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(54) **Cover of a manhole**

Mannlochdeckel

Regard de chaussée

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US-A1- 2011 200 388

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Description

Technical field

[0001] The present invention relates to a ground cover according to the preamble of the first claim.

Background art

[0002] A ground cover known in the art as disclosed in the art as disclosed in US 20110200388 A comprises an inner frame, arranged to be filled with a ground surface material, e.g. paving stones, and an outer frame. The outer frame is embedded in a ground surface layer and is arranged to support and laterally enclose the inner frame. Provided between side walls of the inner and outer frames is a gap, so that the inner frame is removably contained within the outer frame.

Disclosure of the invention

[0003] An aim of the present invention is to provide a ground cover with a longer life span.

[0004] This aim is achieved according to the invention with a ground cover showing the technical characteristics of the first claim.

[0005] The invention provides a ground cover comprising an inner frame, arranged to be filled with a ground surface material, and an outer frame, arranged to be embedded in a ground surface layer and arranged to support and laterally enclose the inner frame, wherein a gap of predetermined dimensions is provided between side walls of the inner and outer frames so that the inner frame is removably contained within the outer frame. The ground cover comprises a first seal at its top side, in a first seal material, forming a resilient closure of the gap between the side walls of the inner frame and the outer frame.

[0006] The first seal forms a resilient closure that prevents, or at least limits, dirt entering the gap between the frames from above. The resilience of the closure offers the advantage that dirt located at the closure can follow the movements of the inner frame relative to the outer frame when the cover is under pressure, such as for example from a car driving over it. The inventor has found that with a rigid, non-resilient closure, dirt located at the closure can lead to deformations of the inner and/or outer frame under such pressure, so that the closure is opened and dirt can freely enter and fill the gap, with the result that the inner frame can no longer, or only with great difficulty, be taken out of the outer frame. All of this can be prevented by providing the first seal.

[0007] In a preferred embodiment, the first seal is provided at the inside of the outer frame, and the inner frame is provided at the top with an outwardly extending flange abutting the first seal. The inventor has found that providing the first seal at the inside of the outer frame yields a better closure than providing the first seal at the outside of the inner frame, because then the closure holds better under pressure on the inner frame.

[0008] In a preferred embodiment, the first seal is a T-profile, wherein the upper part of the T-profile is accommodated in a slot provided in the inside of the outer frame. The inventor has found that this embodiment yields a precise and sturdy closure between the two frames.

[0009] In a preferred embodiment, the first seal material is EPDM rubber. The inventor has found that this material has the best elastic properties.

[0010] In a preferred embodiment, the outer frame has a bottom wall with a central opening, and the ground cover comprises a second seal in a second seal material at the bottom around the central opening, with which the inner frame rests upon the bottom wall of the outer frame. This way, the ground cover has a seal around the central opening that prevents or at least limits gases and scents escaping from e.g. an underlying well covered by the ground cover.

[0011] In a preferred embodiment, the second seal is accommodated in a slot at the underside of the inner frame. The weight of the inner frame, which is filled with ground surface material, presses this rubber against the bottom wall of the outer frame, thereby sealing off the underlying well substantially completely, allowing virtually no gases or scents to escape.

[0012] In a preferred embodiment, the second seal material is EPDM rubber. The inventor has found that this material has the best elastic properties.

Brief description of the drawings

[0013] The invention will be further elucidated by means of the following description and the appended figures.

Figure 1 shows a cross section of a first embodiment of a ground cover according to the invention.
Figure 2 shows a detail of figure 1.

Modes for carrying out the invention

[0014] The present invention will hereafter be described with respect to particular embodiments and with reference to certain drawings, yet the invention is not limited thereto, but only by the claims. The drawings presented here are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated, meaning that they are not drawn to scale and are solely for illustrative purposes. The dimensions and the relative dimensions do not necessarily correspond to actual reductions to practice of the invention.

