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(54) **Operator access door for underground buildings**

(57) The invention relates to an access door for underground buildings intended to house electronic, electrical, mechanical equipment or other equipment, configured by a main body (2) and an upper cover (1). According to the invention, the access door consists of a main lid (4) configured in a single metal part with reduced weight, resistant to mechanical stress, which is collapsible to-

ward the outside with respect to a frame (3) integrated in the upper cover (1) by means of hinging elements (8) installed on its inner face and at the inner part of the frame (3). The main lid (4) likewise comprises a closure (6) and integrates therein an auxiliary lid (5) concealing and protecting the closure (6). The access door allows the operators to easily access the inside of the building in order to perform operation or maintenance work.

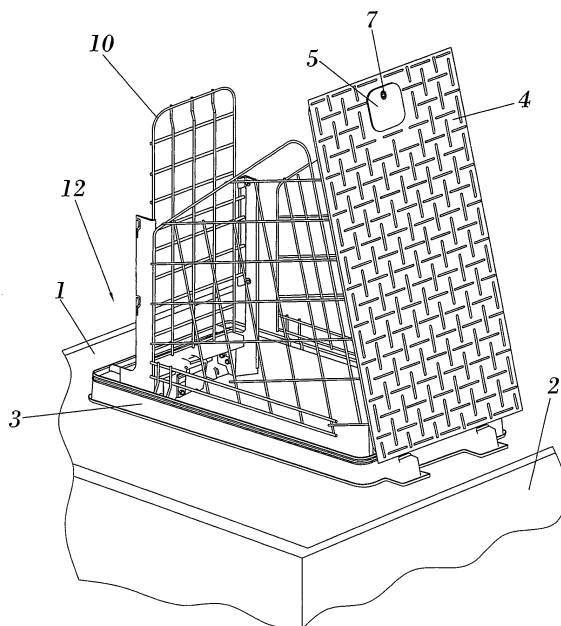


FIG. 1

Description

Object of the Invention

[0001] The present invention relates to an operator access door for underground buildings which can be used for telephony applications, as handling and/or electric transformation centers, for water pumping facilities, gas distribution facilities and other uses.

[0002] The object of the invention consists of an access door allowing the operators to easily access the inside of the building in order to perform the typical maintenance and operation tasks of the installed equipment, designed such that it is resistant to mechanical stress, such as the passage of pedestrians or the passage of vehicles over such building for example, having reduced weight and allowing the incorporation of different closures.

Background of the Invention

[0003] The underground buildings used for industrial purposes, for example such as telephony applications, as handling and/or electric transformation centers, for water pumping facilities, gas distribution facilities, etc, are generally formed by a body or casing and a cover forming the floor or surface which can be traveled over, said cover being able to be covered with any type of covering, such as paving blocks, tiles, etc. The assembly formed by the cover-casing can be of a prefabricated or a civil construction nature, made both of concrete and of other materials, inside which different industrial equipment is housed, such as for electric distribution, telephony, gas or water for example.

[0004] These underground buildings can be classified according to the needs of the operators to access the inside in order to perform operation or maintenance tasks. Said buildings would thus be classified into:

- Indoor operation: the buildings in which the operator must access the inside in order to carry out his or her work.
- Outdoor operation: the operators carry out the work from the outside without needing to access the inside of the building.

[0005] The indoor operation constructions have the advantage of providing the operators with greater protection against atmospheric agents, and above all making it difficult for passers-by to access the equipment installed therein during the operation.

[0006] In order to perform operation and maintenance work, said buildings usually have an opening in their cover which is closed by means of a door. These doors for operation access inside the building can be formed from one single lid or from several lids or semi-trapdoors. In this sense some examples of patents and utility models can be mentioned, such as ES2181581, ES2157770,

ES1055376 and ES1049753 for example, in which these types of doors for operator access are defined. Patent ES2157770 describes a solution in which the access door is formed by two semi-trapdoors, whereas in the rest of the examples the access door is formed by a single lid.

