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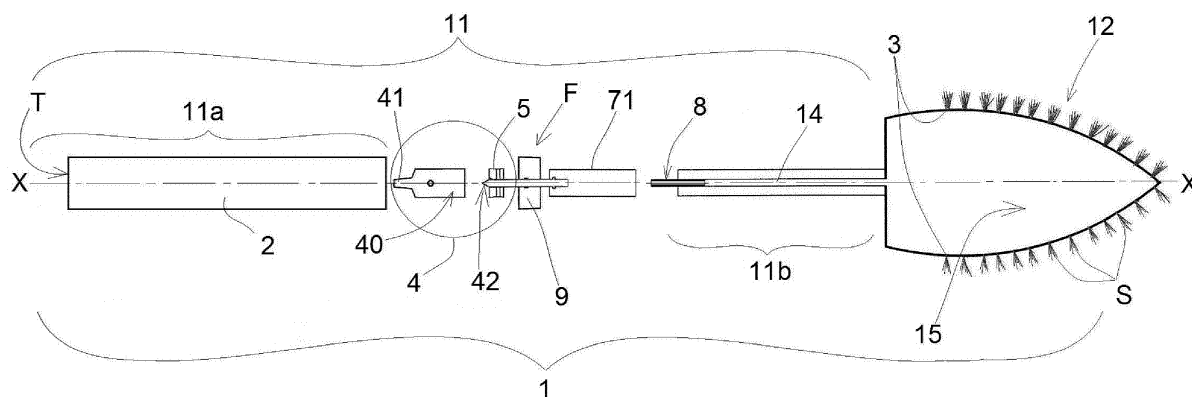
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(54) **IMPROVED WC CLEANING BRUSH**

(57) A WC cleaning brush (1) with disinfection system comprising a tank (2) containing a disinfecting liquid, a pump (4) and actuation means of said pump (4).



Description

[0001] The present patent application for industrial invention relates to an improved WC cleaning brush.

[0002] The use of a WC cleaning brush to clean a WC after use is known. A WC cleaning brush is normally provided with a rod with handle and a brush (or similar cleaning part) fixed at one end of the rod.

[0003] To clean the WC bowl the operator holds the rod and lifts the cleaning brush until the brush comes in contact with the walls of the WC bowl. Such a traditional cleaning brush is impaired by some drawbacks. When the operator replaces the cleaning brush in its container, after cleaning, the cleaning brush starts dripping, diffusing microbes and bad odors.

[0004] Such a drawback becomes even worse considering that drops of contaminated liquid may accidentally fall on the WC seat, with evident health risks, especially in case of public toilets.

[0005] These drawbacks are partially solved by devices provided with a pumping chamber in the cleaning brush to pump a disinfecting liquid.

[0006] DE29517960 discloses a cleaning brush provided with a pumping chamber with a stem of a piston protruding in upper position in order to be actuated directly by the operator, in such manner to dispense the disinfecting liquid from nozzles disposed in proximity to the brush of the cleaning brush.

[0007] WO02/071907 discloses a WC cleaning tool comprising an elongated body with an inclined handle wherein a cartridge with disinfecting liquid is slidably inserted. The cartridge is pushed downwards in order to dispense the disinfecting liquid from nozzles provided in the brush.

[0008] The purpose of the present invention is to remedy the aforementioned drawbacks by devising an improved WC cleaning brush that is versatile, practical and easy to use.

[0009] The WC cleaning brush of the invention comprises:

- a rod comprising a handle portion adapted to be held by the operator and a support portion;
- a cleaning head fixed at one end of said support portion; said cleaning head being adapted to go at least partially in contact with an internal walls of the WC;
- a tank containing disinfecting liquid;
- at least one nozzle disposed in said cleaning head to dispense the disinfecting liquid;
- a pump comprising:
 - a pumping chamber,
 - a piston moving in the pumping chamber,
 - a stem connected to the piston; and
 - an extraction opening in communication with the tank and a delivery opening in communication with said at least one nozzle,

- actuation means of said pump to pump the disinfecting liquid from the tank to the nozzle.

[0010] The peculiarity of the WC cleaning brush of the invention consists in that:

- the tank is disposed inside the handle portion of the rod,
- the pumping chamber is joined to the handle portion of the rod,
- the support portion of the rod telescopically slides with respect to the handle portion and the support portion is connected to the stem of the pump so that, when the handle portion is moved with respect to the support portion, the disinfecting liquid is pumped from the tank to the nozzle.

