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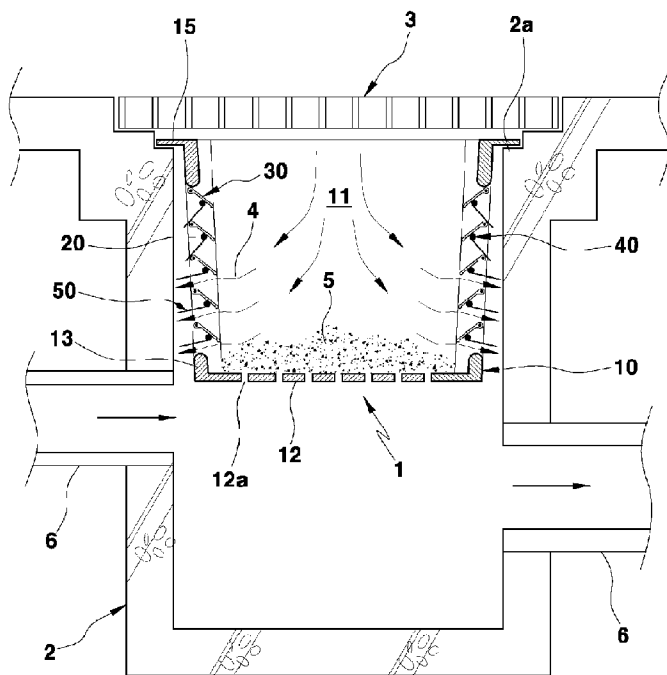
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(54) Title: WASTE COLLECTING AND DEODORIZING CHAMBER FOR MANHOLE

[Fig. 2]



(57) Abstract: A waste-collecting and deodorizing chamber for a manhole including a main body (10) removably inserted into the manhole (2) and caught on an upper portion of the manhole, and having an internal space (11) which is open upward and into which flowing water (4) and waste (5) are introduced, an opening section (20) provided on at least one side of the main body (10), and a plurality of guide plates (30) horizontally installed parallel with each other between opposite side rods (14) of the opening section (20) in such a manner as to form a certain gap (G) therebetween and incline toward the internal space (11) so as to introduce the flowing water (4) and the waste (5) into the main body (10), and the flowing water (4) is drained out of the main body (10) through the gap (G).

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Description

WASTE COLLECTING AND DEODORIZING CHAMBER FOR MANHOLE

Technical Field

- [1] The present invention relates to a waste-collecting and deodorizing chamber for a manhole, and more particularly, to a waste-collecting and deodorizing chamber for a manhole, which is installed in the manhole so as to filter and collect waste, which is introduced into the manhole, to thereby prevent the waste from being introduced into the manhole and sewer pipes, and which prevents the manhole from emitting a stench, effluent from flowing backward, and allows for the easy removal of the collected waste.

Background Art

- [2] Alongside roads, sewerage is generally installed in order to drain flowing water such as sewage and storm rainwater, and the water flowing along the surface of the road is collected in a manhole, which is installed at regular intervals along the side of the road, and is drained along with the sewerage.
- [3] FIG. 13 is a schematic cross-sectional view illustrating a conventional sewerage manhole. In the figure, a conventional manhole 100 is provided such that a manhole, which is fabricated into a hexahedron or the like with concrete or so on, is buried in underground sewerage, and sewer pipes 101 are connected on upstream and downstream sides of the manhole, so that the flowing water is temporarily collected in the manhole and flows from upstream to downstream through the sewer pipes 101. The manhole 100 has an open upper portion, through which flowing water is introduced, and which is covered with a grill (a cover) 110 in order to prevent foreign matters, e.g. waste, from being introduced into the manhole to some degree.
- [4] However, although the manhole is covered with such a grilled cover, it cannot filter smaller waste, e.g. cigarette butts and soil, nor can it cut off the back flow of flowing water or stench from seeping into the ground. Because of this, foreign matter 102 is introduced into the manhole along with flowing water, so that a person has to frequently clean the manhole and sewer pipes. Nevertheless, owing to the clogging of the sewer pipes, rainwater is not drained well in the rainy season, and the sewer stench is emitted from the sewer pipes to the ground via the manhole, making sanitary environments poor and causing inconveniences owing to a back flow of the collected water upon torrential raining.
- [5] In order to solve these problems, proposed for example were a manhole for the cutting off of stench and the introduction of earth and sand, which was disclosed in

Korea Utility Model Registration No. 265463 (Publication Date: 02. 21. 2002), a manhole as disclosed in Korea Utility Model No. 161948 (Pub. Date: 12. 01. 1999), a deodorizing structure of a manhole disclosed in Korea Patent Laid-Open No. 1999-0046751 (Pub. Date: 07. 05. 1999), and a deodorizing application for a sewerage manhole, which was disclosed in Korea Patent No. 406853 (Pub. Date: 11. 21. 2003), Korea Utility Model Registration Nos. 385529 (Pub. Date: 05. 30. 2005) and 338761 (Pub. Date: 01. 16. 2004).

Disclosure of Invention

Technical Problem

- [6] The present invention has been made to solve the foregoing problems with the prior art, and therefore an object of the present invention is to provide a waste-collecting and deodorizing chamber for a manhole, installed in the manhole, so as to easily collect waste, which is introduced into the manhole, to thereby prevent the waste from being introduced into the manhole and sewer pipes, the manhole from emitting a stench, and effluent from flowing backward, and to thereby allow easy removal of the collected waste.

Technical Solution

- [7] In order to accomplish the above object of the present invention, according to an aspect of the present invention, there is provided a waste-collecting and deodorizing chamber for a manhole.
- [8] The waste-collecting and deodorizing chamber for a manhole essentially includes a main body, an opening section, and a plurality of guide plates.
- [9] The main body is removably inserted into the manhole and is caught on an upper portion of the manhole, and has an internal space which is open upward and into which flowing water and waste are introduced.
- [10] The main body is provided, on at least one of its sides, with the opening section.
- [11] The guide plates are horizontally installed parallel to each other between opposite side rods of the opening section in such a manner as to form a certain gap therebetween and incline toward the internal space so as to introduce the flowing water and the waste into the internal space such that the waste is collected on the bottom of the main body, and the flowing water is drained out of the main body through the gap.
- [12] Preferably, the guide plate has a tilting axis about which it is able to tilt up and down with a blade of the guide plate extending toward the internal space, and between adjacent guide plates is provided a tilt-restricting member so as to restrict a tilting range of the guide plate.
- [13] Preferably, a plurality of deodorizing plates is further horizontally provided parallel to each other between adjacent guide plates between the side rods so as to cover the

gap. The deodorizing plate is able to tilt up and down with its blade extending opposite the internal space, and the tilting range of the deodorizing plates is restricted by the guide plates. Thus, when the main body stands upright, the internal space is isolated from the manhole under cooperation between the guide plates and the deodorizing plates, thereby preventing a stench from being emitted from the manhole into the internal space.

