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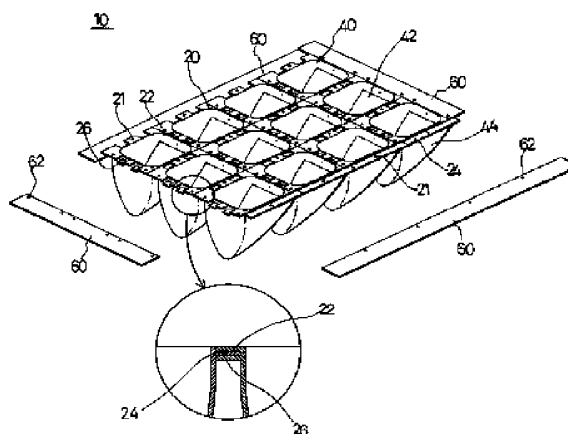
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(54) Title: DEVICE TO PROTECT OFFENSIVE ODOR AND VERMIN FROM THE SEWAGE



(57) Abstract: A protection device for offensive odor and vermin installed on an inner side of a manhole lid of a drain, including a plurality of sub devices to prevent offensive odor and vermin assembled in all directions, each of device including an upper opening part where the running water is coming in, an outlet formed in a tilted angle on a lower part of a body section through which running water is discharged, and an open and close door plate installed on the outer side of the outlet that is automatically opened by the weight of the running water and is automatically closed after the running water is discharged by an elastic device separately equipped, includes: the sub device including protruded leafs of certain heights arranged on the tops of all four sides such that upper protruded leafs with a mounting hole are arranged on two sides of the four edges and a lower protruded leaf is arranged on the lower part of the upper protruded leaf in a distance so a certain gap is formed between the upper and lower protruded leaves, mounting holes are arranged on the remaining two sides of the four edges, and a middle protruded leaf formed at the same thickness and the same location as the gap, wherein the plurality of sub devices are installed in the same direction, the middle protruded leaf and the gap are coupled in a putting-in method, a fixing hole is arranged on one end of the most outer rim of the sub device and is screw-coupled to the mounting hole, a supporting plate is hung on the inner rim of the man hole.



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Description

DEVICE TO PROTECT OFFENSIVE ODOR AND VERMIN FROM THE SEWAGE

Cross-Reference to Related Application

- [1] This application claims the benefit of Korean Patent Application No. 20-2004-0036043, filed on December 20, 2004, the disclosure of which is hereby incorporated herein by reference in its entirety.

Background of the Invention

- [2] 1. Field of the Invention
- [3] This invention is relating to the device which is intended to protect offensive odor and vermin from the sewage, and it is designed to assemble the multiple number of the device to protect offensive odor and vermin from the sewage in series by the protruded leaves on the four outer side surfaces and gaps in each other so that it can achieve the simplification of the parts and improve the convenience of the assembling operation and can protect offensive odor and vermin from the sewage in an effective way.
- [4] 2. Description of the Related Art
- [5] There are sewage pipe under the ground of the drive way and sidewalk for the industrial waste and for the domestic waste water and there are manhole of the sewage on the ground of the sewage pipe so that running water on the ground can flow thru these manhole.
- [6] The manhole of the sewage which deliver the running water on the ground is connected to the sewage pipe directly or indirectly, and on the top of the manhole of the sewage there is a cover with multiple holes to protect foreign material going through with the running water on the ground.
- [7] But when this manhole of the sewage is located at the near by side walks or near by the residential neighborhood, it make extremely dangerous to the living health environment by emitting offensive odor and vermin from the sewage.
- [8] Especially during the summer season with the high temperature, the offensive odor evaporated through the manhole of the sewage which is originated from the trapped sewage or emission and it makes uncomfortable feeling to the passenger or resident near by the manhole of the sewage.
- [9] Considering these situation, there have been lots of invention to protect offensive odor and vermin from the sewage until now, and the inventor for this device have invented new patent (Publication number. 359464: Device to protect offensive odor and vermin from the sewage.) and have actually installed it to the nationwide and have a good result to protect offensive odor and vermin from the sewage.