[0007] The lids of the access doors are formed by several parts, including a preferably bellmouthed and stepped stainless steel perimetric frame, and incorporating therein a concrete plate with a steel framework, sufficiently robust to withstand the stress both due to the passage of pedestrians and due to the passage of vehicles over the door.

[0008] Likewise, the lids of the access door are usually aided by an automatic opening and closing system, for example based on pneumatic or hydraulic cylinders compensating for the weight of the door, so that these doors can be easily handled by the operators.

[0009] In addition the lids forming the access door are complemented with protection handrails, which can be folded in the closing, remaining concealed inside the building, whereas in the open position they can be unfolded, such that together with the lids of the door they define a protection surround around the access opening for the purpose of preventing the risk of the passers-by falling inside.

[0010] The previously mentioned examples can present problems for accessing the inside of the building, especially when the building is formed in areas in which vehicles can circulate and consequently in which the structural features of the access door, for withstanding the considerable stress to which it is subjected, make said door very heavy due to its own mechanical strength and consequently, it is difficult to handle. For this reason, the necessary hydraulic or pneumatic struts to aid in opening the lids must be of high quality since they must ensure a good operation thereof for many years, which considerably increases their cost.

[0011] In addition the access doors for operators comprise a closure preventing the opening of said door when the industrial equipment which the building contains is in operation. Thus, as is defined for example in invention patent ES2181581, the access doors are normally closed by means of fixing screws which can only be removed through a special key provided by the manufacturer. These fixing screws can be accessed from outside the building, whereby they are exposed to external damage, such as acts of vandalism or atmospheric agents, the latter being able to cause the deterioration of said screws over time, due to rusting for example, and consequently making their removal impossible at the time of performing operation or maintenance work.

[0012] Likewise the access door pivots through a hinged shaft when it is subjected to opening and closing operations. The hinges joining the lid with the frame of the opening of the cover are normally outer hinges, therefore, as occurs with the closure, said hinges are exposed to external damages, problems being able to arise in the

opening and in the closing of the lid in operation or maintenance work.

[0013] Another drawback of these types of constructions is that water coming from rain can penetrate therein through the closure between the lid and the cover. To that end sealing gaskets are normally placed which can deteriorate and lose their properties over time, making it possible for water to penetrate inside the building, damaging the existing electronic and electrical equipment.

Description of the Invention

[0014] The present invention relates to an operator access door for underground buildings, which can be used for telephony applications, as handling and/or electric transformation centers, for water pumping facilities, for gas distribution facilities, etc. and which are structured from a body having a cover at its upper part, these buildings being able to be civil construction buildings or buildings of a prefabricated nature, made both of concrete and of other materials.

[0015] The operator access door comprising a main lid collapsible with respect to a frame is arranged on the mentioned cover, which lid is formed as a single part, made of a material with reduced weight and with a non-slippery surface, for example a metal material such as cast aluminum, which, as a result of the reinforcement means comprised by said lid, such as transverse and/or longitudinal reinforcement ribs, in turn has sufficient robustness to withstand the stress caused by the passage of pedestrians or even by the passage of vehicles on the lid itself. This lid also allows the easy access of the operators easily and working inside the building in maintenance and operation tasks.

[0016] Given the reduced weight of said lid, it allows using an automatic opening and closing system, which for example can consist of hydraulic or pneumatic struts which are simpler and have a lesser load than those necessary to open a heavier lid than those known up until now. These struts with a lesser load are in turn able to maintain the lid in its open position, ensuring the locking in this position, preventing any gust of wind or the fall of an object from accidentally closing said lid. Likewise, due to the reduced weight of the lid, in the event of deterioration of any of the struts, the stress which the operator must carry out in order to open and close the lid is the minimal.