[14] Preferably, the tilt-restricting member serves as a tilting axis of the deodorizing plate.

[15] Preferably, a guide plate-holding unit is further provided so as to selectively hold the guide plate which is supported on the underlying tilt-restricting member, so that the flowing water is prevented from flowing backward from the manhole into the internal space under cooperation between the guide plates, which are held by the guide plate-holding unit, and the deodorizing plates.

[16] Preferably, the guide plate-holding unit includes a holder which is removably inserted and mounted in the internal space of the main body in such a manner as to come into contact with the guide plates so as to prevent the guide plates from being tilted, and lower and upper supports respectively connected with upper and lower portions of the holder to support the holder so as to maintain the contacting state of the holder against the guide plates.

[17] Preferably, the guide plate-holding unit includes upper and lower latch ears formed on upper and lower portions of the main body, and a locking bar which is removably mounted in the internal space in such a manner as to be inserted into the upper and lower latch ears so as to come into contact with the guide plates, preventing the guide plates from being tilted.

[18] Preferably, the guide plate-holding unit is a punched plate having through-holes for filtering the waste.

[19] Preferably, the guide plates, the tilt-restricting members, and the deodorizing plates are pre-assembled in two frames, which are formed corresponding to the size of the opening section, so as to form a separate cartridge, which is mounted in the opening section.

Advantageous Effects

[20] As set forth above, according to the waste-collecting and deodorizing chamber for the manhole of the present invention, the waste, which is introduced into the manhole, can be filtered so as not to flow into the sewer pipes, the filtered waste can be easily removed by separating and then cleaning the waste-collecting and deodorizing chamber, and the stench generated from the manhole and the sewer pipes is prevented from being leaked into the ground and the flowing water is prevented from flowing backwards from the manhole into the ground while having a minimum influence upon

drainage of the flowing water.

Brief Description of the Drawings

- [21] FIG. 1 is a perspective view illustrating the in-use state of an exemplary waste-collecting and deodorizing chamber for a manhole according to the present invention;
- [22] FIG. 2 is a cross-sectional view illustrating the in-use state of an exemplary waste-collecting and deodorizing chamber for a manhole according to the present invention;
- [23] FIG. 3 is a perspective view illustrating an exemplary waste-collecting and deodorizing chamber for a manhole according to the present invention;
- [24] FIG. 4 is a view illustrating the operation of guide plates and deodorizing plates which are applicable to the present invention;
- [25] FIG. 5 is a view illustrating the manner of removing waste which has been collected by the waste-collecting and deodorizing chamber according to the present invention;
- [26] FIG. 6 is a perspective view illustrating the in-use state of an exemplary guide plate holding unit of a waste-collecting and deodorizing chamber for a manhole according to the present invention;
- [27] FIG. 7 is a cross-sectional view illustrating the use state of the waste-collecting and deodorizing chamber in which the guide plate holding unit of FIG. 6 is employed;
- [28] FIG. 8 is a perspective view illustrating the use state of another exemplary guide plate-holding unit of a waste-collecting and deodorizing chamber for a manhole according to the present invention;
- [29] FIG. 9 is a schematic view illustrating mounting structures for mounting the waste-collecting and deodorizing chamber in the manhole;
- [30] FIG. 10 is a perspective view illustrating another exemplary waste-collecting and deodorizing chamber for a manhole according to the present invention;
- [31] FIG. 11 is a cross-sectional view of FIG. 10;
- [32] FIG. 12 is an exploded perspective view of FIG. 10; and
- [33] FIG. 13 is a schematic view illustrating a conventional manhole.

Best Mode for Carrying Out the Invention

- [34] Description will now be made of exemplary embodiments of a waste-collecting and deodorizing chamber for a manhole according to the present invention with reference to the accompanying drawings. The embodiments are provided only for illustrative purposes so they are not intended to limit the scope of the present invention.
- [35] As illustrated in FIG. 1 and so on, the waste-collecting and deodorizing chamber for the manhole 1 is removably inserted and mounted in a manhole 2, which is installed in sewerage placed e.g. at the side of the road, so as to filter, collect, and allow cleaning of the waste 5 introduced into the manhole 2 with ease, and also prevent a stench and flowing water from leaking or flowing backward from the manhole 2 into the ground.

Preferably, the waste-collecting and deodorizing chamber 1 is removably inserted and mounted in a space underlying a grill (a cover) 3 covering an upper opening of the manhole 2.

[36] As illustrated in FIGS. 2 to 12, the waste-collecting and deodorizing chamber 1 essentially includes a main body 10, an opening section 20, and guide plates 30.

Preferably, the waste-collecting and deodorizing chamber 1 further includes deodorizing plates 50 and a guide plate-holding unit 60.

[37] The main body 10 is a frame member which is inserted into the manhole 2 and is engaged with an upper portion of the manhole. The main body has a shape which is removably inserted into an internal space of the manhole. Since the sewerage manhole generally has a shape of a rectangular figure, the waste-collecting and deodorizing chamber 1 may also have the similar shape. However, the present invention is not limited to that shape.

[38] Preferably, the shape of the waste-collecting and deodorizing chamber 1 may be a frustum of a quadrangular pyramid having a wide upper portion and a narrow lower portion such that the waste-collecting and deodorizing chamber is easily inserted into and removed from the manhole. Further, the main body 10 may be provided, on its upper portion, with a flange edge 15 which is put on a step 2a of the manhole 2.

[39] Since the waste-collecting and deodorizing chamber 1 temporarily stores flowing water 4 and waste 5 therein, the main body 10 is open upward and has an internal space 11 for storing the flowing water 4 and the waste 5. Although the bottom of the main body 10 is closed, at least one side thereof is open for installing the guide plate 30 and selectively the deodorizing plate 50. The bottom 12 of the main body 10 is provided with small drain-holes 12a for draining the flowing water 4, which is collected in the bottom 12, to the manhole 2.

