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(54) **A CLEANSING AND SANITATION SYSTEM FOR SANITARY APPLIANCES**

(57) The present invention concerns a system for cleaning and sanitizing of sanitary appliances, comprising:
- a container (1), divided into two separate compartments, respectively upper (2) and lower (3);
- a water supply system (4) contained in said upper compartment (2;
- a rotating brush (5) contained in lower compartment (3), operated by the pressure of the water supplied by said water supply system (4), that may be held for reaching any point of the internal surface of said sanitary appliances.

In particular, said system for cleaning and sanitizing sanitary appliances comprises:
- an ozonator device (24), suitable for adding sanitizing ozone the water supplied by said water supply system (4) and coming out of said rotating brush (5);
- a sterilizing lamp (17) of said rotating brush (5), arranged on an internal lateral wall of said lower compartment (3) of said container (1);
- and anti-odor filter (18) arranged on an internal lateral wall of said lower compartment (3) of said container (1);
- an anti-bacterial coating (29) acting as a handle for the upper portion of said rotating brush (5) for preventing the possible proliferation of germs and/or bacteria due to the repeated contact with the users' hands;
- a protection (30) arranged on the upper part of said rotating brush (5) for preventing the contact of users' hands with drops of water and/or of organic residuals during working.

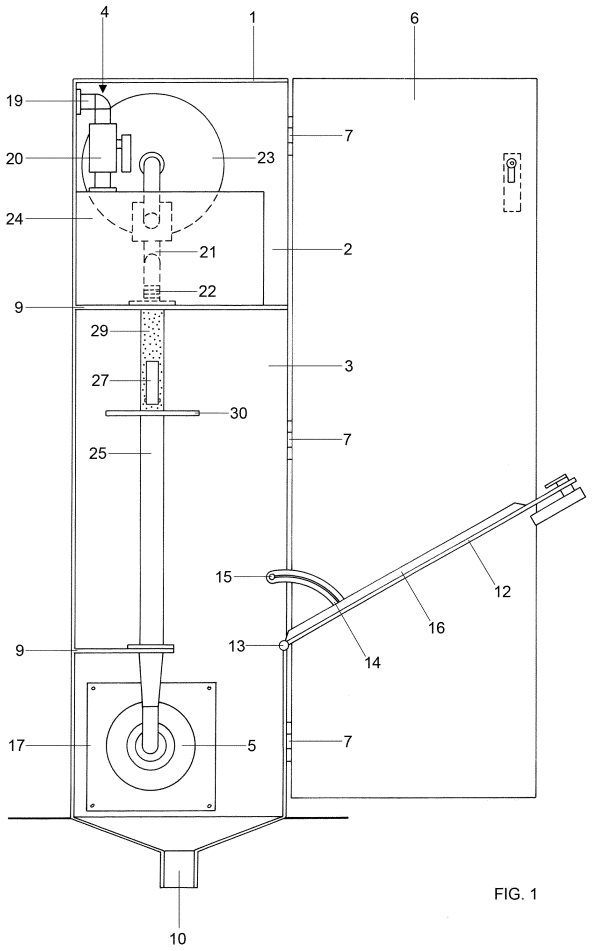

FIG. 1

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Description

Background of the invention

[0001] The present invention concerns the field of appliances for cleansing and sanitizing rooms for private or public use.

[0002] More in detail, the present invention concerns a system for cleansing and sanitizing sanitary appliances.

[0003] In the following specification, the term "sanitary appliances" will be referred to all bathroom and kitchen accessories requiring a permanent connection to a drinkable water distribution network and to a waste water discharge system like water closets, bathtubs, showers, sinks, wash basins etc.