- [10] The existing patented device is easy in repair and maintenance compare with the other devices and also have good effectiveness in protecting offensive odor and vermin from the sewage and so have been received popularity at the actual market, but there seems certain complexity in assembling these devices for the offensive odor and vermin from the sewage because it require lot of parts such as multiple fixing frame (5) or gap sealing parts (5') and during his constant striving to improve this patented device, the necessity to develop more versatile model with more improved function, the inventor finally applied for the new device to protect offensive odor and vermin from the sewage with the improved structure in certain components which is based on the existing patented device.

Summary of the Invention

- [11] It is an object of the present invention to provide a device to protect offensive odor and vermin from the sewage which is made simplification of the installation operation for the device to protect offensive odor and vermin from the sewage by keeping the advantage of the existing patented device, and at the same time make improvement in fabrication of the device by making simplification of the components so as to improve the practicality of the device.
- [12] It is another object of the present invention to provide a device to protect offensive odor and vermin from the sewage which can make opening outlet of the running water smoothly by preparing devices that can protect accumulation or suspension of the foreign material and sludge coming in with the running water in side of the device to protect offensive odor and vermin from the sewage.
- [13] To achieve the above mentioned objects, this design to protect offensive odor and vermin from the sewage has composed with the upper opening hole in which running water coming in, and the bottom side sloped outlet which is located on the bottom of the body section through which running water go to the sloped outlet, and the open and close door plate which is attached on the outside of the sloped outlet and it can be opened automatically by the weight of the inlet sewage and can be closed automatically by the plate spring after discharging the sewage. And for the structure which is made in multiple row in longitudinally and transversely and is installed on the inner side of the sewage manhole cover so that it can protect offensive odor and vermin from the sewage, it has upper protruded leaf on the both sides of the four outer side surfaces on a designated height and there is mounting holes at the middle of the leaf and in which there is bottom protruded leaf which is located beneath of the upper protruded leaf with a certain gap to the upper protruded leaf and on the other hand the other two sides of the four outer side surfaces, it has a middle protruded leaf which have mounting holes and have the same thickness as the upper and lower protruded leaves

and same height as the gap so that when assembling the multiple number of these devices to protect offensive odor and vermin from the sewage can be assembled in the same plane by using the middle protruded leaf and gaps. And one upper outer sides of these multiple structure to protect offensive odor and vermin from the sewage will be hanging to the edge of the sewage manhole cover and the other upper outer sides of these multiple structure assembled with the supporting plate which has mounting holes in it by using screw thread through the mounting hole and can be attached to the inner sides of the sewage manhole cover. It can provide device to protect offensive odor and vermin from the sewage which can do installation operation easily and quickly when install device to protect offensive odor and vermin from the sewage.

Brief Description of the Drawings

- [14] The above and other features and advantages of the present invention will become more apparent to those of ordinary skill in the art by describing in detail preferred embodiments thereof with reference to the attached drawings in which:
- [15] FIG. 1 shows the existing patent which is applied by the inventor;
- [16] FIGs. 2 and 3 show a isometric side view in both different direction for the sub assembly which is used to this patented device to protect offensive odor and vermin from the sewage;
- [17] FIG. 4 shows sectional view and detail view of the sub assembly to protect offensive odor and vermin from the sewage;
- [18] FIG. 5 shows the assembled condition and detailed view of the multiple devices to protect offensive odor and vermin from the sewage and it's supporting channel are assembled to each other;
- [19] FIG. 6 and 7 show the assembly condition and detail view of the channel which is used to insert the multiple sealing device to protect offensive odor and vermin from the sewage; and
- [20] FIG. 8 and 9 show the sectional view and operating method of the installed device to protect offensive odor and vermin from the sewage to the manhole of the sewage.

Detailed Description of the Invention

- [21] The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. In the drawings, the thickness of layers and regions are exaggerated for clarity. Like numbers refer to like elements throughout the specification.