[40] The opening section 20 is provided in at least one side of the main body 10. In FIGS. 1 and 3, four opening sections 20 are respectively formed in four sides of the main body 10, and in FIGS. 6, 8, and 10, two opening sections 20 are formed in only two opposite sides of the main body. In this case, the other two sides of the main body are closed and thus are not provided with the opening sections. Although not shown in the figures, the opening section 20 may be provided in only one side where the downstream sewer pipe 6 is located.

[41] In FIG. 4, the opening section 20 is separated from the bottom 12 by a certain height H, which forms a stepped side 13 of the bottom 12. This is for temporarily halting of the flowing water 4, which is introduced in the bottom, by the stepped side 13, and for preventing the collected waste from flowing out of the waste-collecting and deodorizing chamber 1 together with the flowing water 4. However, the stepped side 13 is not an essential element.

- [42] The guide plates 30 are vertically installed in series between the opposite rods 14 of the opening section 20 with a certain gap G formed between the guide plates. That is, the adjacent guide plates 30 are horizontally installed while forming the gap G therebetween, in such a manner as to incline such that an internal space-side end thereof has a lower position and the opposite-side end has a higher position (referred hereinafter to as a “positive inclination”).
- [43] With continuous positive inclined installation of the guide plates 30 in the opening section 30, the flowing water 4 and the waste 5 introduced into the waste-collecting and deodorizing chamber 1 naturally drop along the guide plates 30 and are introduced into the bottom 12 via the internal space 11. Then, the waste collected in the bottom 12 is confined within a space defined by the bottom 12 and the stepped sides 13, and is blocked by the inclined guide plates 30, so that it is minimally drained from the waste-collecting and deodorizing chamber 1, together with the flowing water 4. Further, the flowing water 4 is naturally drained to the manhole 2 via the drain-holes 12a, or otherwise via the gap G between the adjacent guide plates 30 when overflowing the stepped sides 13.
- [44] As a result, according to the waste-collecting and deodorizing chamber 1 of the invention, the waste 5 such as cigarette butts or the like is collected on the bottom 12, and the flowing water 4 is temporarily stored in the main body 10, flows to the manhole 2 via the gap G or the drain holes 12a, and is drained via the sewer pipes 6. Then, if a person wants to remove the waste 5, as illustrated in FIG. 5, the person can easily remove it by, after lifting, turning upside down the waste-collecting and deodorizing chamber 1 from the manhole 2 and removing the waste, without requiring the performance of troublesome work such as scraping of the bottom of the manhole 2.
- [45] Further, according to the waste-collecting and deodorizing chamber 1, although there are gaps G between the guide plates 30, the guide plates 30 are positively inclined relative to the waste, so that a stench from the manhole 2 and the sewer pipes 6 is minimally emitted outside via the gap G.
- [46] When the waste 5 is brushed down while the waste-collecting and deodorizing chamber 1 is turned upside down, inclination of the guide plates 30 is not positive, but becomes negative. Thus, if the guide plates 30 are of a fixed type, a portion of the dropping waste 5 may be caught on the guide plates 30 or in the gap G between the guide plates, rendering cleaning work complicated.
- [47] To solve this problem, the guide plate 30 may not be of the fixed type, but may be installed so as to be able to tilt between the rods 14. That is, as illustrated in FIG. 3, a tilting axis 32 which is formed in one side of the guide plate 30 is inserted into an axial hole 32a formed in the rod 14, so that a blade 31 on the other side of the guide plate 30 can tilt up and down from the tilting axis 32 while extending toward the internal space

11. Unlike the construction in FIG. 3, diverse tilting structures may be adopted, such as the construction in which an axial hole is formed in the guide plate 30 and a tilting axis is formed in the rod 14.

[48] If the tilting range of the guide plate 30 is not restricted, the guide plate 30 can tilt and even take a vertical position by its own weight, making it difficult to accomplish the collection and deodorization of the waste. Thus, a tilt-restricting member 40 is provided between the adjacent guide plates 30 so as to restrict the tilting range of the guide plate 30 to within a certain range. While the embodiment illustrates, as the tilt-restricting member 40, a protrusion extending from the rod 14 toward a tilting path of the guide plate 30, the construction is not limited thereto.

[49] With adaptation of the tilt-restricting member 40 to a proper position in the tilting path of the guide plate 30, in a normal state of the waste-collecting and deodorizing chamber 1 being inserted into the manhole 2 (See FIG. 2), upon tilting, the respective guide plates 30 are engaged with the tilt-restricting members 40 thereunder so as to maintain the positive inclination, and if the waste-collecting and deodorizing chamber 1 is turned upside down, as illustrated in FIG. 5, the respective guide plates 30 tilt until being engaged with the tilt-restricting member 40 thereabove (in the normal state, the tilt-restricting member above the guide plate), thereby maintaining the positive inclination again even in the state of being turned over. Thus, when the waste 5 collected in the waste-collecting and deodorizing chamber 1 is brushed down, the waste 5 is prevented from being caught on the guide plates 30 or in the gap G between the guide plates.

[50] According to the waste-collecting and deodorizing chamber 1, the guide plates 30 arranged in a positive inclination can hinder the rising flow of the stench from the manhole 2 from being introduced into the main body 10 to some degree, such that the guide plates 30 alone provide the deodorizing effect. However, at the time, e.g. in summer, when ascending air current is strong and the stench is severe, there is concern about emission of the stench via the gap G.

[51] To solve this problem, the waste-collecting and deodorizing chamber 1 according to the present invention may further include a plurality of deodorizing plates 50. The deodorizing plates 50 are tiltably installed e.g. on the rod 14 between the guide plates 30. Here, while the deodorizing plates 50 can be tiltably installed on the rod 14 using a separate tilting axis provided on the rod, they preferably use, as the tilting axis, the tilt-restricting members 40 (e.g., protrusions), which are between the guide plates 30 so as to restrict the tilting of the guide plates 30.