[0015] Furthermore, the terms first, second, third and the like in the description and in the claims are used for distinguishing between similar elements, and not necessarily for describing a sequential or chronological order. The terms are interchangeable under appropriate circumstances and the embodiments of the invention can

operate in other sequences than described or illustrated herein.

[0016] Moreover, the terms top, bottom, over, under and the like in the description and the claims are used for descriptive purposes, and not necessarily for describing relative positions. The terms so used are interchangeable under appropriate circumstances and the embodiments of the invention described herein can operate in other orientations than described or illustrated herein.

[0017] The term "comprising" and terms derived from it, as used in the claims, should not be interpreted as being restricted to the means listed thereafter; it does not exclude other elements or steps. The term should be interpreted as specifying the stated features, integers, steps or components as referred to, but does not preclude the presence or addition of one or more other features, integers, steps or components, or groups thereof. Thus, the scope of the expression "a device comprising means A and B" should not be limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B.

[0018] The ground cover shown in figure 1 comprises an inner frame 1 and an outer frame 2. The inner frame comprises side walls 11,12 and a bottom wall 13, together forming a bowl 14, provided to be filled with ground surface material of e.g. a ground paving such as paving stones. The outer frame 2 comprises side walls 21,22 and a partial bottom plate 23 with a central opening 24. The outer frame 2 is placed in a ground surface layer over e.g. a well or piping to be covered (not shown). The dimensions of the inner and outer frames are mutually adapted so that the outer frame encloses the inner frame at the sides, wherein a gap 3 of predetermined dimensions is provided between the side walls of the frames, so that the inner frame is removably contained within the outer frame. The ground cover comprises a first seal 4 at its top side and a second seal 5 at its bottom side.

[0019] The predetermined dimensions of the gap are preferably 1 to 10 mm (on either side of the inner frame) for a cover height of 60 to 100 mm. In the embodiment shown here, the gap 3 has a width of about 5 mm and the height is about 80 mm. The dimensions may of course be adapted by the person skilled in the art according to the situation, wherein for example a somewhat larger gap is provided for a larger and/or higher cover to ensure removability. The dimensions stated here merely serve as examples and should not be taken as limiting.

[0020] The first seal 4 comprises a T-profile 25 in a first seal material, e.g. EPDM rubber, which together with an outwardly extending flange 15 at the top of the inner frame 1 forms a resilient closure meant to prevent or at least limit dirt entering the gap 3. The upper part of the T-profile is fully accommodated in a recess provided in the wall of the outer frame, ensuring a sturdy mechanical anchoring of the first seal 4 in the wall of the outer frame 2. The first seal may however be implemented in other ways as well.

[0021] The second seal 5 comprises a round shaped seal profile 16 and is accommodated in a corresponding slot at the bottom of the side walls of the inner frame 1. The inner frame 1 rests upon the bottom plate 23 of the outer frame 2 with this seal profile 16, such that it is compressed and can prevent or at least limit gases and scents escaping from e.g. an underlying well covered by the ground cover. The second seal is preferably also made from EPDM rubber. It may, however, have other shapes and be made from other seal materials as well.

[0022] The inner frame 1 is further provided with lifting means at the top. In the embodiment shown here, these lifting means comprise the threaded holes 17 as shown, into which a T-shaped lifting member (not shown) is screwed for lifting the inner frame 1, and in which an ordinary screw is inserted in use for filling the threaded hole. These lifting means are preferably located in the corners of the inner frame, either on both ends of a diagonal or in all four corners, depending on size. The lifting means may however also be implemented in any other way known to the person skilled in the art.

[0023] The inner frame 1 is executed as a rectangular assembly of side walls 11,12, fixed to each other in the corners by welding, and a bottom plate 13, held with some tolerance in holding elements 18 provided around the bottom plate. The side walls 11,12 are preferably made from a first material, preferably a lighter material such as for example aluminum, and the bottom plate 13 from a second material, preferably a sturdier material such as for example galvanized steel. This way, a sturdy structure can be achieved which is able to withstand any common load but is at the same time relatively light. The tolerance between the two materials is for absorbing dilatation. In embodiments of larger dimensions, the bottom plate can be provided with strengthening elements at the underside of the bottom plate. In alternative embodiments, other materials known to the person skilled in the arts may also be used. In alternative embodiments, shapes other than rectangular may also be used.

