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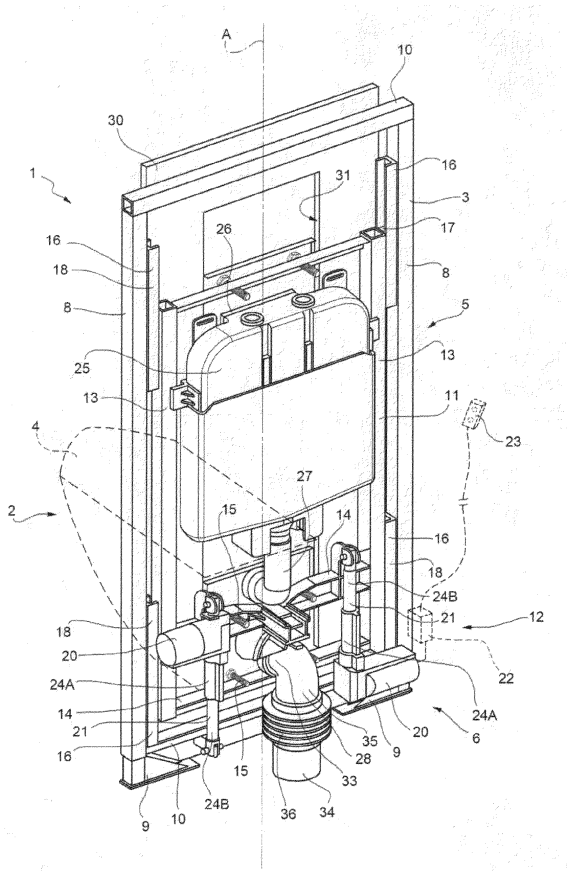
(71) Applicant: **Oliveira & Irmao S.A.**
3800 Aveiro (PT)

(72) Inventors:
- **Vasconcelos Machado, Leonel Pedro**
  3800-334 Aveiro (PT)
- **Tendeiro Padhilha, Francisco José**
  3800 Aveiro (PL)

(74) Representative: **Ferreira, Maria Silvina**
Clarke, Modet & Co.
Rua Castilho, 50-9°
1269-163 Lisboa (PT)

(54) **Installation structure for sanitary fixtures, with a system for adjusting the height of a sanitary bowl**

(57) A structure (1) for installing a sanitary appliance (2) extends substantially along an axis (A) and comprises a fixed frame (3), a sanitary bowl (4), auxiliary components (5) that serve the bowl (4), and a system (6) for adjusting the height of the bowl (4) for raising and lowering the bowl (4) on the frame (3) and hence adjusting the height of the bowl (4) from the ground; the height adjusting system (6) is a motor drive system and comprises a movable part (11), supported by the frame (3) and slidable with respect to the frame (3) parallel to the axis (A), and an actuation group (12) that moves the movable part (11) with respect to the frame (3); the movable part (11) supports the bowl (4) and auxiliary components (5) for the operation of the bowl (4), said auxiliary components (5) being fixed on the movable part (11) and moving integrally with the movable part (11).



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Description

[0001] The present invention relates to an installation structure for a sanitary appliance (WC, urinal, lavatory, bidet, etc.), in particular a built-in installation structure, with a system for adjusting the height of a bowl of the sanitary appliance.

[0002] A sanitary appliance, in particular a sanitary appliance having a bowl, like WCs, urinals, etc., are often known to be installed by means of a built-in installation structure; a typical built-in installation structure for sanitary appliances generally comprises a metal frame on which various structural elements and functional components, such as the flushing tank, conduits, controls, etc., are also fixed, in addition to the bowl of the sanitary appliance and the fastenings for fixing the frame to a support wall.

[0003] The frame normally comprises a pair of vertical uprights provided with support feet, which rest on the floor; the uprights often have a telescopic structure so as to be able to vary the length of the uprights and accordingly the height of the structure and hence adjust, in the installation step, the position of the bowl with respect to the floor. Clearly, the position of the bowl may not be changed subsequently.

[0004] An example of an installation structure of a sanitary appliance with a mechanism for adjusting the height of the bowl is shown in EP-A-1785533.

[0005] In this solution, the structure comprises a fixed frame, which supports the tank and the flushing device with related controls; and a movable part, slidable with respect to the fixed frame and which carries the bowl. The height adjusting mechanism acts on the movable part and is manually operated. The drain curve, which connects the bowl to an outer drain tube, is made in two telescopic pieces, one of which is fixed and the other is integrally carried by the movable part.

