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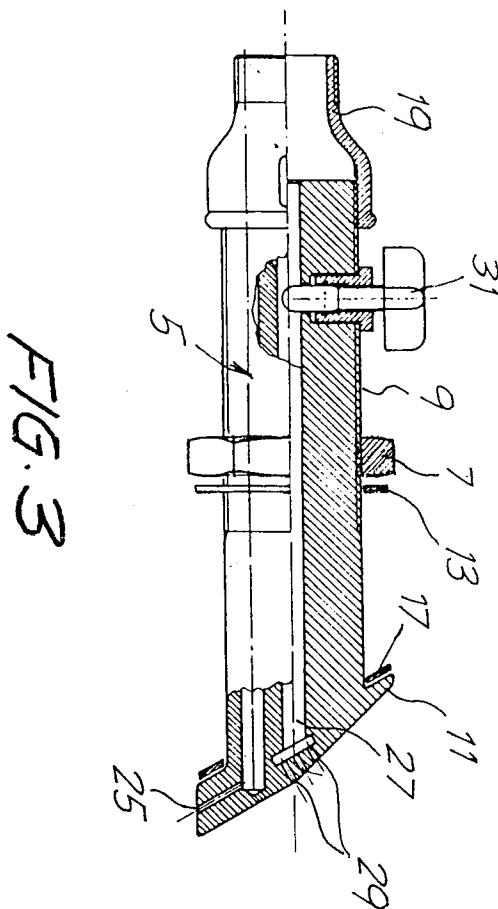
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(54) **Apparatus for flushing toilet bowls and toilets incorporating said apparatus.**

(57) For the inner cleaning of toilet bowls a tubular member is disclosed to be applied to the bowl (1) and comprising a water supply duct (23) ending at a plurality of nozzles (29) disposed in such a way that, when the tubular member is applied to the rear portion of the bowl, said nozzles generate a jet of water (G1) almost tangent to the inner rear surface (1T) of said bowl.



The invention refers to an apparatus to be applied to a toilet bowl and, further, to a toilet or the like provided with an apparatus of the type herein described, able to facilitate, among other things, the inner flushing of said toilet.

The toilet bowls are provided with a series of holes disposed below the upper edge on which the bowl is supported, which holes deliver a jet of water intended to produce the discharge of the fecal material which is inside the said bowl. These nozzles or holes are sufficient to ensure a flow able to cause said discharge and, partially, to wash the inside of the bowl. However, it is known that the rear portion of the bowl is often likely to become dirty with fecal material to such an extent that cleaning by the water flush becomes impossible. It is then necessary, in these cases, to use brushes, which are very impractical and poorly hygienic, as well.

It is a first object of the present invention to provide an apparatus to be applied to toilet bowls and similar sanitary equipment, which makes it possible to completely and thoroughly flush the inner surface of the bowl, without resorting to hardly practical expedients such as the use of brushes and the like.

Substantially, the apparatus according to the invention consists of a tubular member to be applied to the bowl of a toilet or other sanitary equipment, and comprising a water supplying duct leading to a plurality of nozzles disposed in such a way that, when the tubular member is applied to the rear portion of the bowl, said nozzles generate a jet of water almost tangent to the inner rear surface of the said bowl.

This tubular member is advantageously connected to a water line independent of the flush system and, in particular, to the cold water supply of the sanitary equipment. The water fed by the tubular member is then delivered at a sufficiently high pressure able to produce jets of water from the nozzles at a speed and, therefore with a kinetic energy sufficient for the desired purposes. Advantageously, the nozzles of the tubular member may be fanwise disposed to flush a wide surface of the bowl. In an improved embodiment of the apparatus according to the invention, this is modified to provide, not only a jet for the inner washing of the bowl, but also a jet for the user's personal cleaning. According to this improved embodiment of the apparatus, the tubular member comprises a second duct with one or more end nozzles to generate a jet of water obliquely oriented upwards and intended for the user's hygiene. Once the toilet has been used, the user opens the tap for supplying water to the tubular member, and this causes on one hand, the washing under pressure of the inner rear surface of the bowl and, on the other hand, the generation of the washing jet for the user. In order to suitably adjust the upwardly directed jet and thus to direct it correctly toward the user, the second duct of the tubular member may be provided with an apparatus for regulating the

pressure of the jet, and this also take the different pressure conditions of the supplied water into account, such as the different location of the sanitary apparatus within a multi-floor building.

