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Description

It is known that in the vehicles, both terrestrial and of the marine and aerial type, intended for transportation, and also for housing, of persons, it is useful or sometimes absolutely necessary to install a water-closet to be utilized both with a stationary and a moving vehicle.

Apart from the consideration of the room, always very scarce, available in said vehicles, it is to be kept in mind that the sewage cannot be freely exhausted outside, but must be collected in tanks which successively are discharged into the suitable places of collection and digestion.

It is also known the ever increasing employment of synthetic resins in the realization of sanitary equipments owing to the known qualities of lightness, unassailability, absence of porosity and so on.

It is, however, to be pointed out that the sanitary equipment, generally speaking, and the water-closets in particular, are subjected to loads which may be very high and to stresses which are variable owing to the operating conditions.

Water-closets for vehicles are known, for example, from EP-A 0 025 635 which disclose a portable toilet having two vertically stacked sections, the lower section having the side walls suitably strengthened and a storage chamber for a container of chemical additive and a storage chamber for the toilet tissue paper.

But, in this EP-A 0 025 635 are not foreseen means to support the toilet seat and the toilet bowl, means that are very important for the toilet functionality, nor are foreseen means for the access to the inside of the base part for installation and servicing.

It is, therefore, very felt the need of improvements in the water-closet, which would simplify their manufacturing and installation, and in the same time would render them more efficient, thus achieving economical and practical advantages.

The invention overcomes the aforementioned drawbacks as show in the annexed principal and dependent claims.

The water-closet according to the invention, completely made preferably of ABS, is substantially constituted by two basic parts, to which other parts may be added.

The two basic parts are a seat with a bowl for the momentary collection of the sewage, provided with an outlet opening, and a base, provided with a connection between the bowl and the outlet, receiving at its inside the said bowl.

The other parts (which can be substituted by other parts of a different type) are a lid, a support for achieving the desired height for the two basic parts, and a recovery reservoir which can be housed within the said support.

For the present invention, characteristic are the means foreseen to strengthen the various parts, as well as the distribution of the available room in order to receive the accessory services and to assemble the various parts with each other and together with the vehicle.

The invention will be now described in one of its preferred embodiments with reference to the enclosed indicative drawings, wherein:

5 Figures 1 and 2 show, according to an isometric view from outside, respectively with lowered and raised seat-cover, the seat with the bowl and the base which supports the seat and receives the tank itself;

10 the Figures 3 and 4 are views similar to the preceding ones, with the true and proper water-closet installed on a support

Fig. 5 shows, according to an isometric view, the seat with the bowl;

15 Fig. 6 shows, according to an isometric view, the inside of the base of the water-closet of the invention;

Fig. 7 shows, according to an isometric view, the lid or seat-cover;

20 Fig. 8 shows, according to an isometric view, the complementary element acting as a support or container;

Fig. 9 shows according to an isometric view, the recovery tank which can be housed within the support of Fig. 8;

25 Figures 10 and 11 show, according to isometric views, two types of small doors which may be applied on the sides of the base of the Figures 1 and 2;

Fig. 12 shows the water-closet mounted upon its support seen in elevation from behind;

30 Figures 13, 14 and 15 show in a view from above the seat with the tank, the base and the support, with the corresponding supplementary reservoir, respectively of Figures 5, 6 and 8-9;

35 Figures 16 and 17 show two possible lay-outs for mounting the water-closet of the invention.

With reference to said drawings and as it appears from the Figures 1 to 4, the water-closet of the invention formed of two basic parts, that is of a seat 1, provided with a collecting bowl 3, and a base 2, upon which the seat 1 is applied and which receives inside it the bowl 3. Below the base 2, a supporting element 4 is foreseen which has the main function of bringing the seat 1 and the base 2 to the height which is necessary with respect to the resting plane. The seat 1 may be covered by a lid 5 which is suitably ribbed in order to increase its strength and is provided with means 6' in order to facilitate its opening.