[0017] This lid or main lid incorporates a second auxiliary lid integrated therein, which auxiliary lid conceals and protects at least one closure of the main lid, such as a padlock, a lock, etc., such that said closure cannot be to the object of acts of vandalism nor subjected to atmospheric agents which can deteriorate it. The auxiliary lid is thus provided with at least one closing element in order to prevent accessing the closure of the main lid, this closing element being able to consist of a fixing screw, for example an Allen screw. Furthermore, when opening the auxiliary lid, it can be completely separated from the main

lid or can be joined to the main lid through the mentioned closing element, such that with the loosening of said closing element, this auxiliary lid can be lifted and turned, leaving the access to the closure of the main lid free and preventing the possibility of said auxiliary lid being lost.

[0018] Another particularity of the operator access door according to this invention relates to the hinging elements which allow pivoting the main lid, which can consist of hinges which are installed at the inner part of the main lid, such that they are protected from external damage.

[0019] Both the space comprised between the frame and the main lid and the space between the main lid and the auxiliary lid, are duly sealed by means of sealing gaskets, for example rubber gaskets, such that the introduction of water, humidity etc. which can damage the equipment inside the building as well as the closure of the main lid, is prevented.

[0020] The access door for underground buildings is complemented with a protection means, such as a fence that is foldable and unfoldable on the frame of the access door for example, such that in the open position of the lid there is defined a protection surround preventing passers-by from accidentally falling inside the building.

Description of the Drawings

[0021] To complement the description and for the purpose of aiding to better understand the features of the invention according to practical preferred embodiments thereof, a set of drawings is attached as an integral part of said specification, in which the following has been shown with an illustrative and non-limiting character:

Figure 1 shows a perspective view of the access door for underground buildings according to the invention in the open position, in which the main lid of the access and the auxiliary lid with its closing element are shown, the auxiliary lid being integrated in said main lid.

Figure 2 shows another perspective view of the access door in the open position.

Figure 3 shows a detail of a possible embodiment of the invention, in which the main lid is shown with auxiliary lid open in order to allow the access to the closure of the main lid.

Figure 4 shows a detail of the main lid with the auxiliary lid closed, the closure of said auxiliary lid being ensured by means of a closing element.

Preferred Embodiment of the Invention

[0022] A preferred embodiment of the operator access door for underground buildings forming the object of this invention is described below.

[0023] Figure 1 shows an underground building (12) intended to be used as a handling and/or electric transformation center comprising therein electronic and elec-

trical equipment, formed by a body (2) and an upper cover (1), this building (12) being able to be a civil construction building or a building of a prefabricated nature, made both of concrete and of other materials.

[0024] As shown in Figures 1 and 2, the cover (1) of the underground building (12) comprises an access door according to the invention, which is formed by a main lid (4) collapsible toward the outside with respect to a frame (3) integrated in the upper cover (1), which cover has a non-slippery surface, it is configured in a single part and is made of a material with reduced weight, such as a metal material such as cast aluminum. This main lid (4) is also able to resist mechanical stress such as for example those caused by the passage of pedestrians or even by the passage of vehicles over such lid, said lid (4) comprising to that end transverse and longitudinal reinforcement ribs (13) providing it with sufficient mechanical strength.

[0025] Likewise, due to the reduced weight of the door, the lid (4) incorporates hydraulic or pneumatic struts (11), used for opening/closing the lid (4), with a lesser load than the struts used up until now. The feature of the reduced weight allows handling the door even without struts (11) in the event of gas loss of any of them, the stress which the operator must carry out in this case being minimal.

[0026] As shown in Figures 1, 3 and 4, said main lid (4) in turn comprises a second auxiliary lid (5) integrated therein, which auxiliary lid conceals and protects a closure (6) of the main lid (4) from the outside, which according to the electric company to which said building (12) belongs, can consist either of a padlock closure or a lock closure, as shown in Figure 3. Said auxiliary lid (5) is complemented with a closing element (7) which can be accessed from the outside, which element can consist of a fixing screw, such as an Allen screw for example, such that by means of its loosening it allows lifting and turning said lid (5) without the latter being separated from the main lid (4) and thus accessing the closure (6). Leaving the auxiliary lid (5) closed, the closure (6) is protected against possible external damage. In the closed position of the access door, the tightness between the lids (4, 5), as well as between the main lid (4) and the frame (3) is ensured by means of gaskets (9).

