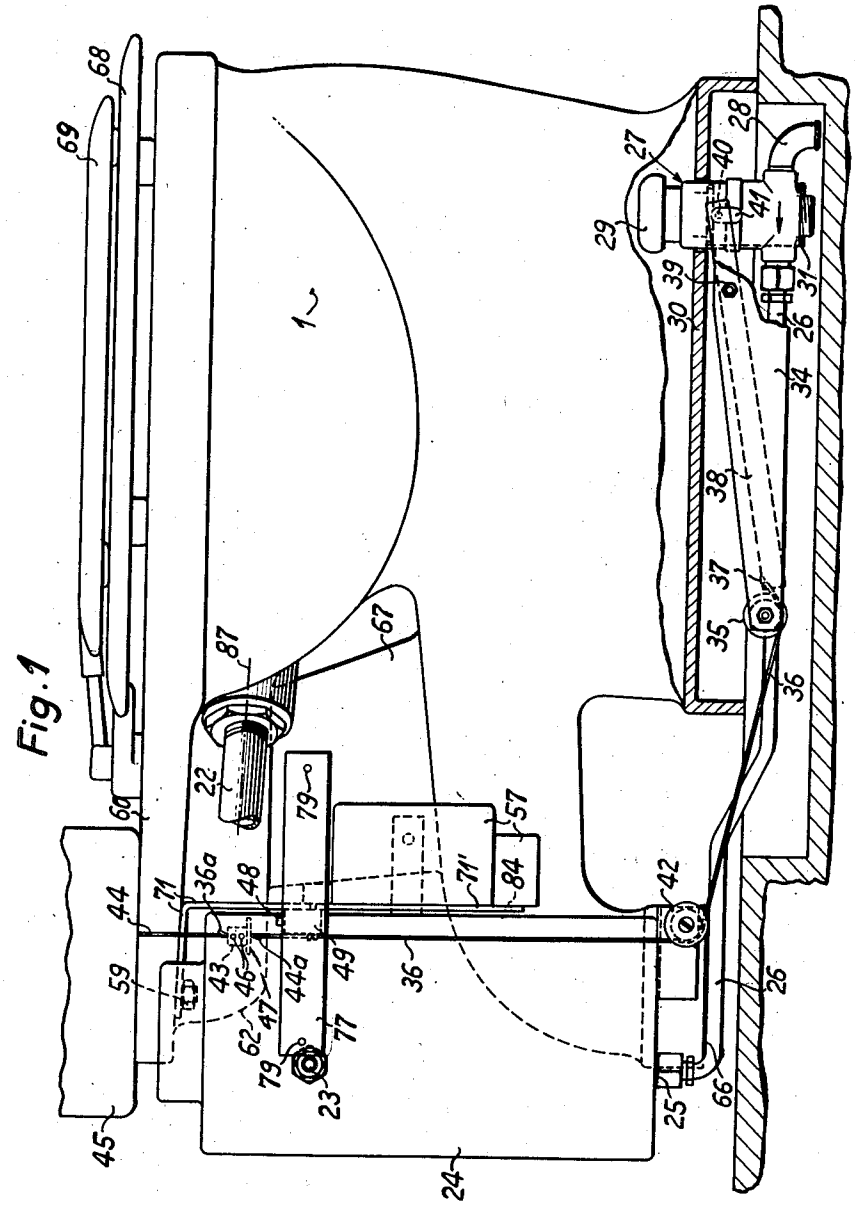
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WATER CLOSET APPLIANCE

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Fig. 1



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Fig. 2

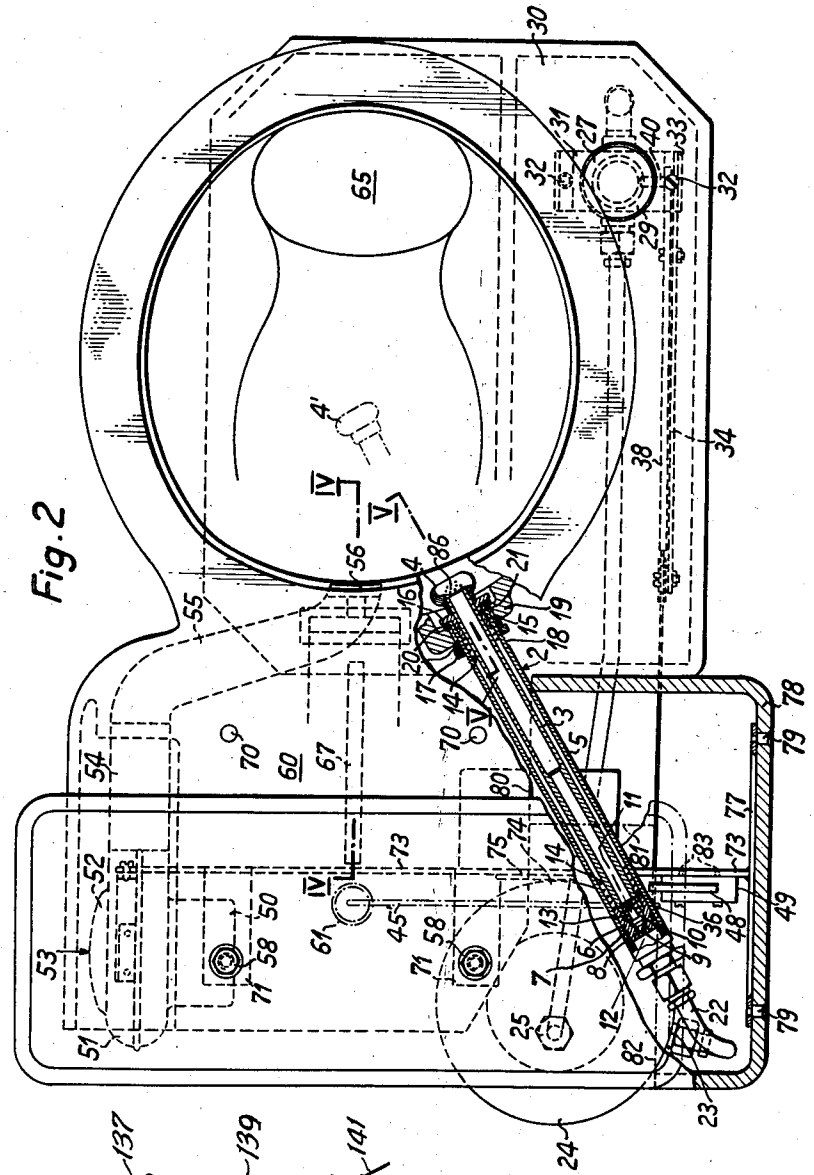
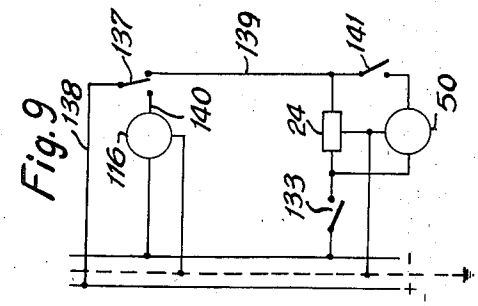