40 As it is better seen in the Figures 5 and 13, the bowl 3, preferably integral with the seat 1, is provided with an outlet hole 6 for the sewage, this hole, through a suitable connecting flange 7, communicating with the outlet proper, which starts from the base 2 of the water-closet, as it will be better seen in the following. The seat 1 is completed by housings 8 for a flushing nozzle.

55 The base 2 (see in particular Figures 6 and 14) which receives on its upper rim the seat 1, has inside itself, on the back side, a support and/or a strengthening rib 9 and a coupling 10 for a venting pipe and, arranged towards the front, a wall or rib 11, having a curved outline, whose purpose is to support the seat 1 and to receive the flexible piping

12 feeding water to the flushing nozzle 13 which exits from the housing 8 of the seat. In the non-use position of the flushing nozzle 13, the flexible piping 12 takes, inside the base 2, the position which is illustrated by dash lines in the Fig. 14, whereas, when the flushing nozzle 13 is in the extracted position, the flexible piping 12 takes the position which is indicated by full lines. In this way one has the possibility to house the flushing nozzle in such a way that it will give no trouble during the non-use periods, and in the same time one gets a suitable protection for the water-feeding pipe.

As said, the base 2, preferably near the strengthening rib 9, is provided with a flange 7 connecting the outlet pipe of the bowl 3 with the outlet proper, both if this happens through an internal tank and an external tank, as it will be more clearly explained in the following. Furthermore, the base 2 is provided with holes 14 permitting the passage of members for fixing said base to a support, for instance the support 4.

In order to gain access to the fixing members of the base 2 and to the flange 7, on the sides of the base 2 two small doors 15 and 16 respectively, are provided which permit access to the inside of the base 2 and one at least of which, for instance the door 16, shown in the Fig. 10, acts also to hold a toilet-paper roll. These small doors are fixable in any way to the base 2, preferably hinged at the sides and, as said, have the purpose to permit access to the inside of the base for the mounting and servicing operations.

The seat 1 and the base 2, in the whole, reach a height from ground which is less than that which is normal and useful. It is, therefore, necessary to provide a support able to bring to the right height the seat's plane. To this purpose, apart from the possible utilization of other supports, the invention foresees a support which presents particular advantages. This support, generally indicated by 4 in the drawing, open at the bottom, apart from being superiorly provided with holes 18 corresponding to the holes 14 of the base 2, and with a hole adapted to receive in a sealing way the outlet piping from the flange 7, is externally provided, at the periphery of its base, with holes 19 for the passage of fixing members for attachment to the floor. Furthermore, on its back portion, two vertical channels 17 are foreseen, which are adapted to receive one of them the venting pipe 10 and the other one the piping 12 feeding water to the flushing nozzle. The support 4 is completed by a tank 20 housed in its inside, provided in its turn, on the upper portion, with assembling holes 25 intended to unite the base 2, the support 4 and the tank 20, and provided internally with small columns 22 which constitute supporting pillars of the upper wall of the support 4, and therefore of the lower wall of the base 2 and, in substance, of the seat 1. These small columns 22 cooperate, that is, to strengthen the whole of the water-closet. Furthermore, the bottom 21 and the back wall of the tank 20 are foreseen with "marks" 23 which, when they are open, permit to connect the tank 20 itself with a reservoir placed under the platform of the vehicle, after the passage of the sewage through it, or di-

rectly with a culvert, as shown in the Figures 16 and respectively 17. In every case, a valve 24, operable from inside the vehicle or from the outside of it, will permit discharge from the water-closet according to the need.

From the foregoing description, the characteristics and advantages offered by the water-closet according to the invention appear to be evident. In effects, the sanitary apparatus may be made of any suitable synthetic resin, with thicknesses reduced to the minimum and with the most various manufacturing processes, always keeping characteristics of strength that up to date have been never reached. Its installation is extremely simple, since it may be effected by the successive assembling and mounting of the various parts, and by the exploitation of the small doors 15, 16 for fixing the outlet of the bowl 3 with the exhaust which is foreseen ahead of the base. Furthermore, the adoption of an internal reservoir 20 does remarkably increase the capacity of the sewage's tank and constitutes a standby for emergency situations.

