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(54) **FLOOD BARRIER AND THE USE THEREOF**

(57) Flood barrier (1) for temporarily sealing an opening in a building, said flood barrier (1) comprising a flood barrier panel (2), wherein said flood barrier panel (2) has a bottom edge (5), wherein said flood barrier panel (2) has a top edge (3), wherein said flood barrier panel (2) has two side edges (5), wherein at least one said side edge (5) is provided with an inflatable flexible chamber (6), whereby said side edge (5) is provided with an end cap (8) disposed over said side edge (5) and which is, slidably in the direction in which said bottom edge (4) extends, attached to said flood barrier panel (2), wherein said inflatable flexible chamber (6) is disposed between said side edge (4) of said flood barrier panel (2) and said end cap (8) so that, upon inflation of said inflatable flexible chamber, (6) said end cap (8) is pushed outwards.

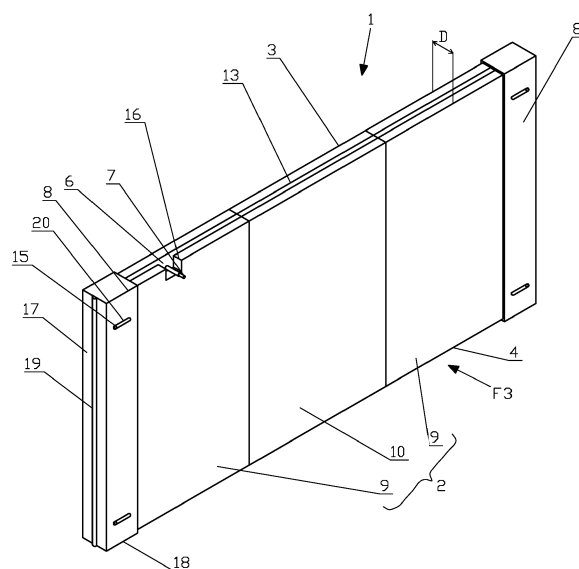


Fig 2

Description

[0001] The present invention relates to a flood barrier and the use thereof.

[0002] Such a flood barrier is intended as a temporary provision which can be placed in openings in buildings, mostly in door openings, to prevent water from outside the building flowing in. Such a flood barrier is applied in particular in buildings situated in areas where the water level is mostly low, but where such a water level can incidentally occur that water could flow into the buildings.

[0003] A known type of such a flood barrier consists mainly of a flood barrier panel provided with an inflatable chamber at the side edges and bottom edge which, in inflated state, both at the side edges and at the bottom edges, works as a seal, and possibly also provides a clamping force in horizontal direction to keep the flood barrier in its place.

[0004] Such flood barriers are, for example, disclosed in US2003102637, FR2844826, US2016047102 and GB2252348.

[0005] The known flood barriers with an inflatable chamber have as a problem, however, that good sealing in the corners is difficult, because the inflatable chamber does not snugly abut to a right-angled corner, such as is common for an opening in a building, whereby leakage can occur there, or whereby complex modifications are needed to prevent leakage.

[0006] This problem is further aggravated by the part of the inflatable chamber at the bottom edge in an inflated state being capable of exerting a significant upward force on the panel, greater than the weight of the panel, so that said panel is pushed upward and the risk of leakage increases.

[0007] This is certainly the case when the clamping force exerted by the inflatable chamber in horizontal direction is used exclusively or substantially to keep the flood barrier in its place, since the flexible chamber must then be inflated to a significant pressure.

[0008] The present invention seeks to offer a solution for the aforementioned and other disadvantages and to this end provides a flood barrier for the temporary sealing of an opening in a building, wherein the flood barrier comprises a flood barrier panel consisting of one panel or of a number of separate partial panels, wherein said flood barrier panel has a bottom edge, wherein said flood barrier panel has a top edge, wherein said flood barrier panel has two side edges at least one said side edge being provided with an inflatable flexible chamber to be able to increase the width of the flood barrier and thereby affix it in the opening, wherein said side edge is provided with an end cap disposed over the side edge and which is, slidably in the direction in which the bottom edge extends, attached to said flood barrier panel, wherein said inflatable flexible chamber is disposed between said side edge of said flood barrier panel and said end cap so that, upon inflation of said inflatable flexible chamber, said end cap is pushed outwards, that is, away from the centre of said flood barrier panel.

[0009] In this respect, said flood barrier panel, during use, is wedged with the side edges against the sides of the opening, normally speaking a door opening. The bottom edge is the edge which, upon use, is directed downwards and which, while in use, rests against a floor, threshold or other horizontal bottom side of the opening.

[0010] The advantage hereof is that, thanks to said end cap, a much better seal at the bottom corners of the flood barrier is obtained. To this end, said end cap is, normally speaking, implemented such that its flanking side and bottom side mutually form a right-angle so that they snugly abut the mostly rectangular form of the opening that is to be closed off.

[0011] Normally speaking, said end cap encompasses the whole side edge.

[0012] In a preferred embodiment, at least one of said end cap and said flood barrier panel is provided with at least one guiding slot which runs at least substantially parallel to the bottom edge, wherein the other of said end cap and said flood barrier panel is provided with a protrusion which, with regard to position and size, is complementary to the guiding slot in order to guide, by means of the guiding slot and the protrusion, a sliding movement of said end cap with respect to said flood barrier panel.

[0013] Preferably, both said side edges are provided with a said inflatable flexible chamber and a said slidable end cap, and said inflatable flexible chambers on both side edges of said flood barrier panel are the same.

[0014] In another preferred embodiment, said inflatable flexible chamber is also disposed at the bottom edge of said flood barrier panel to form an inflatable seal at the bottom side.

[0015] In a preferred embodiment, in each of the top edge, bottom edge and side edges at which a said inflatable flexible chamber resides, a groove is implemented running in the direction in which the related edge extends, said inflatable flexible chamber being disposed in said groove or grooves, so that said inflatable flexible chamber cannot easily slide away.

[0016] With further preference, said groove or grooves is/are in this respect such that when said inflatable flexible chamber is not inflated or is inflated to atmospheric pressure, said inflatable flexible chamber, at the places where such a groove is implemented, can completely reside in the groove or grooves. By this, said inflatable flexible chamber in non-inflated state does not protrude outside the grooves and said inflatable flexible chamber is protected against damage that could undo the action of the flood barrier.

[0017] Another aspect of the invention is defined by the following clauses.