[0027] In addition, as shown in Figure 2, the main lid (4) comprises hinges (8), installed at the inner part of the frame (3), such that they are protected from any external damage they may experience.

[0028] Finally, as shown in Figures 1 and 2, this access door has a fence (10) that is foldable and unfoldable with respect to the frame (3), forming together with the main lid (4) in its open position a protection barrier preventing passers-by from accidentally falling inside the building (12).

Claims

1. An access door for underground buildings intended to house electronic, electrical, mechanical equipment or other equipment, defined by a body (2) finished in an upper cover (1), **characterized in that** it comprises a single main lid (4) collapsible toward the outside with respect to a frame (3) integrated in the upper cover (1), said lid (4) configured in a single part which is provided with reinforcement means (13).
2. An access door for underground buildings according to claim 1, **characterized in that** the main lid (4) has hinging elements (8) installed on its inner face and at the inner part of the frame (3), protected from the outside.
3. An access door for underground buildings according to any of the previous claims, **characterized in that** the main lid (4) is a metal lid.
4. An access door for underground buildings according to any of the previous claims, **characterized in that** the main lid (4) comprises at least one closure (6).
5. An access door for underground buildings according to claims 1 and 4, **characterized in that** it comprises an auxiliary lid (5) integrated inside the main lid (4) concealing and protecting the closure (6).
6. An access door for underground buildings according to claim 5, **characterized in that** the auxiliary lid (5) comprises at least one closing element (7) preventing or facilitating the access to the closure (6) of the main lid (4).
7. An access door for underground buildings according to claim 6, **characterized in that** the closing element (7) consists of a screw partially joining the main lid (4) with the auxiliary lid (5), which in the loosened position leaves the access to the closure (6) of the main lid (4) free while at the same time it links the auxiliary lid (5) with the main lid (4) preventing the auxiliary lid (5) from being lost.
8. An access door for underground buildings according to claim 1, **characterized in that** the reinforcement means (13) consist of transverse and/or longitudinal ribs.
9. An access door for underground buildings according to claim 2, **characterized in that** the hinging elements (8) consist of hinges.
10. An access door for underground buildings according to claim 3, **characterized in that** the main lid (4) is made of cast aluminum with a non-slippery surface.

11. An access door for underground buildings according to claim 1, **characterized in that** it comprises a protection fence (10) foldable and unfoldable with respect to the frame (3), forming together with the main lid (4) in its open position a protection barrier preventing passers-by from accidentally falling inside the building (12). 5
12. An access door for underground buildings according to claim 1, **characterized in that** it comprises an automatic opening and closing system (11). 10
13. An access door for underground buildings according to claim 12, **characterized in that** the automatic opening and closing system (11) consists of hydraulic or pneumatic struts. 15
14. An access door for underground buildings according to claims 1 and 5, **characterized in that** both between the lid (4) and the frame (3) and between the lids (4, 5) there is at least one sealing gasket (9). 20
15. An access door for underground buildings according to claim 4, **characterized in that** the closure (6) consists of a padlock closure. 25
16. An access door for underground buildings according to claim 4, **characterized in that** the closure (6) consists of a lock closure. 30
17. An access door for underground buildings according to any of the previous claims, **characterized in that** the building (12) consists of a handling and/or electric transformation center. 35