5 A further object of the invention is a toilet bowl as described below and claimed in the appended claims.

In particular, the bowl according to the invention may be provided, in addition to a tubular member of the type herein described, also with a mouthpiece for 10 the generation of a jet of warm air towards the user. This mouthpiece, connected to a suitable fan or blower for the delivery of warm air at one or more speeds, generates a jet of air which provides for drying the user who has made use of the jet of water for washing 15 himself/herself. Advantageously, the air delivering mouthpiece is so oriented as to cause the jet of air to interfere with the jet of water, thereby determining a partial warming up of the same water to make the personal cleaning operation more comfortable.

20 The invention will be better understood by following the description and the attached drawing, which shows a practical, not limiting example of the same invention. In the drawing:

25 Figs. 1 and 2 show a longitudinal section and a cross- section taken on line II-II, respectively, of the bowl according to the invention;

Fig. 3 shows a side view with partial longitudinal section of an apparatus with tubular member according to the invention;

30 Fig. 4 shows a side view with partial longitudinal section of a mouthpiece for the delivery of warm air; and

Fig. 5 shows a side view of the bowl with relevant 35 outer accessory devices for the activation of the various jets of water and air.

In the drawing, numeral 1 generally denotes a toilet bowl connected to an outlet 3 of a water flush device. The outlet 3 delivers water at a relatively low pressure towards a set of openings disposed traditionally under the upper edge 1B of the bowl. Applied below the edge 1B is a tubular member designated 5 as a whole and shown in detail by the longitudinal section of Fig. 3. The tubular member 5 is anchored to the wall of the bowl by a nut 7 screwed on the threaded portion 9 of the tubular member 5. The nut 7 tightens the tubular member against the outer wall of bowl 1, said member being retained on the inner surface of the bowl by a flanged portion 11 thereof. Two gaskets 13 and 17 ensure the seal.

50 Disposed on the threaded portion 9 of the tubular member 5 is a fitting element 19 for the connection with a water supplying pipe 21. This pipe 21 is independent of the outlet 3 of the flush device.

55 As can be seen in the sectional view of Fig. 3, inside the tubular member 5 is a first duct 23 where the water from the pipe 21 is made to enter and then to flow into a plurality of radial nozzles 25 fanwise arranged (see in particular Fig. 2) in the lower region of

the flanged portion 11 of the tubular member 5. The orientation of the nozzles 25 is such as to generate a high-pressure jet of water indicated by G1 in Fig. 1, which is substantially tangent to the rear portion 1T of the inner surface of bowl 1. The high-pressure jet G1 has the purpose of detaching any residual fecal material or other, that might remain stuck to the surface 1T of the same bowl.

A further duct 27 extends inside the tubular member 5 and ends into a plurality of nozzles 29 disposed in the flanged portion 11 of the tubular member 5, which are oriented obliquely to the axis of the tubular member 5. The nozzles 29 are intended to direct a jet of water G2 towards the user. The opening of the tap such as a fast opening ball tap disposed on the supply line of pipe 21, causes the generation of two jets of water G1 and G2 which provide for the separate flushing of the inner rear surface 1T of bowl 1 and the washing of the user, respectively, with jet G2.

To adjust the strength of jet G2 and cause it to reach the desired region regardless of the supply pressure, a knob-shaped regulator 31 is disposed on the tubular member 5 engaging a threaded portion of said tubular member 5, the end portion of said regulator reducing to a certain extent the internal section of the second duct 27. Screwing down more or less the knob 31 within its housing will cause the reduction to a more or less degree of the section for the passage of the water towards the nozzles 29 and, thus, the output pressure of the jet G2 and its speed as well. The regulator 31 may also be used for suppressing the jet G2.

As shown in detail in Figs. 1 and 2, the bowl 1 is further provided with a mouthpiece 33, a longitudinal section thereof being separately shown in Fig. 4. This mouthpiece is connected to a blower 35 which produces an upwards flow of warm air inwardly of the bowl 1. The mouthpiece 33 is applied to the bowl by a flanged portion 37 and a threaded nut 39, in the same way as described for the tubular member 5. The warm air blower 35 may be actuated by a switch 41 disposed close to the bowl and, in particular, to the tap 43 for the admission of water feeding the tubular member 5. After having used the sanitary apparatus, the user may activate both the jets G1 and G2 by opening the tap 43, and the flow of warm air through the mouthpiece 33 by acting on the switch 41 which operates the blower 45.