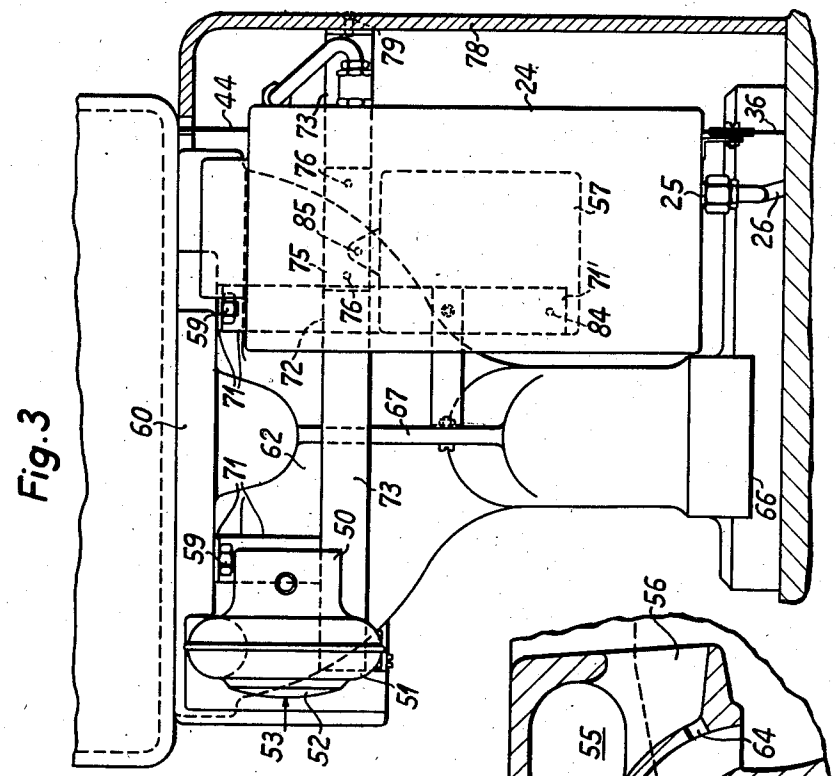
Fig. 9

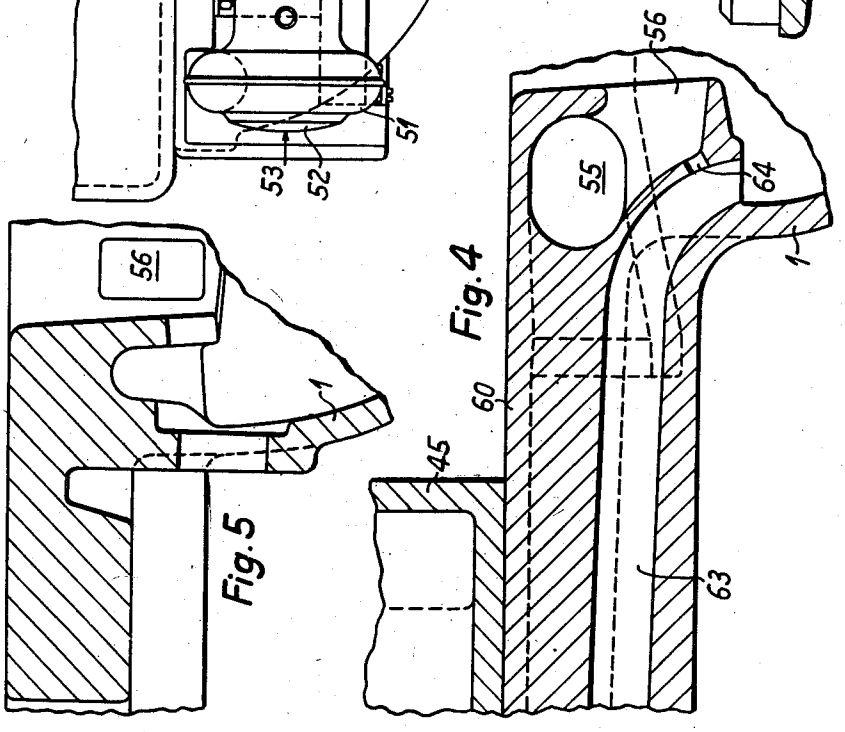


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WATER CLOSET APPLIANCE

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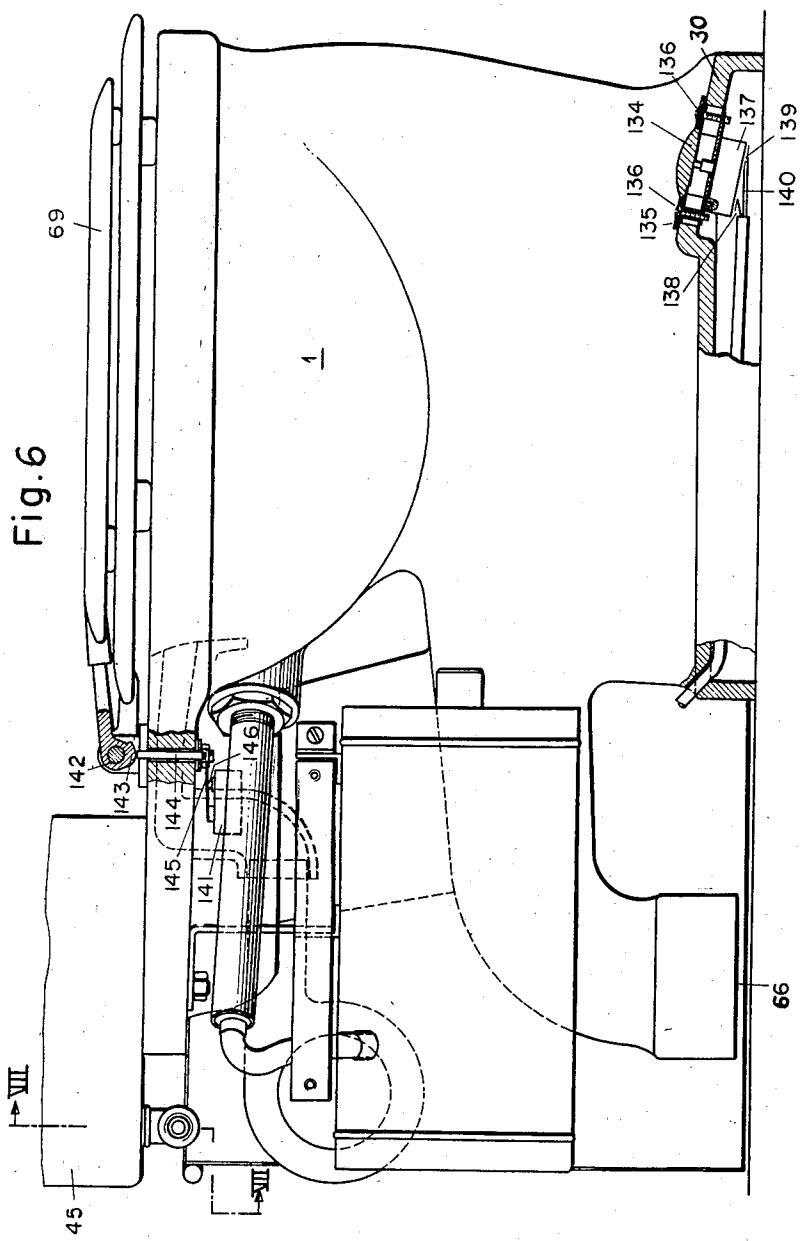


