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(54) **Flushing device for a toilet**

Spülvorrichtung für eine Toilette

Dispositif de chasse pour une toilette

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Description

[0001] The present invention refers to a toilet security device that prevents the water from the toilet deposit to return to the mains if a pressure drop is produced in the water feeding.

BACKGROUND OF THE INVENTION

[0002] The toilets comprise a water deposit where the water that is used to be flushed to the toilet bowl is stored, so that the wastes inside the bowl are sent to the drainage system.

[0003] The water inside the toilet deposit has a classification according to the regulations, and the water inside the toilet bowl has a different classification, according to the same regulations, and it is necessary to prevent these waters to return to the water mains in case of a breakdown for sanitary reasons.

[0004] This requirement is relatively easy to fulfill currently, because the conventional toilet deposits are placed above the upper part or rim of the toilet bowl, so that in the case of a breakdown, the water would fall by gravity to the toilet bowl and it would overflow by the toilet bowl.

[0005] However, if the toilet deposit is placed below the toilet bowl, it is necessary to provide a security device to prevent the return, in any circumstances, of the water inside the toilet deposit to the water mains.

[0006] The holder of the present application is currently working on the design of a toilet whose deposit is placed at a lower level than the rim of the toilet bowl, and it directs the water from said deposit to the bowl introducing pressurized air inside said deposit, so that the object of the present invention is a security device permitting the toilet to fulfill the current regulations.

[0007] Patent DE 941900 refers to a flush toilet according to the preamble of claim 1.

[0008] Patent US 4,345,619 A refers to a backflow preventer at a fill valve inlet including an upstream disc member, a downstream cup member and a unitary elastic body having an outer ring portion and two inwardly extending check valve portions cooperating with flow passages in the disc and cup members.

[0009] Patent US 3,603,336 A refers to a fluidically controlled refill mechanism with backflow preventer, including a fluidically controlled valve which maintains itself in the "on" position once the fluid flow starts and switches to the "off" position in response to the attainment of a predetermined liquid level. The flowing fluid in the control chamber of the mechanism, acts as a wall or air barrier. When the fluid flow stops, the barrier is eliminated leaving a substantial distance between the maximum water height and the lowest "siphon" inlet to the valve, thereby preventing accidental backflow of water from the tank into the main waterline.

DESCRIPTION OF THE INVENTION

[0010] With the toilet security device of the present invention said drawbacks can be solved, presenting other advantages that will be described.

[0011] The toilet security device of the present invention as stated in appended claim 1 serves to prevent the water inside a toilet flushing deposit to return to the water mains. Advantageously, the valve can be mechanical or electric.

[0012] According to a preferred embodiment, the flushing means are a compressor, even though it could be any suitable flushing means.

[0013] The water inlet is placed at a height higher than a critical water level, said critical water level being above an overflow opening of said tank.

[0014] According to a preferred embodiment, said valve comprises a ball that closes the water communication between said tank and said deposit when the flushing means is operated.

[0015] Thanks to the toilet security device of the present invention, the water inside the toilet tank is prevented to return to the water mains in the case of a pressure drop in the water mains, because before this happens, the water will overflow over the upper part of the toilet bowl.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] For a better understanding of what has been described, some drawings are attached in which, diagrammatically and only as a non-limitative example, one embodiment is shown.

[0017] Fig. 1 is a diagrammatical elevation view of the toilet security device of the present invention applied in a toilet.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0018] As shown in Fig. 1, the security device of the present invention is applied in a toilet, which comprises a bowl 1 and a deposit 2, which stores the water that will be flushed to the bowl 1 by flushing means 3, e.g. a compressor or any suitable flushing means.

[0019] This deposit 2 can be placed at the same height or below said toilet bowl 1, behind it, around it or even fitted in a wall.

[0020] Inside the deposit 2 a water nominal level is defined, indicated by letter N, corresponding to the water level during the normal operation of the toilet.

[0021] According to the invention, the security device comprises a tank 4 placed inside said deposit 2, as shown in Fig. 1, o above said deposit 2. It is important to place the bottom of said tank 4 at a higher lever than the bottom of said deposit 2. Said tank 4 is communicated with the deposit 2 by a valve 5.

