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(54) Air extraction system for toilets

(57) An air extraction system for toilets that comprises an extractor fan (3) connected by means of some tubes (1,6,10a) to a water discharge pipe, in such a way that it takes advantage of the internal cavities of the toilet (4) to extract air from inside it, expelling the air to the part behind the siphon or to the outside.

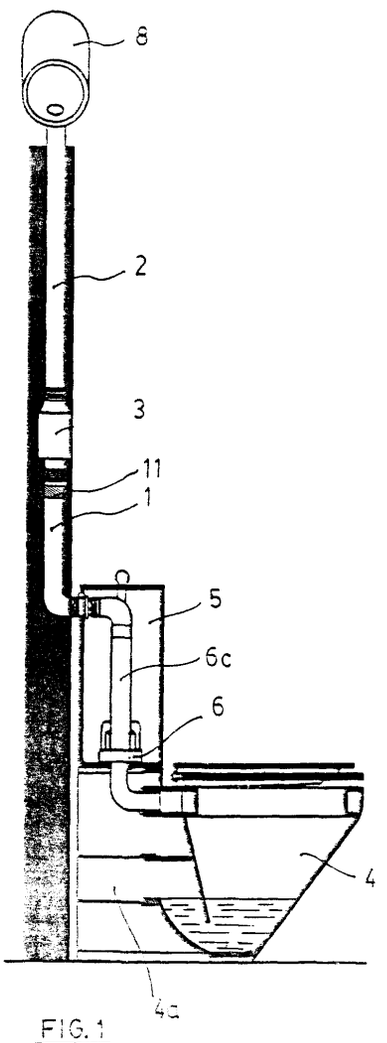

FIG. 1

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates, as is indicated by its title, to an air extraction system for toilets whose aim is to prevent possible smells produced during use of the toilet from extending to the room where the toilet is housed.

BACKGROUND OF THE INVENTION

[0002] As prior art for the invention different systems could be mentioned whose aim consists of preventing the smells from extending from the inside of the toilet to the rest of the room.

[0003] These systems consider in general fashion some extraction means that suck air from inside the toilet or from inside the cistern associated with the toilet and then pump it to a ventilation pipe connected with the outside.

[0004] Some of these systems carry out the air suction by means of some nozzles coupled to the toilet. These may be deployed in the space existing between the lid and the rim of the toilet in which case a planar configuration is adopted or in some orifices defined for the purpose in the zone behind the toilet.

[0005] In the first case, the nozzle is not fixed in a stable manner to the toilet, and may be displaced or even free from it. This makes it awkward, especially during cleaning tasks.

[0006] In the second case it is necessary for the toilet to have a suitable orifice defined during the manufacturing process of the toilet, which prevents this system from being adapted to toilets already installed.

[0007] Another of the systems available considers sucking air inside the cistern and inside a zone above water level; the aim of this system being to extract odours from inside the toilet by means of an overflow that connects the aforementioned zone with the inside of the toilet, as this overflow passes over the closure defined by the flushing device of the cistern. This system does not satisfactorily resolve the problem of smells either, due partly to the small capacity of the overflow duct and partly because the lid does not make an airtight seal over the cistern, allowing air in from outside through the gaps between the two.

DESCRIPTION OF THE INVENTION

[0008] To solve the aforementioned problem the idea of the extraction system of the invention has been thought up. This system has some constructive characteristics oriented towards allowing its installation both in new toilets and in toilets that have already been installed. It assures sufficient suction to prevent the propagation of smells to outside the toilet system.

[0009] In accordance with the invention, the system comprises an extraction fan located within or outside the cistern. This fan is provided with control means and is connected to a suction pipe and an impulsion pipe; the suction pipe is connected either directly or by means of some auxiliary pieces to the orifice defined in the toilet allowing the entrance of water from the cistern, in such a way that said orifice serves both to allow the passage of water and for air extraction, with a possible automatic device preventing back-flow.

[0010] It is foreseen that the suction pipe has at least an initial vertical stage or with an inclination large enough to prevent the water from the flushing of the cistern from reaching the fan that provides the suction, for example with an anti-flow back valve.