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Fig.6



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WATER CLOSET APPLIANCE

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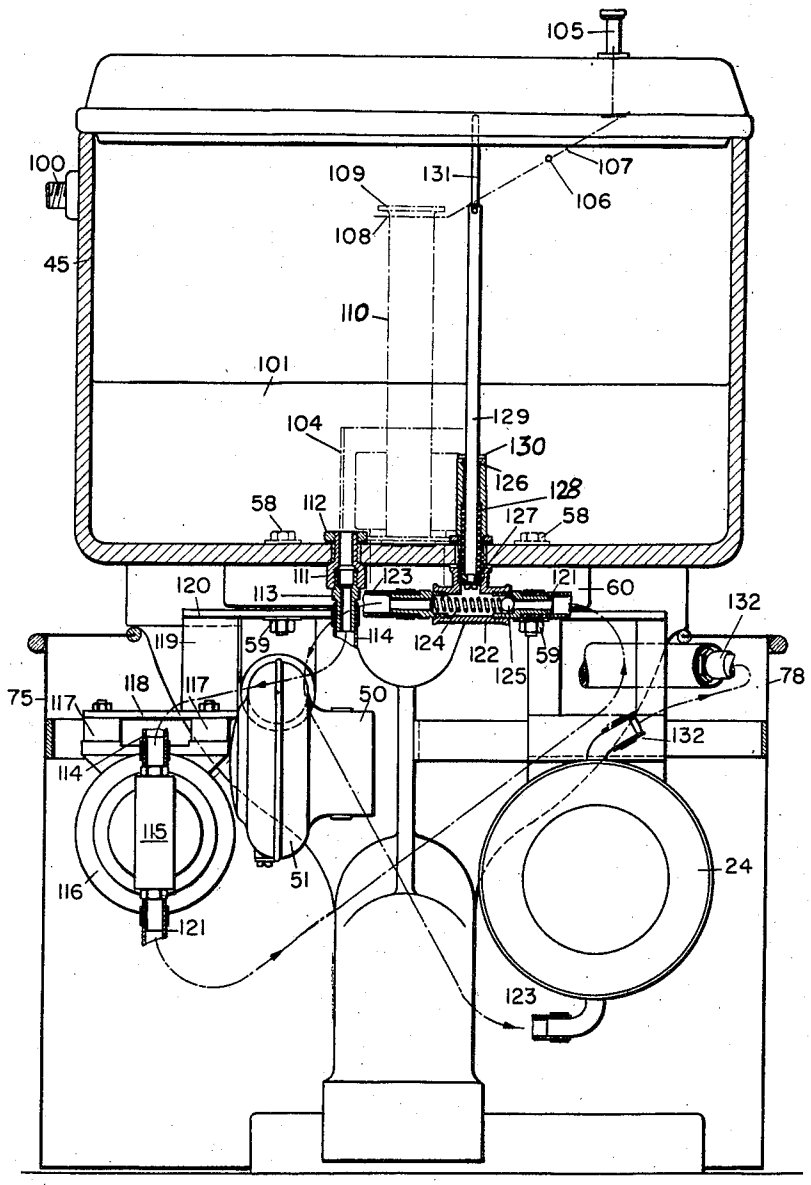