[0018] Clause 1.- A flood barrier for the temporary sealing of an opening in a building, wherein the flood barrier comprises a flood barrier panel, wherein said flood barrier panel has two side edges and a bottom edge, wherein said flood barrier panel is provided with an inflatable flexible chamber disposed at the bottom edge of said flood barrier panel and at at least one of said side edges of said flood barrier panel, wherein in or at said bottom edge a first groove is implemented extending in the direction in which said bottom edge extends, and which preferably extends over the whole bottom edge, wherein said first groove is open and has a first open width, wherein in said at least one of said side edges a second groove is implemented extending in the direction in which the related side edge extends and which preferably extends over the whole related side edge, wherein said second groove is open and has a second open width, wherein said inflatable flexible chamber is disposed in said first groove and second groove, wherein the ratio between said first open width and said second open width is less than 1.

[0019] In this respect, said flood barrier panel, during use, is affixed with said side edges against the flanking sides of the opening, normally speaking a door opening. Said bottom edge is the edge which, upon use, is directed downwards and which, while in use, rests against a floor, threshold or other horizontal bottom side of the opening.

[0020] To avoid unclarity, it is mentioned that said ratio is numerically equal to said first open width divided by said second open width.

[0021] Said invention has as an advantage that, upon inflation of said inflatable flexible chamber, the latter, at said bottom edge, has a less wide contact area upon which an outwardly directed force can be exerted than at said side edge. In this way, the required force can be exerted sidewise to clamp the flood barrier firmly in the opening, without exerting at said bottom edge an excessive upward force that would lead to the disadvantage described above.

[0022] Also, by the smaller open width of said first groove, said inflatable flexible chamber will only emerge from said first groove at a higher pressure, even in the case that said inflatable flexible chamber were to start exerting an upwardly directed force on said flood barrier panel, the flood barrier already being relatively firmly clamped at that moment, so that said upwardly directed force has few or no consequences.

[0023] Clause 2.- Preferably, said ratio is less than 0.9, with greater preference less than 0.8, with even greater preference less than 0.7, with even greater preference less than 0.6, with even greater preference less than 0.5 and with even greater preference less than 0.4.

[0024] Clause 3.- In a preferred embodiment, both side edges of said flood barrier panel are provided with a said second groove, wherein said inflatable flexible chamber in said second groove is disposed at both side edges of said flood barrier panel.

[0025] Clause 4.- In a preferred embodiment, the depth and width of said first groove and said second groove are such that, when said inflatable flexible chamber is not inflated or is only inflated to atmospheric pressure, said inflatable flexible chamber, at the places where such a first groove and second groove are disposed, can reside completely in said first groove and said second groove.

[0026] In this way, said inflatable flexible chamber in non-inflated state does not protrude outside the grooves and said inflatable flexible chamber is protected against damage that could undo the action of the flood barrier.

[0027] Clause 5.- Preferably, said first open width is greater than or equal to 5 mm, and with greater preference greater than or equal to 8 mm, since otherwise the risk would be present that said inflatable flexible chamber upon inflation cannot or can not sufficiently emerge from said first groove to obtain a good seal.

[0028] Clause 6.- In a preferred embodiment, said side edge or side edges on which said inflatable flexible chamber is disposed is/are provided with an end cap disposed over said side edge and which is attached, slidably in the direction in which said bottom edge extends, to said flood barrier panel, wherein said inflatable flexible chamber is disposed between the related side edge of said flood barrier panel and said end cap, so that, upon inflation of said inflatable flexible chamber, said end cap is pushed outwards, that is, away from the centre of said flood barrier panel.

[0029] The advantage hereof is that, thanks to said end cap, a much better seal is obtained at the bottom corners of the flood barrier. To this end, said end cap is, normally speaking, implemented such that its flanking side and bottom side mutually form a right-angle so that they snugly abut the mostly rectangular form of the opening that is to be closed off.

[0030] Normally speaking, said end cap encompasses the whole side edge.

[0031] Clause 7.- Preferably, said second open width is less than 70 mm, and with greater preference less than 50 mm.

[0032] In a preferred embodiment of the flood barrier according to any of the aforementioned variants, said end cap extends to under said bottom edge of said flood barrier panel, so that there is room for a seal at said bottom edge of said flood barrier panel while said end caps can still abut well in the corner.

[0033] Preferably in this respect, said end cap, at parts thereof arranged to rest against a wall and/or against a floor upon use of the flood barrier, is provided with a seal made from elastic plastic or rubber.

[0034] The hardness of said seal can hereby be independently chosen of the hardness of said inflatable flexible chamber. Hereby the two functions of said inflatable flexible chamber in traditional flood barriers, to wit exerting a horizontal force and affording a minimal water permeability to the transition to the wall around the opening, can be optimised independently of each other by choosing optimal materials for said inflatable flexible chamber and the seal independently of each other, this as opposed to prior art flood barriers.

[0035] In a preferred embodiment of the flood barrier according to any of the aforementioned variants, said inflatable flexible chamber is annular.

[0036] This has as an advantage that such flexible inflatable chambers are cheaply and easily obtainable, since they correspond to an inner tube for a bicycle or a similar tube.

[0037] In this respect, in a preferred embodiment, said flood barrier panel has a top edge and said inflatable flexible chamber is arranged via the top edge, bottom edge and side edges of said flood barrier panel around said flood barrier panel, and is preferably tensioned in that state.

[0038] This is an easy manner of application, requiring few or no attachment means, but in which said inflatable flexible chamber remains in place by its own form and tension.

[0039] Preferably in this respect, said end cap or end caps is/are removable and can be placed back again, whereby said inflatable flexible chamber can be easily replaced.

[0040] Said flood barrier panel according to any of the aforementioned variants can consist of one panel or of a number of mutually coupled partial panels, but in a preferred embodiment said flood barrier panel consists of at least two partial panels, in which the partial panels are mutually detachable. This allows compact storage when the flood barrier is not being used.

[0041] In this respect, in a preferred embodiment, the partial panels are pushed watertightly against each other by said inflatable flexible chamber when it is in an inflated state and when it is inflated to a minimal pressure above atmospheric pressure, in which said minimal pressure is 50 kPa, is preferably 100 kPa, with greater preference is 140 kPa, and with even greater preference is 150 kPa.

[0042] This can be achieved by implementing said inflatable flexible chamber as an annular inflatable flexible chamber and choosing the correct size for the same, so that it exerts a sufficient force on the partial panels in inflated state.

[0043] This has as an advantage that no specific measures are needed to allow the partial panels to mutually connect in a watertight manner, so that installing/uninstalling the flood barrier is very simple.