The drawing shows only an exemplification of the invention which may vary in the forms and arrangements.

Claims

1. A tubular member to be applied to the bowl of a toilet, comprising a water supply duct leading into a plurality of nozzles disposed in such a way that,

when the tubular member is applied to the rear portion of the bowl, said nozzles generate a jet of water almost tangent to the inner rear surface of the said bowl.

5. 2. A tubular member according to claim 1, characterized in that said nozzles are fanwise disposed.
10. 3. A tubular member according to claim 1 or 2, characterized in that it comprises a second duct with one or more end nozzles for generating a jet of water obliquely directed upwards and intended for the personal hygiene of the user.
15. 4. A tubular member according to claim 3, characterized in that a device is provided on said second duct for regulating the pressure of the jet.
20. 5. A toilet bowl, comprising means for flushing the inner surface of the said bowl, characterized in that said means comprise a tubular member according to one or more of claims 1 to 4.
25. 6. A bowl according to claim 5, characterized in that said tubular member is applied in the rear region of the bowl and below the upper edge of the said bowl.
30. 7. A bowl according to claims 5 or 6, characterized in that it further comprises a mouthpiece for the delivery of warm air towards the user.
35. 8. A bowl according to claim 7, characterized in that the flow of warm air generated by said mouthpiece is oriented in such a way as to interfere with the upwardly directed jet of air.

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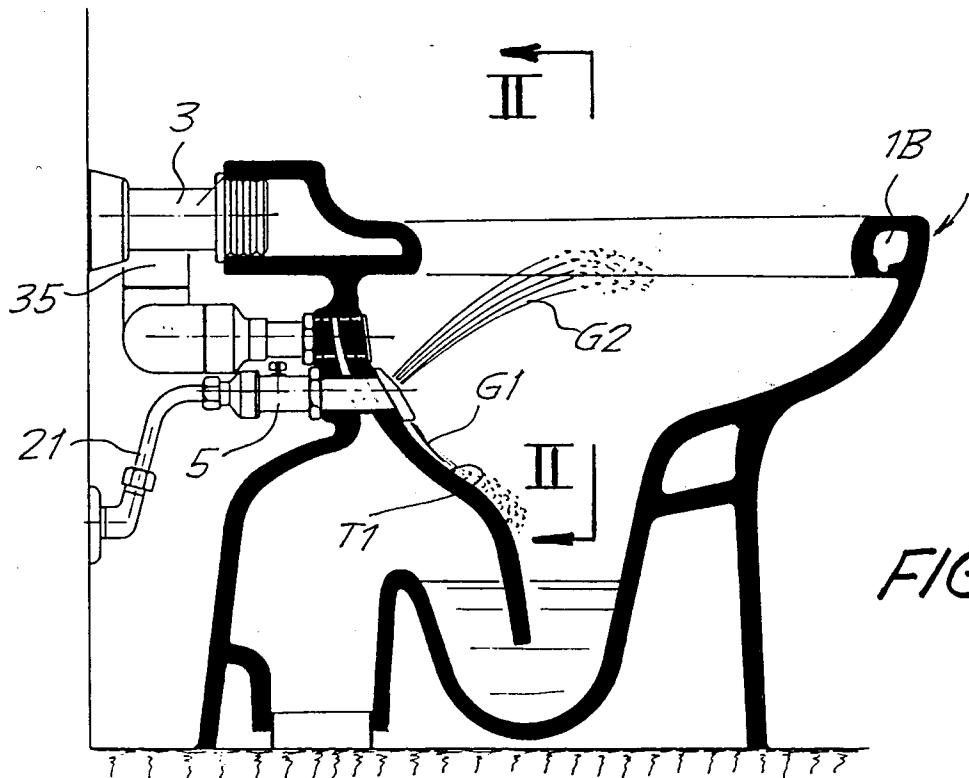