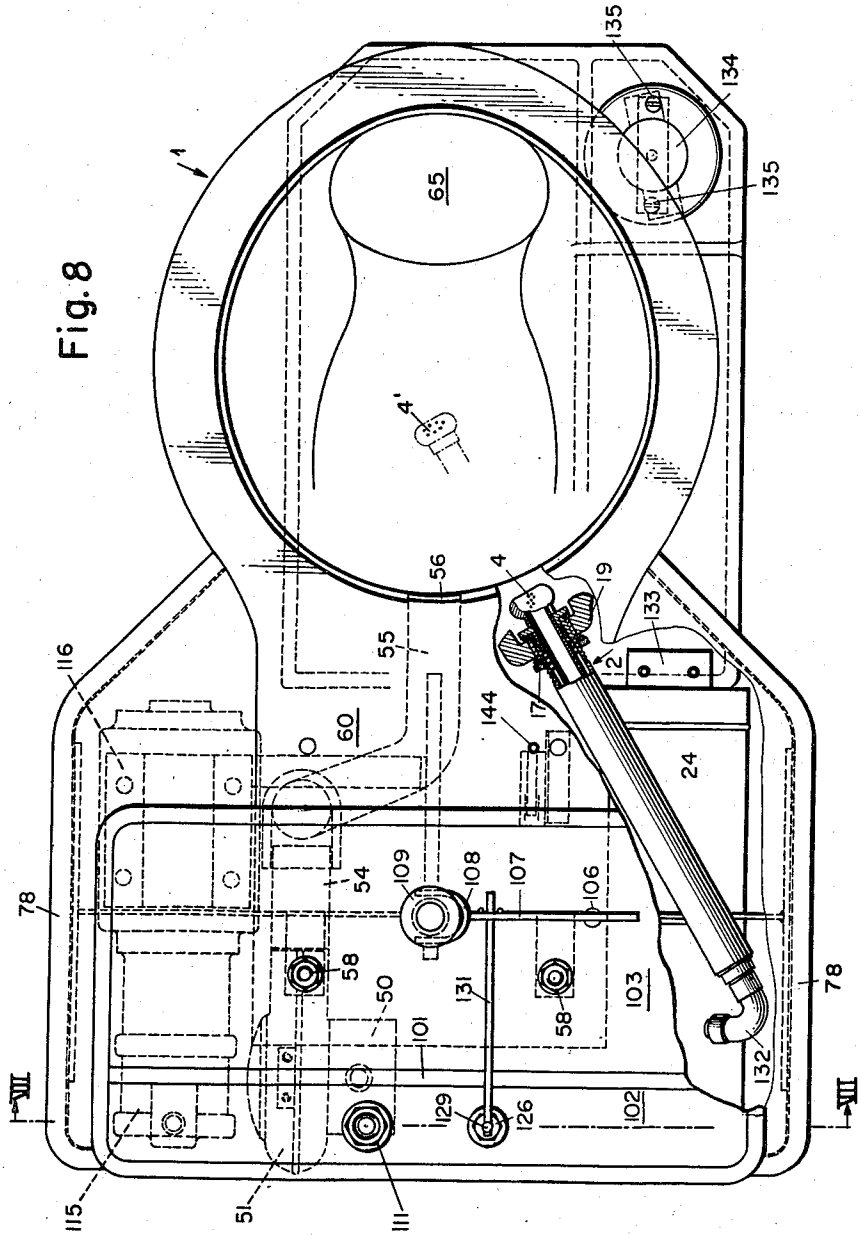
Fig.7

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Fig. 8



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2,872,687

WATER CLOSET APPLIANCE

Hans Maurer, Zollikerberg, Zurich, Switzerland

Application September 11, 1957, Serial No. 683,309

Claims priority, application Switzerland September 14, 1956

13 Claims. (Cl. 4—7)

The invention relates to a water closet appliance and has the primary object of providing a device for the washing, and preferably the subsequent drying of the lower body parts of the user.

With this and other objects in view I provide a water closet appliance comprising in combination: a flushing bowl and a sprayer device arranged on the said bowl for washing the lower body parts of the user, the said sprayer device having a cylinder fixedly attached to the said bowl and adapted to be supplied with water under pressure, a tube mounted slidably in said cylinder, a sprayer head arranged on the outer end of said tube and an obturator means arranged on the inner end of the said tube, the said tube being displaced by water pressure applied to the said cylinder in the sense of projecting from the latter and into the said bowl, the said sprayer head then being in its operative position, and the said obturator means then being opened by the said water pressure, and the water flowing through the said tube and being sprayed at least partly in an upward direction by the said sprayer head.

Preferably the water closet appliance according to my said invention comprises also a water heater having a thermostat, operatively connected upstream of the said cylinder.

Preferably also an electric hot air unit is provided on the said bowl, blowing when operated heated air on the wetted lower body parts of the user and thus drying the same.

These and other objects and features of my said invention will be clearly understood from the following description of two preferred embodiments thereof, given by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation of a first embodiment, partly in section,

Fig. 2 is a plan view to Fig. 1, also partly in section,

Fig. 3 is a back view to Fig. 1, also partly in section.

Fig. 4 is a part-section on the line IV—IV of Fig. 2, and

Fig. 5 is a part-section on the line V—V of Fig. 2, Figs. 4 and 5 being on a larger scale.