The water-closet according to the invention has been described and illustrated by way only of a non-limitative example. Within the scope of the technical equivalences, variants and modifications can be made within the scope of the appended Claims.

Claims

1. A water closet, particularly for use in vehicles, comprising an upper part (1) and a lower part (2), the upper part having a toilet seat and a toilet bowl (3) and the lower part constituting a supporting base for the upper part, characterized in that the lower base part (2) is provided at the rear on its inner wall with a substantially vertical strengthening rib (9) and a coupling (10) for a vent pipe, and in the region of its front wall with an upstanding curved wall (11) serving as a support for the front portion of the seat, said wall delimiting with the front wall of the lower part (2) a space which receives a flexible pipe (12) for supplying water to a flushing nozzle (13) mounted on the upper part (1).

2. A water closet according to Claim 1, characterized by a support (4) having a receiving tank (20) therein, the lower base part (2) being adapted to be attached to the upper wall of the support (4), the last-named member being adapted to be attached to the floor or resting surface by means of holes (19) provided on the outside thereof.

3. A water closet according to Claim 1, characterized in that the lower base part (2), preferably near the strengthening rib (9), presents a flange (7) connecting the outlet (6) of the toilet bowl (3) with the outlet proper.

4. A water closet according to Claim 1, characterized in that at the sides of the low base part (2) two small doors (15, 16) are foreseen, which permit the access to the inside of the base part (2) for the installation and servicing, at least one of the small doors (16) acting also as a toilet-paper-roll holder.

5. A water closet according to Claim 2, characterized in that the support (4) is open at the bottom and is provided with holes (18) in its top wall correspond-

ing with holes (14) in the base and holes (25) in the tank, and with a hole adapted to receive sealingly the outlet piping from the flange (7), and in that on its back wall two vertical channels (17) are foreseen, which receive the vent pipe (10) and the pipe (12) intended to feed the water to the flushing nozzle (13).

6. A water closet according to Claim 2, characterized in that the support (4) is provided with small columns (22) having a strengthening function, suitable holes, only marked, permitting the connection of the receiving tank (20) with another tank placed below the platform of the vehicle, or directly with a culvert, through an outlet valve (24).

Patentansprüche

1. Besonders für Fahrzeuge geeignetes Water closet bestehend aus einem oberen Teil (1) und einem unteren Teil (2), wobei der obere Teil einen Sitz und ein Auffangbecken (3) besitzt und der untere Teil eine Basis des oberen Teiles bildet, dadurch gekennzeichnet, daß der untere Basisteil (2) innen an der Rückseite eine im wesentlichen vertikale Verstärkungsrippung (9) und einen Einsatz (10) für ein Abzugsrohr aufweist und zur Vorderseite eine gekrümmte Wand oder Rippe (11) besitzt, die als Stütze für den vorderen Teil des Sitzes dient und mit der vorderen Wand des unteren Teiles (2) einen Raum begrenzt, in dem ein Schlauch (12) für die Zufuhr des Wassers zur Dusche (13) untergebracht werden kann, welche am vorderen Teil (1) angebracht ist.

2. Water closet, nach Anspruch 1, dadurch gekennzeichnet, daß eine Stütze oder Carter (4) und ein zwischen dem Carter angebrachter Tank (20) vorgesehen sind, wobei die Basis (2) an der Oberwand der Stütze (4) und letztere von außen am Fußboden oder an der Aufsatzfläche über Löcher (19) befestigt ist.

3. Water closet, nach Anspruch 1, dadurch gekennzeichnet, daß der untere Basisteil (2) vorzugsweise in der Nähe der Verstärkungsrippung (9) eine Verbindungsflansch (7) des Abflußrohres (6) aus dem Becken (3) zu dem Abfluß als solchem aufweist.

