl, a movable nozzle mounted in the opening for reciprocation therethrough, the nozzle being connected to the spray tube for receiving pressurized water therefrom and for extending outward into the bowl upon receiving pressurized water from the spray tube, lower means for delivering water into the closet bowl, and actuating means for operating the flushing valve and the pressure generating means.

7. A sanitary closet according to claim 6 in which said base frame has a forward extending portion partially surrounding the bowl, and wherein the bowl has a circumferential horizontal flange extending outward along an upper annular edge of the bowl, whereby the bowl is supported on the forward extending portion of said frame.

8. A sanitary closet according to claim 7 in which said forward extending frame portion includes two spaced horizontal beams and a frame member supported on the beams, said flange of the bowl resting on said frame member, and encasing panels mounted on the frame member for enclosing the bowl.

9. A sanitary closet according to claim 6 in which the water pressure generator means comprises an electrically driven pump mounted in the frame, and wherein the movable nozzle tube comprises a horizontally oriented telescoping nozzle tube for horizontal forward extension into a center of the bowl upon receiving water pressure from said pump and further comprising a spring for withdrawing a telescoping portion of the nozzle out of the bowl when the pump is turned off.

10. A sanitary closet according to claim 6 further comprising air delivery and suction conduit respectively connected with an outlet and an intake of the air blower means, and further comprising an air heating device in one conduit.

11. A sanitary closet according to claim 2, in which the connection of the air delivery and suction conduit with the blower of warm air or with the suction ventilator is controlled by a

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pivotable flap adapted to occupy two positions for alternately closing and opening the communication of said conduit with the air blower or with said suction ventilator.

pivotable flap is held in one of its two positions by gravity and in the other position by the pressure of the air delivered by said blower.

12. A sanitary closet according to claim 11, in which said

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