[0011] The advantages of the WC cleaning brush of the invention are evident. The operator loads the tank with a disinfecting liquid and pushes the handle portion downwards, when the cleaning head is in contact with the WC wall, thus dispensing the disinfecting liquid from the nozzles provided in the cleaning head.

[0012] For explanatory reasons the description of the WC cleaning brush according to the present invention continues with reference to the attached drawings, which only have an illustrative, not limiting value, wherein:

Fig. 1 is an exploded, partially axially sectioned view that diagrammatically shows the WC cleaning brush of the invention;

Figs. 2 and 3 are axially sectioned views of a portion of the WC cleaning brush of Fig. 1, showing the extraction opening of the pump in cleared and in closed condition, respectively;

Fig. 4 is a plan view of a metal ring of the WC cleaning brush of Fig. 1.

[0013] With reference to the attached figures, the WC cleaning brush of the invention is disclosed, which is generally indicated with reference numeral (1).

[0014] The WC cleaning brush (1) comprises a rod (11) with longitudinal axis (X-X). The rod (11) comprises a handle portion (11 a) and a support portion (11 b).

[0015] A cleaning head (12) is fixed at one end of the support portion (11 b), in such manner to go in contact with the internal walls of the WC bowl.

[0016] Advantageously, the cleaning head (12) of the WC cleaning brush (1) is internally hollow and comprises a chamber (15) in communication with a plurality of nozzles (3) to deliver a disinfecting liquid. The nozzles (3) are holes inside which bristles (S) are inserted, externally protruding from the cleaning head.

[0017] The WC cleaning brush (1) comprises a tank (2) containing disinfecting liquid. The tank can be obtained in the handle portion (11 a). In view of the above, the handle portion (11 a) is internally hollow and open on the back in order to fill the tank (2). A cap (T) closes the

back of the handle portion (11 a). Alternatively, the tank (2) can be a cartridge disposed inside the handle portion (11 a).

[0018] The WC cleaning brush (1) comprises a pump (4) provided with a pumping chamber (40). The pumping chamber (40) is joined to the handle portion (11 a) of the rod. The pump (4) comprises an extraction opening (41) in communication with the tank (2) and a delivery opening (42) in communication with the nozzles (3).

[0019] The pump (4) comprises a piston (5) that slides inside said pumping chamber (40). A stem (50) is fixed to the piston (5). The stem (50) is internally hollow and comprises a channel (50b). In such a case, the delivery opening (42) of the pump is the end of the stem (50) disposed in the pumping chamber (40), while the extraction opening (41) is obtained at one end of the pumping chamber (40).

[0020] The stem (50) is connected to the support portion (11 b) of the rod. The support portion (11 b) of the rod is internally hollow and provided with a channel (14) in communication with the chamber (15) of the cleaning head (12). Advantageously, a connection pipe (80) connects the stem (50) to the support portion (11 b).

[0021] The support portion (11 b) is slidingly mounted with respect to the handle portion (11 a). In view of the above, when the handle portion (11 a) is moved with respect to the support portion (11 b), the piston (5) is moved in the pumping chamber (40), thus pumping the liquid from the tank (2) to the nozzles (3).

[0022] The WC cleaning brush comprises a guide sleeve (71) that protrudes axially from the handle portion (11 a) of the rod and the support portion (11 b) is slidingly mounted inside the guide sleeve (71). Spring means (70), such as for example a helical spring, are disposed inside the guide sleeve (71) around the stem (50), between the handle portion (11 a) and the support portion (11 b) of the rod.

[0023] The pump comprises closing means (6), such as for example a ball shutter, disposed inside said pumping chamber (40) to close or clear the extraction opening (41) of the pumping chamber (40).

[0024] Elastic connection means (7), such as a helical spring, are provided to connect said closing means (6) to the piston (5).

[0025] Advantageously, the WC cleaning brush comprises blocking means (F) adapted to block the stem (50) of the piston when the closing means (6) close the extraction opening (41) of the pump.

[0026] The blocking means (F) comprise a metal ring (9) revolvingly mounted on the handle portion (11 a) of the rod. The stem (50) comprises at least one tooth (51) that protrudes radially outwards from the stem (50).