FIG. 1

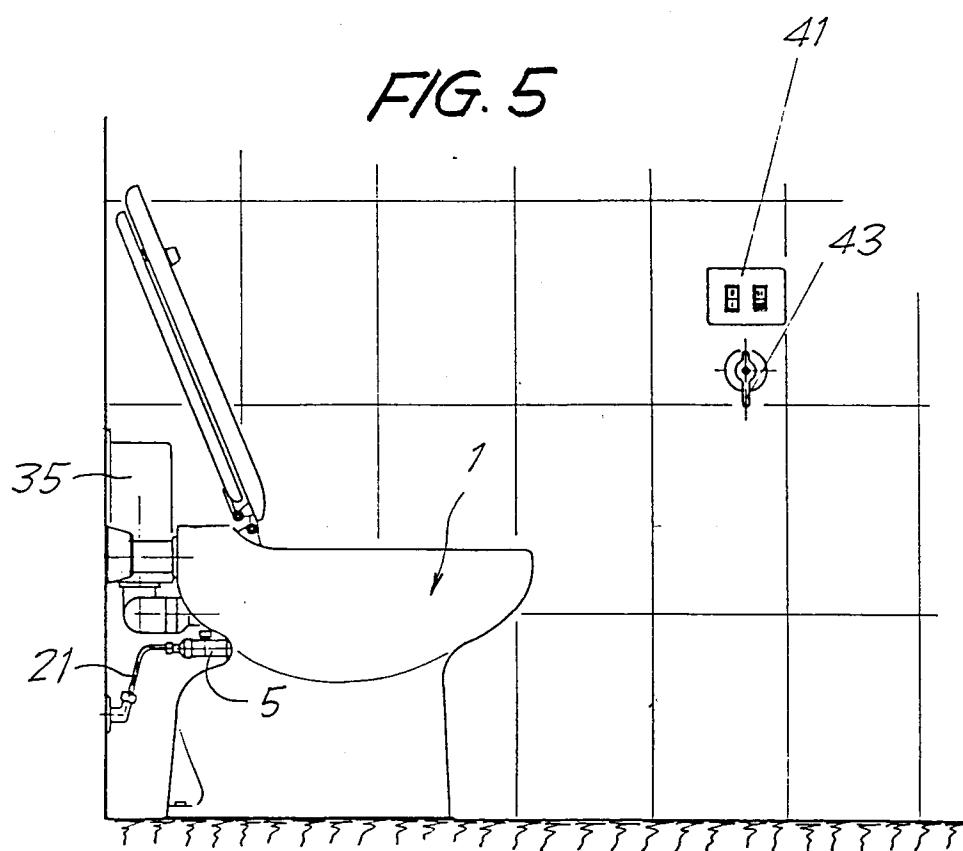
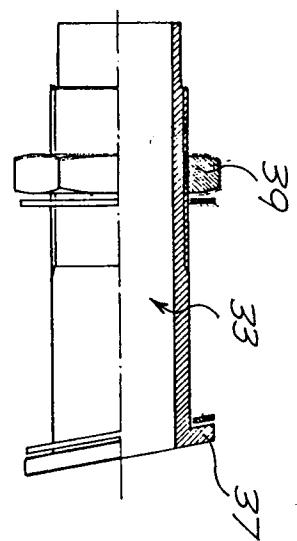
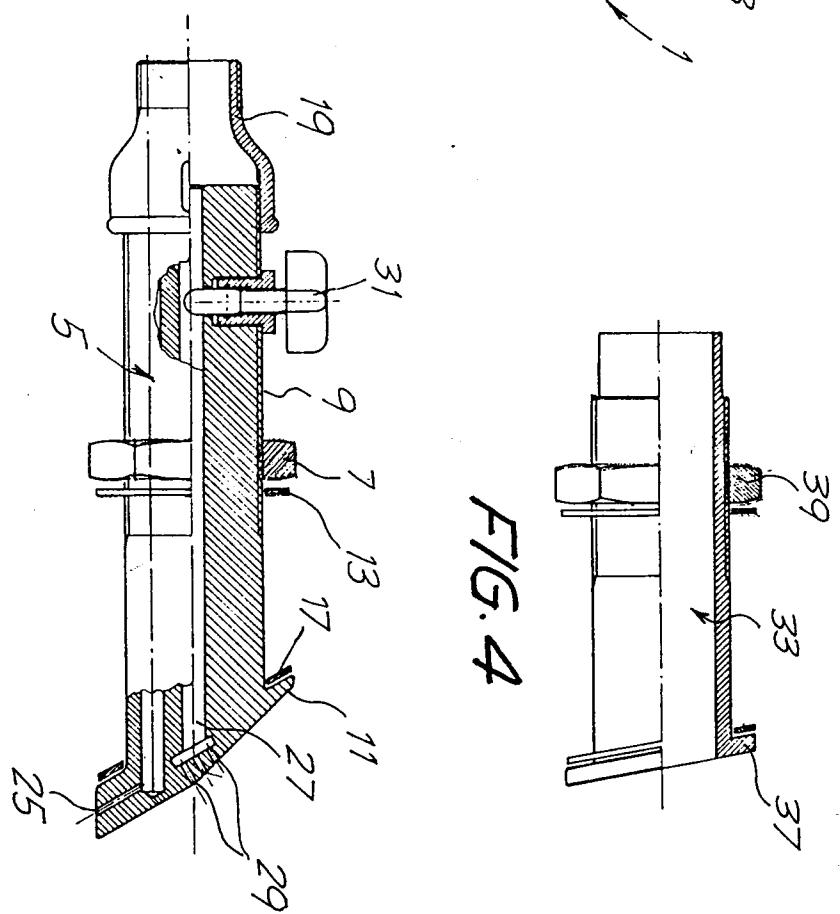
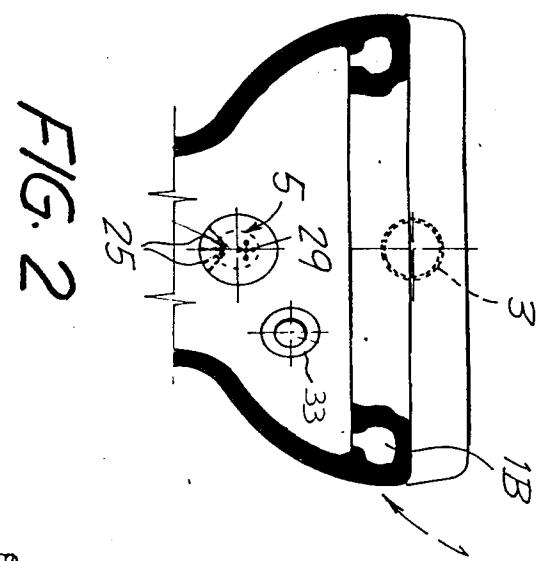