[52] In FIG. 4, the axial hole on one side of the deodorizing plate 50 is inserted into the tilt-restricting member 40 so as to tilt about the tilt-restricting member 40 as a tilting axis. A blade 51 of the deodorizing plate 50 extends downward opposite the internal

space 11. The deodorizing plate 50 is caught for its blade 51 on the portion where the tilting axis 32 of the guide plate 30 exists, so that the tilting range thereof is restricted.

[53] In the above construction of the deodorizing plate 50, in a normal state in which the waste-collecting and deodorizing chamber 1 is inserted into the manhole 2, the respective guide plates 30 tilt until they are caught on the tilt-restricting members 40 thereunder, positively inclining toward the internal space 11, whereas the respective deodorizing plates 50 are caught on one side (where the tilting axis of the guide plate exists) of the guide plates 30 thereunder, inclining downward opposite the internal space 11, thereby closing the gap G. Thereby, with cooperation between the guide plates 30 and the deodorizing plates 50, the internal space 11 of the main body 10 is completely isolated from the manhole 2, thereby effectively preventing the stench from the manhole 2 from being emitted toward the ground via the waste-collecting and deodorizing chamber 1.

[54] Further, since the flowing water 4 introduced into the internal space 11 is drained to the manhole 2 via the gaps G when the deodorizing plates 50 are pushed up and tilt upward, although the deodorizing plates 50 isolate the internal space 11 from the manhole 2, the flowing water 4 can be drained.

[55] Further, as illustrated in FIG. 5, if the waste-collecting and deodorizing chamber 1 is turned upside down in order to brush down the waste 5, the guide plates 30 tilt in the positive direction and the deodorizing plates 50 tilt until they are caught on the tilting axis 32 of the guide plates thereabove, so that the deodorizing plates 50 do not hinder the collected waste 5 from dropping down.

[56] As set forth before, one of the problems occurring in connection with the manhole 2 is the problem that the flowing water flows backwards to the ground via the manhole in case of torrential rain or unsmooth drainage by the sewer pipes.

[57] In FIG. 1, in cases where the guide plates 30 are of the fixed type, not the tiltable type, although receiving water pressure from the manhole 2 toward the inside of the main body 10, the guide plates are still fixed, the deodorizing plates 50 then are caught on the guide plates 30 so as not to tilt, blocking the gaps G between the guide plates 30. Thus, the internal space 11 is isolated from the manhole 2, preventing the flowing water 4 of the manhole 2 from flowing backwards to the inside of the main body 10. However, when the guide plates 30 are of the tiltable type, the flowing water 4 may rotate the guide plates 30 to the inside of the main body 10 and flows backwards through the gaps G.

[58] However, for preventing the backflow of the flowing water possibly occurring when the guide plates are of the tiltable type, as illustrated in FIGS. 6 to 8, the waste-collecting and deodorizing chamber 1 may further include a guide plate-holding unit 60. The guide plate-holding unit 60 is a unit which selectively holds the tiltable guide

plates 30 so as not to tilt upward when the guide plates are caught on the tilt-restricting members 40 thereunder.

[59] The guide plate-holding unit 60 may be of any construction so long as, in the normal state, it fixedly holds the guide plates 30 when the waste-collecting and deodorizing chamber 1 is installed in the manhole 2, and when in the cleaning state the waste-collecting and deodorizing chamber 1 is turned upside down for cleaning work or the like, and the waste 5 is brushed down, it releases the guide plates 30 so that they tilt. The guide plate-holding unit 60 may be constructed such that it is removably inserted and mounted in the internal space 11 of the main body 10.

[60] As illustrated in FIGS. 6 and 7, the guide plate-holding unit 60 includes holders 61 preventing the guide plates 30 from tilting in contact with the guide plates 30, and lower and upper supports 62 and 63 connected with lower and upper portions of the holders 61 respectively and supporting the holder 61 such that the holders 61 maintain contact with the guide plates 30 as part of a stable structure.

[61] In the embodiments illustrated in FIGS. 6 and 7, the configuration in which the guide plates 30 are formed only on the opposite sides of the main body 10 is taken by way of example. In detail, the holders 61 are made up of two sets of bars pressing the guide plates 30 on the opposite sides of the main body 10. The lower support 62 includes a plate having a size corresponding to the bottom 12 of the main body 10, and is placed on the bottom 12 of the main body 10 after being connected with the lower portions of the holders 61. The upper supports 63 are made up of two bars connecting the upper portions of the holders 61, and are pressed by the grill 3 placed thereon. The plate-shaped lower support 62 is provided with a stepped side 62a protruding upwardly from an edge thereof. The stepped side 62a serves to allow the flowing water 4 to stay for a while, and to allow the dropping waste 5 to easily flow out of the waste-collecting and deodorizing chamber 1 along with the flowing water 4. Although not illustrated, the plate-shaped lower support 62 is provided with drain holes such that the flowing water 4 collected thereon can be drained to the manhole 2.

[62] According to the configuration of the guide plate-holding unit 60 of FIG. 6, when the guide plate-holding unit 60 is inserted into the main body 10 using the upper supports 63 as grips, the holders 61 come into contact with the guide plates 30, and thus prevent the tilting of the guide plates 30, and the holders 61 are maintained in a firm structure by the lower and upper supports 62 and 63.

[63] As illustrated in FIG. 6, in the embodiment of the present invention in which the guide plate-holding unit 60 has the plate-shaped lower support 62, when the guide plate-holding unit 60 is pulled out in order to remove the dropping waste 5, the dropping waste 5 deposited on the lower support 62 is also pulled out. Thus, the removal of the dropping waste is made easier.