- [22] FIG. 2 and 3 are isometric side views in both different direction to make easy understanding of the outside feature of the sub assembly (20) for the device to protect offensive odor and vermin which is used to this patented device to protect offensive odor and vermin from the sewage.
- [23] As shown on the isometric drawing, the sub assembly (20) for the device to protect offensive odor and vermin which is used to this patented device to protect offensive odor and vermin from the sewage is equipped with the inlet opening hole (40) at the top side and the body section (44) where running water coming from the inlet opening hole (40) at the top side go through is composed with the round shape and on the one side of the bottom is composed with the sloped outlet (42) and on the out side of the aforementioned outlet opening hole (42), there is a hinge bracket (49) on the top side of the body section (44) and hinge (48) is inserted in the hinge bracket (49) so that the open and close door plate (49) can be opened automatically by the weight of the inlet sewage and can be closed automatically by the plate spring after discharging the sewage.
- [24] Especially for the unique featured body section (44), there is protruded leaf on the upper sides of the four outer side surfaces on a designated height and both sides of the four outer sides, there is mounting hole (21) and it has upper protruded leaf which can make even level with the top side of the body section (44) and there is bottom protruded leaf which is located beneath of the upper protruded leaf (22) with a certain gap (25) to the upper protruded leaf.
- [25] Also, for the other two sides, it has a middle protruded leaf which have mounting holes (21) and have the same thickness as the upper and lower protruded leaves and same height and depth as the gap (25).
- [26] That is for the both two sides of the four out side surfaces, there are upper and bottom protruded leaves (22) (26) and for the other two sides, there is middle protruded leaf (24) which is located between the upper protruded leaf (22) and bottom protruded leaf (26) in height so that when assembling the multiple number of these sub assembly (20) to protect offensive odor and vermin from the sewage, it can be assembled simply inserting each other by using the middle protruded leaf (24) and gaps (25) with out any need of the special part.
- [27] Also, these sub assembly (20) to protect offensive odor and vermin from the sewage are composed with the rectangular shape for the upper assembling parts but the other inner rim of the body section (44) are composed with unique feature of round shape to make opening outlet of the running water smoothly and protect accumulation or suspension of the foreign material and sludge coming in with the running water in side of the device.
- [28] FIG. 4 is a sectional view 'A-A' and detail view of the sub assembly (20) to

protect offensive odor and vermin from the sewage, and in this drawing as shown, there is an elastic device (50) which control the opening and closing of the open and close door plate (46) located on the top of the outlet opening hole (42) in which the aforementioned open and close door plate (46) is installed on it. And for this design, this elastic device (50) is composed of a plate spring and assembled on to the body section (44) and make the opening and closing of the open and close door plate (46). And this elastic device (50) can be optionally made of the coil spring which will be wound to the hinge (48) and any kinds of elastic device which can surely make opening and closing of the open and close door plate (46) will satisfy these function.

[29] FIG. 5 shows the assembled condition of the multiple devices of the sub assembly (20) to protect offensive odor and vermin from the sewage in series at the same direction to make a united body and it is assembled by inserting the middle protruded leaf (24) prepared at the each outside of the sub assembly to the gaps (25).

[30] As shown above, protection device for the offensive odor and vermin(10) that uses multiple devices of the sub assembly to become a united body and the number of the sub assembly to be used to be the completed protection device for the offensive odor and vermin(20) depending on the size of the drain and on the outer rim of protection device for the offensive odor and vermin(10), it is a supporting plate(60) to be hanged to the man hole of the sewage.

[31] On the supporting plate(60) mentioned above, there are mounting holes(62) on a same distance to be assembled to the mounting hole(21) on the protruded leaf part of each sub assembly to protect offensive odor and vermin by the screw thread through each other. In case upper and bottom protruded leaf(22)(26) are located on the most outer side, the mounting hole(62) of supporting plate(60) is first inserted into the gap(25) and in case the middle protruded leaf(24) is located on the most outer side, on the top side of this middle protruded leaf, the one side of the supporting plate where mounting hole is located will be laid down to the middle protruded leaf and is fixed with screw so as to be parallel with the surface of protection device for the offensive odor and vermin.