[0022] Said valve 5 can be any suitable valve, e.g. a mechanical valve or an electric valve. In a preferred em-

bodiment, said valve 5 comprises a ball that closes the water communication between said tank 4 and said deposit 2 when the flushing means 3 is operated.

[0023] When the toilet is not flushing, the valve 5 allows the water to flow between the deposit 2 and the tank 4, so that the water level inside the tank 4 and inside the deposit 2 will be the same.

[0024] Said valve 5 is associated with said flushing means 3 so that when said flushing means 3 are on operation, the valve 5 is closed, not permitting the passage of water from the deposit 2 to the tank 4.

[0025] The toilet also comprises a water level detector 6 that is placed inside said tank 4. This water level detector 6 is e.g. a buoy vertically movable along a guide 7, even though it could be any suitable level detector.

[0026] According to the regulations applicable to toilet fill valves, a critical level is defined, indicated in Fig. 1 by letter C, so that the water from the tank 4 could not reach the water mains because the water inlet 8 is always at a level (the inlet level I indicated in Fig. 1) higher than this level C.

[0027] If the water is accumulated in excess inside the deposit 2, this water will never return again to the water inlet 8 from the mains, but it will be directed in the toilet bowl 1, through which it could overflow, if it would be the case.

[0028] In the case of the tank 4, if water in excess is accumulated inside it, it will overflow through an overflow opening or open part 9 in said tank 4. Said overflow opening 9 is always at a level lower than the critical level, so that there is no possibility for the water to return the water mains, as it is required by the regulations.

[0029] Therefore, with the security device of the present invention it is possible to meet the regulations for toilets independently from the position of the water deposit 4 of the toilet, even if this deposit 4 is placed at the same level or below the toilet bowl 1.

[0030] Even though reference is made to a specific embodiment of the invention, it is apparent for a person skilled in the art that the described toilet security device is susceptible of variations and modifications, and that all the details cited can be substituted by other technically equivalent ones, without departing from the scope of protection defined by the attached claims.

Claims

1. A toilet security device for preventing water to return to the water mains, the device comprising:

   - a flush water deposit (2)
   - flushing means (3) suitable for directing the water from the deposit (2) to a toilet bowl (1), said deposit (2) storing the water to be flushed to the toilet bowl (1) by the flushing means (3),
   - a water inlet (8) from the mains, comprising a water inlet valve which controls the inflow of water from the water mains such that the water level in the deposit (2) does not exceed a water nominal level (N) inside the deposit (2) of the toilet,

   characterized in that the divice comprises a tank (4) housed inside or placed above said deposit (2), said tank (4) being provided with a valve (5) to permit the water communication between said tank (4) and said deposit (2) to be opened or closed, said valve (5) being associated with the flushing means (3), so that when said flushing means (3) are operated, the valve (5) closes the communication between said tank (4) and said deposit (2), and **in that** said water inlet (8) is placed at a height higher than a critical water level (C), said critical water level (C) being above an overflow opening (9) of said tank (4) to prevent the water from the tank (4) to reach the water mains when the communication between the tank (4) and the deposit (2) is opened.

2. Security device for toilets according to claim 1, wherein said valve (5) is mechanical or electric.

3. Security device for toilets according to claim 1, wherein said flushing means (3) is a compressor.

4. Security device for toilets according to claim 2, wherein said valve (5) comprises a ball that closes the water communication between said tank (4) and said deposit (2) when the flushing means (3) is operated.