[0024] The side and bottom walls of both the inner and the outer frame preferably, but not crucially, extend substantially perpendicular to each other. This way, the frames each provide vertical walls against which paving stones of a ground paving can be laid. The side walls may however deviate from the vertical by a small angle, e.g. 1 to 2°.

[0025] The ground cover shown in figures 1 and 2 functions as follows.

[0026] The outer frame 2 is installed in a ground surface layer (not shown), e.g. a paving made with paving stones, over e.g. a well or piping to be covered (not shown) in the central opening 24. The inner frame 1 is filled with ground surface material, e.g. the same paving, and placed in the outer frame 2, with the inner frame 1 resting with seal profile 16 of the second seal 5 on the bottom plate of the outer frame 2. The second seal 5 thus forms a closure that prevents or at least limits gases and/or scents escaping from the underlying well or piping.

[0027] The gap 3 provided between the inner and outer frames to ensure removability of the inner frame is closed at the top by means of the first seal 4, formed by the T-profile 25 and the outwardly extending flange 15 abutting each other. It is noted that the inner frame 1 is substantially supported by the second seal 5; at the level of the first seal 4, the components abut each other, though substantially without supporting. The first seal 4 thereby forms a resilient closure that prevents, or at least limits, dirt entering the gap 3 between the frames from above. The resilience of the closure offers the advantage that dirt located at the closure can follow the movements of the inner frame relative to the outer frame when the cover is under load, such as for example from a car driving over it. The inventor has found that with a rigid, non-resilient closure, dirt located at the closure can lead to deformations of the inner and/or outer frame under such pressure, so that the closure is opened and dirt can freely enter and fill the gap, with the result that the inner frame can no longer, or only with great difficulty, be taken out of the outer frame. All of this can be prevented by providing the resilient first seal.

Claims

1. Ground cover comprising an inner frame (1), arranged to be filled with a ground surface material, and an outer frame (2), arranged to be embedded in a ground surface layer and arranged to support and laterally enclose the inner frame, wherein a gap (3) of predetermined dimensions is provided between side walls of the inner frame and the outer frame so that the inner frame is removably contained within the outer frame, **characterized in that** the ground cover comprises a first seal (4) at its top side, in a first seal material, forming a resilient closure of the gap between the side walls of the inner and outer frames.

2. Ground cover according to claim 1, **characterized in that** the first seal (4) is provided at the inside of the outer frame, and **in that** the inner frame is provided at the top with an outwardly extending flange (15) abutting the first seal.

3. Ground cover according to any of the previous claims, **characterized in that** the first seal comprises a T-profile (25), wherein the upper part of the T-profile is accommodated in a slot provided at the inside of the outer frame.

4. Ground cover according to any of the previous claims, **characterized in that** the first seal material is EPDM rubber.

5. Ground cover according to any of the previous claims, **characterized in that** the outer frame has a bottom wall (23) with a central opening, and **in that** the ground cover comprises a second seal (5) in a second seal material at the bottom around the central opening, with which the inner frame rests upon the bottom wall (23) of the outer frame.

6. Ground cover according to any of the previous claims, **characterized in that** the second seal is accommodated in a slot at the underside of the inner frame.

7. Ground cover according to any of the previous claims, **characterized in that** the second seal material is EPDM rubber.

8. Ground cover according to any of the previous claims, **characterized in that** the inner frame is an assembly of side walls (11,12) and a bottom plate (13), held with some tolerance in holding elements (18) provided around the bottom plate at the bottom of the side walls.