[32] Also, when such standardized sub assembly (20) to protect offensive odor and vermin from the sewage is assembled and installed, it will maintain close contact between each sub assembly to protect offensive odor and vermin from the sewage through inserting method between the middle protruded leaf and gap as shown on the some of the detail drawing of the FIG 5. As such aforementioned manner, through close sealing maintained between two assembled parts, the offensive odor & vermin generated from inside the sewage can be effectively prevented from coming out through but depending on the man hole cover for the sewage, there will be a difference in size between the most outer rim of protection device for the offensive odor and

vermin and the size of inner part of the man hole cover for the sewage. To prevent offensive odor and vermin from coming out through such a difference in size between the outer rim of the protection device for the offensive odor and vermin and the inner part of the man hole cover for the sewage, adjustable supporting channel(70) can be equipped additionally to adjust the gap between sub assembly to protect offensive odor and vermin from the sewage.

- [33] The adjustable channel(70) mentioned above, as shown in FIG 6, is located between each of the sub assembly to protect offensive odor and vermin, there will be plate which have different height for the inserting area (72) in both sides so that middle protruded leaf(24) is inserted to the gap for the one side and upper and bottom protruded leaf(22)(26) will be inserted to the gap to the other sides. And the assembled condition and detail view of the assembled condition is shown in FIG. 7.
- [34] The adjustable channel(70) mentioned above can be inserted between sub assembly (20) to protect offensive odor and vermin from the sewage as explained above but it can also be used on the most outer side of the united sub assembly (20) to protect offensive odor and vermin from the sewage by attaching supporting plate(60) to the out side of it.
- [35] On the other hand from this point, explanation on the function and operation of this patented the protection device for the offensive odor and vermin(10) which is composed as the above will be described by referencing FIG. 8 and 9.
- [36] The number of the sub assembly to protect offensive odor and vermin from the sewage of the patented protection device for the offensive odor and vermin(10) can be decided depending on the size of the sewage man hole, it can be applied to the various sizes of the sewage man hole.
- [37] Also, the protection device for the offensive odor and vermin(10) can be composed of multiple of sub assembly (20) to protect offensive odor and vermin from the sewage by tight fit each other using the gap (25) and upper and bottom protruded leaf (22)(26), it can be assembled easily and give the convenience of the installation with out the need of the special tool.
- [38] Also, after putting a separate coffin-shaped supporting plate(60) using fixing screw onto the rim part on the most outer side of the standardized sub assembly (20) device to protect offensive odor and vermin from the sewage, the sub assembly (20) device to protect offensive odor and vermin from the sewage that has the supporting plate(60) assembled can be hanged on the inner part of the sewage man hole. After that ether by placing a separately equipped protection device for the inlet of foreign materials or just by placing the manhole cover (5) on it, the installation process will be completed. With such simple process, it will save working hours and labor cost.
- [39] Also, as shown in FIG 9, should the running water from the outside reaches a

certain point within the body section (44) where a protection device for the offensive odor and vermin(10) is installed, open and close door plate(46) equipped inside the body section (44) will fall back depending on the weight of the running water.

[40] When weight has been reduced on open and close door plate(46) after the running water has been discharged, open and close door plate(46) will close the outlet opening hole (42) promptly due to the elasticity of the elastic device(50) and do not let any offensive odor or vermin created inside the sewage be emitted to the outside.

[41] Especially, because the inner rim of the sub assembly device to protect offensive odor and vermin from the sewage is a round shape, even if some foreign materials come in with the running water, it will not let suspend or accumulate on it effectively compare with the former square shaped device.