Patentansprüche

1. Toilettensicherheitseinrichtung zur Verhinderung, dass Wasser zu den Wasserleitungen zurückfließt, wobei die Einrichtung aufweist:

   - ein Spülwasserreservoir (2)
   - Spülungsmittel (3), welche zum Leiten des Wassers von dem Reservoir (2) zu einer Toilettenschüssel (1) geeignet sind, wobei das Reservoir (2) Wasser speichert, welches mittels der Spülungsmittel (3) zu der Toilettenschüssel (1) gespült werden soll,
   - einen Wassereinlass (8) von den Leitungen, aufweisend ein Wassereinlassventil, welches den Zufluss von Wasser von den Wasserleitungen derart steuert, dass das Wasserniveau in dem Reservoir (2) ein Wassernormalniveau (N) in dem Reservoir (2) der Toilette nicht überschreitet,

   dadurch gekennzeichnet, dass die Einrichtung einen Tank (4) aufweist, welcher in dem Reservoir (2) beherbergt oder über dem Reservoir (2) platziert ist, wobei der Tank (4) mit einem Ventil (5) versehen ist, das es ermöglicht, eine

Wasserverbindung zwischen dem Tank (4) und dem Reservoir (2) zu öffnen oder zu schließen, wobei das Ventil (5) mit den Spülungsmitteln (3) zusammenhängend ist, so dass wenn die Spülungsmittel (3) betätigt werden, das Ventil (5) die Verbindung zwischen dem Tank (4) und dem Reservoir (2) schließt, und dadurch, dass der Wassereinlass (8) an einer Höhe höher als ein kritisches Wasserniveau (C) platziert ist, wobei das kritische Wasserniveau (C) über einer Überlauföffnung (9) des Tanks (4) liegt, um zu verhindern, dass Wasser aus dem Tank (4) die Wasserleitungen erreicht, wenn die Verbindung zwischen dem Tank (4) und dem Reservoir (2) geöffnet wird.

2. Sicherheitseinrichtung für Toiletten gemäß Anspruch 1, wobei das Ventil (5) mechanisch oder elektrisch betätigt ist.

3. Sicherheitseinrichtung für Toiletten gemäß Anspruch 1, wobei das Spülungsmittel (3) ein Kompressor ist.

4. Sicherheitseinrichtung für Toiletten gemäß Anspruch 2, wobei das Ventil (5) eine Kugel umfasst, welcher die Wasserverbindung zwischen dem Tank (4) und dem Reservoir (2) schließt, wenn das Spülungsmittel (3) betätigt wird.

Revendications

1. Dispositif de sécurité pour toilette pour empêcher l'eau de retourner dans les conduites d'eau, le dispositif comprenant :

- un réservoir d'eau de chasse (2),
- des moyens de chasse (3) appropriés pour diriger l'eau du réservoir (2) à une cuvette de toilette (1), ledit réservoir (2) stockant l'eau destinée à être évacuée dans la cuvette de toilette (1) par les moyens de chasse (3),
- une entrée d'eau (8) provenant du réseau, comprenant un robinet d'entrée d'eau qui commande l'entrée de l'eau des conduites d'eau de sorte que le niveau d'eau dans le réservoir (2) ne dépasse pas un niveau nominal d'eau (N) à l'intérieur du réservoir (2) de la toilette,

caractérisé en ce que le dispositif comprend une cuve (4) logée à l'intérieur ou placée au-dessus dudit réservoir (2), ladite cuve (4) étant prévue avec un robinet (5) pour permettre d'ouvrir ou de fermer la communication d'eau entre ladite cuve (4) et ledit réservoir (2), ledit robinet (5) étant associé aux moyens de chasse (3), de sorte que lorsque lesdits moyens de chasse (3) sont actionnés, le robinet (5) ferme la communication entre ladite cuve (4) et ledit réservoir (2), et **en ce que** ladite entrée d'eau (8) est placée à une hauteur plus haute qu'un niveau d'eau critique (C), ledit niveau d'eau critique (C) étant au-dessus d'une ouverture de trop-plein (9) de ladite cuve (4) pour empêcher l'eau de la cuve (4) d'atteindre les conduites d'eau lorsque la communication entre la cuve (4) et le réservoir (2) est ouverte.

2. Dispositif de sécurité pour toilette selon la revendication 1, dans lequel ledit robinet (5) est mécanique ou électrique.

3. Dispositif de sécurité pour toilette selon la revendication 1, dans lequel lesdits moyens de chasse (3) sont un compresseur.

4. Dispositif de sécurité pour toilette selon la revendication 2, dans lequel ledit robinet (5) est une bille qui ferme la communication d'eau entre ladite cuve (4) et ledit réservoir (2) lorsque les moyens de chasse (3) sont actionnés.