Fig. 6 is a side elevation of a second embodiment, partly in section,

Fig. 7 is a back view thereof, the upper part being in section on the lines VII—VII of Figs. 6 and 8, while in the lower part only a casing is sectioned on the line VII—VII of Fig. 8.

Fig. 8 is a plan view thereof, partly in section, with the cover of the flushing cistern and of the flushing bowl omitted.

Fig. 9 is a wiring diagram illustrating the electrical connections for embodiment of Figs. 6. to 8.

In the Figs. 1 to 3 some components have been omitted for the sake of simplicity and clarity.

The water closet appliance according to Figs. 1 to 5 comprises a bowl 1 on which a spraying device 2 is attached which is designed for washing the lower body parts. This spraying device comprises a straight tube 3 which is provided at one of its ends with a sprayer head 4 (see Fig. 2). This tube is slidable in a cylinder 5 so that it protrudes in the washing position from the cylinder 5 and into the bowl 1. The washing position of the sprayer

head is indicated in Fig. 2 at 4' in chain-dotted lines. The other end of the tube 3 is screwed into a piston 6 which slides in the cylinder 5 and is provided with a sealing ring 7.

The piston 6 is provided with a central bore 8 into which projects a valve head 9. The valve seat provided on the piston is denoted 10. The valve head is provided for reasons to be explained later with a small central bore 11 so that the valve 9, 10 does not completely isolate the cylinder space 12 from the interior of the tube, even in its closed position. A spring 13 tends to close the valve 9, 10. A further spring 14, which however is weaker than the spring 13, is arranged in the annular space existing between the cylinder 2 and tube 3.

A spring 14 abuts at one end on the piston 6 and at its other end on a bushing 15 which is screwed into the adjacent end of the cylinder 2 and serves for guiding the tube 3. The washing position 4' of the sprayer head is reached, when the turns of the spring 14 contact one another directly. The bushing 15 is provided with a flange 16 which together with a nut 17 arranged on an external screw thread 18 of the cylinder end serves for the attachment of the cylinder 2 to a bulge 19 formed on the bowl 1. Sealing rings are denoted 20 and 21.

The cylinder space 12 is connected by a pipe 22 (shown only partly in Fig. 1) and appropriate adaptors to the outlet 23 of an electric water heater 24. This water flow heater, the internal components and electrical leads of which are not shown, is provided with a thermostat which keeps the water at an adjustable temperature of about 30 to 40° C. The water enters into the water heater 24 from below at 25. It is supplied to the same through a pipe 26 which is normally obturated by an obturator valve 27. The valve 27 is to be connected by a pipe bend 28 to a pressure water supply.

The valve 27 has a button 29 which can be depressed by the foot of the user sitting on the water closet bowl, in order to open the valve. As soon as the pressure on the button 29 ceases, the valve closes automatically in the usual manner by the action of a spring contained therein. The valve 27 is arranged to the better part below a plate 30 forming part of the base of the bowl 1, and is attached to this plate by means of a carrier bracket 31, which is in turn fixed to the plate at 32 by means of two screws. To one leg 33 of the carrier bracket 31 a carrier arm 34 is fixedly attached, e. g. by welding which arm carries at its free end a guide roller 35 for a cord 36 consisting for example of nylon.

One end of the cord 36 is attached at 37 to one end of a lever 38 which is pivotally mounted at 39 on the carrier arm 34. The other end of the lever is fixedly connected to a pin 40 which projects through a slot 41 of the casing of valve 27 into the latter and which upon depressing the button 29 is carried along downwardly by the valve head.

Thereby the lever 38 is turned clockwise (Fig. 1), and accordingly a pull is applied to the cord 36.

The cord 36 is passed upwardly about a further guide roller 42, and is connected by a coupling piece 43 with another cord 44 which enters from below into a flushing cistern 45 and is there connected to the usual release lever by means of which the flushing of the water closet bowl is released. This lever is shown in Fig. 2 in chain-dotted lines and is denoted 45'. The coupling member 43 has a bore, through which the ends 36*a* and 44*a*, respectively, of the cords 36 and 44 can be pushed more or less deeply, and can be clamped fast by means of two clamping screws at 46. Thereby the effective length of the cords 36 and 44 can be adjusted to the correct value.

On the coupling member 43 moreover an abutment flange 47 is provided, which hits the switch lever 48 of

an electrical microswitch 49, when the cord 39 is pulled, and thereby switches on a motor 50 (see Figs. 2 and 3). The motor 50 drives a centrifugal blower 51 into which air flows through a lid 52 provided with perforations (not shown) in the direction of the arrow.

In the outlet socket 54 of the blower 51 an electrical heating resistor (not shown) is built-in, which is switched on simultaneously with the motor 50 by switch 48. The heated air flows through a conduit 55 provided in the body of the bowl 1, which issues at 56 into the interior of the bowl 1 (see Figs. 4 and 5).

When pressure is no longer applied by the foot to the button 29, the cord 44 is pulled upwardly again by the spring-biased release lever of the flushing cistern 45, and the coupling member 43 with its abutment flange 47 returns accordingly to its initial position as illustrated in Fig. 1. The hot air unit 50—52, 54 remains, however, in operation for a certain duration, e. g. of 1 to 2 minutes, which is attained in the usual manner by means of a delayed action relay 57.

As regards structural design and assembly of the water closet appliance described, the following may be added:

The bottom of the flushing cistern 45, the lid of which is not shown, is attached by means of two screws 58 (see Fig. 2) and associated nuts 59 (see Fig. 3) on a shelf 60 formed on the bowl 1. The usual handle protruding from the lid with which the flushing cistern 45 is provided, is indicated in Fig. 2 in chain-dotted lines and is denoted 61. It may be operated at will for flushing the bowl without operating the spraying device 2. The shelf 60 has on its underside a bulge 62 in which the conduit 63 for the flushing water is located (see Fig. 4). The conduit 63 is connected by an aperture 64 near its outlet with the end of the hot air conduit 55, so that part of the flushing water passes at any time through this aperture and cleans the end of the hot air conduit of fouling, if any. The faeces and the flushing water get at 65 into the drain which by means of a syphon (not shown), provided in the lower part of the bowl 1 is to be connected to the sewer system at 66. A stiffener rib provided below the shelf 60 is denoted 67. On the bowl 1 a foldable annular seat 68 and a lid 69 are provided in the usual manner (see Fig. 1). In Fig. 2 two screw holes 70 are shown for the attachment of the annular seat and of the lid on the shelf 60.