[0027] The figures show two teeth (51) disposed in diametrically opposite positions. The metal ring (9) comprises an annular seat (90) in communication with two grooves (91) (Fig. 4) wherein the teeth (51) of the stem slide. When the teeth (51) of the stem reach the seat (90), the rotation of the metal ring (9) blocks the tooth

(51) in the seat (90) in bayonet coupling mode.

[0028] Fig. 2 shows the initial idle position of the WC cleaning brush (1), wherein the extraction opening (41) of the pump (4) is not closed and the pumping chamber (40) is in communication with the tank (2). The pumping chamber (40) is filled with disinfecting liquid. The piston (5) is in backward position with respect to the extraction opening (41) of the pump and the spring means (70) are not compressed.

[0029] When the handle portion (11 a) of the rod is pushed in the direction of arrow A, the support portion (11 b) slides inside the guide sleeve (71) towards the handle portion (11 a) and the spring means (70) are compressed. Simultaneously, the piston (5) slides inside the pumping chamber (40) towards the extraction mouth (41) of the pump. In view of the above, the elastic connection means (7) are compressed and the closing means (6) close the extraction opening (41) of the pump (4). The volume of the pumping chamber (40) is reduced and the disinfecting liquid contained in the pumping chamber forcedly enters into the channel (50b) of the stem through the delivery opening (42) of the pump. In this way, the disinfecting liquid flows towards the chamber (15) of the cleaning head (12) and is dispensed by the nozzles (3).

[0030] Upon releasing the handle portion (11 a), the spring means (70) are released, the piston (5) is moved back inside the pumping chamber (40) and the WC cleaning brush returns to the initial idle position, thus interrupting the distribution of disinfecting liquid from the nozzles (3).

Claims

1. WC cleaning brush (1) comprising:

- a rod (11) comprising a handle portion (11 a) adapted to be held by the operator and a support portion (11 b);
- a cleaning head (12) fixed at one end of said support portion (11 b); said cleaning head (12) being adapted to go at least partially in contact with an internal wall of the WC;
- a tank (2) containing disinfecting liquid;
- at least one nozzle (3) disposed in said cleaning head (12) to dispense the disinfecting liquid;
- a pump (4) comprising:
 - a pumping chamber (40),
 - a piston (5) moving in the pumping chamber (40),
 - a stem (50) connected to the piston (5); and
 - an extraction opening (41) in communication with the tank (2) and a delivery opening (42) in communication with said at least one nozzle (3),
- actuation means (11a, 11 b) of said pump (4)

to pump the disinfecting liquid from the tank (2) to the nozzle (3);

characterized in that

- said tank (2) is disposed inside the handle portion (11 a) of the rod,
 - said pumping chamber (40) is joined to said handle portion (11 a) of the rod,
 - said support portion (11 b) telescopically slides with respect to said handle portion (11a); and said support portion (11b) is connected to said stem (50) of the pump (4) so that, when the handle portion (11 a) is moved with respect to the support portion (11 b), the disinfecting liquid is pumped from the tank (2) to the nozzle (3).
2. The WC cleaning brush (1) of claim 1, comprising a guide sleeve (71) fixed at the handle portion (11 a) in such manner to axially protrude from the handle portion, said support portion (11 b) being slidably mounted inside said guide sleeve (71).
3. The WC cleaning brush (1) of claim 2, also comprising spring means (70) disposed inside said guide sleeve (71) between the handle portion (11 a) and the support portion (11 b).
4. The WC cleaning brush (1) of any one of the preceding claims, wherein:
- said stem (50) and said support portion (11b) are internally hollow and provided with communicating channels (50b, 14),
 - said cleaning head (12) is internally hollow, being provided with a chamber (15) in communication with the channel (14) of the support portion (11 b) of the rod,
 - said delivery opening (42) of the pump is obtained at one end of said stem (50) inside said pumping chamber (40).
5. The WC cleaning brush (1) of any one of the preceding claims, wherein said pump (4) comprises:
- closing means (6) disposed inside said pumping chamber (40) to close and clear the extraction opening (41) of the pumping chamber (40); and
 - elastic connection means (7) that connect said closing means (6) to the piston (5) to close and clear the extraction opening (41) according to the movement of the piston (5).
6. The WC cleaning brush (1) of any one of the preceding claims, wherein said tank (2) is obtained inside said handle portion (11 a) of the rod.
7. The WC cleaning brush (1) of any one of the preceding claims, comprising a connection pipe (8) that con-

nects the stem (50) of the pump to said support portion (11 b) of the rod, in such manner to put the channel (50b) of the stem in communication with the channel (14) of the support portion (11 b) of the rod.