[0006] This system too allows the height of the bowl to be adjusted when it is installed and/or requires complicated manual operations which may not be performed by the user.

[0007] Generally, the known system, and the like, does not allow the simple and quick adjustment of the height of the bowl before each use. Thus the system does not allow, in use, the position of the bowl to be simply, conveniently and quickly adapted by the user, which is useful for example for the elderly or disabled.

[0008] It is an object of the present invention to resolve the problems emphasized by the known art, especially by providing a structure for installing a sanitary appliance provided with a system for adjusting the height of the bowl of the sanitary appliance which allows each user to adapt the height of the bowl to his/her own needs in a simple, convenient and quick manner.

[0009] The present invention therefore relates to a structure for installing a sanitary appliance (WC, urinal, lavatory, bidet, etc.) with a system for adjusting the height of a bowl of the sanitary appliance as essentially defined in the appended claim 1.

[0010] Further preferred features of the installation structure in accordance with the invention are the object of the dependent claims.

[0011] The installation structure of the invention allows the height of the sanitary appliance, and specifically of the bowl, to be adjusted, on request by the user, who may also be seated on the bowl, in a highly convenient, simple and quick manner.

[0012] The invention is described in detail in the following non-limiting embodiment, with reference to the accompanying figure, which is a diagrammatic and perspective rear view of an installation structure in accordance with the invention.

[0013] Numeral 1 in the accompanying figure indicates a built-in installation structure, as a whole, of a sanitary appliance 2 (WC, urinal, lavatory, bidet, etc.).

[0014] The structure 1 substantially extends along an axis A, vertical in normal configuration of use, and comprises: a fixed frame 3, for example made of a metal section bar, fixable to a wall and/or floor by means of specific fixing members; a sanitary bowl 4; auxiliary components 5 which serve the bowl 4; and a system 6 for adjusting the height of the bowl 4 for raising and lowering the bowl 4 on the frame 3 and hence adjusting the height of the bowl 4 from the ground.

[0015] In particular, the frame 3 has a pair of uprights 8 parallel to axis A (vertical in use), inferiorly provided with respective feet 9 resting, in use, on the ground, and a pair of crosspieces 10 arranged between the uprights 8, for example at respective axially opposite ends of the frame 3.

[0016] The height adjusting system 6 is a motor drive system and comprises a movable part 11, supported by the frame 3 and slidable with respect to the frame 3 parallel to axis A (hence, vertically in use), and an actuation group 12 that moves the movable part 11 with respect to the frame 3.

[0017] The movable part 11 comprises a pair of lateral rods 13 parallel to axis A and to the uprights 8 of the fixed frame 3, and hence they too also vertical in use, and one or more crosspieces 14 arranged between the lateral rods 13, especially at least at one lower end of the lateral rods 13.

[0018] The bowl 4 is fixed to the movable part 11, for example to a crosspiece 14 of the movable part, by means of fixing elements 15.

[0019] The frame 3 is provided with guides 16 parallel to axis A, for example arranged along the uprights 8, and the movable part 11 has slides 17 made of low-friction material (with a low friction coefficient) inserted in respective guides 16 of the frame 3 for allowing the movable part 11 to slide with respect to the frame 3.

[0020] In particular, the uprights 8 carry respective guides 16 facing each other, each guide 16 being preferably formed by two or more guide sectors 18 separated and spaced apart from one another parallel to axis A and positioned at least at two axially opposite ends of the

frame 3.

[0021] The movable part 11 is provided with two pairs of slides 17; the slides 17 are arranged in pairs on respective lateral rods 13 and are axially spaced apart from each other on each lateral rod 13 and are inserted in respective guide sectors 18.

[0022] The actuation group 12 comprises at least one electric motor 20, supported by the frame 3 or the movable part 11 and optionally associated to a reducer, one or more actuator members 21 operated by motor 20 and acting on the movable part 11, and a control unit 22 having controls 23 operable by the user.

[0023] In the disclosed example, the actuation group 12 comprises two electric motors 20 acting on respective actuator members 21.

[0024] In particular, the actuator members 21 are telescopic members: each actuator member 21 has two portions 24A, 24B that slide with respect to one another parallel to axis A and integrally fixed to the frame 3 and to the movable part 11, respectively.