- [64] As another example of the guide plate-holding unit 60, a latch structure as illustrated in FIG. 8 can be adopted. In this case, the configuration in which the guide plates 30 are formed only on the opposite sides of the main body 10 is taken by way of example. In detail, the main body 10 is provided with latch ears 64 at the lower and upper portions thereof. U-shaped latches 65 are fitted into the latch ears 64. Thereby, the latches 65 press the guide plates 30 to prevent the tilting of the guide plates 30. In this embodiment, when the dropping waste 5 is to be removed, the latches 65 are separated from the latch ears 64, and then the waste-collecting and deodorizing chamber 1 is turned upside down.
- [65] As the guide plate-holding unit 60 is applied to the waste-collecting and deodorizing chamber 1, both the deodorizing plate 50 restricted on the tilting by the guide plates 30 and the guide plates 30 which cannot be tilted by the guide plate-holding unit 60 block the gaps G to completely isolate the internal space 11 of the main body 10 from the manhole 2 although the flowing water tries to flow backwards from the manhole 2 to the main body 10. Thus, the flowing water of the manhole 2 can be prevented from flowing back to the main body 10. In contrast, the flowing water 4 that naturally flows from the main body 10 to the manhole 2 tilts the deodorizing plate 50 in an upward direction due to the pressure of the flowing water, and is drained through the gaps G. Thus, despite the application of the guide plate-holding unit 60, the flowing water 4 can be drained.
- [66] Meanwhile, in the case in which the bottom 12 of the main body 10 and the lower support 62 of the embodiment of FIG. 6 are provided with drain holes 12a, there is a possibility of discharge of the offensive odor or backflow of the flowing water through the drain holes. However, the drain holes that may be so applied are merely small holes through which a considerable small amount of flowing water flows, and typically the dropping waste 5 becomes deposited thereon. Thus, actually, the discharge of the offensive odor or the backflow of the flowing water through the drainage is very slight, and the object of the present invention is not spoiled.
- [67] As illustrated in FIG. 9, the waste-collecting and deodorizing chamber 1 is mounted on the inner upper portion of the manhole 2 in such a manner that the flange edge 15 thereof is placed on the step 2a of the manhole 2.
- [68] FIG. 9A shows an example where the waste-collecting and deodorizing chamber 1 is mounted on the manhole 2. The step 2a for the waste-collecting and deodorizing chamber 1 and the step 2b for the grill 3 are formed on the manhole 2 in a two-stage structure.
- [69] FIG. 9B shows an example where the waste-collecting and deodorizing chamber 1 is mounted on the conventional manhole 2 having one step 2c on which the grill 3 is placed. The waste-collecting and deodorizing chamber 1 and the grill 3 are vertically

placed on the step 2c.

[70] FIG. 9C shows an example where a separate mount 7 having a step 7a is installed on the conventional manhole 2 having one step 2c on which the grill 3 is placed, the waste-collecting and deodorizing chamber 1 is placed on the step 7a of the mount 7, and then the grill 3 is placed on the step 2c located on the mount 7.

[71] While the waste-collecting and deodorizing chamber 1 as illustrated in FIGS. 1 to 8 has a structure in which the guide plates 30, the tilt-restricting members 40, and the deodorizing plates 50 are directly installed in the main body 10, similar to the construction in which the tilting axis 32 formed on one side of the guide plate 30 is inserted into the axial hole 32a formed in the rod 14 of the main body 10, the guide plates 30, the tilt-restricting members 40, and the deodorizing plates 50 may be fabricated as a single cartridge type and then be assembled.

[72] FIGS. 10 to 12 are views illustrating examples of fabricating the guide plates 30, the tilt-restricting members 40, and the deodorizing plates 50 as the cartridge type. As illustrated in the figures, the waste-collecting and deodorizing chamber 1 of this embodiment is also provided with the opening section 20 in the side of the main body similar to those former embodiments. Further, the construction of the guide plates 30, the tilt-restricting members 40, and the deodorizing plates 50 is also substantially identical to those above constructions.

[73] However, in this embodiment, the guide plates 30 are not directly installed on the rod 14, but the guide plates 30, the tilt-restricting members 40, and the deodorizing plates 50 are respectively pre-assembled between two rod-type frames 70, which are formed correspondingly to the size of the opening section 20, to thereby form a cartridge 80. That is, the cartridge 80 is formed in such a manner that e.g., the tilting axis 32 formed on one side of the guide plate 30 is tiltably installed into the axial hole 71 of the frame 70, and the cartridge 80 then is assembled to the main body 10 so as to come into contact with the opening section 20. The assembling method is not limited to a specified method, so that for example, the opposite frames 70 and the main body 10 may be coupled by bolting. Reference numeral 72 denotes a bolt hole for bolting.

[74] A difference between the cartridge-assembly type of FIG. 10 and the embodiments of FIG. 4 or the like is that in the embodiment of FIG. 4, the guide plate 30 is arranged on the uppermost portion and the bottom 12 is provided with the stepped sides 13, whereas in the embodiment of FIG. 10, the deodorizing plate 50 is arranged on the uppermost portion and the bottom has no stepped sides.

[75] The guide plate-holding unit 60 can be implemented with a punched plate 66 having a plurality of through-holes 66a for filtering the waste 5. In an embodiment illustrated in FIGS. 10 to 12, the punched plate 66 is fitted into the interior of both frames 70 and is in contact with the guide plates 30, thereby fixing the guide plates 30 so as not to

allow them to tilt. A structure for fitting the punched plate 66 into the frames 70, holding the punched plate 66 in the fitted position, and separating the punched plate 66 may include a slit 73, which is formed in lower ends and substantially middle portions of the both frames 70 such that the punched plate 66 can be fitted between the slits 73 and the frames 70. The punched plate 66 is provided with cuts 66b on opposite end portions thereof such that the punched plate 66, during fitting and pulling, is not caught by the slits 73.

[76] The punched plate 66, implemented as the guide plate-holding unit 60, makes it possible to selectively restrict the tilting of the guide plates 30 as well as to prevent the flowing water from flowing back from the manhole 2 to the main body 10 by the co-operation between the guide plates 30 and the deodorizing plates 50. Further, once the flowing water 4 is introduced into the internal space 11 from the ground, the waste 5 is filtered from the flowing water 4 while it is flowing through the through-holes 66a and then the deodorizing plates 50 are tilted to drain the filtered flowing water into the manhole 2. In this manner, the waste 5 can be effectively filtered from the flowing water 4 and then the punched plate 66 can be separated to remove the waste 5.

[77] In the embodiment illustrated in FIGS. 10 to 12, the height of the punched plate 66 as the guide plate-holding unit 60 is spaced at a predetermined interval from the upper end of the frames 70 such that the flowing water 4, when not properly drained to the manhole 2 and thus rising in the internal space 11, can drain away by thrusting the uppermost deodorizing plates 50.

[78] Since the deodorizing plates 50 are arranged in the uppermost side of the opening section, gaps are formed between the flange edge 15 and the uppermost deodorizing plates 50. The gaps can be closed by attaching covers 74 to the flange edge 15, and the covers 74 can keep a fixed position by being fitted into the slots 75 in the upper side of the frames 70.