[0044] The invention further relates to the use of a flood barrier such as described above to protect a building against inflowing water, wherein the flood barrier, with said inflatable flexible chamber in non-inflated state, is placed in an opening in a building, and wherein said inflatable flexible chamber is subsequently inflated in order to thereby increase the width of the flood barrier and affix the flood barrier in the opening.

[0045] In this respect, said end cap or end caps is/are not attached to the building.

[0046] Preferably in this respect, said inflatable flexible chamber is first inflated to a first pressure whereby the width of the flood barrier is increased such that it is clamped in the opening and whereby said inflatable flexible chamber, at the bottom edge of said flood barrier, is not pushed against the bottom side of said opening, said inflatable flexible chamber subsequently being inflated to a higher second pressure, whereby said inflatable flexible chamber, at said bottom edge of said flood barrier panel, is pushed against the bottom side of the opening and works as a seal, and whereby said inflatable flexible chamber exerts a higher horizontal clamping force than for said first pressure.

[0047] In order to clarify the invention, a preferred embodiment is hereinafter described, with reference to the following drawings, wherein

Figure 1 illustrates in perspective the use of a flood barrier according to the invention,

Figure 2 illustrates in perspective a flood barrier according to the invention,

Figure 3 illustrates a front elevation of the flood barrier of Figure 2,

Figure 4 illustrates the same as Figure 3, but with some parts removed,

Figure 5 illustrates a top view according to F5 of the flood barrier of Figure 2,

Figure 6 illustrates a bottom view according to F6 of the flood barrier of Figure 2,

Figure 7 illustrates a cross section according to VII-VII of the flood barrier of

Figure 2 in a state in which it is not in use,

Figure 8 illustrates a cross section according to VIII-VIII of the flood barrier of

Figure 2 in a state in which it is not in use,

Figures 9 respectively 10 illustrate cross sections such as Figures 7 respectively 8 respectively, in a state in which the flood barrier is prepared for use, and

Figures 11 and 12 illustrate cross sections such as Figures 7 and 8 respectively, in a state in which the flood barrier is in use.

[0048] The flood barrier 1 illustrated in the drawings consists substantially of the following parts: a flood barrier panel 2 with a top edge 3, a bottom edge 4 and two side edges 5; an annular inflatable flexible chamber 6, made of rubber, and provided with a valve 7; and two end caps 8 disposed over said side edges 5 and encompassing said side edges 5.

[0049] In this example, said flood barrier panel 2 consists of three partial panels, to wit two end panels 9 and a centre panel 10. The centre panel 10 and the end panels 9 are provided with round holes 11, which in the case of the centre panel 10 pass entirely through the centre panel. Two aluminium tubes 12 are slid in the holes of the centre panel 10

and the end panels 9, so that said centre panel 10 and said end panels 9 are mutually coupled.

[0050] In principle, said partial panels 9,10 can be made of standard plastics, such as HDPE.

[0051] Obviously, the precise width B of said flood barrier panel 2 is dependent on the dimension of the opening of a building in which the flood barrier 1 is to be placed, and in this example is 110 cm. The height H in this example is 50 cm and the thickness D in this example is 6 cm.

[0052] The flood barrier panel 2, at its top edge 3 and bottom edge 4, over the whole length of the related top edge 3 and bottom edge 4, is provided with a first groove 13, having a depth d1 of 3 cm and a maximal width b1 of 3 cm. Said first groove 13 is open, and has, at its open flanking side, a first open width o1 of 10 mm.

[0053] Said flood barrier panel 2, at its side edges 5, over the whole length of the related side edges 5, is provided with a second groove 14, having a depth d2 of 3 cm and a maximal width b2 of 3 cm. Said second groove 14 is open, and has, at its open flanking side, a second open width o2 of 30 mm. The transitions between said first grooves 13 and said second grooves 14 are rounded.

[0054] Said end panels 9 are provided with studs 15 on the surface, near said side edges 5.

[0055] One of said end panels 9 is provided with a recess 16 in the side wall of the first groove 13 at the top edge 3.

[0056] The annular inflatable flexible chamber 6 in this example is a standard bicycle inner tube for a wheel size of 29 inches. Said inflatable flexible chamber 6 is disposed in said first grooves 13 and second grooves 14 and encompasses said flood barrier panel 2. Said inflatable flexible chamber 6 has a valve 7 that protrudes outwards via the recess 16.

[0057] Obviously an annular flexible chamber 6 can also be manufactured from rubber, specifically for use in the flood barrier 2.

[0058] Said inflatable flexible chamber 6 is slightly tensioned because it is stretched by approximately 30%. Because of this, said end panels 9 and said centre panel 10 are pushed against each other and said flood barrier panel 2 becomes a stable entity, also without said end panels 9 and said centre panel 10 being connected in another way, although such cannot be ruled out.

[0059] The end caps 8 are made of PVC. They are disposed around said side edges 5, together with the therein present inflatable flexible chamber 6. On the flanking side 17 and bottom side 18 of said end caps 8, strips of soft silicone rubber 19 are disposed. Said end caps 8 are slightly larger than said side edges 5 of said end panels 9, so that said side edges 5 can be slid into said end caps 8.

[0060] Said flanking side 17 and said bottom side 18 of said end caps 8 are perpendicular to each other. The corner formed thereby is not, or not significantly, rounded. Said end caps 8 should, after all, fit snugly in the usually right-angled corner formed by the flanking sides and the bottom side of a standard door opening.

[0061] Said end caps 8 are provided with guiding slots 20, which fit around the studs 15 at said end panels 9. Said end caps 8 are slightly flexible, and by manually bending them slightly they fit over said studs 15, so that they can be removed and placed back again to install a new inflatable flexible chamber 6, or to allow said flood barrier 1 to be uninstalled.

[0062] For the sake of clarity it is remarked that Figure 3 illustrates the flood barrier 1, while Figure 4 illustrates the flood barrier with said end caps removed.

[0063] The use of a flood barrier 1 according to the invention is simple and is as follows.

[0064] The flood barrier 1 is placed in an opening in a building 21, for example a door opening when high water is expected. This is illustrated in Figure 1. Here, in first instance, said inflatable flexible chamber 6 is not inflated.

[0065] In this case, the seal 19, at said bottom side 18 of said end caps 8, rests on the bottom side of the opening, for example a level floor 21. As a consequence hereof, said bottom edge 4 of said flood barrier panel 2 is situated at a small distance, approximately 1 cm, from the floor 21.

[0066] This state is illustrated in Figures 7 and 8.

[0067] Subsequently, said inflatable flexible chamber 6 is inflated. This can be done with a standard bicycle pump.