4. Water closet, nach Anspruch 1, dadurch gekennzeichnet, daß an den Seiten des unteren Basisteiles (2) zwei Klappen (15, 16) vorgesehen sind, welche den Zugang zum Basisinneren (2) für Installations- und Wartungszwecke gestatten, wobei mindestens eine der beiden Klappen als Toilettenpapierhalter dient.

5. Water closet, nach Anspruch 2, dadurch gekennzeichnet, daß die Stütze (4) nach unten offen ist, während sie oben Löcher (18) aufweist, die den Löchern (14) der Basis und (25) des Tanks entsprechen, und durch ein Loch, welches geeignet ist das aus der Flansch (7) austretende Abflußrohr dicht auszunehmen, wobei an der Rückwand zwei senkrechte Kanäle (17) vorgesehen sind, welche zur Aufnahme des Abfluß- oder Abzugsrohres (10) und des Zufuhrrohres (12) des Duschwassers geeignet sind.

6. Water closet, nach Anspruch 2, dadurch gekennzeichnet, daß die Stütze (4) mit Stützsäulen

(22) versehen ist, welche Verstärkungszwecke haben, wobei nur angedeutete Löcher eine Verbindung des Tanks (20) mit einem anderen Tank unter dem Fahrzeugboden oder unmittelbar mit einem Abwasserkanal gestatten, u.zw. über ein Abflußventil (24).

Revendications

1. Water closet particulièrement adapté aux véhicules, qui comprend une partie supérieure (1) et une partie inférieure (2), la partie supérieure ayant un siege et une cuve (3) qui recueille le liquide et la partie inférieure (2) constituant une base pour le support de la partie supérieure, caractérisé en ce que la partie de base inférieure (2) est pourvue, à l'intérieur, sur le côté postérieur, d'une nervure de renforcement (9), essentiellement verticale, et d'un embrayage (10) pour un tube d'échappement et frontalement d'une paroi ou nervature (11) courbée, qui a pour fonction le support de la partie antérieure du siege, en délimitant avec la paroi antérieure de la partie de base inférieure (2) un espace pour recevoir un tube flexible (12) abducteur de l'eau de la douche (13) montée sur la partie antérieure (1).

2. Water closet selon la revendication 1, caractérisé par un support ou enveloppe (4) ayant en lui même un réservoir (20), la partie de base inférieure (2) pouvant être rattachée à la paroi supérieure du support (4), qui peut être lié au sol, ou à des surfaces d'appui, en se servant des trous (19) purvus à l'extérieur.

3. Water closet selon la revendication 1, caractérisé en ce que la partie de base inférieure (2), de préférence à côté de la nervure de renforcement (9), présente une bride (7) raccordant le tube d'échappement (6) de la cuve (3) avec l'échappement proprement dit.

4. Water closet selon la revendication 1, caractérisé en ce que sur les parois de la partie de base inférieure (2) on a prévue deux petites ouvertures (15, 16) permettant l'accès à la partie de base (2) pour l'installation et la manutention, au moins l'une des ouvertures (16) ayant la fonction de porter le rouleau de papier hygienique.

5. Water closet selon la revendication 2, caractérisé en ce que le support (4) est ouvert sur le fond, tandis qu'il contient sur la partie supérieure des trous (18) qui correspondent aux trous (14) de la base et (25) du réservoir ainsi que un trou prévu pour recevoir et maintenir le tube d'échappement provenant de la bride (7), et en ce que sur sa paroi postérieure on a prédisposé deux canaux verticaux (17) qui reçoivent le tube d'échappement (10) et le tube (12) abducteur de l'eau vers la douche (13).

6. Water closet selon la revendication 2, caractérisé en ce que le support (4) est pourvu de petites colonnes (22) de soutien, ayant fonction fortifiante, des trous, uniquement marqués, permettant de relier le réservoir (20) avec un autre réservoir situé sous le plancher du véhicule ou bien directement avec une égout par l'entremise d'une valve de sortie.