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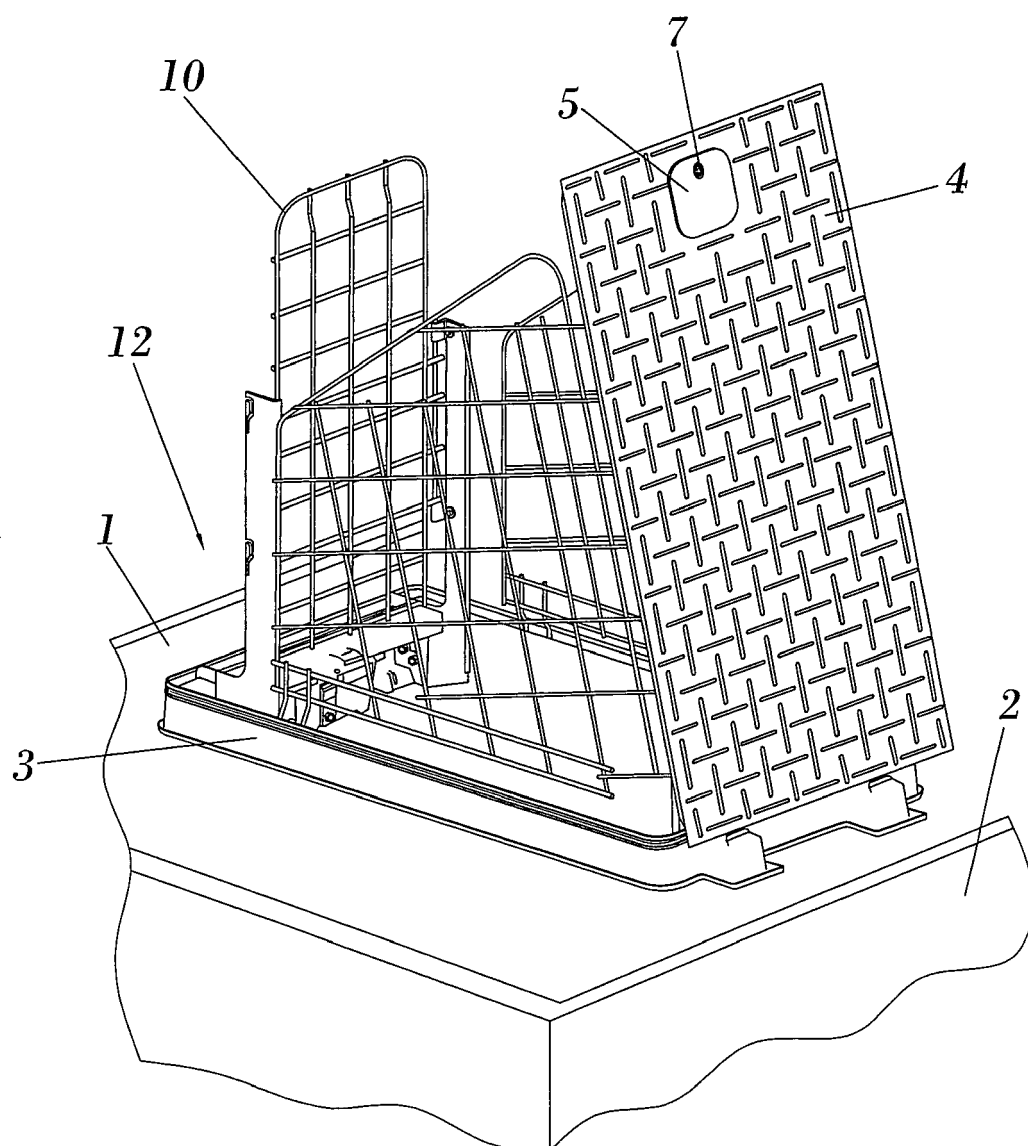