[0068] At a certain pressure, said inflatable flexible chamber 6 is expanded to the extent that it is situated partly outside said second grooves 14. Said end caps 8 are thereby pushed away, until they press against said walls 22 of the opening. With this, said studs 15 glide into said slots 20 and provide a guidance of the movement of said end caps 8.

[0069] At this pressure, by the narrower open width o1 of said first groove 13, said inflatable flexible chamber 6 at said bottom edge 4 does not emerge, or hardly emerges, outside said first groove 13.

[0070] This state is illustrated in Figures 9 and 10.

[0071] Upon inflation to a higher pressure, the force exerted by said inflatable flexible chamber 6 on the end pieces 8 becomes increasingly larger, and thus clamping of the flood barrier 1 is increasingly improved. At a certain moment, said inflatable flexible chamber 6 at said bottom edge 4 of said flood barrier panel 1 also comes into contact with the floor 21 and exerts an increasingly larger force on said floor 21, thereby forming a seal.

[0072] At the desired final pressure, preferably at least approximately 120 kPa, both a good clamping force in horizontal direction and a sufficiently high vertical force for obtaining a good seal at the bottom side is exerted, but not so high that the flood barrier 1 moves upward and thereby itself possibly creating chinks. In this state, said seals 19 on the flanking side 18 of said end caps 8 are pushed firmly against said walls 22 of the opening, so that they seal well.

[0073] At the bottom side and in the corners, a good sealing is also obtained.

[0074] This state is illustrated in Figures 11 and 12.

[0075] The flood barrier 1 now prevents water from outside flowing into the building via the lowest approximately 50 cm of the opening. If there is no longer such a high water level that said flood barrier 1 is needed, the pressure of said inflatable flexible chamber 6 can be reduced and said flood barrier 1 can be removed.

[0076] To facilitate the storage of said flood barrier 1, said flood barrier 1 can be uninstalled in its main parts, namely said two end caps 8, said two end panels 9, said centre panel 10, said inflatable flexible chamber 6 and said two aluminium tubes 12.

[0077] The vertical forces and horizontal forces, per running metre of length of said bottom edge 4 and the joint side edges 5 were determined at various pressures of said inflatable flexible chamber 6. This led to the following result:

Pressure (kPa above atmospheric)	Horizontal force (N/m)	Vertical force (N/m)
50	175	0
70	245	37
100	350	108
120	420	156
150	526	228

[0078] This shows, by approximation, that at a normal operating pressure between 100 and 200 kPa above atmospheric pressure, the ratio between the horizontal and vertical forces corresponds to the ratio of the open width α_1 , α_2 of the respective grooves 13, 14.

[0079] It also shows that, at a low pressure in vertical direction, a force by said inflatable flexible chamber 6 is not yet exerted, while a significant force is already exerted in horizontal direction.

[0080] Said inflatable flexible chamber 6 in its inflated state pushes said two end panels 9 and said centre panel 10 against each other to such an extent that they form a watertight abutment, so that said flood barrier 1 will not leak. To this end, said end panels 9 and said centre panel 10 are obviously implemented such that they mutually connect.

[0081] Sufficient strength against the water pressure is provided by each of said aluminium tubes 12 passing through all partial panels 9, 10.

Claims

1. Flood barrier (1) for temporarily sealing an opening in a building, said flood barrier (1) comprising a flood barrier panel (2), wherein said flood barrier panel (2) has a bottom edge (5), wherein said flood barrier panel (2) has a top edge (3), wherein said flood barrier panel (2) has two side edges (5), wherein at least one said side edge (5) is provided with an inflatable flexible chamber (6), **characterised in that** said side edge (5) is provided with an end cap (8) disposed over said side edge (5) and which is, slidably in the direction in which said bottom edge (4) extends, attached to said flood barrier panel (2), wherein said inflatable flexible chamber (6) is disposed between said side edge (4) of said flood barrier panel (2) and said end cap (8) so that, upon inflation of said inflatable flexible chamber, (6) said end cap (8) is pushed outwards.
2. Flood barrier according to Claim 1, wherein at least one of said end cap (8) and said flood barrier panel (2) is provided with at least one guiding slot (20) which runs at least substantially parallel to said bottom edge (4), wherein the other of said end cap (8) and said flood barrier panel (2) is provided with a protrusion (15) which is complementary to the guiding slot (20), to guide a sliding movement of said end cap (8) with respect to said flood barrier panel (2) by means of the guiding slot (20) and the protrusion (15).
3. Flood barrier according to any of the previous claims, wherein said end cap (8) extends to below said bottom edge (4) of said flood barrier panel (2).
4. Flood barrier according to any of the previous claims, wherein said end cap (8), on parts thereof arranged to rest against a wall (22) and/or against a floor (21) upon use of the flood barrier (1), is provided with a seal (19) made from elastic plastic or rubber.
5. Flood barrier according to any of the previous claims, wherein both said side edges (5) are provided with a said

inflatable flexible chamber (6) and a said slidable end cap (8).

6. Flood barrier according to Claim 5, wherein said inflatable flexible chambers (6) on both side edges (5) of said flood barrier panel (2) are the same inflatable flexible chamber (6).
7. Flood barrier according to any of the previous claims, wherein said inflatable flexible chamber (6) is also disposed at said bottom edge (4) of said flood barrier panel (2).
8. Flood barrier according to any of the previous claims, wherein said inflatable flexible chamber (6) is annular and preferably mounted via the top edge (3), bottom edge (4) and side edges (5) of said flood barrier panel (2) around said flood barrier panel (2).
9. Flood barrier according to any of the previous claims, wherein said flood barrier panel (2) consists of at least two partial panels (9,10), wherein said partial panels (9,10) are mutually detachable.
10. Flood barrier according to Claims 8 and 9, wherein said partial panels (9,10) are pushed watertightly against each other by said inflatable flexible chamber (6) when it is in an inflated state and is inflated to a minimal pressure above atmospheric pressure, wherein said minimal pressure is 50 kPa, and is preferably 100 kPa and with greater preference is 140 kPa.
11. Flood barrier according to Claims 8 and 9, wherein said partial panels (9,10) are pushed against each other by said inflatable flexible chamber (6) when the same is in non-inflated state.
12. Flood barrier according to any of the previous claims, wherein each of the top edge (3), bottom edge (4) and side edges (5) at which a said inflatable flexible chamber (6) resides, is provided with a groove (13,14), said inflatable flexible chamber (6) being disposed in said groove or grooves (13,14).
13. Flood barrier according to Claim 12, wherein said groove or grooves (13,14) is/are of such a size that, when said inflatable flexible chamber (6) is not inflated, said inflatable flexible chamber (6), at the places where a such groove (13,14) is disposed, can reside completely in the groove or grooves (13,14).
14. Use of a flood barrier (1) according to any of the previous claims to protect a building against inflowing water, wherein the flood barrier (1), with said inflatable flexible chamber (6) in non-inflated state, is placed in an opening in a building, and wherein said inflatable flexible chamber (6) is subsequently inflated to thereby increase the width of the flood barrier (1) and affix the flood barrier (1) in the opening.
15. Use according to Claim 14, wherein said end cap or end caps (8) is/are not attached to the building.