[0025] Each actuator member 21 has a base portion 24A that is fixed to the motor 20 that operates said actuator member 21, and a sliding portion 20B that slides with respect to the base portion 20A.

[0026] The base portions 24A and the sliding portions 24B of the two actuator members 21 are reversed with respect to one another: a first actuator member 21 has the base portion 24A fixed to the frame 3 and the sliding portion 24B fixed to the movable part 11; and, vice versa, a second actuator member 21 has the base portion 24A fixed to the movable part 11 and the sliding portion 24B fixed to the frame 3.

[0027] In particular, the actuation group 12 comprises a pair of pistons (defining the sliding portions 24B) accommodated and axially sliding in respective cylinders (defining the base portions 24A).

[0028] In particular, the actuator members 21 are connected to a crosspiece 10 of the movable part 11, for example the same crosspiece 10 which also supports the bowl 4.

[0029] In the disclosed example, a first motor 20 is supported by the frame 3 and a second motor is instead fixed to the movable part 11; the actuator members 21 connected to the two motors 20 are mounted in a reversed configuration with respect to one another, for example they have respective cylinders fixed to the frame 3 and to the movable part 11, respectively, and the respective pistons fixed to the movable part 11 and the frame 3, respectively.

[0030] The auxiliary components 5 which serve the bowl 4 are generally supported by the movable part 11, like the bowl 4. In particular, the movable part 11 supports the components required for the operation of the bowl 4, such as specifically control components which operate the bowl 4 and hydraulic conduits which connect the bowl 4 to an external supply network (for bringing water to the sanitary appliance) and to an outer drain tube, for draining the water from the bowl 4.

[0031] In the disclosed example, in particular, the auxiliary components 5 include: a flushing tank 25 internally provided with a flushing valve (now shown), a control plate 26 with buttons that operate the flushing valve, a flushing conduit 27 that connects the tank 25 with the bowl 4, a drain conduit 28 connected to a drain of the bowl 4. These components are all fixed to the movable part 11 and hence move integrally with the movable part 11 and the bowl 4.

[0032] Optionally, the installation structure also includes a front plate 30, fixable to the wall into which the structure 1 is built; the plate 30 is provided with at least one longitudinal window 31 extending along axis A and through which the bowl 4 and the control plate 26 of the flushing valve are arranged.

[0033] The drain conduit 28 comprises, at the opposite ends thereof, a first portion 33, connected to the drain of the bowl 4 and fixed to the bowl 4 and hence to the movable part 11, and a second portion 34, integrally connectable to an outer tube and hence fixed with respect to the movable part 11. The portion 33 is substantially perpendicular to axis A and has a curved end portion 35 folded 90°.

[0034] A bellows duct 36 that joins the two portions 33, 34 and is extendable for following the related movement of the portions 33, 34 with respect to each other, is arranged between the portions 33, 34.

[0035] The bellows duct 36 is arranged downstream of the curved portion 35 and is substantially parallel to axis A (extending about and along an axis parallel to axis A); the bellows duct 36 is shaped so as to be axially deformable parallel to axis A (selectively extending and contracting), thus allowing the two portions 33, 34 to move with respect to one another parallel to axis A.

[0036] In use, the position of the movable part 11 with respect to the fixed frame 3 (and hence the height of the sanitary bowl 4 from the ground) may be varied by a user, also seated on the bowl 4, by operating the controls 23; the control unit 22 operates the actuation group 12 by moving the movable part 11 along the guides 16 until the bowl 4 is brought to the desired position.

[0037] Lastly, it is understood that further modifications and variants may be made to the installation structure herein described and shown, which do not depart from the scope of the appended claims.

Claims

1. An installation structure (1) for a sanitary appliance (2), extending substantially along an axis (A) and comprising a fixed frame (3), a sanitary bowl (4), auxiliary components (5) that serve the bowl (4), and a system (6) for adjusting the height of the bowl (4) for raising and lowering the bowl (4) on the frame (3) and hence adjusting the height of the bowl (4) from the ground; the structure (1) being **characterized in that** the height adjusting system (6) is a motor drive

system and comprises a movable part (11), supported by the frame (3) and slidable with respect to the frame (3) parallel to the axis (A), and an actuation group (12) that moves the movable part (11) with respect to the frame (3); and **in that** the movable part (11) supports the bowl (4) and auxiliary components (5) for operation of the bowl (4), said auxiliary components (5) being fixed onto the movable part (11) and moving integrally with the movable part (11).