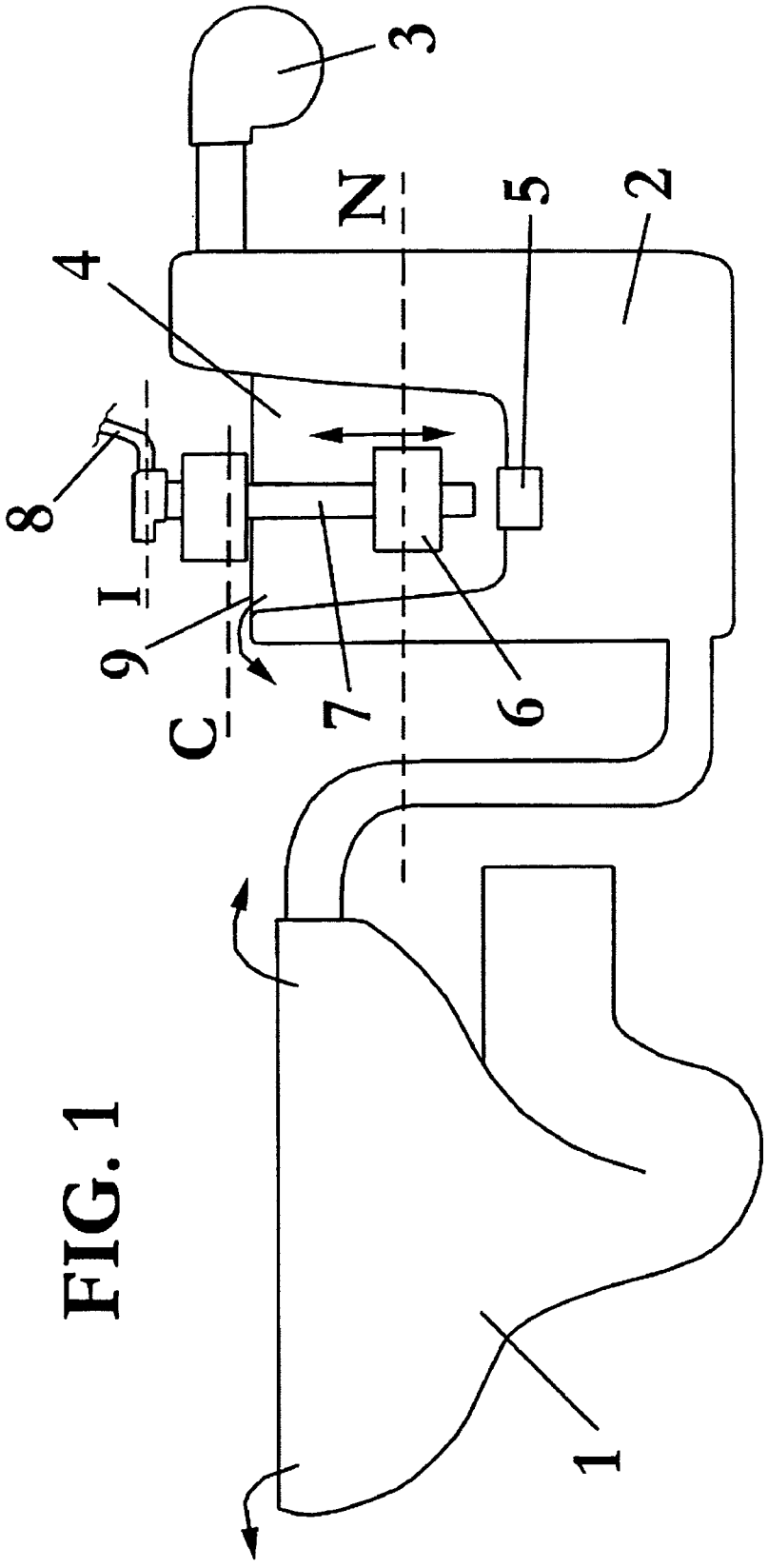

FIG. 1

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 941900 **[0007]**
- US 4345619 A **[0008]**
- US 3603336 A **[0009]**