[0011] The impulsion pipe through which the air sucked by the fan passes can be coupled, as convenient, via a ventilation pipe to the outside or with the scupper pipe, in which case the connection will be made in a zone behind the siphon of the toilet in order to prevent the return of smells to inside the toilet. It may also be provided with a chemical or charcoal filter.

[0012] In the event that the cistern forms part of the toilet, it is foreseen that the connection of the suction pipe is carried out with an auxiliary piece or an integrated piece that is provided with a lower mouth suitable for fixing to the cistern exit, an upper mouth to mount the corresponding closure and flush device and with an additional outlet for coupling said suction pipe.

[0013] In the event that the cistern is located in a raised position with respect to the toilet, connected thereto by a flush pipe, it is foreseen that the suction pipe is connected directly to the flush pipe and preferably in the zone nearest to the toilet or by means of a hole expressly drilled in the bowl with an additional piece provided with a suitable detector.

[0014] In any of the previous cases, air suction from the inside of the toilet is carried out via an orifice defined in the upper rear zone of the toilet, and conventionally used for the entrance of flush water, assuring a correct suction of the smells by the system object of the invention as a result of the strategic position of said orifice.

[0015] The control means of the fan are composed of an electrical circuit allowing the activation and deactivation of the motor associated with the circuit.

[0016] The means of activating and deactivating the fan can be composed, by way of example, of a manual or automatic on/off switch, by an on switch and timer that switches it off after a pre-set period of time has elapsed, by a sensor that activates and deactivates it, a speed regulator of the motor, a dry/wet water detection probe and an on or off cell or automatically depending on the pressure that the toilet seat exerts thereon.

DESCRIPTION OF THE DRAWINGS

[0017] To complete the description that is being carried out and with the aim of aiding a better understanding of the characteristics of the invention the present spec-

ification is accompanied, as an integral part thereof, by a set of drawings, in which, for illustrative purposes that are not limiting, the following has been represented:

- Figure 1 shows a schematic view of the system object of the invention connected to a ventilation duct applied to a toilet provided with a cistern forming part of the toilet, these being represented in profile and sectioned in the vertical plane.

- Figure 2 shows a rear view of the same elements represented in the previous figure and in which only the cistern has been sectioned.

- Figure 3 shows in schematic form a section of the accessory piece in the realisation of the previous figures for making the connection with the suction pipe.

- Figure 4 shows a variation of the set-up of the same system, in which the impulsion pipe is connected to the scupper pipe of the toilet and in the zone located next to the siphon.

- Figure 5 shows a variation of the embodiment of the system applied to a toilet with a raised cistern and associated thereto by means of a flush pipe to which the suction pipe is connected.

PREFERRED EMBODIMENT OF THE INVENTION

[0018] As can be observed in the cited figures, the system object of the invention considers a suction pipe (1) and an impulsion tube (2) coupled to a fan (3) given the task of sucking the air from inside the toilet (4) via the pipe (1) and forcing it to the outside through pipe (2).

[0019] To couple the system to toilets (4) provided with a cistern (5) forming part of the toilet, as represented in figures 1 and 2, it is foreseen that this includes a connecting piece (6) with or without a probe destined to be positioned between the corresponding flush device (7) and the lower exit of the cistern that is coupled to the toilet (4) or with an integrated assembly.

[0020] Said piece (6), as well as a lower mouth (6a) destined to be coupled to the lower mouth of the cistern and an upper mouth (6b) for coupling of the flush mechanism (7), defines an additional outlet (6c) for coupling the suction pipe (1), carrying out both the suction of the air from the inside of the toilet and the flushing of water from the cistern via the piece (6).

[0021] To achieve the air extraction to the outside the impulsion pipe is connected to a ventilation duct (8) as is represented in figures 1 and 2 or to the scupper pipe itself of the toilet as is shown in figure 4; in this latter case the connection will be made in the zone located next to the siphon, and will be provided with a device or system to prevent back-flow.

[0022] In the event that the toilet (4) has a cistern (10) that is connected with the toilet by means of a flush pipe (10a), as is shown in figure 5, the suction tube (1) will be connected directly to said flush pipe, without it being necessary to use the accessory piece (6).

[0023] It is not considered necessary to make this description more extensive for an expert in the art to understand the scope of the invention and the advantages that can be derived therefrom.