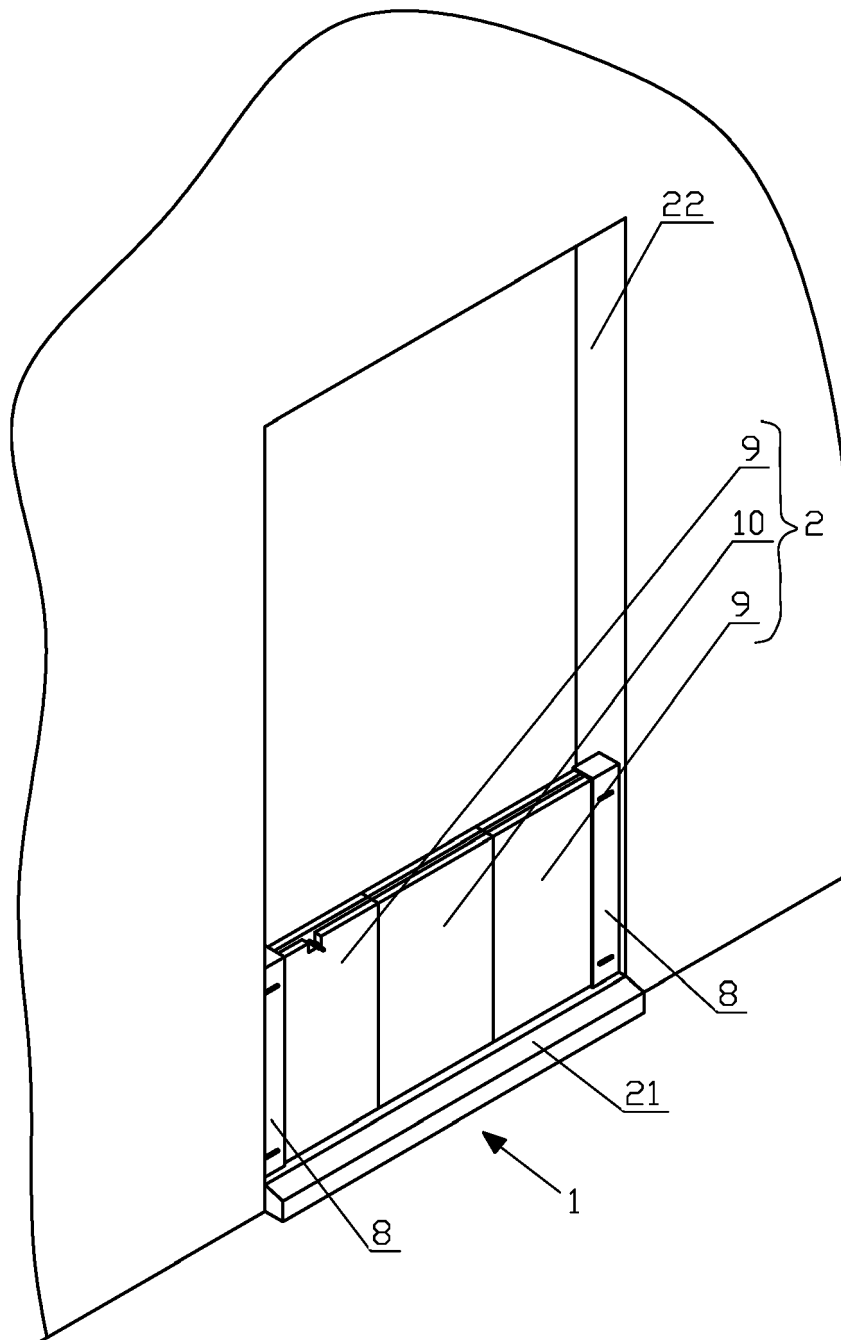


Fig 1

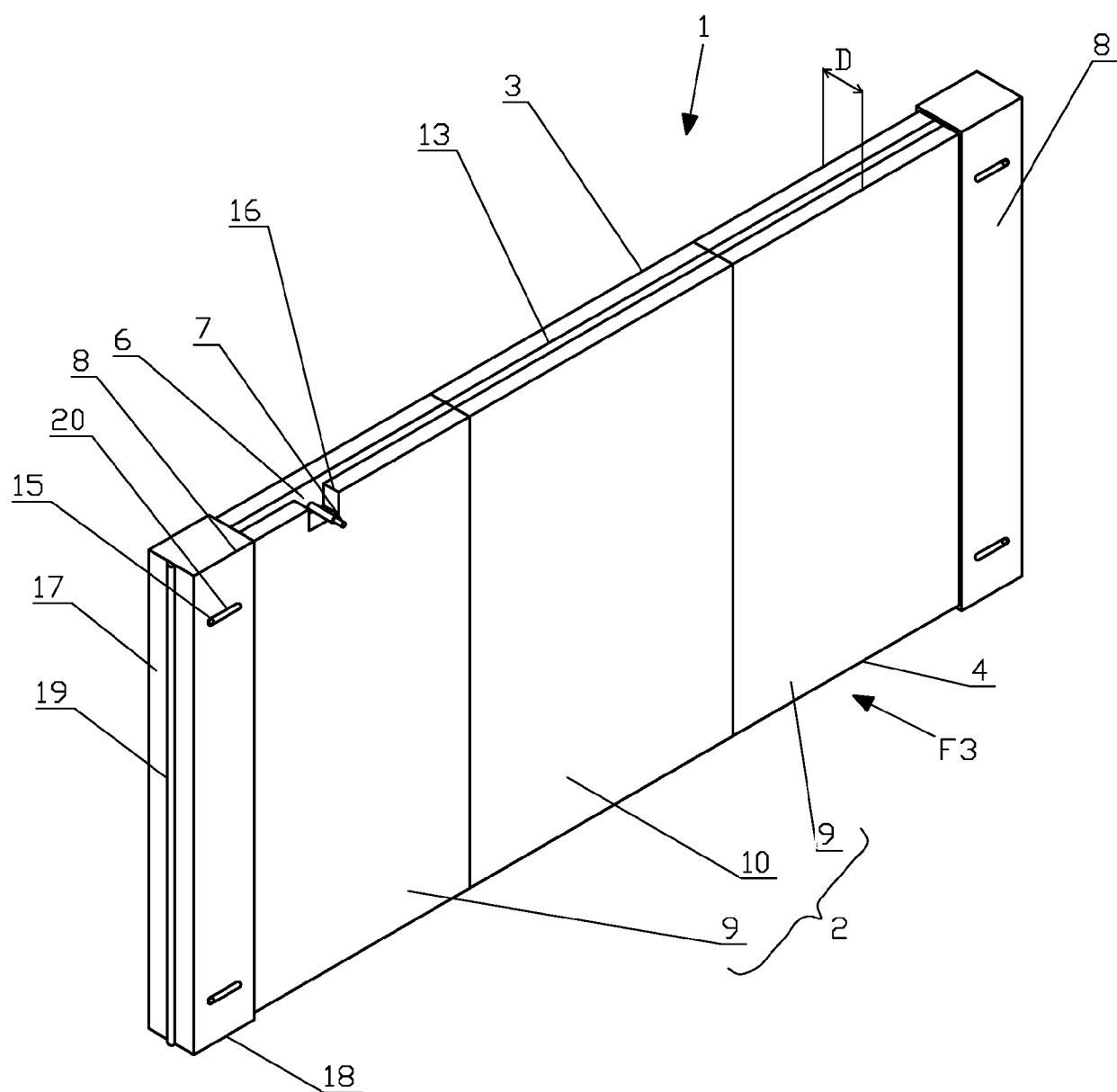


Fig 2

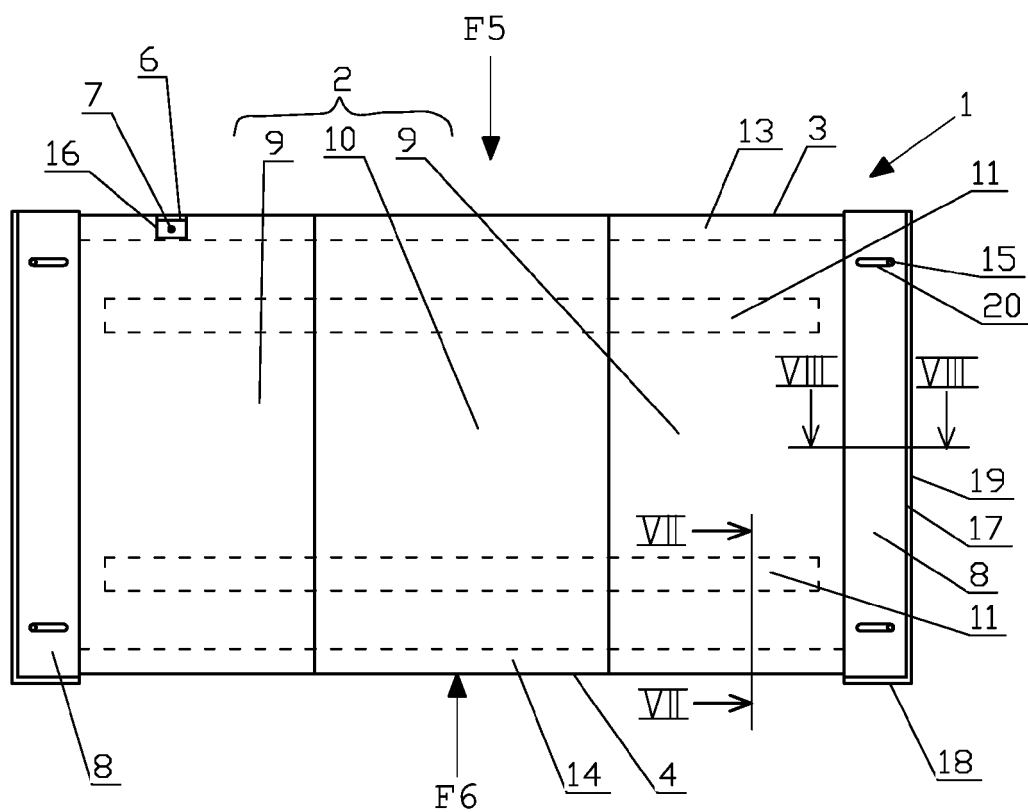


Fig 3

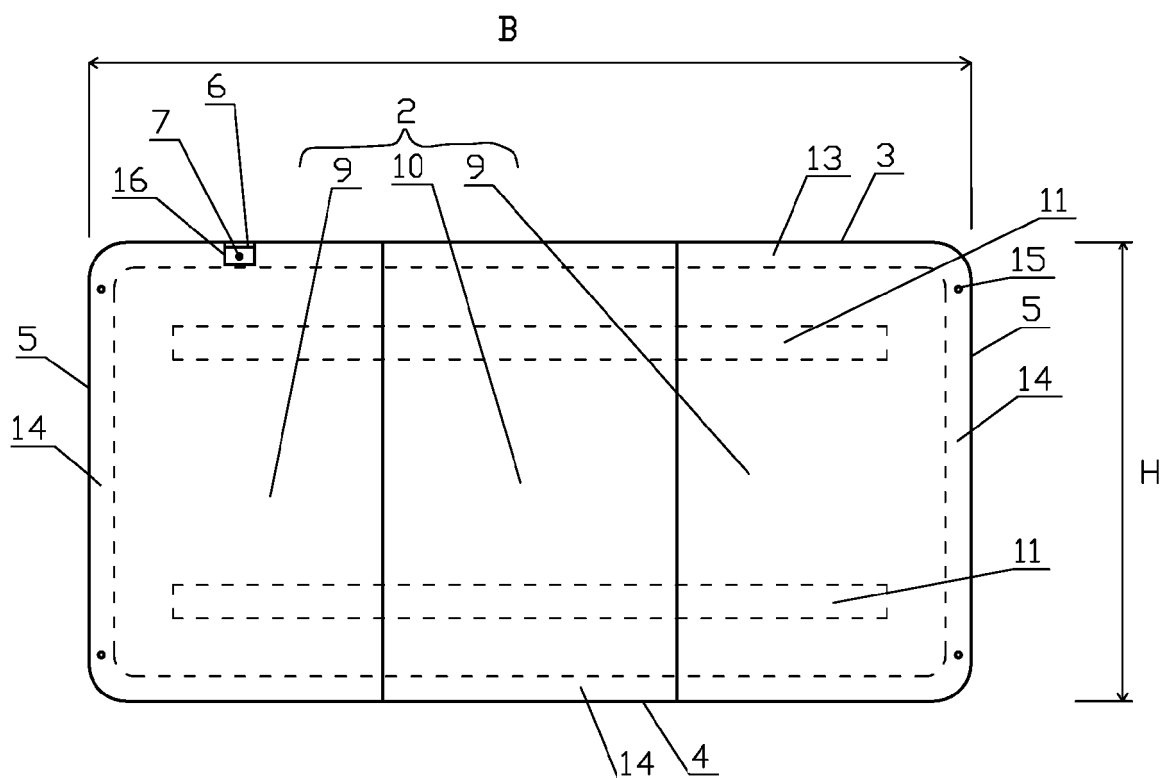


Fig 4