9. Ground cover according to claim 8, **characterized in that** the side walls are made from a first material, preferably a lighter material, and **in that** the bottom plate is made from a second material, preferably a sturdier material.

Patentansprüche

1. Bodenabdeckung, umfassend einen inneren Rahmen (1), der ausgelegt ist, mit einem Bodenoberflächenmaterial gefüllt zu werden, und einen äußeren Rahmen (2), der ausgelegt ist, in eine Bodenoberflächenschicht eingebettet zu werden, und ausgelegt ist, den inneren Rahmen zu stützen und seitlich zu umschließen, wobei ein Spalt (3) von vorbestimmten Abmessungen zwischen Seitenwänden des inneren Rahmens und des äußeren Rahmens bereitgestellt ist, sodass der innere Rahmen entfernbar in dem äußeren Rahmen aufgenommen ist, **dadurch gekennzeichnet, dass** die Bodenabdeckung eine erste Dichtung (4) an ihrer Oberseite in einem ersten Dichtungsmaterial umfasst, sodass eine elastischer Verschluss des Spalts zwischen den Seitenwänden des inneren und des äußeren Rahmens gebildet wird.

2. Bodenabdeckung nach Anspruch 1, **dadurch gekennzeichnet, dass** die erste Dichtung (4) an der Innenseite des äußeren Rahmens bereitgestellt ist und dass der innere Rahmen an der Oberseite mit einem sich nach außen erstreckenden Flansch (15) bereitgestellt ist, der an die erste Dichtung angrenzt.

3. Bodenabdeckung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die

erste Dichtung ein T-Profil (25) umfasst, wobei der obere Teil des T-Profils in einem Schlitz untergebracht ist, der an der Innenseite des äußeren Rahmens bereitgestellt ist.

4. Bodenabdeckung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das erste Dichtungsmaterial EPDM-Kautschuk ist.

5. Bodenabdeckung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der äußere Rahmen eine Bodenwand (23) mit einer zentralen Öffnung aufweist und dass die Bodenabdeckung eine zweite Dichtung (5) in einem zweiten Dichtungsmaterial am Boden um die zentrale Öffnung umfasst, mit der der innere Rahmen auf der Bodenwand (23) des äußeren Rahmens aufliegt.

6. Bodenabdeckung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die zweite Dichtung in einem Schlitz untergebracht ist, der an der Unterseite des inneren Rahmens bereitgestellt ist.

7. Bodenabdeckung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das zweite Dichtungsmaterial EPDM-Kautschuk ist.

8. Bodenabdeckung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der innere Rahmen eine Anordnung von Seitenwänden (11, 12) und einer Bodenplatte (13) ist, die mit einer gewissen Abweichung in Halteelementen (18) gehalten wird, die um die Bodenplatte am Boden der Seitenwände bereitgestellt sind.

9. Bodenabdeckung nach Anspruch 8, **dadurch gekennzeichnet, dass** die Seitenwände aus einem ersten Material, vorzugsweise einem leichteren Material hergestellt sind und dass die Bodenplatte aus einem zweiten Material, vorzugsweise einem robusteren Material hergestellt ist.

Revendications

1. Couvercle de sol comprenant un cadre intérieur (1), agencé pour être rempli d'un matériau de surface de sol, et un cadre extérieur (2), agencé pour être encastré dans une couche de surface de sol et agencé pour supporter et entourer latéralement le cadre intérieur, dans lequel un espace (3) de dimensions prédéterminées est prévu entre les parois latérales du cadre intérieur et du cadre extérieur de sorte que le cadre intérieur est contenu de manière amovible dans le cadre extérieur, **caractérisé en ce que** le couvercle de sol comprend un premier joint (4) sur son côté supérieur, dans un premier matériau de joint, formant une fermeture élastique de l'espace entre les parois latérales des cadres intérieur et extérieur.