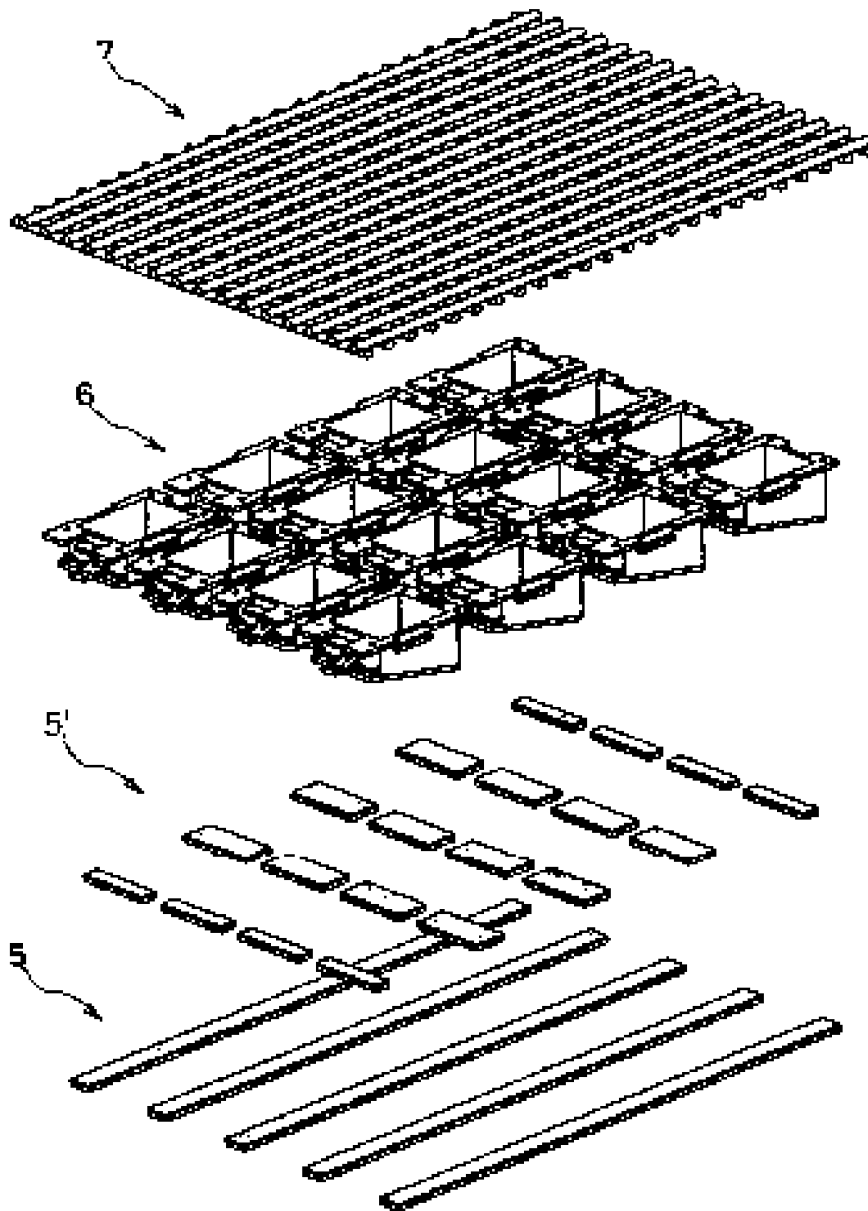
[42] Also, this patented sub assembly (20) to protect offensive odor and vermin from the sewage is assembled and installed in standardized size, there will be a differences in size between the most outer rim of protection device for the offensive odor and vermin and the size of the man hole cover for the sewage. To prevent offensive odor and vermin from coming out through such a difference in size between the outer rim of the protection device for the offensive odor and vermin and the size of the man hole cover for the sewage, adjustable supporting channel(70) can be equipped additionally to adjust the gap between sub assembly to protect offensive odor and vermin from the sewage.

[43] As explained above, since this protection device for the offensive odor and vermin can be used just by simply assembling multiple sub assembly devices to prevent offensive odor and vermin, the installing is simple allowing reduction of cost and increase the efficiency. And should there be a small difference in size between the assembled sub-assembly devices to prevent offensive odor and vermin and the man hole, width adjusting device can be inserted between the most outer rim of the sub-assembly devices to protect offensive odor and vermin and the supporting channel (70), the gap will disappear and the odor and vermin can be effectively prevented from coming out from the sewage. And since the inner rim of the body section is round shaped, even if some foreign materials coming in with the running water, it won't remain inside nor disturb the discharge of the running water thus it is much more effective than the former square-shaped body section.