[79] Moreover, since the punched plate 66 implemented as the guide plate-holding unit 60 filters the waste 5, the waste 4 will not drain out along with the flowing water 5 even if the stepped side 13 is not formed in the bottom 12 of the main body 10.

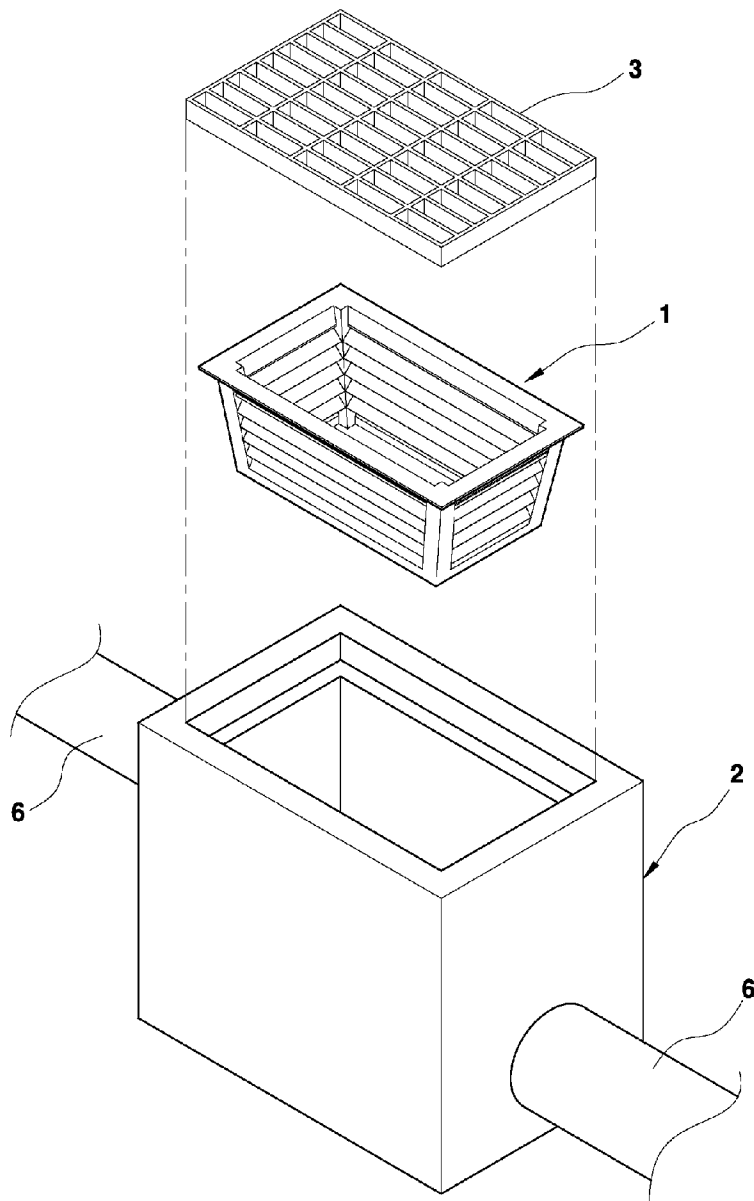
Claims

- [1] A waste-collecting and deodorizing chamber for a manhole, comprising:
a main body (10) removably inserted into the manhole (2) and caught on an upper portion of the manhole, and having an internal space (11) which is open upward and into which flowing water (4) and waste (5) are introduced;
an opening section (20) provided on at least one side of the main body (10); and
a plurality of guide plates (30) horizontally installed parallel with each other between opposite side rods (14) of the opening section (20) in such a manner as to form a certain gap (G) therebetween and incline toward the internal space (11) so as to introduce the flowing water (4) and the waste (5) into the main body such that the waste (5) is collected on the bottom (12) of the main body (10), and the flowing water (4) is drained out of the main body (10) through the gap (G).
- [2] The waste-collecting and deodorizing chamber for a manhole according to claim 1, wherein the guide plate (30) has a tilting axis (32) about which it is able to tilt up and down between the opposite rods (14) with a blade (31) of the guide plate (30) extending toward the internal space (11), and wherein a tilt-restricting member (40) is provided between adjacent guide plates (30) so as to restrict a tilting range of the guide plate (30).
- [3] The waste-collecting and deodorizing chamber for a manhole according to claim 2, further comprising a plurality of deodorizing plates (50) horizontally provided parallel with each other between adjacent guide plates (30) between the side rods (14) so as to cover the gap (G), the deodorizing plate (50) being able to tilt up and down with its blade (51) extending opposite the internal space (11), wherein the tilting range of the deodorizing plates (50) is restricted by the guide plates (30), so that, when the main body (10) stands upright, the internal space (11) is isolated from the manhole (2) thanks to cooperation between the guide plates (30) and the deodorizing plates (50), preventing a stench from being emitted from the manhole (2) into the internal space (11).
- [4] The waste-collecting and deodorizing chamber for a manhole according to claim 3, further comprising a guide plate-holding unit (60) selectively holding the guide plate (30) which is caught on the tilt-restricting member (40) underlying the guide plate, so that the flowing water (4) is prevented from flowing backward from the manhole (2) into the internal space (11) thanks to cooperation between the guide plates (30), which are held by the guide plate-holding unit (60), and the deodorizing plates (50).
- [5] The waste-collecting and deodorizing chamber for a manhole according to claim 4, wherein the guide plate-holding unit (60) is a punched plate (66) having

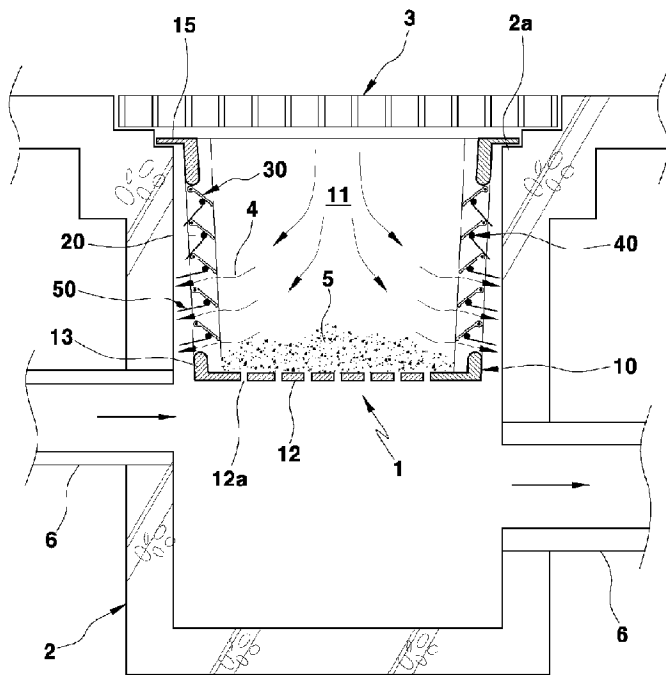
through-holes (66a) for filtering the waste (5).