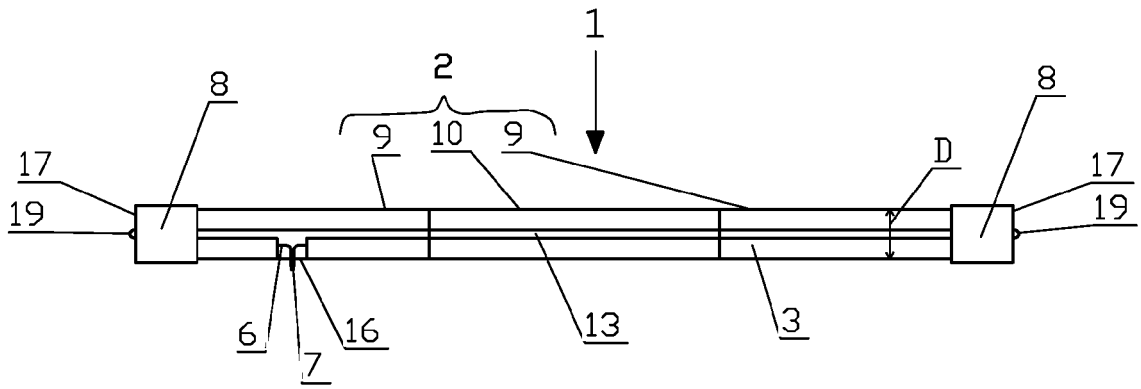


Fig 5

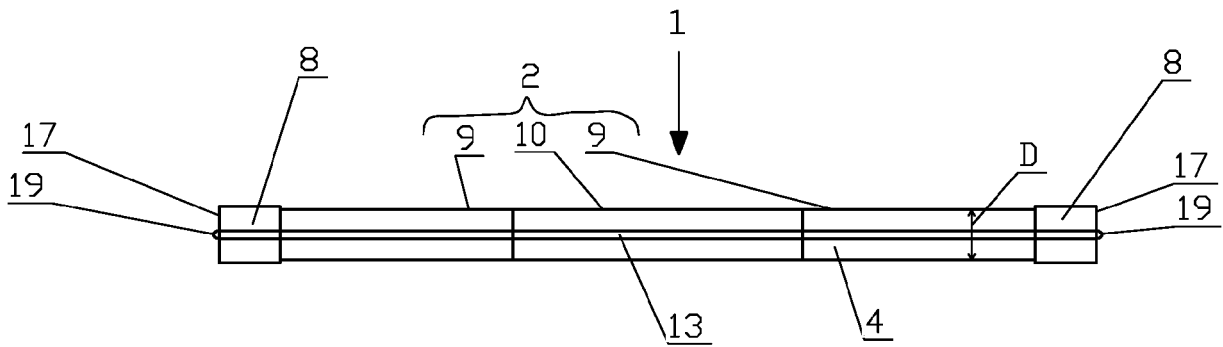


Fig 6

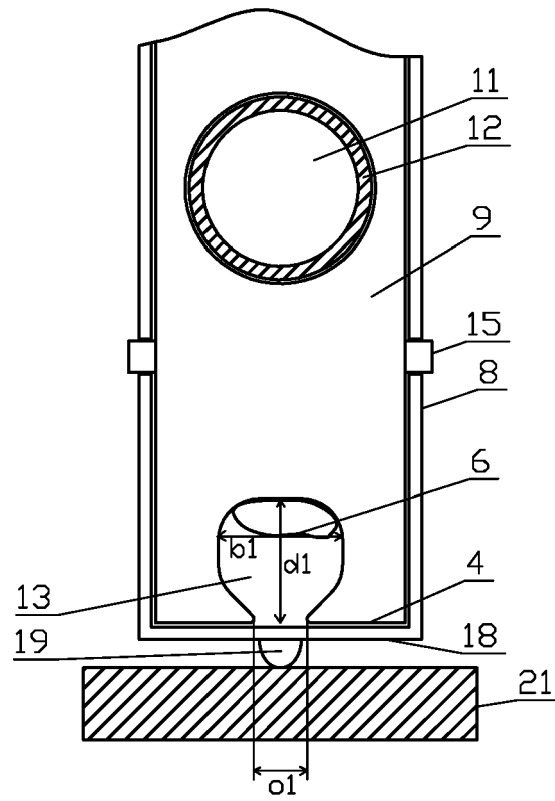


Fig 7

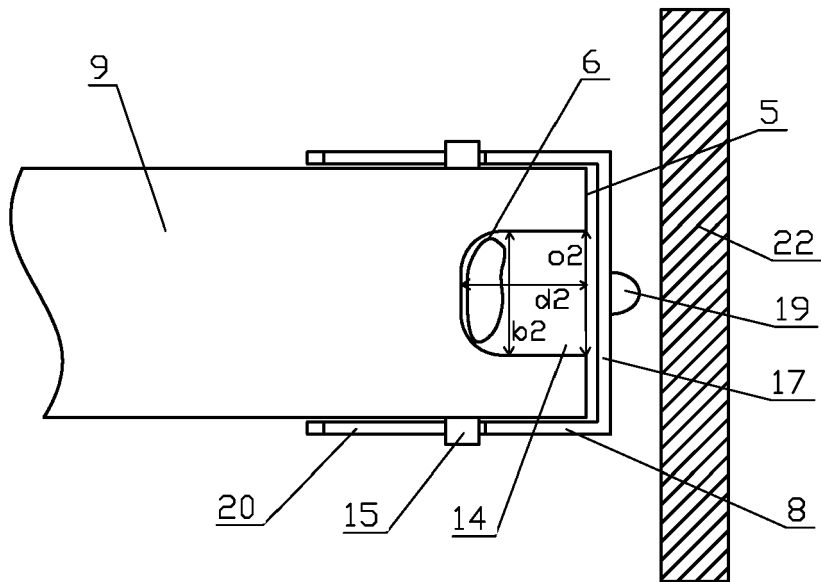


Fig 8

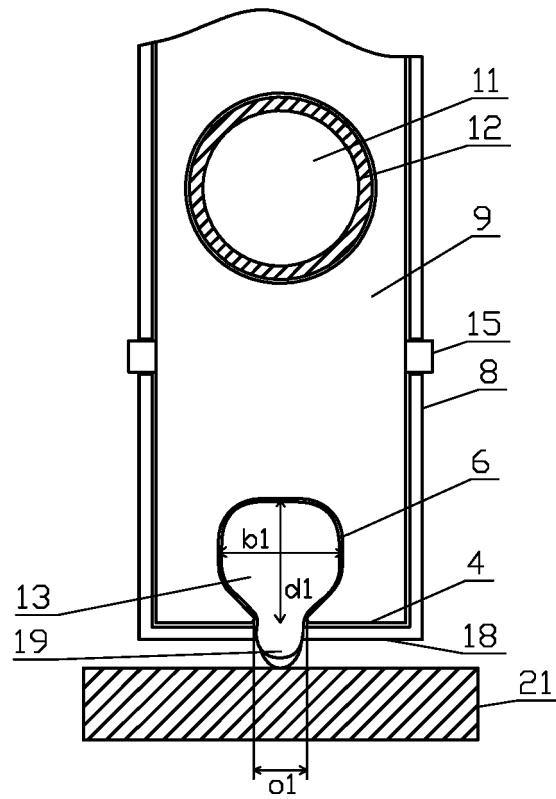