2. A structure according to claim 1, wherein the auxiliary components (5) include: a flushing tank (25) internally provided with a flushing valve, a control plate (26) with buttons that operate the flushing valve, a flushing conduit (27) that connects the tank (25) with the bowl (4), and a first portion (33) of a drain conduit (28) connected to a drain of the bowl (4).

3. A structure according to claim 1 or 2, wherein the frame (3) is provided with guides (16) parallel to the axis (A) and the movable part (11) has slides (17) inserted in respective guides (16) of the frame (3) for allowing the movable part (11) to slide with respect to the frame (3).

4. A structure according to claim 3, wherein the slides (17) are made of a low-friction material.

5. A structure according to claim 3 or 4, wherein the guides (16) are positioned on respective uprights (8) of the frame (3) and facing each other, each guide (16) being formed by two or more guide sectors (18) separated and spaced apart from one another parallel to the axis (A) and at least positioned at two axially opposite ends of the frame (3).

6. A structure according to claim 5, wherein the movable part (11) is provided with two pairs of slides (17); the slides (17) being arranged in pairs on respective lateral rods (13) of the movable part (11) and being axially spaced apart from each other on each lateral rod (13) and inserted in respective guide sectors (18).

7. A structure according to one of the preceding claims, wherein the actuation group (12) comprises at least one electric motor (20), supported by the frame (3) or by the movable part (11) and optionally associated to a reducer, one or more actuator members (21) operated by the motor (20) and acting on the movable part (11), and a control unit (22) having controls (23) operable by a user.

8. A structure according to one of the preceding claims, wherein the actuation group (12) comprises two electric motors (20) acting on respective actuator members (21) that move the movable part (11) with respect to the frame (3).

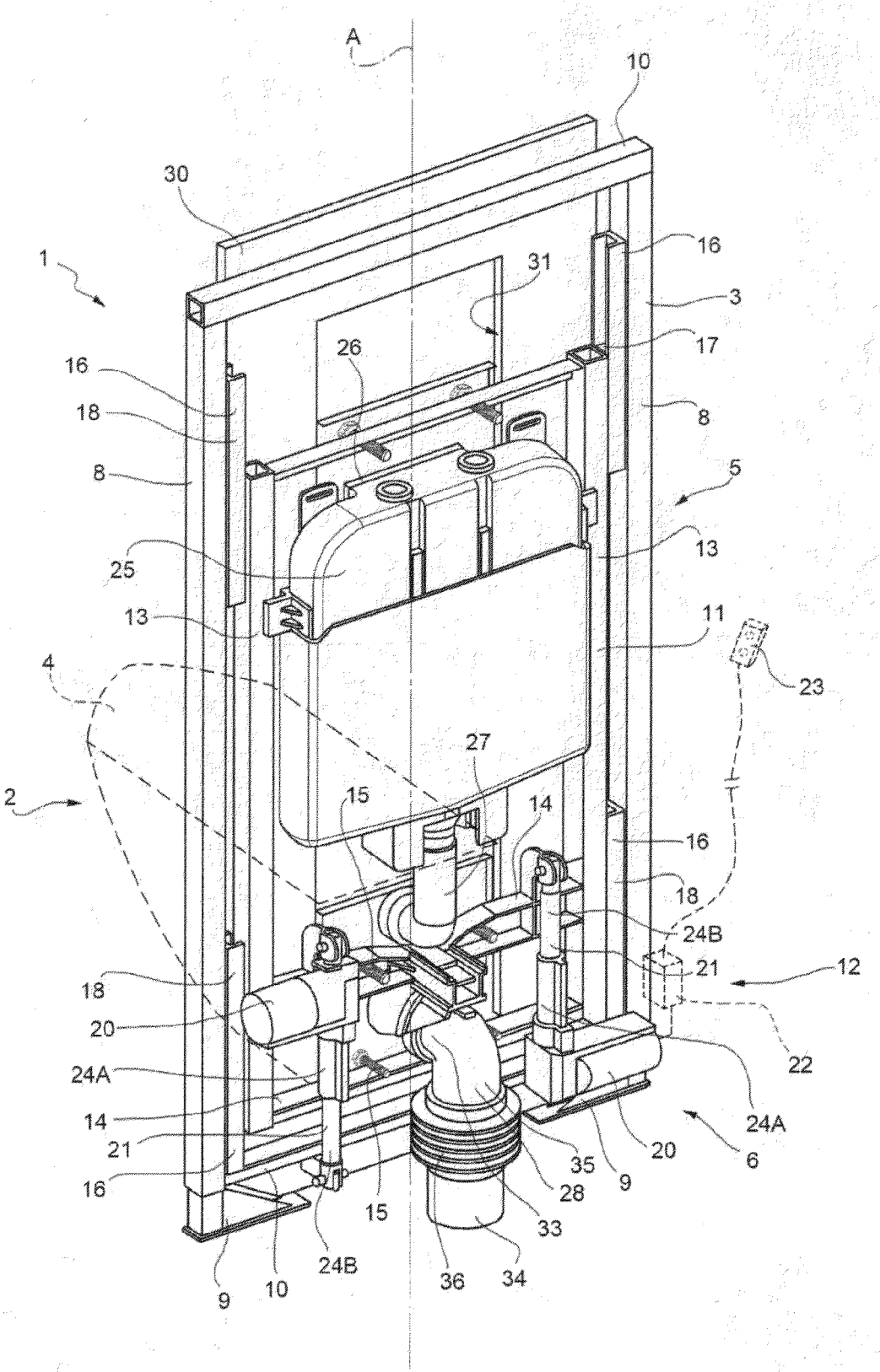
9. A structure according to claim 8, wherein the actuator members (21) are telescopic members and each actuator member (21) has two portions (24A, 24B) that slide with respect to one another parallel to the axis (A) and integrally fixed to the frame (3) and to the movable part (11) respectively.