- [6] The waste-collecting and deodorizing chamber for a manhole according to claim 4, wherein the guide plates (30), the tilt-restricting members (40), and the deodorizing plates (50) are pre-assembled in two frames (70), which are formed corresponding to the size of the opening section (20), so as to form a separate cartridge (80), which is mounted in the opening section (20).

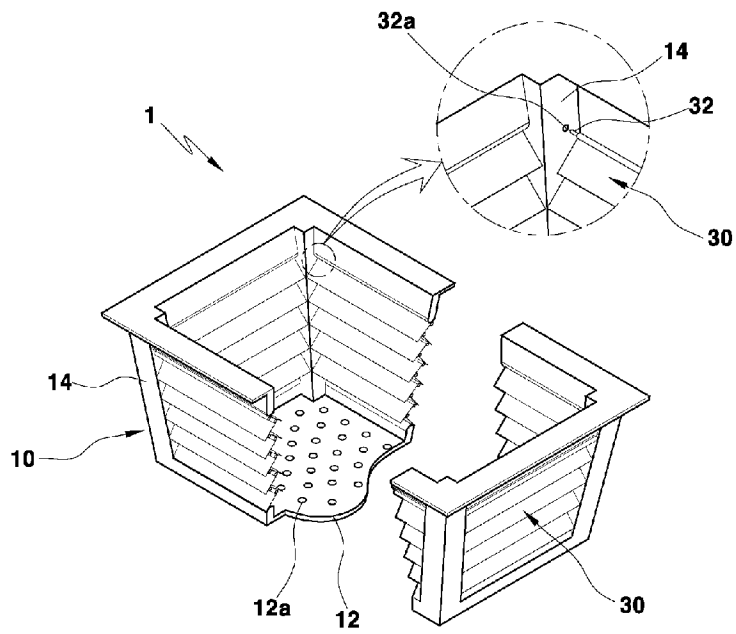
[Fig. 1]



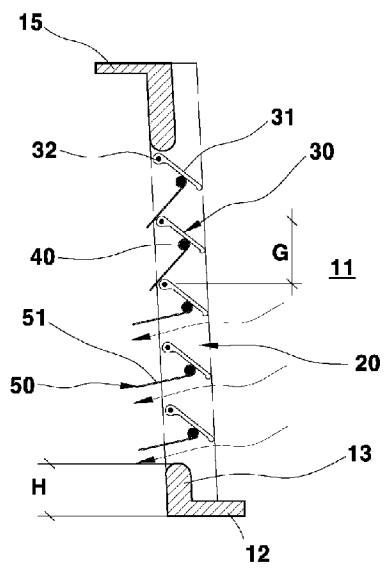
[Fig. 2]



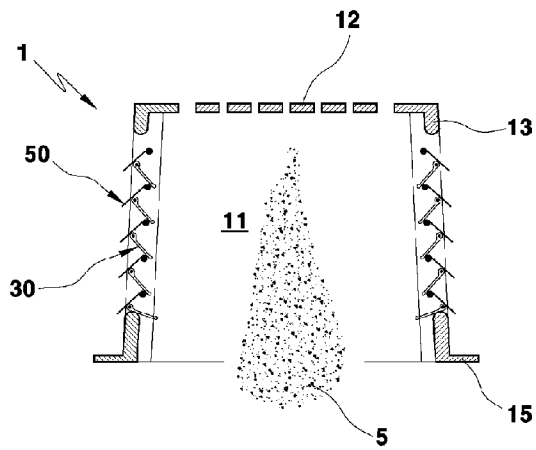
[Fig. 3]



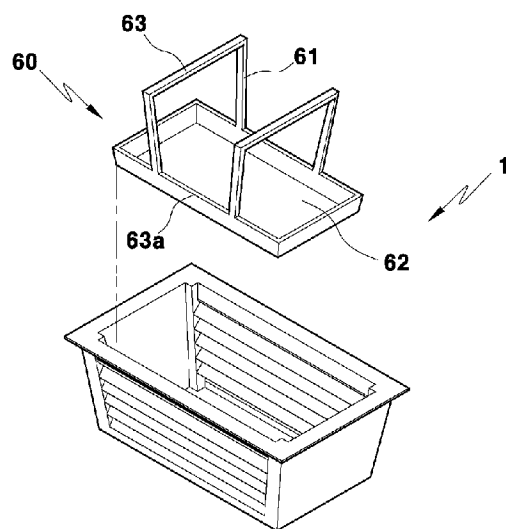
[Fig. 4]



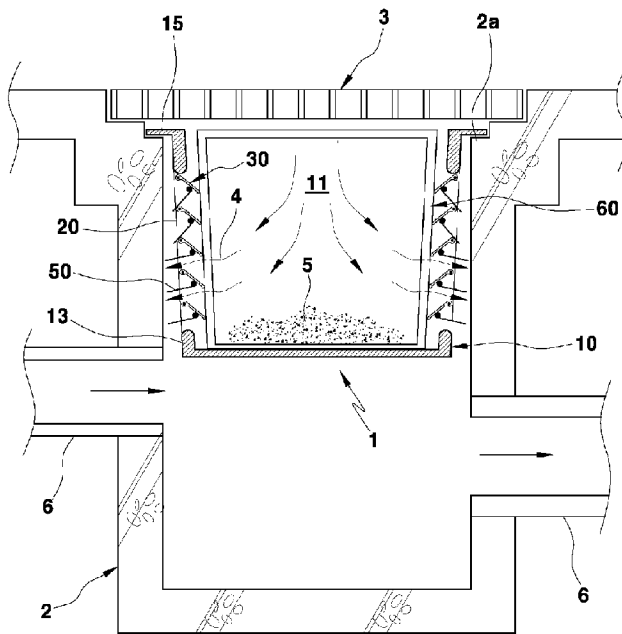
[Fig. 5]