8. The WC cleaning brush (1) of any one of the preceding claims, comprising locking means (F) between the stem (50) and the handle portion (11 a) to lock the sliding of the stem in the pumping chamber (40).
9. The WC cleaning brush (1) of claim 8, wherein said locking means (F) comprise a metal ring (9) revolvingly mounted on the handle portion (11 a) of the rod; said stem (50) comprising at least one tooth (51) that protrudes radially outwards from the stem (50); said metal ring (9) comprising a seat (90) in communication with at least one groove (91) wherein said at least one tooth (51) of the stem slides, the rotation of the metal ring (9) locking the tooth (51) in the seat (90) in bayonet coupling mode.

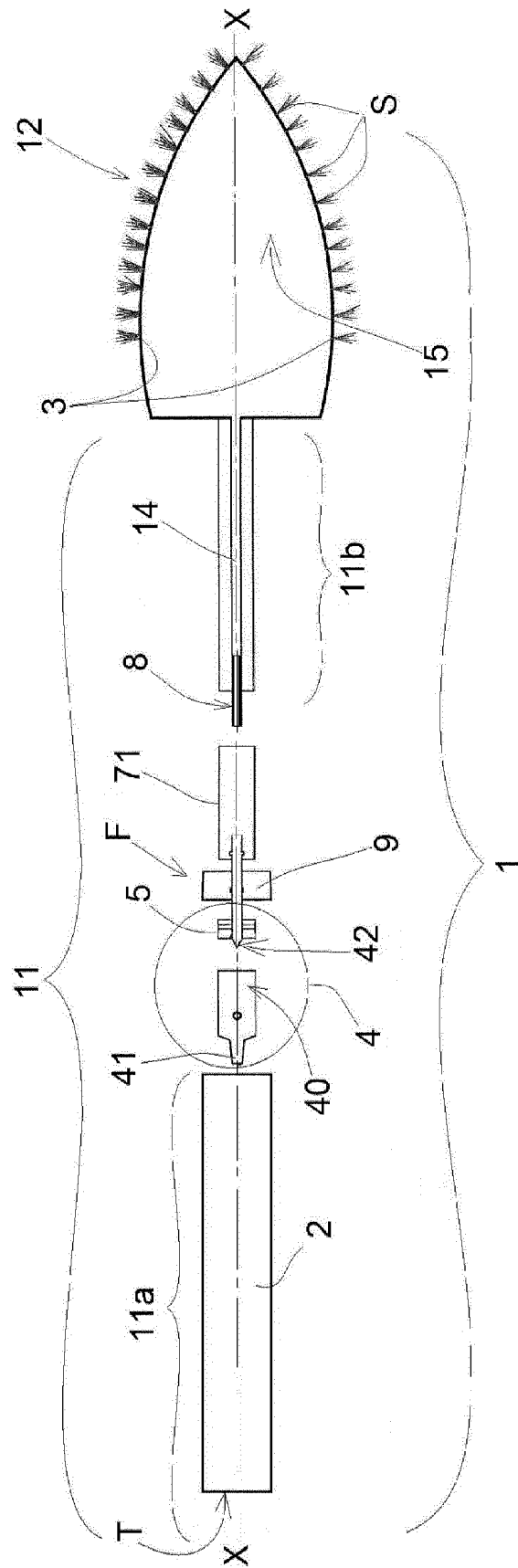


FIG. 1

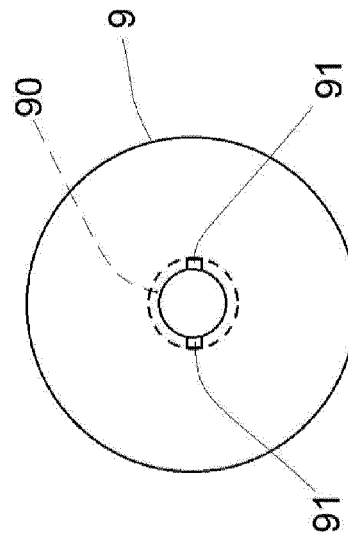
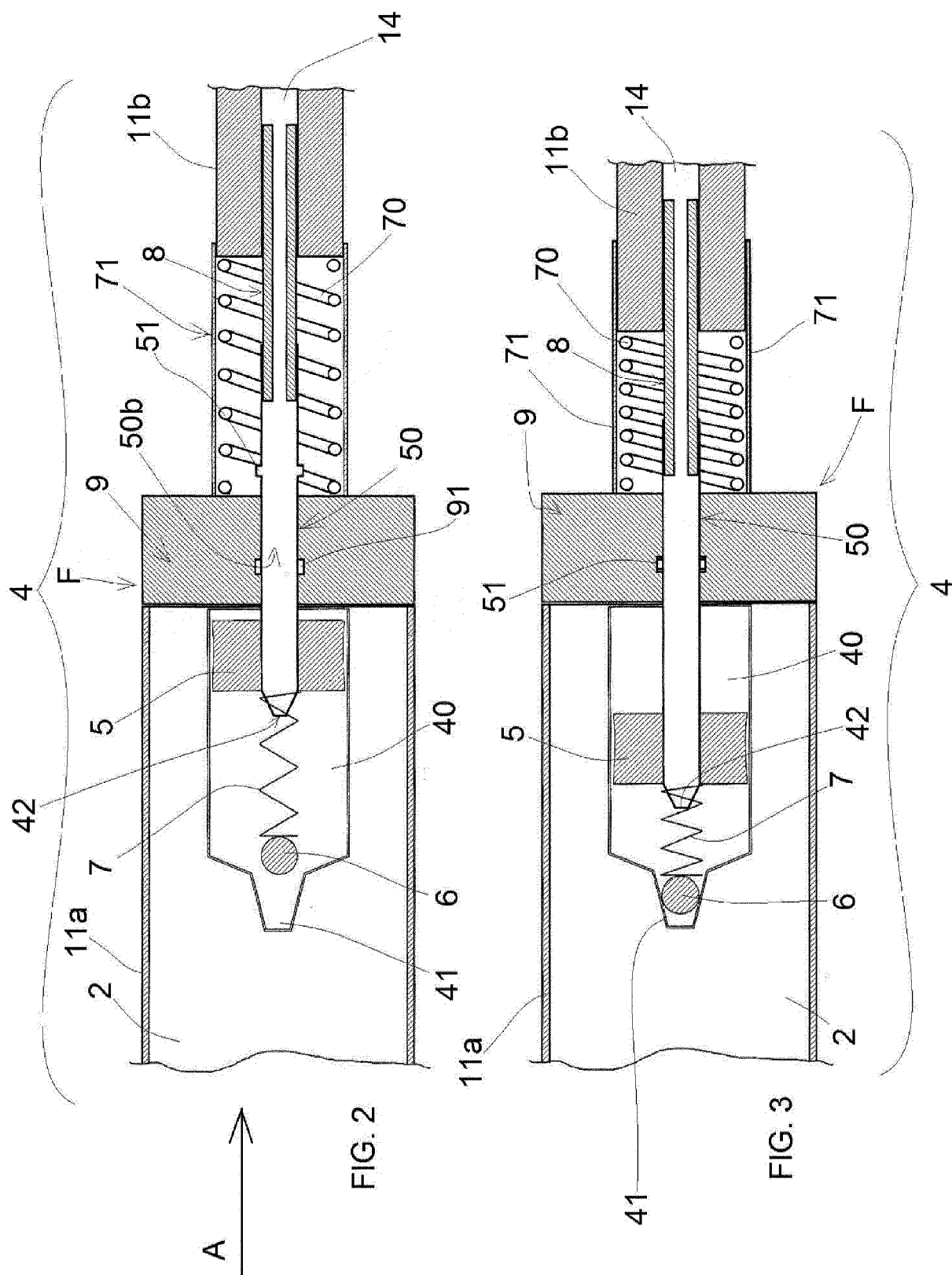


FIG. 4





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EUROPEAN SEARCH REPORT

Application Number
EP 14 19 3198

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		23 March 2015	Fordham, Alan
CATEGORY OF CITED DOCUMENTS			
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		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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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