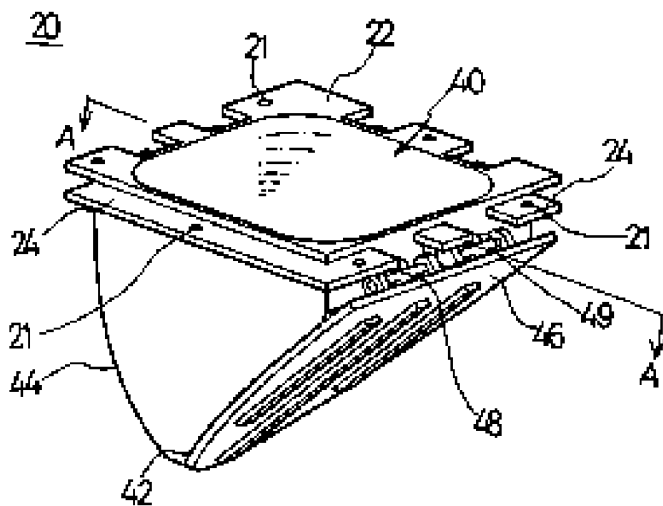
Claims

- [1] A protection device for offensive odor and vermin installed on an inner side of a manhole lid of a drain, including a plurality of sub devices to prevent offensive odor and vermin assembled in all directions, each of device including an upper opening part where the running water is coming in, an outlet formed in a tilted angle on a lower part of a body section through which running water is discharged, and an open and close door plate installed on the outer side of the outlet that is automatically opened by the weight of the running water and is automatically closed after the running water is discharged by an elastic device separately equipped, comprising:
the sub device including protruded leafs of certain heights arranged on the tops of all four sides such that upper protruded leafs with a mounting hole are arranged on two sides of the four edges and a lower protruded leaf is arranged on the lower part of the upper protruded leaf in a distance so a certain gap is formed between the upper and lower protruded leaves, mounting holes are arranged on the remaining two sides of the four edges, and a middle protruded leaf formed at the same thickness and the same location as the gap,
wherein the plurality of sub devices are installed in the same direction, the middle protruded leaf and the gap are coupled in a putting-in method, a fixing hole is arranged on one end of the most outer rim of the sub device and is screw-coupled to the mounting hole, a supporting plate is hung on the inner rim of the man hole.
- [2] The device of claim 1, wherein an inner rim of the body section of the sub device has a round shape to prevent foreign particles coming in with the running water suspended and to make flow of the running water smooth.
- [3] The device of claim 1 or 2, further comprising, an adjustable supporting channel arranged between coupling portions of the sub device and having an inserting portion which are put in between the protruded leafs of the neighboring sub device or between the most outer rim and the supporting plate of the sub device so that a width of the sub device is adjustable within a predetermined range according to a width of the man hole.

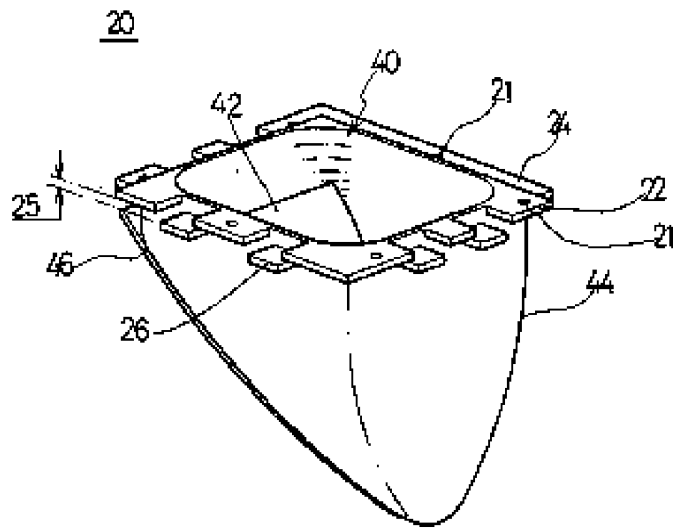
[Fig. 1]