FIG. 1

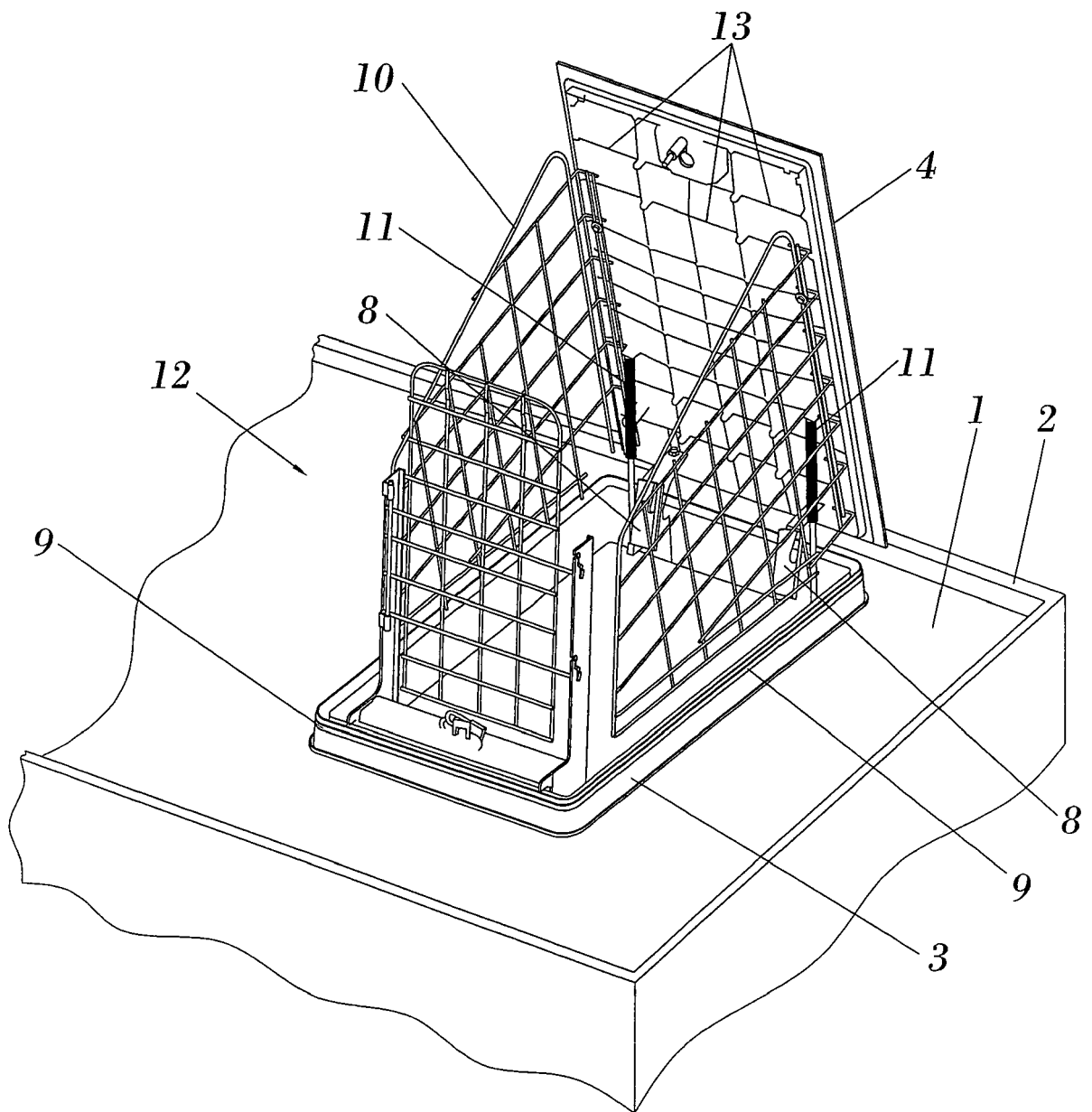


FIG. 2

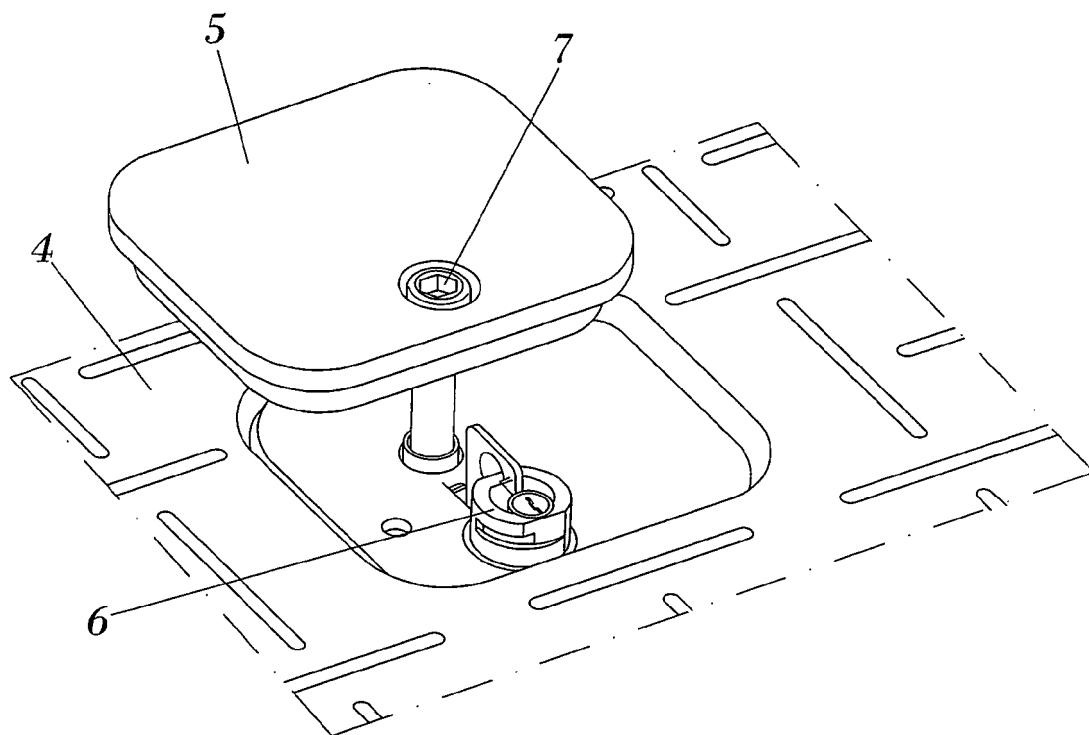


FIG. 3