2. Couvercle de sol selon la revendication 1, **caractérisé en ce que** le premier joint (4) est prévu sur le côté intérieur du cadre extérieur, et **en ce que** le cadre intérieur est pourvu sur le dessus d'une bride (15) s'étendant vers l'extérieur et jointive au premier joint.

3. Couvercle de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le premier joint comprend un profil en T (25), la partie supérieure du profil en T étant logée dans une fente prévue sur le côté intérieur du cadre extérieur.

4. Couvercle de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le matériau du premier joint est du caoutchouc EPDM.

5. Couvercle de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le cadre extérieur a une paroi de fond (23) avec une ouverture centrale, et **en ce que** le couvercle de sol comprend un deuxième joint (5) dans un deuxième matériau de joint sur le fond autour de l'ouverture centrale, par lequel le cadre intérieur repose sur la paroi de fond (23) du cadre extérieur.

6. Couvercle de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le deuxième joint est logé dans une fente sur le côté inférieur du cadre intérieur.

7. Couvercle de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le matériau du deuxième joint est du caoutchouc EPDM.

8. Couvercle de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le cadre intérieur est un assemblage de parois latérales (11, 12) et d'une plaque de fond (13), maintenu avec une certaine tolérance dans des éléments de maintien (18) prévus autour de la plaque de fond au bas des parois latérales.

9. Couvercle de sol selon la revendication 8, **caractérisé en ce que** les parois latérales sont réalisées dans un premier matériau, de préférence un matériau plus léger, et **en ce que** la plaque de fond est réalisée dans un deuxième matériau, de préférence un matériau plus robuste.