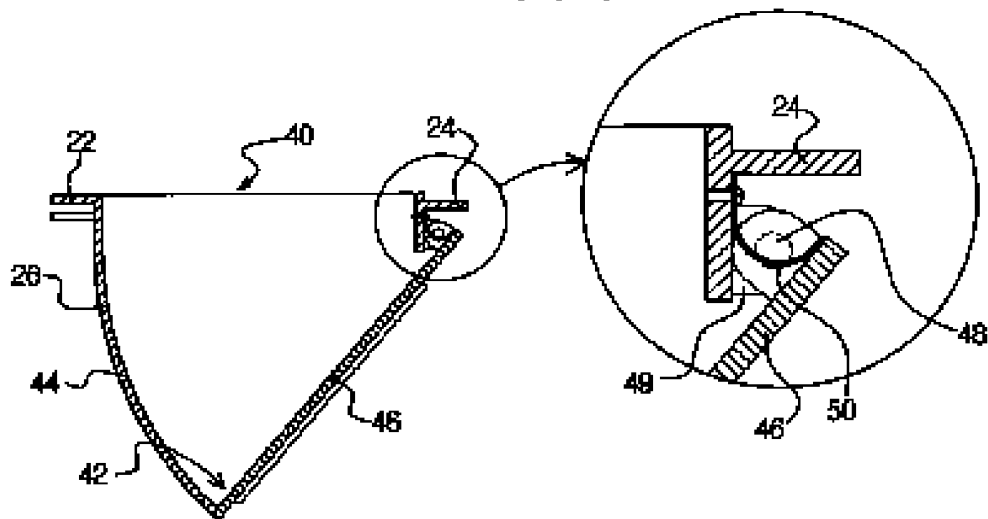
[Fig. 2]



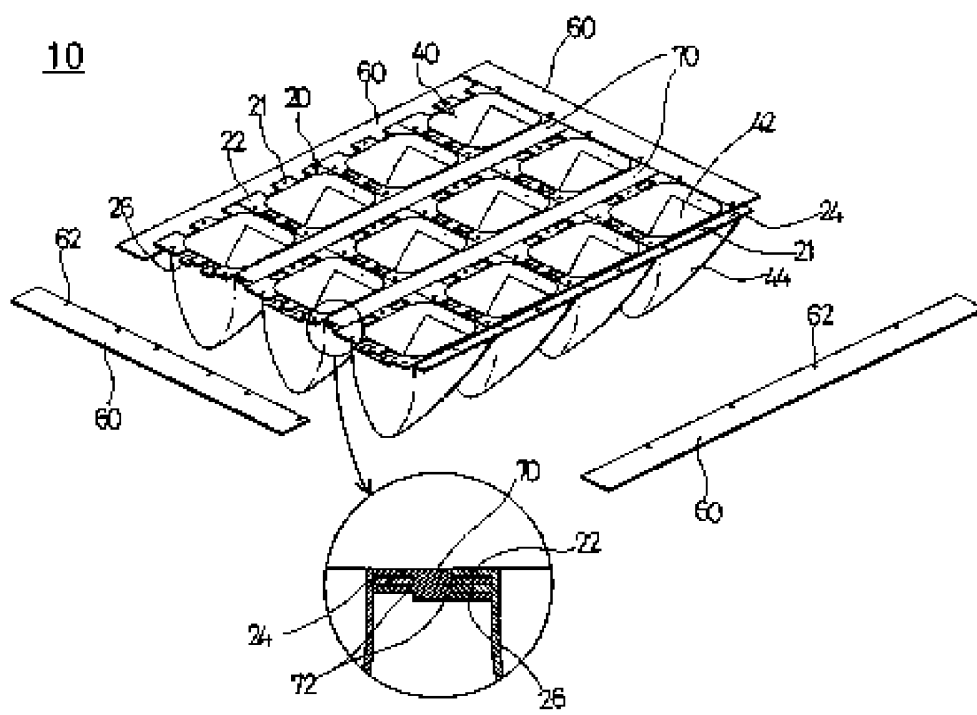
[Fig. 3]