The two aforesaid screws 58 and nuts 59 serve also for the attachment of two angle pieces 71, which are welded at 72 to a horizontal transverse beam 73 (see particularly Fig. 3).

A plate 75 welded at 74 to the shell of the throughflow heater 24 (see Fig. 2) is screwed at 76 to the transverse beam 73. At the right hand side end of the transverse beam 73 a horizontal flat iron 77 is welded on perpendicularly to it, to which a casing 78 is screwed at 79. The contour of this casing 78 is screwed at 79. The contour of this casing 78, which is omitted from Fig. 1, runs on the side of the bowl according to the chain-dotted line 80—81—82 shown in Fig. 2.

The switch 49 is screwed to the transverse beam 73 at 83. One of the two angle pieces 71 (on the right in Fig. 3) has a leg 71' extended downwardly, and the delayed action relay 57 is screwed at 84 to this leg and at 85 to the transverse beam 73. At the left hand side end of the transverse beam (Fig. 3) moreover the hot air unit 50—52, 54 is mounted.

The manner of operation of the water closet appliance illustrated follows essentially already from the foregoing description. When the user presses the button 29 with the foot, the obturator valve 27 is opened. The water under pressure, which is reduced by a reduction valve arranged upstream to about 1.5 atmospheres gauge, passes through the through-flow heater 24 into the space 12 of the cylinder 5 and then firstly pushes by means of the piston 6 the tube 2 so far out of the cylinder that the turns of the spring 14 contact one another and the

sprayer head is in the washing position 4'. Then the pressure overcomes the restoring force of the spring 13 and lifts the valve head 10 off its seat 9. The lukewarm water passes then through the interior of the tube 3 to the sprayer head 4 and is sprayed by the same to the better part upwardly through numerous holes 86. Opposite the holes 86 there are also some holes arranged in the sprayer head 4, through which part of the water is sprayed downwardly in order to clean the bowl additionally.

The cleaning of the bowl is effected mainly by the flushing water supplied by the flushing cistern 45, the flushing being effected likewise by depressing the button 29 by means of the lever 38, the cords 36, 44 and the release lever 45' of the flushing cistern 45. At the same time also the hot air unit 50—52, 54 comes into action.

As soon as the button 29 ceases to be depressed, the valve 27 closes, and the tube 3 returns to its starting position under the bias of the spring 14, after the valve 9, 10 had already previously closed under the action of the spring 13. When the tube 3 returns, the water contained in the contracting cylinder space 12 flows through the restricted orifice 11 mentioned hereinabove of the valve head 9, the tube 3 and the lower holes of the sprayer head 4 out into the bowl 1. The cylinder 5 and accordingly also the tube 3 are slightly inclined downwardly towards the bowl as will be seen in Fig. 1, in which the axis of the tube is denoted 87. Thereby it is attained that in the rest position of the device no water remains in the sprayer device 2 and in the adjacent part of its supply pipe 22. This water would cool down so that, when using the sprayer device, firstly unpleasantly cool jets would hit the user, while with the device described at once water of approximately body temperature comes into use.

The appliance described is particularly suitable for sufferers from piles, but its applicability is by no means limited to hospitals or the like, since even healthy persons feel its use to be very pleasant.

It should also be remarked that the tube 3 need not necessarily be straight. It could be in the shape of a circular arc, in which case naturally also the cylinder 5 had to be correspondingly arcuate. The present embodiment with straight tube and cylinder is however the simplest.

The water heater 24 is preferably so dimensioned that it yields lukewarm water of about 30 to 40° C. only during a short period, for example of 10 seconds, whereafter the temperature of the water issuing from it drops almost to the temperature of the water entering into it. Thereby a double purpose is served. Firstly it is desirable in some cases to be able to carry out cold water massages by the water ejected from the sprayer head. Secondly the user is prevented from unnecessarily using up water and current by depressing the button 29 too long a time. When the spraying water gets cold, it is more pleasant to interrupt the spraying process. A duration of 10 or at a maximum 30 seconds of spraying is amply sufficient for cleaning purposes.

In the embodiment described hereinabove the water closet appliance comprises an obturator member to be connected to a pressure water supply pipe, water entering under pressure into the cylinder when opening this member. For this reason the device operates satisfactorily then only when a sufficient pressure prevails in the water supply pipe. This disadvantage is overcome by the following embodiment in that the water closet appliance comprises a pump, which when put into operation supplies the cylinder of the sprayer device with water under pressure.

In the Figs. 6 to 8 those components of the appliance which correspond to the embodiment according to Figs. 1 to 5, are provided with the same reference characters and are in what follows described only to such an extent as necessary for understanding their function.

The flushing cistern 45 is provided with an inlet socket 100, which may be connected to a water supply pipe of however low a pressure and which in contrast to the embodiment described hereinabove forms the only water supply connection of the appliance. The flushing cistern 45 has its lower portion divided into two compartments by a partition wall 101. In the larger compartment 103 there is a conventional discharge valve 104, which is indicated only quite diagrammatically in Fig. 7 by chain-dotted lines. This discharge valve may be opened in the usual manner by means of a push button 105, which acts on one arm of a lever 107 pivotally mounted at 106, the other arm of which forms a fork 108 (see also Fig. 8) which reaches under the collar 109 of a moveable tube 110 forming part of the discharge valve 104. When opening the discharge valve 104 the flushing water enters through a conduit (not shown) into the water closet bowl 1, which it leaves with the faeces at 65, getting into a drain which is to be connected at 66 to the sewer system.

