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(71) Applicant *(for all designated States except US)*: **URILIFT B.V.** [/]; Beemterweg 3, NL-7341 PB Beemte-Broekland (NL).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **SCHIMMEL, Marten, Alberto** [/]; Beemterweg 3, NL-7341 PB Beemte-Broekland (NL).

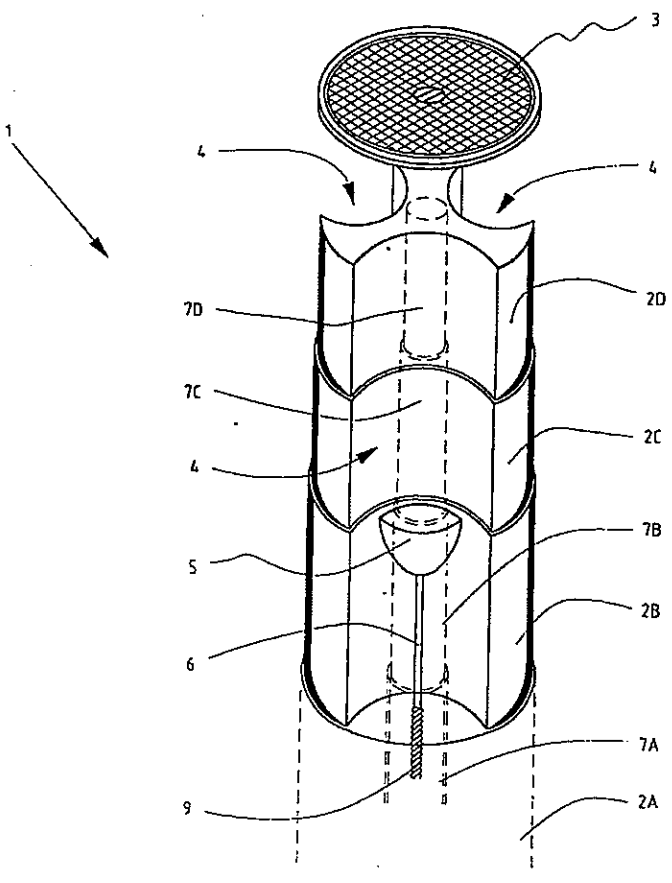
(74) Agent: **MINK-LINDENBURG, Charlotte, Hildegard;** Octrooibureau Mink, Erve de Plecht 1, NL-7468 JP Enter (NL).

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(54) Title: SUBMERGIBLE PUBLIC SANITARY DEVICE



(57) Abstract: The invention relates to a public sanitary device, comprising one or more walk-in positions, each having a receptacle for human excrement and/or urine, which is connected to a waste pipe for connection to a sewage system. The sanitary device according to the invention has the characteristic that it is provided with means for causing at least partial submerging thereof in the ground.

WO 01/36765 A1

WO 01/36765 A1



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SUBMERGIBLE PUBLIC SANITARY DEVICE

The present invention relates to a public sanitary device, comprising a housing having one or more walk-in positions, each having a receptacle for human excrement and/or urine.

Such a sanitary provision is known in practice. These are usually old urinals which still exist to a limited extent, particularly in the large cities. These urinals are generally little used because of poor hygienic conditions.

Public urination is a problem which currently has to be coped with, particularly in the entertainment districts in cities, owing to a shortage of public sanitary provisions. This has been solved heretofore by placing mobile sanitary provisions. These are placed on Friday evening and removed again early on Saturday morning because of shops opening. The sanitary provisions are then re-placed on Saturday evening and removed again on Sunday. This procedure is time-consuming, expensive and not very efficient.

A public sanitary device is also known from CH 658 491. The known sanitary device has two or more water closets and is rotatable around an axis such that one of the water closets is available for use while the other is being cleansed.

The invention has for its object to provide a solution for the problem of public urination in the form of a sanitary device where the housing is provided with means for causing at least partial submerging thereof in the ground.

The sanitary device can be submerged in the ground during the day without for instance the shopping public or market stallholders being inconvenienced thereby. In the evening it can be placed ready for use as required.

A submergible public sanitary device is known per se in the art and is described in JP10295584. This device is ordinarily submerged underground and can be pulled up and fixed on the ground by a gear mechanism. It is to be used in emergencies and is not suitable for permanent repetitive use. This known device also has a number of drawbacks. When the housing is pulled up out of the pit, it must first be secured in position next to the pit before it can be accessed for use. Furthermore, there is no mention of a connection to a sewage system, suggesting that the sanitary device must first be emptied after use before it can again be submerged underground.

The invention solves all these drawbacks by means of the characterizing features as worded in the characterizing part of the main claim.