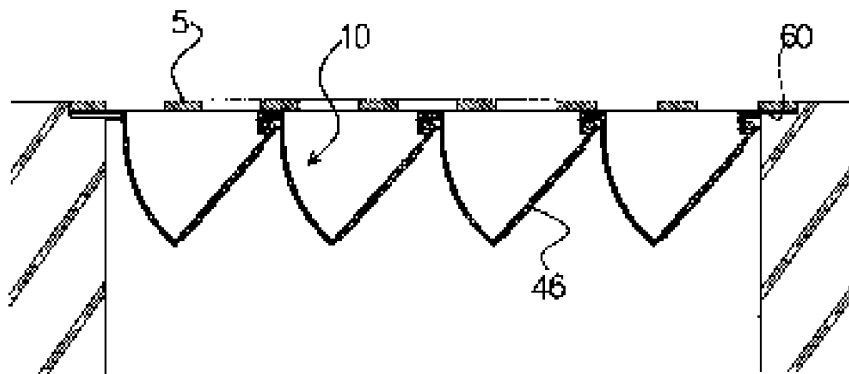
[Fig. 4]



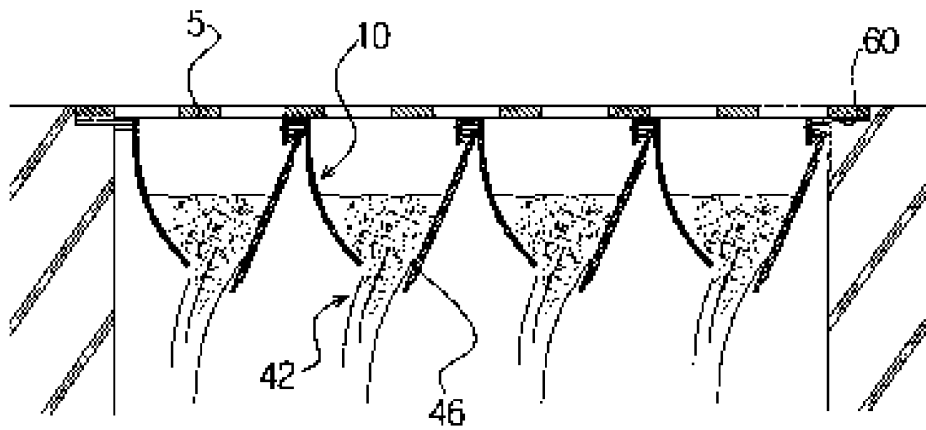
[Fig. 7]



[Fig. 8]



[Fig. 9]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2005/002146

A. CLASSIFICATION OF SUBJECT MATTER**IPC7 E03F 5/04**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 E03F, E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

KR, JP IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02/077378 A1 (MY's TECH CO.,LTD) 03 October 2002 Claims, Figure 2,4	1
A	WO 02/086248 A1 (IMOTO) 31 October 2002 See the whole documents	1
A	JP 08-277571 A (HIYOSHI CHUKO KK) 22 October 1996 See the whole documents	1



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

25 OCTOBER 2005 (25.10.2005)

Date of mailing of the international search report

25 OCTOBER 2005 (25.10.2005)

Name and mailing address of the ISA/KR



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LEE, In Goo

Telephone No. 82-42-481-8177



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2005/002146

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
W002077378A1	03. 10. 2002	W002077378A1	03. 10. 2002
W002086248A1	31. 10. 2002	CN1461371A	10. 12. 2003
		CN1461371T	. . T
		JP14201704	19. 07. 2002
		JP2002201704A2	19. 07. 2002
		JP3377515B2	17. 02. 2003
		KR1020030011901	11. 02. 2003
		US20040099586A1	27. 05. 2004
		US2004099586A1	27. 05. 2004
		US2004099586AA	27. 05. 2004
		W02002086248A1	31. 10. 2002
JP08277571	22. 10. 1996	JP08277571	22. 10. 1996
		JP8277571A2	22. 10. 1996