Fig 9

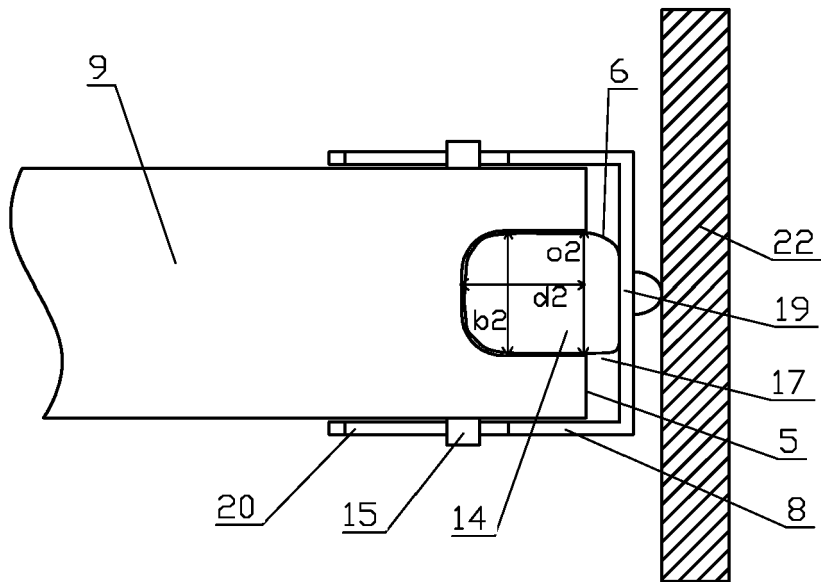


Fig 10

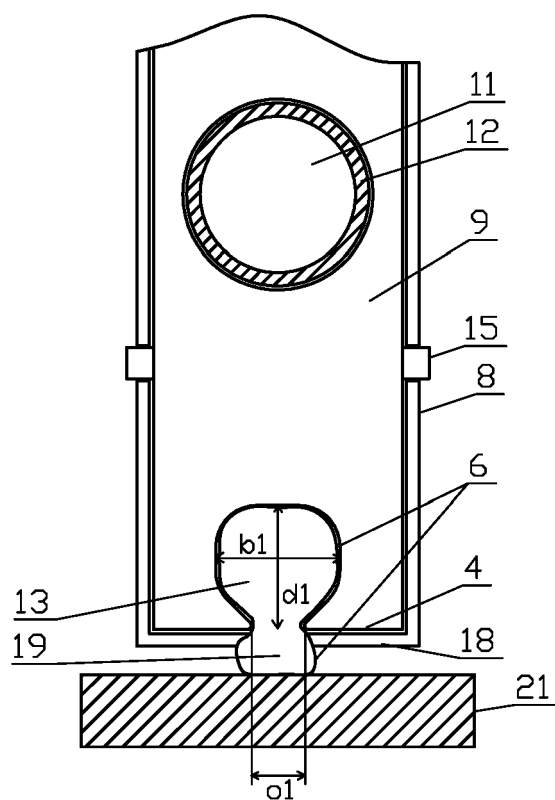


Fig 11

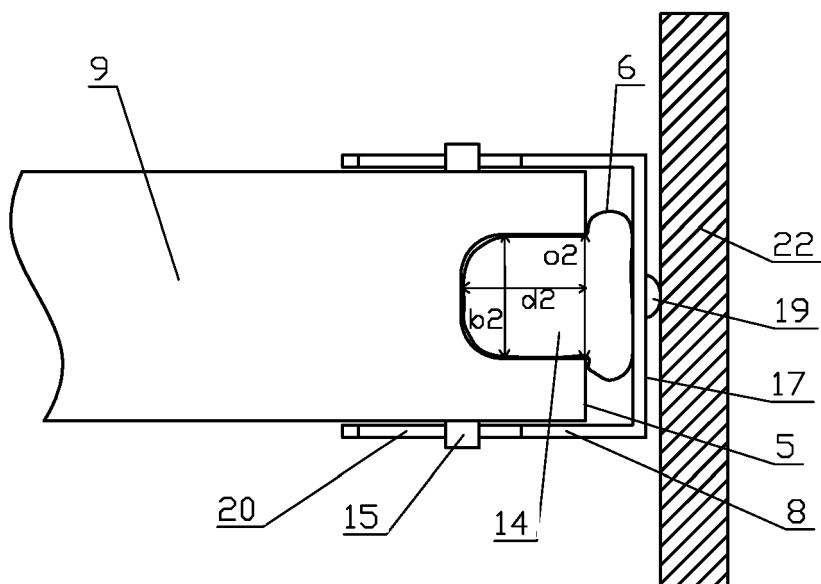


Fig 12



EUROPEAN SEARCH REPORT

 Application Number
 EP 18 02 0265

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Place of search		Date of completion of the search	Examiner
Munich		9 November 2018	Kofoed, Peter
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