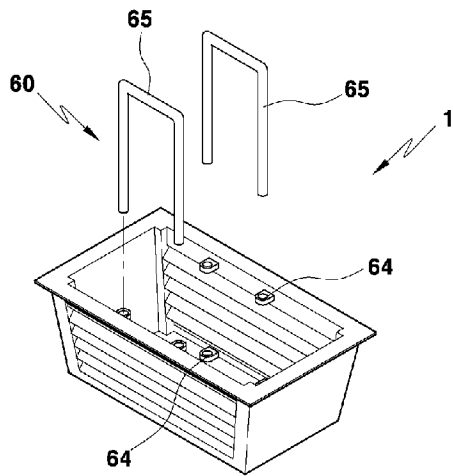
[Fig. 6]



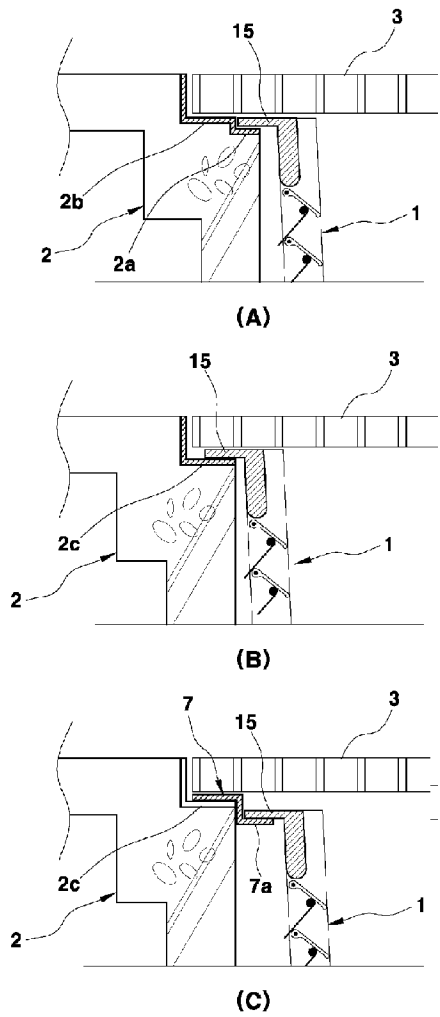
[Fig. 7]



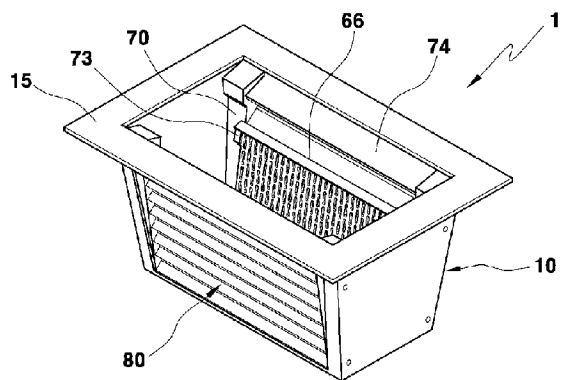
[Fig. 8]



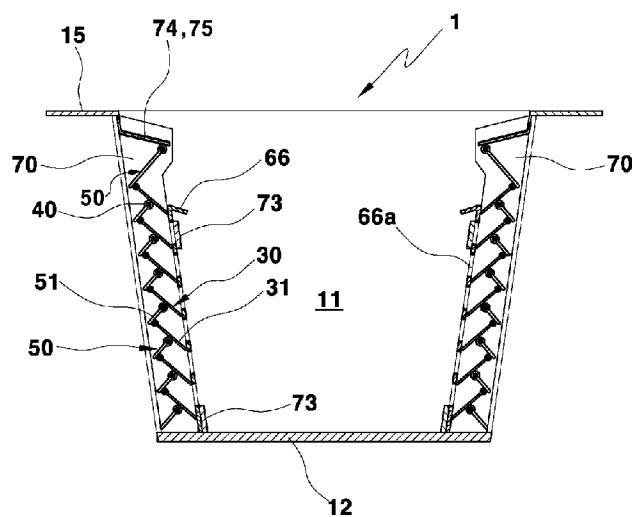
[Fig. 9]



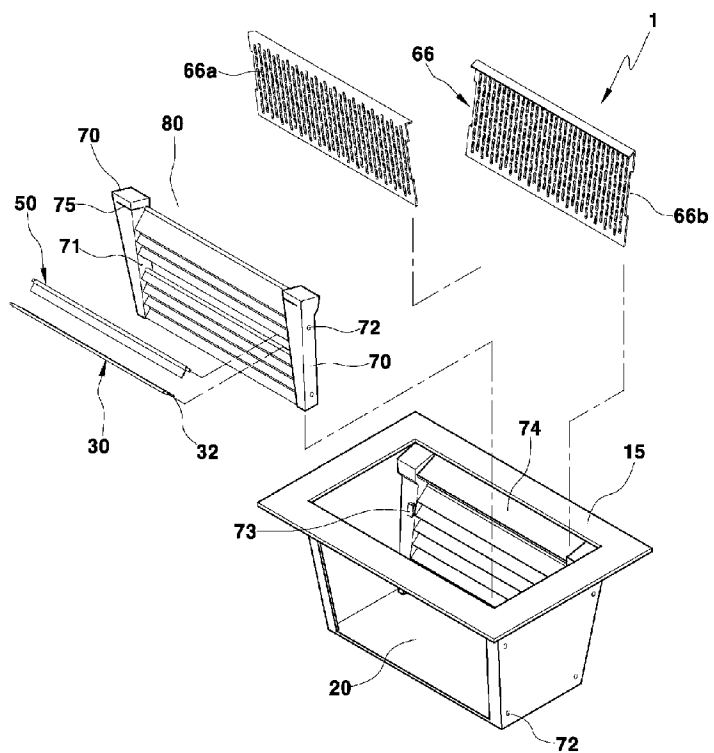
[Fig. 10]



[Fig. 11]



[Fig. 12]



[Fig. 13]