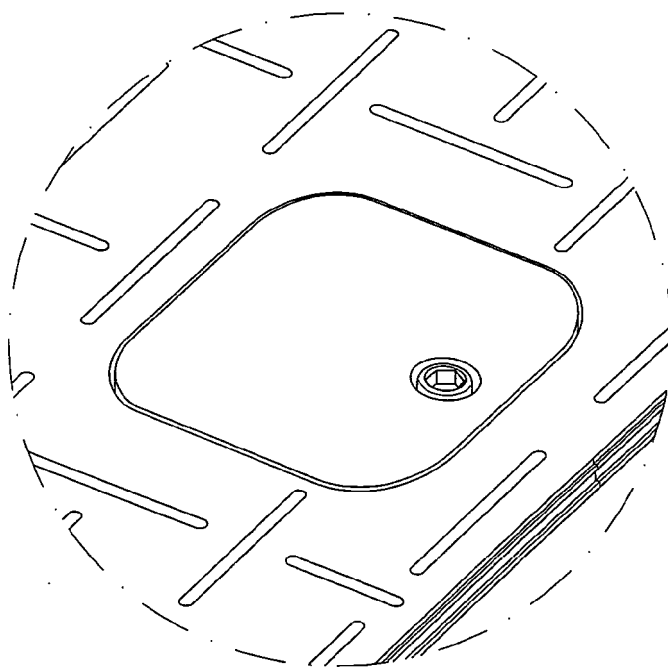


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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