The flushing cistern 45 is provided at its inlet socket 100 with a conventional float valve (not shown) which stops the inflow of water when a certain level has been reached. On the bottom of the smaller compartment 102 of the flushing cistern a transfer nipple 111 is attached by means of a nut 112, into which nipple 111 a hose adaptor nipple 113 is screwed. The hose 114 leads along the chain-dotted line provided with an arrow to a pump 115 which can be driven by a motor 116. Motor and pump form a structural unit which by means of rubber buffers 117 is mounted on a bracket 118, which is connected through a lug 119 to a mounting bracket 120. Two screws 58 with nuts 59 serve for the attachment of the flushing cistern 45 and of the bracket 120 to a shelf 60 of the water closet bowl 1.

When the motor 116 drives the pump 115, water under pressure enters through a hose 121, a non-return valve 122 and a further valve 123 into a water heater 24. The non-return valve 122 contains an obturator ball 125 of rubber or the like, biased by a spring 124. On the non-return valve 122 a cylinder 126 is attached which passes through the bottom of the flushing cistern and wherein a piston 127 is slidable which is held by a compression spring 128 in the position illustrated as defined by an abutment pin 130 fixed in the piston rod 129, as long as no pressure prevails in the non-return valve 122. When the pump 115 is put in operation, the pressure then prevailing in the non-return valve 122 overcomes the force of the spring 128, the piston rod 129 is moved upwardly and, by means of a transverse arm 131 rigidly connected to it. The transverse arm 131 is in view of the float rod (not shown) bent in the vertical plane, starting from the piston rod 129, firstly upward and then again downward and finally horizontally at its end, this end reaching under the lever 107.

From the water heater 24 a further hose 132 leads to the sprayer device 2, which is attached to the bulge 19 of the bowl by means of the nut 17.

The motor 50 serves for driving the centrifugal blower 51, in the discharge socket 54 of which an electric heating resistor (not shown) is provided. The warmed air flows through the conduit 55 adjoining the discharge socket 54 and issues at 56 into the interior of the bowl.

The water heater 24 is provided with a thermostat which at about 30° C. closes a contact, and at about 38° C. opens the same.

For setting the pump motor 116 in operation a rubber pedal 134 is provided, which at its circumference is attached by means of a ring 135 and of two screws 136 to a base portion 30 of the water closet bowl 1, the screws 136 serving at the same time for the attachment of a small push button throw-over switch. In the rest position illustrated this throw-over switch 137 connects a conductor 139 leading to the thermostat contact. When the latter is closed and the water accordingly has not yet been heated to a temperature of 38° C. the circuit through the heating resistor of the water heater is closed. Parallel to this heating resistor the motor 50 of the blower 51 and the heating resistor for warming the air supplied by the blower are shunted.

Referring particularly to Fig. 9, when the rubber pedal 134 is depressed with the foot, the throw-over switch interrupts the connection between the conductors 138 and 139 and instead connects the former to the conductor 140 leading to the motor 116, whereby the latter is energized. Consequently the pump 115 feeds water over the path described into the water heater 24, which in turn supplies water under pressure to the cylinder of the sprayer device 2, so that the sprayer head 4 gets into its working position 4' and the lower body parts of the user are washed by the water ejected from the sprayer head.

At the same time as the sprayer device 2 begins to work, the discharge valve 104 of the flushing cistern 45 is opened in the manner described hereinabove, namely through the piston 127, piston rod 129, transverse arm 131 and lever 107. This discharge valve 104 can close again then only when the pump 115 has ceased to supply water under pressure; as long as the sprayer device 2 is in operation, accordingly the water entering the flushing cistern through the float valve (not shown) after the main flushing operation will pass through the discharge valve 104 into the water closet bowl and will rinse the dirtied spraying water into the drain.

The spraying water becomes gradually cooler so that upon reaching about 30° C. the thermostat 133 closes its switch. When the user depresses no longer the rubber pedal 134, the same returns owing to its resiliency into its rest position, the circuit of the pump motor 116 is interrupted and instead the motor 50 of the blower is energized simultaneously with the heating resistor for the warming of the air and with the heating resistor for the water heater 24. The heating resistor of the water heater and the hot air unit 50, 51 are automatically switched off again by the thermostat 133, as soon as the water has reached again the temperature desired of about 38° which may last for example about 2½ minutes.

Since in general for the drying of the washed body parts only ½ to 1 minute is needed, a micro switch 141 (Fig. 1) is provided in a shunt parallel to the heating resistor of the water heater for the switching off the hot air unit 50, 51 contained therein, which is opened, when the lid 69 of the bowl 1 is closed. For this purpose the hinge 142 of the lid is provided with a cam 143 which when closing the lid 69 depresses a shiftable pin 144 against the bias of a leaf spring 145; thereby the leaf spring acts on the operating member 146 of the switch 141, so that the same interrupts the circuit of the hot air unit. The user is reminded by the noise of this unit that he should close the lid 69. If he fails to do so, the unit would continue functioning until the thermostat 133 responds.

The closing of the lid is desirable in order that, when incidentally operating the rubber pedal 134 without using the water closet bowl, no spray water can get outside. The switching-off of the hot-air unit with the lid closed has the further advantage, that the former does not start running when owing to a slow drop in the temperature in the water heater 24 the thermostat 133 closes its circuit, which may happen after a prolonged non-use of the appliance e. g. during the night. In this case merely the water is heated up again by the closing of the thermostat switch.