Aims of the present invention

[0004] As it is already known from the art, the conventional means for cleansing sanitary appliances show a plurality of important critical issues, as:

- the use of manual pipe cleaners and similar for cleansing water closets determines the progressive build-up of organic (faecal) residues on said brushes and the possible formation of smelly sewage in the special containers for their housing;
- the use of abrasive brushes for cleansing bathtubs showers, sinks and similar causes the progressive build-up of organic (epidermal, lipidic etc.) residues on their surfaces and the consequent possible proliferation of germs and/or bacteria on their surface and/or inside them;
- the use of pipe cleaners, brushes, abrasive sponges and similar for cleansing sanitary appliances determines dripping of washing water and/or of organic residuals on the floor of the rooms in which said sanitary accessories are subjected to cleansing, thus determining the progressive soiling thereof;
- the use of pipe cleaners, brushes, abrasive sponges and similar for cleansing sanitary appliances prevents from easily reaching all parts of their internal surface and/or all angles, all reliefs or all curvatures of their structure, thus obtaining only a partial cleansing;
- the use of pipe cleaners, brushes, abrasive sponges and similar for cleansing sanitary appliances prevents from performing a perfect and complete sanitation of their internal surface and/or of their structure;
- the use of pipe cleaners, brushes, abrasive sponges and similar for cleansing sanitary appliances requires the inevitable joint use of detergents and/or disinfectants and/or perfumers, which are expensive and often harmful to the environment.

[0005] In the specific art, devices for cleansing sanitary appliances are already known but they do only partially solve above mentioned problems.

[0006] In detail, documents US5926893 and IT102003901096222, respectively of De Bella/Cestari and of the same inventor of the present application, describe a specific device for internal cleansing of water closets and similar.

Specification of the present invention

[0007] It is the aim of the present invention to overcome above mentioned problems deriving from the use of instruments inadequate for cleansing and sanitizing sanitary appliances in a bathroom or in a kitchen, and to contextually achieve the maintenance of a perfect hygienic and sanitary condition of the rooms in which said sanitary appliances are placed.

[0008] It is a further aim of the present invention to overcome above mentioned problems for what concerns rooms for private (domestic) use as well as of premises for public (commercial, institutional etc.) use like hospitals, schools, communities, railway stations, gas stations, cinemas, restaurants etc.

[0009] It is finally the aim of the present invention to overcome above mentioned problems in views of energy saving and respect of the environment.

[0010] The aims set forth are reached according to the present invention by realizing a system comprising a container that may be installed in bathrooms or kitchens nearby the relative sanitary appliances from which a brush means is extracted and held, wherein said brush means is rotating due to the water pressure supplied via internal pipes to the handle so as to determine the rotation thereof and to maintain it always clean, preventing the formation of deposits of washing residual on its bristles.

[0011] In particular, the aims of the present invention are reached by means of a cleansing and sanitizing system of sanitary appliances according to the main independent claim 1. Further features of the present invention are shown in the dependent claims.

[0012] The cleansing and sanitizing system for sanitary appliances according to the present invention shows many advantages, as:

- it allows the removal of organic residuals form inner surfaces of sanitary appliances and the contextual sanitation of said surfaces also in parts that are not reachable by conventional cleaning means;
- it allows the removal of organic residuals from the inner surfaces of sanitary appliances and the contextual sanitizing of said surfaces by means of substances with low environmental impact;
- it prevents the deposit of organic residuals on the cleansing means;
- it prevents the sewage formation inside the container housing the cleansing instrument;
- it limits the dripping of washing and/or organic residuals on the floor of the rooms in which the sanitary

appliances served by the system according to the present invention are found;
- it prevents the formation and diffusion of bad odours inside the rooms housing the sanitary appliances served by the system according to the present invention;
- it allows to wash dishes and tableware in kitchen wash basins served by the system according to the present invention, thus avoiding the use of dedicated household appliances and consequently reducing electricity consumption.

Description of the figures

[0013] Further features and advantages of the system according to the present invention will be more evident from the following detailed description and with the help of the enclosed drawings in which a preferred embodiment is shown for exemplifying and not limiting purposes, wherein:

- figures 1, 2 respectively show a complete lateral view and a partial front view of the internal and external structural shape of a cleansing and sanitizing system for sanitary appliances, according to the present invention;
- figure 3 show a complete lateral view of the structural shape of a water-powered rotating-brush means that is part of said cleansing and sanitizing system for sanitary appliances according to the present invention.