It is noted that the American patent US 4 174 546 describes a water closet having a urine bowl that is height adjustable with respect to a support member. The known water closet does not form part of a submergible housing and is as such not suitable for public use.

In one aspect of the invention, there is provided a public sanitary device, comprising a housing having one or more walk-in positions, each having a receptacle for human excrement and/or urine, which housing is provided with means for causing at least partial submerging thereof in the ground, characterized in that the housing comprises a first housing part that is situated underground, a second housing part that is telescopically slidable receivable in the first part, and a drive for moving the second housing part between an underground and a substantially above-ground position, wherein the one or more receptacles with waste pipe are arranged in the second part and are connected to a waste pipe for connection to a sewage system.

In a more elaborate preferred embodiment the telescopically slidable housing parts comprise one or more further housing parts which are received in the second part for sliding into each other. The sanitary device can now be extended to for instance the height of a man. Very space saving is the embodiment in which the length of each housing part is smaller than or equal to the length of the housing part in which the relevant housing part is slidably received. In retracted state the sanitary device can now be completely submerged in the ground.

According to a further preferred embodiment the sanitary device is provided with a roof-like element, which serves as closing element in the retracted state of the sanitary device. This closing element can for instance have the appearance and form of a manhole cover, whereby it can be integrated inconspicuously in the street scene.The walk-in positions can be formed in efficient manner by recesses in the second and further housing parts, and substantially take the form of for instance a semicircle, in which urine basins are placed as receptacles.

In another embodiment one or more of the walk-in positions are closable. The closable walk-in positions are preferably provided with urine bowls as receptables.

In a further embodiment the drive is hydraulic. A hydraulic drive has been found in practice to be reliable and powerful in other applications. The hydraulic drive preferably comprises a rod comprising a number of parts telescopically slidable into each other, which make it highly suitable for application in the preferred embodiment of the sanitary device with telescopically slidable housing parts. The number and length of the rod parts preferably corresponds with the number and length of the housing parts. The rod can be placed in efficient manner substantially centrally in the sanitary device.

The invention will now be discussed in more detail with reference to the drawings, wherein

Figure 1 shows a schematic view of a first preferred embodiment of a sanitary device according to the invention in the form of a urinal;

Figure 2 shows a longitudinal section of the urinal of figure 1 in the extended position;

Figure 3 shows a longitudinal section of the urinal of figure 1 in the retracted position;

Figure 4 shows the urinal of figure 1 in cross-section;

Figure 5 shows schematically the operating components of the urinal according to the invention.

Figure 1 shows a schematic view of a sanitary device according to the invention in the form of a urinal 1 in a first preferred embodiment. Urinal 1 has a housing which consists of four housing parts 2A to 2D telescopically slidable into each other, which are shown in figure 1 in the extended position. Housing part 2A, also referred to as the first housing part, is situated wholly underground in this embodiment, while the other housing parts are movable between an underground and an above-ground position. All housing parts have a generally cylindrical form. Urinal 1 is provided with a round, preferably circular roof 3.

The above-ground housing parts 2B to 2D comprise three walk-in positions 4 which are formed by recesses in the form of a semi-circle.

Placed in each recess 4 in housing part 2B, also designated the second housing part, is a receptacle for urine or a urine basin 5, which can be connected to the sewer system at that location by means of a fixed waste pipe 6 and pipes 9. The cylindrical housing parts 2A to 2D are slidable into each other by means of a central hydraulically drivable rod or cylinder 7. Retracting and extending of urinal 1 will now be described in more detail with reference to figures 2 and 3.

Figure 2 shows a longitudinal section of the urinal of figure 1 in the extended position, while figure 3 shows a longitudinal section of the urinal of figure 1 in the retracted position. The street level is designated 8 by way of illustration.

Rod 7 comprises a hydraulic cylinder consisting of four parts 7A to 7D, each of which substantially corresponds in length with the associated cylinder housing part, respectively 2A to 2D, which they drive. Diverse drives known in the field of hydraulics can be applied to drive hydraulic cylinder 7. In the shown preferred embodiment the drive is formed by a hydraulic pump 15 with hydraulic lines 11, 12 which can be connected to a reservoir for hydraulic fluid (not shown). If desired, the hydraulic pump can be accommodated in a separate unit (not shown) which may or may not be underground. An electricity cable 13, which can be connected to the local mains electricity, provides the required electric power.

Urinal 1 is movable between a wholly extended position (see figure 2) and a wholly retracted position (see figure 3) by means of the described hydraulic driving.