The non-return valve 122 prevents the water from the flushing cistern 45 which is positioned higher than the sprayer head 4 from flowing off through the latter the partition wall 101 provided in the flushing cistern has the effect that the smaller lower compartment 102 of the flushing cistern always remains filled with water and that consequently no air can penetrate into the pump 115 either, which in the course of time would lead to detrimental corrosion phenomena therein.

It should be also remarked, that the casing 78 in the embodiment described last is symmetrical.

While I have described herein and illustrated in the accompanying drawings what may be considered typical and particularly useful embodiments of my said invention, I wish it to be understood that I do not limit myself to the particular details and dimensions described and illustrated, for obvious modifications will occur to a person skilled in the art.

What I claim as my invention and desire to secure by Letters Patent is:

1. A water closet appliance comprising, in combination, a flushing bowl and a sprayer device arranged on the said bowl for washing the lower body parts of the user, the said sprayer device having a cylinder fixedly attached to the said bowl and adapted to be supplied with water under pressure, a tube mounted slidably in said cylinder, a sprayer head arranged on the outer end of said tube and an obturator means arranged on the inner end of the said tube, the said tube being displaced by water pressure applied to the said cylinder in the sense of projecting from the latter and into the said bowl, the said sprayer head then being in its operative position, and the said obturator means then being opened by the said water pressure, the water flowing through the said tube being sprayed at least partly in an upward direction by the said sprayer head, an obturator member arranged between the said cylinder and an external source of water pressure, whereby opening of the obturator member causes water under pressure to be admitted into the said cylinder, a water heater having a thermostat operatively connected between the said obturator member and the said cylinder, a foot operated control member for opening the said obturator member, restoring means automatically closing the said obturator member when the pressure of the user's foot on the said control member ceases, an electrical hot air generating unit arranged on the said bowl, a flushing cistern adapted to discharge into the said bowl, connecting means operatively connecting both the said hot air generating unit and the said flushing cistern to the said obturator member in the sense of the said flushing cistern being discharged into the said bowl and the said hot air unit blowing warm air towards the lower body parts of the user upon the latter operating the said control member, and delayed action means operatively connected to the said hot air unit in the sense of continuing the operation thereof with a time lag after the closing of the said obturator member in order that the warm air may dry the wetted lower body parts of the user.

2. A water closet appliance as claimed in claim 1, wherein the said connecting means comprise at least one pull member operatively connected to the said obturator member and having an abutment, and an electric switch adapted to co-operate with the said abutment and electrically connected to the said hot air unit, and wherein the said delayed action means comprise a time lag relay electrically connected to the said switch switching the said hot air unit off at least one minute after the opening of the said switch.

3. A water closet appliance as claimed in claim 2, comprising in addition: a shelf integral with the said bowl, angle pieces attached to the said shelf, a transverse beam attached to the said angle pieces, and a casing, the said switch, time lag relay, hot air unit and casing being attached to the said transverse beam.

4. A water closet appliance comprising in combination: a flushing bowl, a sprayer device arranged on the said bowl for washing the lower body parts of the user, a water pressure pump attached on the said bowl and an electric motor in driving connection with the said pump, and electric circuit containing the said motor, the said sprayer device having a cylinder attached to the said bowl and hydraulically connected to the said pump, a tube mounted slidably in the said cylinder, a sprayer head arranged on the outer end of the said tube and an obturator means arranged on the inner end of the said tube, the said tube being displaced by water pressure applied by the said pump to the said cylinder in the sense of projecting from the latter and into the said bowl, the said sprayer head then being in its operative position, and the said obturator means then being opened by the said water pressure, and the water flowing through the said tube and being sprayed at least partly in an upward direction by the said sprayer head.

5. A water closet appliance as claimed in claim 4 comprising a flushing cistern the said pump having its inlet connected to the said flushing cistern.

6. A water closet appliance as claimed in claim 4 comprising a flushing cistern having two compartments and a discharge valve hydraulically interposed between one of the said compartments and the said bowl, the said pump having its inlet connected to the other one of the said two compartments which does not discharge itself into the said bowl when opening the said discharge valve.

7. A water closet appliance as claimed in claim 4 comprising a water heater and a non-return valve interposed in succession between the said pump and the said cylinder of the water spraying device.

8. A water closet appliance as claimed in claim 7, comprising in addition: a piston kinematically connected to the said discharge valve of the flushing cistern and hydraulically connected to the said non-return valve being operated by water under pressure passing through the said non-return valve in the sense of thereby opening the said discharge valve.

9. A water closet appliance as claimed in claim 7, comprising in addition: a piston kinematically connected to the said discharge valve of the flushing cistern and hydraulically connected to the said non-return valve being operated by water under pressure passing through the said non-return valve in the sense of thereby opening the said discharge valve, the latter being held open by being kinematically connected with the said piston as long as the said sprayer device is in operation.

10. A water closet appliance as claimed in claim 7, comprising in addition: a throw over switch mounted on the base of said bowl, and electrical heating element provided in the said water heater, a shunt parallel to the said heating element electrically containing the said hot-air unit, and a thermostat switch responsive to the temperature of the said water heater in series with the said throw-over switch, the latter in its rest position closing a circuit through the said thermostat switch and the said heating element, and in the operative position interrupting the said circuit and closing the circuit of the said electric motor driving the said pump.

11. A water closet appliance as claimed in claim 10, comprising a resilient pedal adapted to operate the said throw-over switch when depressed.

12. A water closet appliance as claimed in claim 10, comprising in addition a lid hinged to the said bowl, a switch mounted on top of the said bowl and adapted to be opened by the closing of the said lid, and an electrical circuit shunted parallel to the said electric heating element and containing the said switch mounted on top of the said bowl and the said hot air unit.

13. A water closet appliance as claimed in claim 12, comprising a cam connected to the said hinged lid and a spring biased pin slidably mounted on the said bowl adjacent said cam, the said pin transmitting movement from the said cam to the said switch mounted on top of the bowl in the sense of opening the said switch when closing the lid.

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