Detailed specification of the invention

[0014] Relating to figures 1, 2, the cleansing and sanitizing system for sanitary appliances according to the present invention mainly comprises:

- a container 1, preferably out of plastic, divided in two separate compartments, respectively an upper one 2 and a lower one 3;
- a water supply system 4, contained in said upper compartment 2;
- a rotating brush 5 contained in said lower compartment 3, preferably of the low rotation regime (200-250 rotations/minute), operated by the pressure of the water supplied by said water supply system 4, that may be gripped so as to reach any part of the internal surface of the sanitary appliances structure.

[0015] Said container 1 comprises:

- an externalsealingreversible closing door 6 with vertical joint hinges 7 that allow the opening thereof by lateral rotation, for preventing the diffusion of bad odours inside the rooms in which the sanitary appliances served by the system according to the present invention are found.

[0016] Said lower compartment 3 of said container 1 comprises:

- a vertical housing 8 with supports 9 preferably of the groove type, for hooking and fixing said rotating brush 5;
- a drain hole 10 on the bottom for conveying possible sewage and/or dripping residuals produced by said rotating brush 5 to a discharge system;
- a cleaning bar 11, preferably of the contrast support type, provided on an inner lateral wall for determining the rubbing and consequent cleansing of the bristles of said rotating brush 5.

[0017] In particular, said lower compartment 3 of said container 1 comprises:

- an internal sealing reversible closingdoor 12 with horizontal joint hinges 13 for their opening with front rotation, curved guides 14 interacting with stop pins 15 for maintaining an inclined maximum opening position, and raised lateral edges 16 collecting possible dripping residuals from said brush 5 rotating on the internal side of said door 12, facilitating the sliding thereof towards the drain hole 10;
- a sterilizing lamp 17, preferably of the ultraviolet and/or infrared beams type, provided on an internal lateral wall, for preventing the proliferation of germs and/or bacteria on said rotating brush 5;
- an anti-odour filter, preferably of the active carbons type, provided on an internal lateral wall for preventing the formation of bad odours inside said lower compartment 3 and/or in the container 1 as a whole.

[0018] Said water supply system 4 comprises:

- a pair of pipes 19 for the supply of cold water with the respective taps 20;
- a flexible hose 21with quick-fit connectors 22 for the connection with said rotating brush 5;
- a reel 23 with return spring for the extraction and the return of said flexible hose 21 during and after the use of said rotating brush 5.

[0019] In particular, said water supply system 4 comprises:

- an ozone device 24 placed between said pipes 19 for supplying cold and warm water and said flexible hose 21 for the connection of said rotating brush 5, suitable for adding ozone with sanitizing action to cold or warm water supplied by said supplying pipes 19 e conveyed to said rotating brush 5 through said flexible hose 21.

[0020] Said ozonator device 24 comprises operating

means (not shown) for allowing a selective and reversible operation thereof for obtaining the cleansing and sanitizing of sanitary appliances by means of ozone-added water, or to their cleansing with sole water that may be cold or warm indifferently.

[0021] Said rotating brush 5 comprises:

- a hollow body 25 with a preferably cylindric shape;
- a pipe 26 internal to said body 25 for the passage of cold or warm water supplied by said water supply system 4 and added with sanitizing action ozone from said ozonator device 24;
- a command 27 to release the water passing through said pipe 26, provided on the upper part of said body 25 preferably of the pressure lever type;
- a command 28 to unhook said rotating brush 5 from said body 25, preferably of the push button type.

[0022] In particular, said rotating brush 5 comprises:

- an antibacterial coating 29 provided on the upper portion of said body 25 and working as a handle of the same, preferably realized with rubber compounds and substances with a bactericidal action (lithium ions, etc.) for preventing the possible proliferation of germs and/or bacteria on said body 25 due to the repeated contacts with users' hands;
- a protection 30, preferably discoid in shape, provided on the upper portion of said body 25, below said antibacterial coating 29 for preventing contamination of users' hands due to drops of washing water and/or organic residuals during working.