[0024] The terms in which this specification has been drawn up should always be taken in their broadest and non-limiting sense.

[0025] The materials, form, size and deployment of the elements will be susceptible to change provided that this does not suppose an alteration of the essential characteristics of the invention, which are now claimed.

Claims

1. An air extraction system for toilets; that, being of the type that comprises a suction pipe (1) and an impulsion pipe (2) coupled to an extraction fan (3) for sucking the air from the inside of the toilet (4) via the pipe (1) and forcing it out to the outside through pipe (2), in which the toilet (4) can be provided with a cistern (5) as part of the toilet or with an elevated cistern (10) connected to the toilet by a flush pipe (10a); characterised in that the suction tube (1) is located connected to the orifice defined in the toilet for the entrance of water from the cistern.

2. An air extraction system for toilets, according to the previous claim, characterised in that the suction pipe (1) has at least an initial vertical section or a section with a large enough inclination to prevent water from the flushing of the cistern (5 or 10) from reaching the extraction fan (3) for sucking air from the inside of the toilet, this system optionally being provided with a device or system (11) to prevent back flow.

3. An air extraction system for toilets, according to claim 1 in which the toilet in question is provided with a cistern (5) forming part of the toilet, characterised in that the connection of the suction pipe (1) with the orifice defined in the toilet (4) for the entrance of water is achieved by means of an accessory piece (6) or a discharge valve provided with this piece.

4. An air extraction system for toilets, according to claims 1 and 3, characterised in that the accessory piece (6) has a lower outlet (6a) destined to be attached to the lower outlet of the cistern (5), an upper mouth (6b) for mounting the flush mechanism (7) of the cistern and an additional outlet (6c) for coupling the suction pipe (1).

5. An air extraction system for toilets, according to claim 1 in which the toilet (4) has an elevated cistern (10) connected to the toilet by means of a flush pipe (10a), characterised in that the suction pipe (1) is connected directly to the flush pipe (10a) by means of an accessory piece which is linked to the toilet by an orifice defined in the toilet (4) for this purpose or expressly drilled for this purpose.

6. An air extraction system for toilets, according to claims 1 and 5, characterised in that the suction pipe (1) is connected to the flush pipe (10a) in a zone near to the toilet (4).

7. An air extraction system for toilets, according to claim 1, characterised in that the impulsion pipe (2) is connected to an exterior ventilation duct (8).

8. An air extraction system for toilets, according to claim 1, characterised in that the impulsion pipe (2) is connected to the scupper pipe (4a) of the toilet (4).