FIG. 5





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0319

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) | | | | | | | | | |
|---|---|---|---|------------------------------|---|---------------------------------|-----------------------------|--|---|--|--|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | | | | | | | | | | |
| X | GB-A-324 437 (BERESFORD & SON LTD) * page 6, line 34 - line 47; figures 4,7 * | 1,5,6 | E03D11/00 E03D9/08 | | | | | | | | | |
| A | GB-A-2 047 300 (STAMFORD ROWLEY) * abstract; figure 1 * | 1,3-6 | | | | | | | | | | |
| A | EP-A-0 143 085 (MORANDI & PARIGI) * page 9, paragraph 1; claim 1 * | 7,8 | | | | | | | | | | |
| A | EP-A-0 011 449 (INTERNATIONAL WATER SAVER TOILETS INC.) * page 19, line 6 - line 15; figures 6,8 * | 1 | | | | | | | | | | |
| A | DE-A-2 241 676 (GEORG ROST & SÖHNE) | ----- | | | | | | | | | | |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl.5) | | | | | | | | | |
| | | | E03D | | | | | | | | | |
| <p>The present search report has been drawn up for all claims</p> <table border="1"> <tr> <td>Place of search THE HAGUE</td> <td>Date of completion of the search 14 SEPTEMBER 1992</td> <td>Examiner VAN BEURDEN J.J.C.A</td> </tr> <tr> <td colspan="2">CATEGORY OF CITED DOCUMENTS</td> <td>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</td> </tr> <tr> <td colspan="2">X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</td> <td></td> </tr> </table> | | | | Place of search THE HAGUE | Date of completion of the search 14 SEPTEMBER 1992 | Examiner VAN BEURDEN J.J.C.A | CATEGORY OF CITED DOCUMENTS | | T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document | | |
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