[0023] In a first preferred embodiment of the cleansing and sanitation system for sanitary appliances according to the present invention as shown in figure 3, said rotating brush 5 may comprise:

- a telescopic cannula 31 associated at the lower end of body 25 for favouring the reaching of any part of the internal surface and of the structure of sanitary appliances;
- a terminal sheath, preferably of rubber, associated at the free end of said telescopic cannula 31, allowing said pipe 26 of said body 25 not to bend and thus not to hinder the passage of the water inside the same;
- a connecting spout 33 of said rotating brush 5, associated to the free end of said end sheath 32;
- a cartridge 34 for the slow release of detergent and/or disinfectant substances in solid or liquid state, or natural origin (lemon or vinegar derivatives, sodium bicarbonate, essential oils, etc.), applied to the free end of said connecting spout 33 of rotating brush 5 or, as an alternative, inside said brush 5;
- an inner section 37 provided with stiff bristles with a pointed shape for energetic and effectiverubbing, and an outer section 38 provided with soft bristles for completing the cleansing.

[0024] In particular:

- said cartridge 34 for slow release of detergent and/or disinfectant substances comprises an unhooking control 35 for its application and replacement, and a transparent portion 36 for verifying the quantity of detergent and/or disinfectant substances inside said cartridge;
- sections 37, 38 with stiff and soft bristles comprise a sheath 39 preferably out of light rubber, that partially surrounds them so as to prevent the leaking allaround of water drops and/or organic residuals while working.

[0025] In a second embodiment, not shown, said rotating brush 5 may further comprise:

- means for restraining in a collected position or covering the bristles of said rotating brush 5, for restraining them inside and hiding them from view when the system is at rest.

Functioning and use of the cleansing and sanitation system for sanitary appliances according to the present invention

[0026] As far as the working of the cleansing and sanitation system for sanitary appliances according to the present invention and according to above specification is concerned, the pressure of the water supplied by said water supply system 4, due to said pipe 26 inside said body 25, determines its supply to an internal blade impeller (not shown) thus allowing brush 5 to rotate due to water induced.

[0027] The abrasive action of rotating brush 5 and the washing action of the water coming out therefrom synergistically cooperate to completely remove solid as well as liquid organic residuals from the internal surface and more in general from the structure of sanitary appliances.

[0028] The angled arrangement of said rotating brush 5 with respect to said body 25 as well as its possible positioning on a telescopic cannula 31 that may be associated to said body 25 allows to easily reach any point of the inner surface and more in general of the structure of sanitary appliances, and thus to efficiently provide for the removal of particularly resistant solid as well as liquid organic residuals from the same.

[0029] The use of the system according to the present invention with ozone-added water, supplied by ozone device 24, jointly with or separately from detergent and/or disinfectant substances from natural origin provided by a slow release cartridge 34 that may be associated to said rotating brush 5, allows to provide for the cleansing and sanitizing of sanitary appliances avoiding the use of chemical productsharmful for the environment.

[0030] Regardless of the way of use of the system ac-

cording to the present invention, the constant irroration of said rotating brush 5 with the same water used for putting it onto rotation produces a constant washing of the relative bristles and therefore prevents the formation of organic residual deposits among the same.

[0031] After putting away rotating brush 5 into housing 8 of lower compartment 3 of said container 1 and closing said inner door 12 the user may proceed with a further cleansing operating for a few seconds one of the taps 20 of said water supply system 4 so that the rubbing of the bristles against said contrast bar 11ensures complete cleansing from possible organic residuals.

[0032] At the end of said further cleansing, germicide lamp 17 provided in housing 8 of said lower compartment 3 of said container 1 provides to irradiate said rotating brush 5 with ultraviolet and/or infrared rays so as to prevent the proliferation of germs and/or bacteria on the bristles of the same.