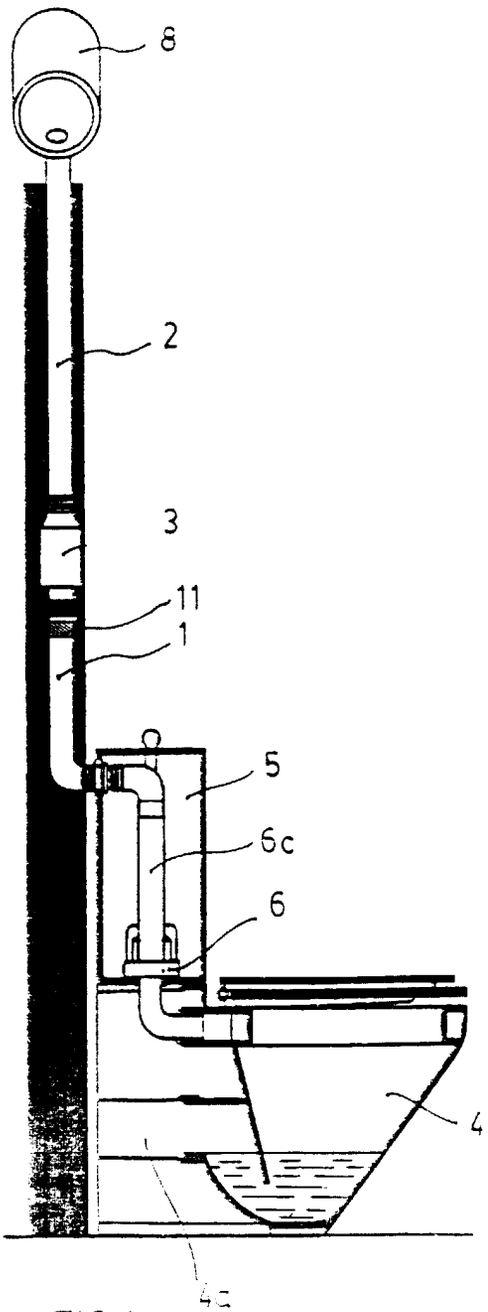

FIG. 1

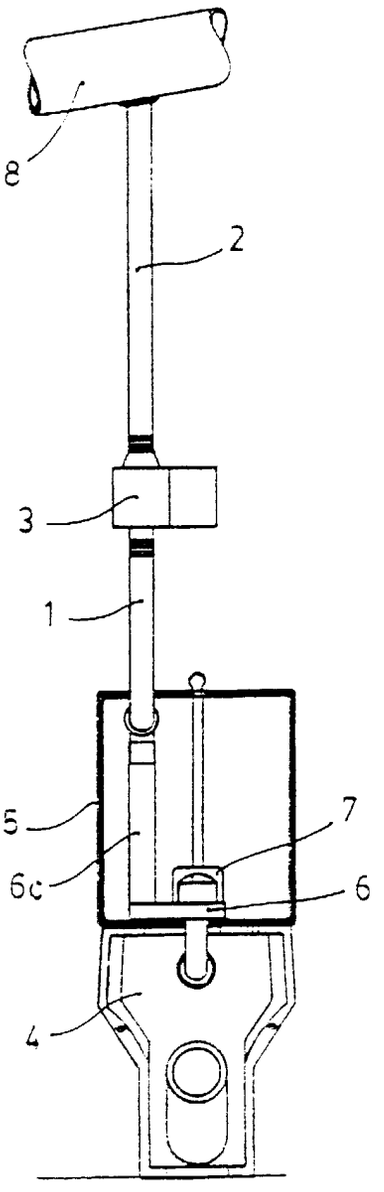

FIG. 2

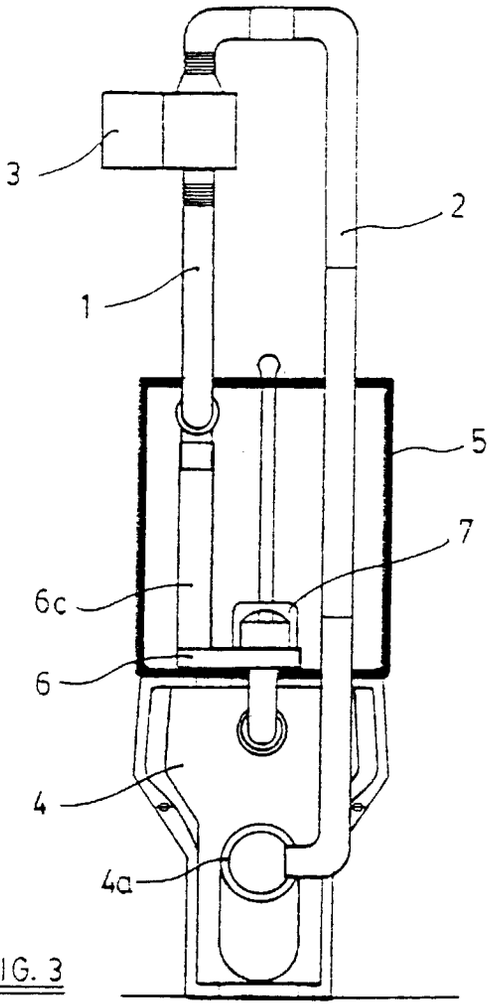

FIG. 3

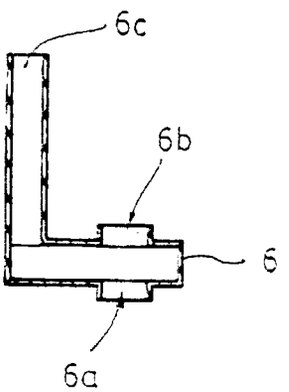

FIG. 4

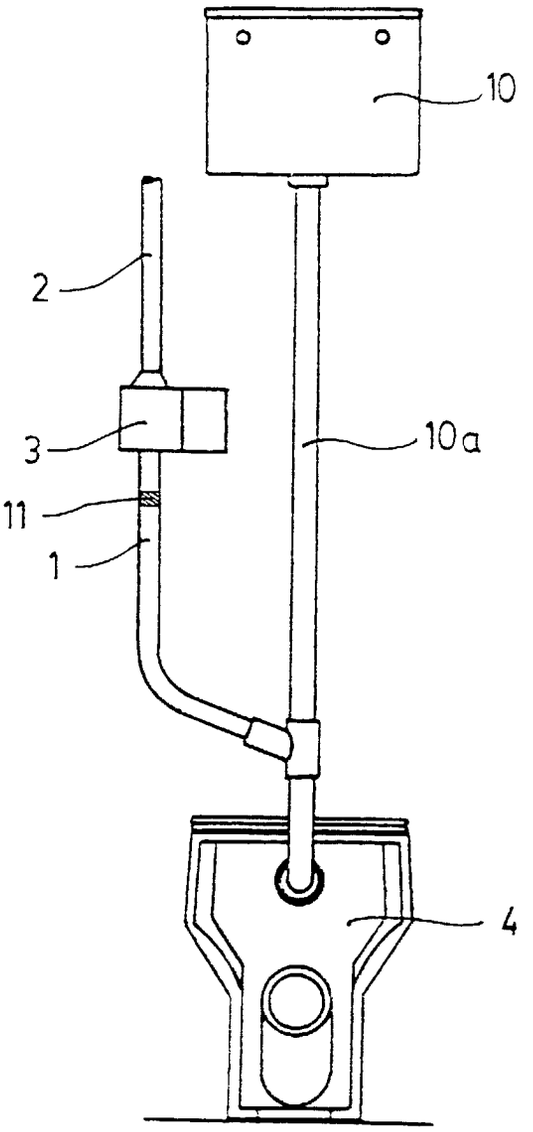

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 99 50 0137

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	FR 2 735 801 A (HUMBERT JACQUES PAUL MARIE) 27 December 1996 (1996-12-27) * page 3, line 1 - page 4, line 10; figures 1,2 *	1-4	E03D9/052
X	GB 2 297 566 A (KAN HAI) 7 August 1996 (1996-08-07) * page 3, line 6 - page 5, line 23; figures *	1-4	
X	CA 1 179 801 A (JENSEN PAUL) 27 December 1984 (1984-12-27) * page 6, line 1 - page 11, line 15; figures 1,3 *	1-4	
X	FR 2 605 658 A (FRIEND EDOUARD) 29 April 1988 (1988-04-29) * page 2, line 3 - page 3, line 8; figure *	1-4	
X	FR 2 593 535 A (HUBERT JUAN) 31 July 1987 (1987-07-31) * page 2, line 6 - page 3, line 8; figure *	1,2,5,6, 8	TECHNICAL FIELDS SEARCHED (Int.Cl.7) E03D
X	DE 28 18 496 A (BUBECK FRIEDRICH) 8 November 1979 (1979-11-08) * page 4, line 11 - line 38; figures *	1,2,5-8	
X	DE 196 51 076 A (ROSKOPF MATTHIAS) 10 June 1998 (1998-06-10) * column 2, line 26 - line 30; figure 2 *	1,2,5,6, 8	
X	GB 2 097 029 A (THORPE LESLIE JOSEPH) 27 October 1982 (1982-10-27) * page 1, line 27 - line 45; figure 1 *	1,2,5,6	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 October 1999	De Coene, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	BE 820 443 A (DE SCHOENMAECKER) 27 March 1975 (1975-03-27) * figures * -----	1,2	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2735801 A	27-12-1996	NONE	
GB 2297566 A	07-08-1996	NONE	
CA 1179801 A	27-12-1984	NONE	
FR 2605658 A	29-04-1988	NONE	
FR 2593535 A	31-07-1987	NONE	
DE 2818496 A	08-11-1979	NONE	
DE 19651076 A	10-06-1998	NONE	
GB 2097029 A	27-10-1982	NONE	
BE 820443 A	27-03-1975	BR 7307557 A	04-11-1975

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