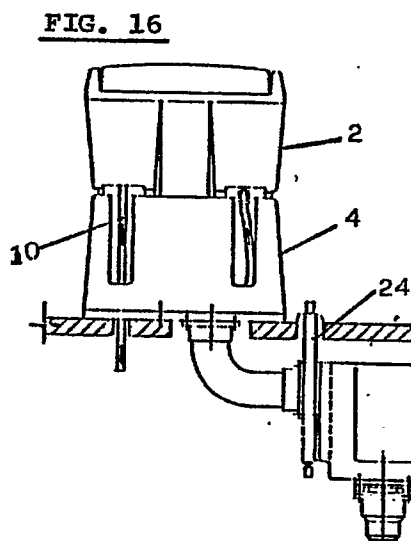
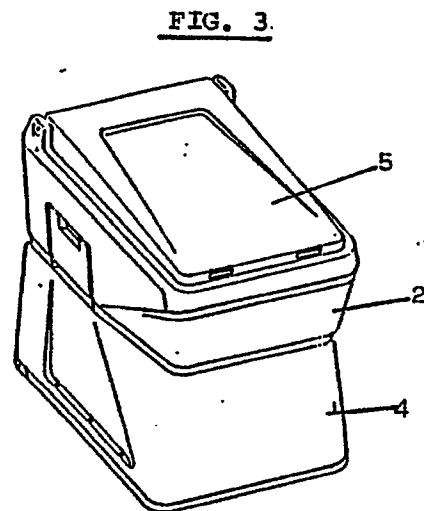
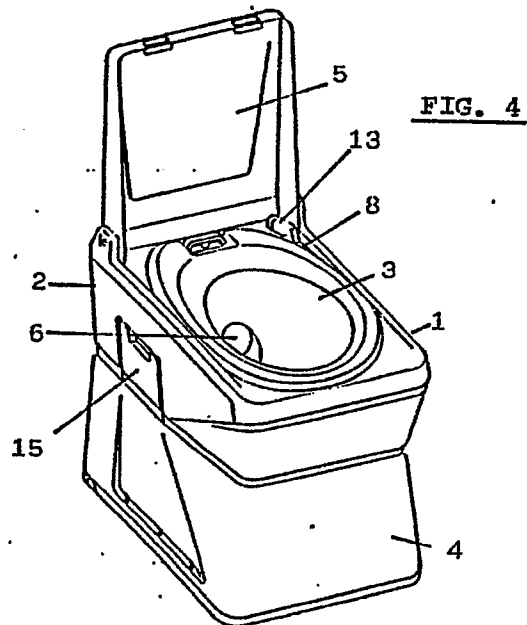
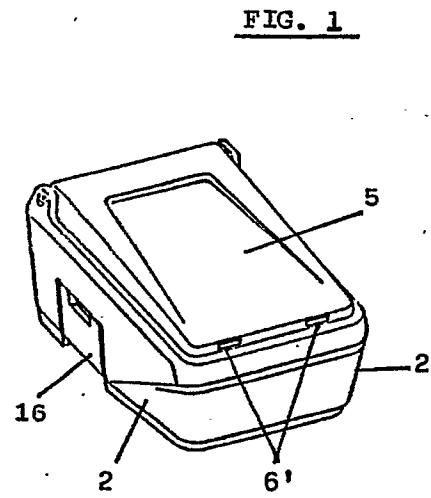
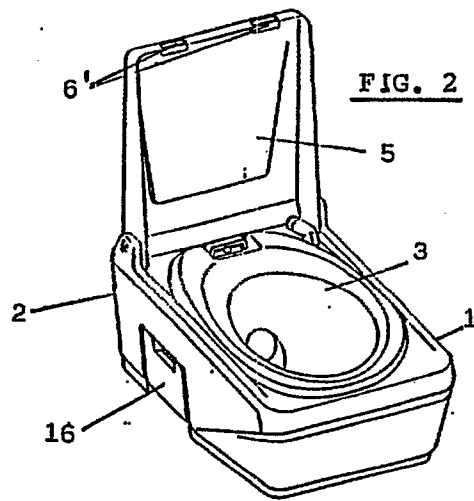


FIG. 17