[0033] Inner door 12 if said compartment 3 of said container 1 has hinges 13 that allows its opening with front rotation, curved guides 14 interacting with stop pins 15 for maintaining a maximum opening inclined position, and raised lateral edges 16 for collecting possible residuals of dripping from said rotating brush 5 on the internal side of said door 12 and favour their sliding towards drain hole 10 so as to prevent the progressive soiling of the floor of the rooms in which said sanitary appliances served by the system according to the present invention are found, due to dripping of said residuals from said rotating brush 5.

[0034] Said rotating brush 5 further comprises an antibacterial coating 29 for preventing the possible proliferation of germs and/or bacteria on said cylindric body 25 due to the repeated contact with users' hands, and a protection 30 to prevent contamination of users' hands due to drops of washing water and/or of organic residuals during its working.

[0035] It is evident that in light of contingent needs and requirements, modifications or variations may be made to the cleansing and sanitizing system of sanitary appliances as described, which will in any case fall within the scope of the protection of the invention as defined in the attached claims.

Claims

1. A system for cleaning and sanitizing of sanitary appliances, comprising:

- a container (1), divided into two separate compartments, respectively upper (2) and lower (3), provided with an outer door (6) with reversible, sealing closure and with hinges (7) which allow the lateral opening thereof;
- a water supply system (4) contained in said upper compartment (2), provided with cold and warm water supply pipes (19), with respective taps (20); with a flexible hose (21) with quick fit connectors (22), and with a hose (21) reel (23);
- a rotating brush (5) contained in lower compartment (3) provided with at least one hollow body (25), with an inner pipe (26) for the passage of the water supplied by said pipes (19) and by said hose (21) from said water supply system (4), with a command (27) for the release of the water passing through pipe (26) and with a command (28) for unhooking from said hollow body (25), as said rotating brush (5) is operated by the pressure of the water supplied by said water supply system (4),

characterized in that:

- an ozonator device (24), placed between said pipes (19) for the water supply and said hose (21) for the connection to aid rotating brush (5), suitable for adding sanitizing ozone the water supplied by said water supply system (4) and coming out of said rotating brush (5);
- a sterilizing lamp (17), arranged on an internal lateral wall of said lower compartment (3) of said container (1), for preventing the possible proliferation of germs and/or bacteria on the bristles of said rotating brush (5);
- and anti-odor filter (18) arranged on an internal lateral wall of said lower compartment (3) of said container (1);
- an anti-bacterial coating (29) arranged in the upper compartment of said hollow body (25) of said rotating brush (5), acting as a handle of the same, for preventing the possible proliferation of germs and/or bacteria due to the contact with the users' hands;
- a protection (30) arranged on the upper part of said hollow body (25) of said rotating brush (5), under the anti-bacterial coating (30) for preventing the contact of users' hands with drops of water and/or of organic residuals during working.

2. A system according to claim 1, **characterized in that** the lower compartment (3) of said container (1) comprises:

- a vertical housing (8) with supports (9) for hooking and fixing said rotating brush (5);
- a drain orifice (10) in a discharge of dripping residues of said rotating brush (5), on the bottom;
- a scrubbing bar (11) for cleaning the bristles of said rotating brush (5), arranged on an internal lateral wall.

3. A system according to claims 1 and 2, **characterized in that** the lower compart (3) of said container (1) comprises:

- an internal door (12) with sealing reversible closing provided with hinges (13) allowing front opening, and with arched guides (14) that interact with stop pins so as to maintain it in an inclined position of maximal opening, and with raised side edges collecting possible dripping residues from said rotating brush (5) on the internal side of said door (12) and facilitate their sliding towards the drain orifice (10).

4. A system according to claim 1, **characterized in that** said rotating brush (5) comprises:

- a telescopic cannula (31), associated with the lower end of said hollow body (25);
- a terminal sheath (32) associated with the free end of said telescopic cannula (31);
- a connecting spout (33) of said rotating brush (5), associated to the free end of said terminal sheath;
- a slow release cartridge of cleaning and/or disinfectant substances applied to the free end of said connecting spout (33) of said rotating brush (5) or alternatively inside said rotating brush (5);
- an internal section (37) provided with stiff bristles shaped like a tip and an outer section (38), provided with soft bristles.