10. A structure according to claim 9, wherein each actuator member (21) has a base portion (24A) that is fixed to the motor (20) that operates said actuator member (21), and a sliding portion (20B) that slides with respect to the base portion (20A).

11. A structure according to claim 10, wherein the base portions (24A) and the sliding portions (24B) of the two actuator members (21) are reversed with respect to one another, a first actuator member (21) having the base portion (24A) fixed to the frame (3) and the sliding portion (24B) fixed to the movable part (11); and, vice versa, a second actuator member (21) having the base portion (24A) fixed to the movable part (11) and the sliding portion (24B) fixed to the frame (3).

12. A structure according to one of the preceding claims, wherein the movable part (11) supports the bowl (4) and at least a first portion (33) of a drain conduit (28) connected to a drain of the bowl (4) and fixed to the bowl (4) and hence to the movable part (11); and wherein he drain conduit (28) comprises a second portion (34), integrally connectable to an outer tube and hence fixed with respect to the movable part (11), and a bellows duct (36) that joins the two portions (33, 34) and is extendable for following the movement of the portions (33, 34) with respect to each other.

13. A structure according to claim 12, wherein the bellows duct (36) is set downstream of a curved portion (35) of the first portion (33) and is substantially parallel to the axis (A) and is shaped so as to be axially deformable, selectively extending and contracting, parallel to the axis (A), and to allow the two portions (33, 34) to move with respect to one another parallel to the axis (A).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EUROPEAN SEARCH REPORT

Application Number
EP 13 39 8004

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 02/42572 A1 (WIRTZ PETER [DE]) 30 May 2002 (2002-05-30)	1	INV. E03D11/14
A	* abstract * * page 5, paragraph 3 *	2-13	E03D11/12
X	FR 2 942 817 A1 (SIAMP CEDAP REUNIES [MC]) 10 September 2010 (2010-09-10) * page 4, line 3 - page 5, line 18 *	1-13	
X	US 5 199 113 A (GLASOW GEORGE L [US] ET AL) 6 April 1993 (1993-04-06)	1	
A	* figures 1,2 *	2-13	

TECHNICAL FIELDS SEARCHED (IPC)

E03D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 August 2013	Flygare, Esa

CATEGORY OF CITED DOCUMENTS

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09-08-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0242572 A1	30-05-2002	AU 2488602 A	03-06-2002
		DE 10058817 A1	11-07-2002
		EP 1337718 A1	27-08-2003
		WO 0242572 A1	30-05-2002
FR 2942817 A1	10-09-2010	NONE	
US 5199113 A	06-04-1993	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1785533 A **[0004]**