In the shown preferred embodiment the height of each housing part is less than or equal to that of the housing part in which the relevant housing part can be received. As a result hereof the urinal can be received wholly in the ground in the retracted state. In the shown preferred embodiment, housing part 2D and 2C are the same size. These are both smaller than housing part 2B, which is in turn smaller than housing part 2A. The difference in length between part 2A and part 2B is chosen such that in the retracted position of the urinal there is sufficient space for the conduits 9 connecting waste pipes 6 to sewer 10. Conduits 9 are embodied flexibly for this purpose and can for instance be stretched or rolled up.

The dimensions of rod parts 7A to 7D are chosen such that they can move the respective housing parts 2A to 2D from the wholly extended to the wholly retracted position, and vice versa.

In the retracted position the roof 3 forms the closure of urinal 1. By giving roof 3 a circular form it has the appearance of a manhole cover which can be integrated inconspicuously in the pavement.

Figure 4 shows the preferred embodiment of urinal 1 in cross-section. The choice of a cylindrical form with three recesses 4, each in the form of a semicircle, imparts a sturdy as well as elegant construction to the urinal.

Finally, figure 5 shows schematically the operating components of the urinal according to the invention. Urinal 1 is connected by means of hydraulic lines 11, 12 to hydraulic pump 15 which can be operated with an electric switch 16 by means of electric cable 13. Switch 16 is preferably situated in the vicinity of urinal 1 such that the operative has a clear overall view of the situation at the particular location, prior to retracting or extending of the urinal, so as to avoid situations occurring which are possibly hazardous for bystanders.

A water conduit 14 is optionally further provided which connects the urinal to the local mains water supply for flushing the urine basins. Flushing could for instance be carried out automatically after a determined, adjustable period of time by means of a time-controlled mechanism.

Lighting can optionally be arranged in the walk-in positions.

It is noted that the invention is expressly not limited to the described and shown preferred embodiment. One or more toilet bowls can for instance be arranged in the walk-in positions instead of one or more urine basins, wherein the walk-in positions are then preferably closable, for instance by means of a sliding door or other suitable construction. The number of walk-in positions can further be varied as desired. This is likewise the case for the

shape of the urinal. It is also conceivable to choose another drive for sliding the housing parts into each other. The number of housing parts slidable into each other can likewise be varied. The urinal can for instance consist of two housing parts slidable into each other, wherein the shown preferred embodiment can be largely retained by choosing housing part 2A and housing part 2B. Alternatively, the urinal can also consist of one part, which is submergible in its entirety in the ground. All the stated examples of possible variations can be implemented by a skilled person in the field after reading of this patent application.

The invention therefore extends generally to any embodiment which falls within the scope of the appended claims seen in the light of the foregoing description and drawings.

CLAIMS

1. Public sanitary device (1), comprising a housing (2A, 2B, 2C,2D) having one or more walk-in positions (4), each having a receptacle (5) for human excrement and/or urine, which housing is provided with means for causing at least partial submerging thereof in the ground, characterized in that, the housing comprises a first housing part (2A) that is situated underground, a second housing part (2B) that is telescopically slidable receivable in the first part, and a drive (7, 11, 12, 15) for moving the second housing part between an underground and a substantially above-ground position, wherein the one or more receptacles (5) with waste pipe (6) are arranged in the second part and are connected to a waste pipe (6) for connection to a sewage system.

2. Public sanitary device as claimed in claim 1, wherein the housing parts comprise one or more further parts (2C, 2D) which are received in the second part (2B) and wherein the drive is arranged for telescopically sliding the housing parts into each other.

3. Public sanitary device as claimed in claim 2, wherein the length of each housing part is smaller than or equal to the length of the housing part in which the relevant housing part is slidably receivable.

4. Public sanitary device as claimed in any of the foregoing claims, wherein the sanitary device is provided with a roof-like element (3), which serves as closing element in the retracted state of the sanitary device.

5. Public sanitary device as claimed in any of the foregoing claims, wherein the walk-in positions are formed by recesses (4) in one or more of the telescopically slidable housing parts.

6. Public sanitary device as claimed in any of the foregoing claims, wherein the drive (7, 11, 12, 15) is hydraulic.

7. Public sanitary device as claimed in claim 6, wherein the hydraulic drive (7, 11, 12, 15) comprises a rod (7) comprising a number of parts (7A, 7B, 7C, 7D) telescopically slidable into each other.

8. Public sanitary device as claimed in claim 7, wherein the number and length of the rod parts (7A, 7B, 7C, 7D) corresponds with the number and length of the housing parts (2A, 2B, 2C, 2D).

9. Public sanitary device as claimed in claim 7 or 8, wherein the rod (7) is placed substantially centrally in the sanitary device.

10. Public sanitary device as claimed in any of the foregoing claims, wherein one or more walk-in positions are closable.