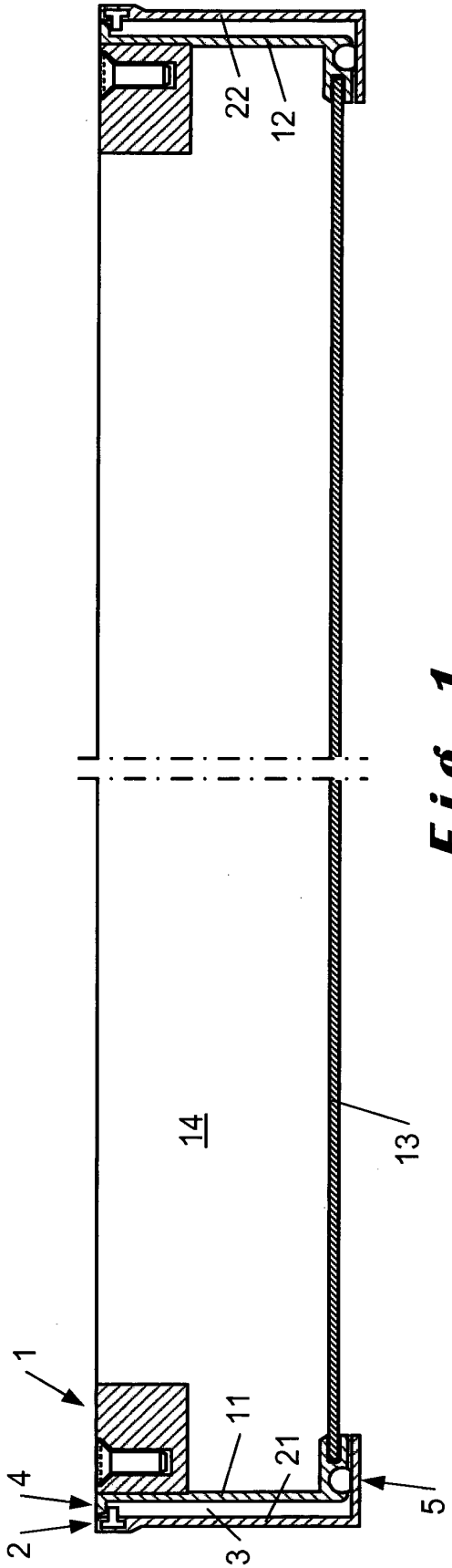


Fig. 1

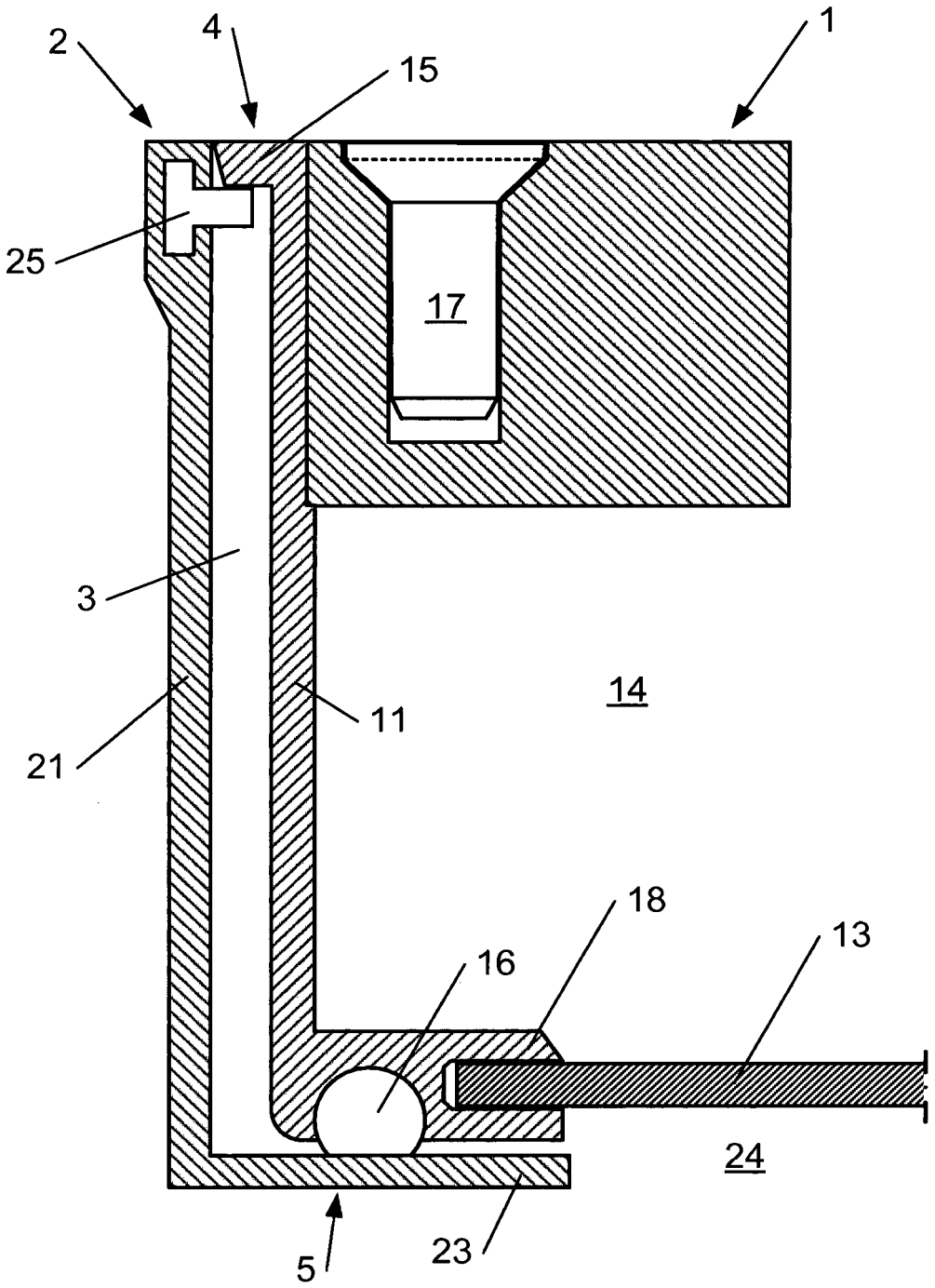


Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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