5. A system according to claim 4, **characterized in that** said slow release cartridge (34) of cleaning and/or disinfectant substances comprises:

- an unhooking command (35) for the application and replacing thereof;
- a transparent portion (36) for the verification of the amount of cleaning and/or disinfectant substances at its inside.

6. A system according to claim 4, **characterized in that**:

- said sections (37, 38) of said rotating brush (5) are partially surrounded by a sheath (39) that prevents the leaking around of drops of water and/or organic residues during working.

7. A system according to claims 1 or 4, **characterized in that** said rotating brush (5) comprises:

- means for maintaining a collected and hedging position of the bristles of said rotating brush (5) so as to determine the containment thereof inside during the rest period of the system.

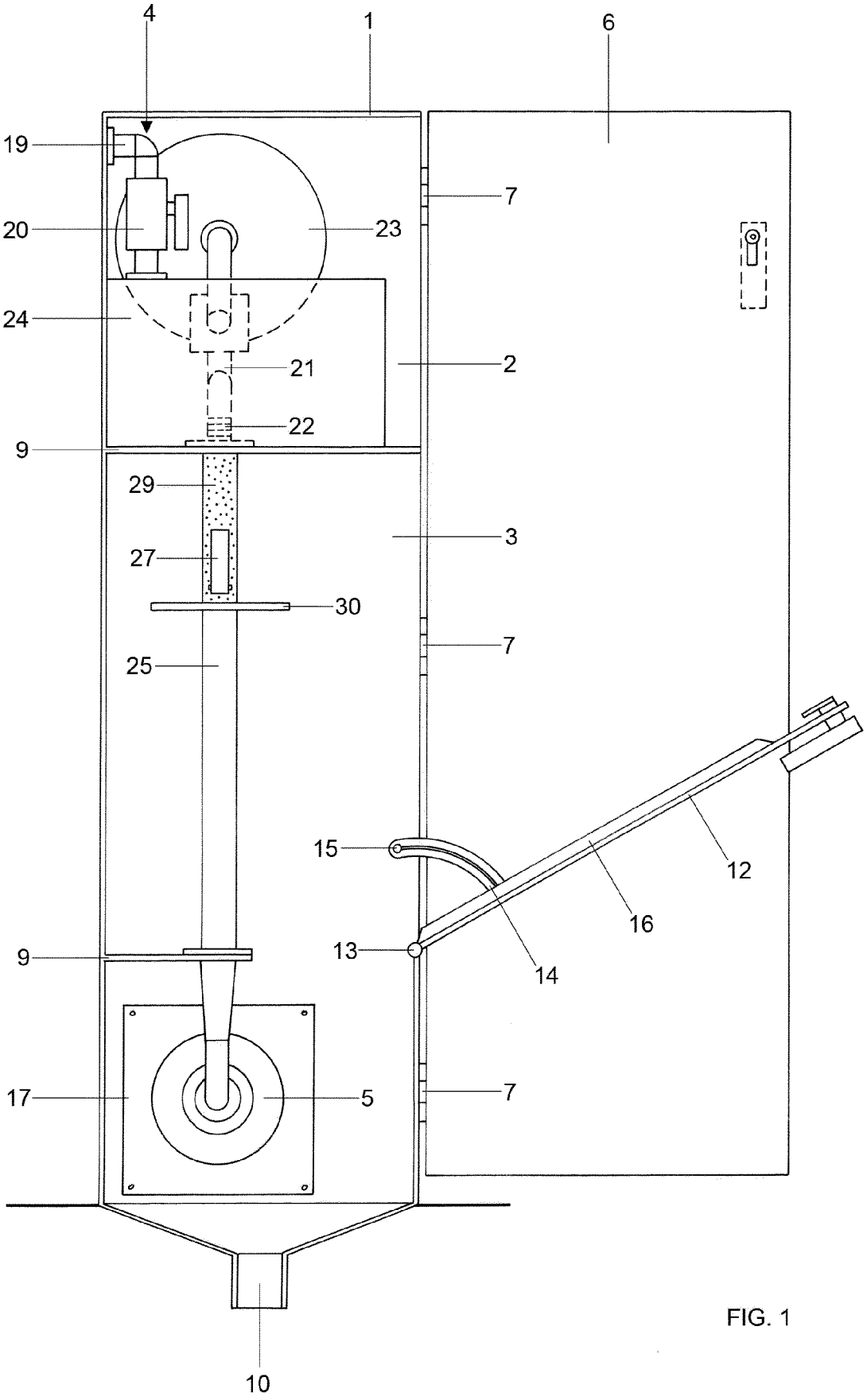

FIG. 1

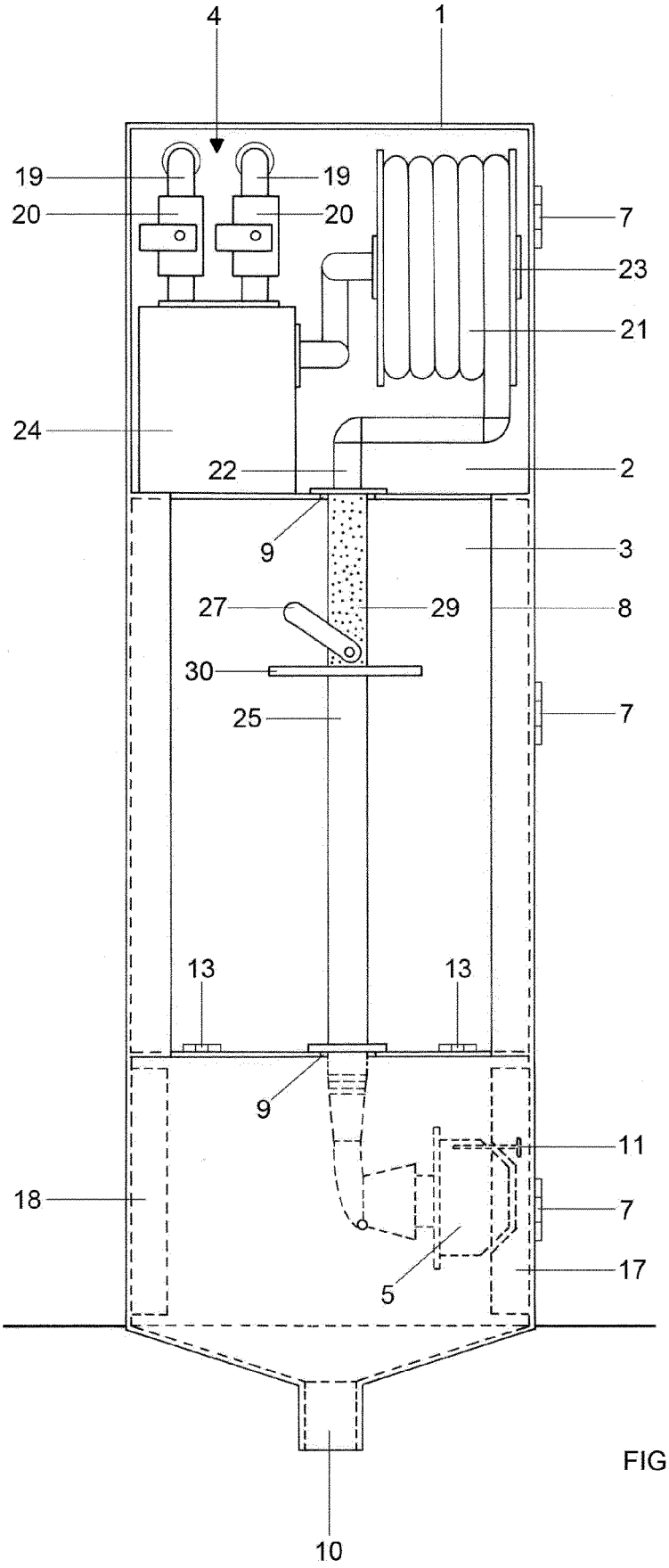

FIG. 2

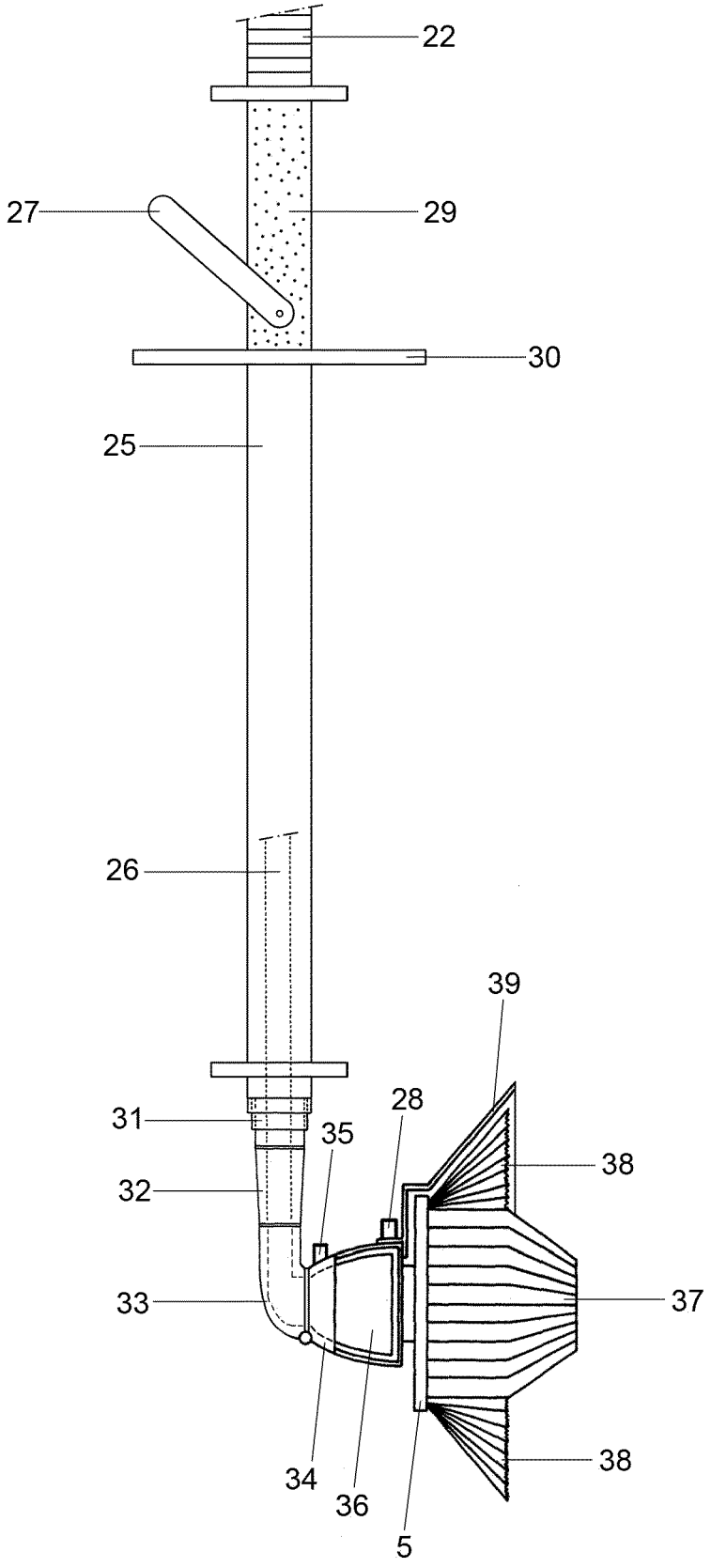

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 23 02 0485

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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
Munich	21 February 2024	Posavec, Daniel

CATEGORY OF CITED DOCUMENTS

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EUROPEAN SEARCH REPORT

Application Number
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Munich	21 February 2024	Posavec, Daniel

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