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(71) Applicant: **Demo Protezioni Antiurto S.r.l.**
42048 Rubiera (RE) (IT)

(72) Inventors:
- **Chiarini, Marco**
  40065 Pianoro, Bologna (IT)
- **Gatti, Luca**
  42034 Casina, Reggio Emilia (IT)

(74) Representative: **Paparo, Aldo**
Bugnion S.p.A.
Via Vellani Marchi, 20
41124 Modena (IT)

(54) A shockproof protection device

(57) A shockproof protection device, comprising a barrier (2) and fixing means predisposed for fixing the barrier (2) to the ground. The fixing means comprise: a first fixing element (3), provided with a threaded seating (31) and a deformable portion (32) designed to deform and enter into contact with the walls of a housing seating (100); an annular body (4), designed to enter into contact with the deformable portion (32) of the first fixing element and with a rest base (21) of the barrier (2); a threaded bar (5), which, at a first end thereof, is designed to screw into the threaded seating (31) of the fixing element (3), while at a second end thereof, it is designed to screw into a lock nut (6); said threaded bar (5) is arranged through the barrier (2) in such a manner that the lock nut (6) locks in contact with an upper abutting surface (22) of the barrier (2), causing traction of the threaded bar (5), which presses the deformable portion (32) and the annular element (4) into contact.

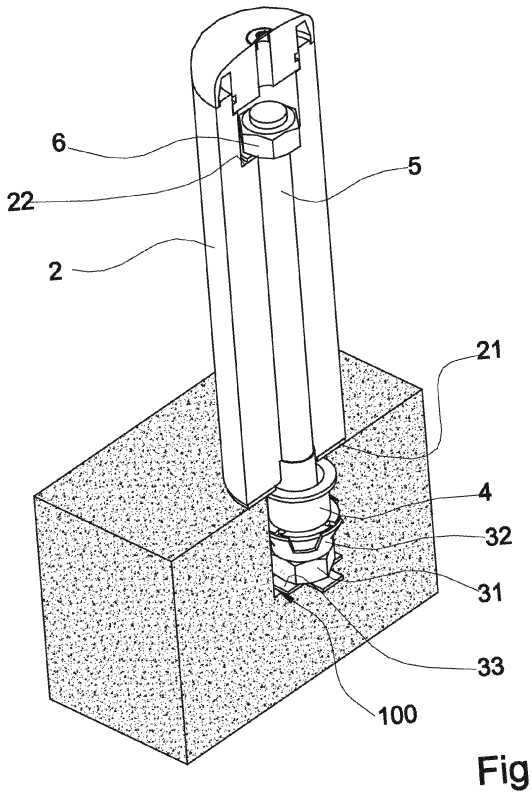

Fig.1

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Description

[0001] The object of the present invention is a shockproof protection device.

[0002] More specifically, the invention refers to a protection device for protecting facilities and plant systems or machinery from accidental impact from forklifts, stacker cranes or other equipment.

[0003] Shockproof protection devices of this sort generally comprise a barrier, in the form of a post or a guardrail, which is securely fixed to the ground by means of an anchoring device.

[0004] A first example of an anchoring device is constituted by expansion screw anchors that make it possible to fasten a metal plate that serves as the base for the barrier.

[0005] Screw anchors are installed by making holes in the floor, the holes being made with a diameter suited to the type of screw anchor utilised. A (plastic or metal) expansion jacket is then inserted in the hole, the expansion sleeve being structured so as to expand after the tightening of a screw, which also serves to lock the barrier. As an alternative to expansion screw anchors, it is possible to use chemical anchors, in which the conventional expansion jacket is substituted by a mesh cage and fastening takes place by action of specific resins contained therein.

[0006] A second example of an anchoring device comprises a metal element that is sunk into a hole made in the floor. Essentially, a hole is made that is then filled with some cement and then the metal element of the protection device is sunk inside the hole. When the cement has cured, the protection device proves to be rigidly fixed to the ground. As an alternative to cement, it is possible to use a resin, which makes it possible to reduce the turnaround time for securing and actual use of the protection device.

[0007] The shockproof protection devices that are currently available have several drawbacks.

[0008] The mechanical expansion screw anchors and chemical anchors do not effectively withstand moderate impacts. The barrier often collapses, which damages the flooring on which the protection device is assembled.

[0009] The resins utilised in chemical anchors or in place of cement have a certain degree of toxicity, which makes their use in food and pharmaceutical environments impossible. Resins are also quite fragile when subjected to impact stress, and they cannot be employed if the floor is not perfectly dry.

[0010] In the event that cement is utilised, it is necessary to wait until the cement has cured completely before the protection device can be locked.

[0011] Making the holes needed for anchoring raises dust, which leads to sanitary problems affecting the environments in which the protection devices are assembled.

[0012] There exists in the prior art a stop block for stopping the wheels of a car during parking manoeuvers, as described in JP11159182. Said device is not suited to the applications indicated above, given that it is not installed by means of the application of cement.

[0013] The aim of the present invention is to offer a shockproof protection device that makes it possible to overcome the drawbacks of the devices of the prior art.

[0014] One advantage of the device according to the present invention is that it enables immediate locking of the barrier, without having to wait for the cement to cure or having to employ resins to limit the turnaround time for the fastening thereof.

[0015] The device is also very resistant to moderate/high impacts.

[0016] A further advantage of the device is that it requires the realisation of a hole of limited depth.

[0017] The device also allows for easy replacement of the barrier, if necessary, without any remaining components protruding from the floor and thus jeopardising safety in the assembly area.

[0018] Further characteristics and advantages of the present invention will become more apparent from the following detailed description of an embodiment of the invention at hand, which is illustrated by way of non-limiting example in the accompanying figures, in which:

- Figure 1 is a schematic axonometric view of the protection device according to the present invention;
- Figure 2 is a schematic partial sectional view of the device appearing in Figure 1;
- Figures 3 and 4 show a portion of the protection device on an enlarged scale.
- Figure 5 is a schematic axonometric view of a second variant of the protection device according to the present invention.

[0019] The shockproof protection device according to the present invention comprises a barrier (2), which, in the example illustrated, is in the form of a cylindrical post, and fixing means predisposed for fixing the barrier (2) to the ground.

[0020] The fixing means comprise a first fixing element (3), provided with a threaded seating (31) and a deformable portion (32) designed to deform and enter into contact with the walls of a housing seating (100), for example a hole made in a floor, so as to constrain the first fixing element (3) to the same seating (100).

[0021] The threaded seating (31) may be constituted for example by a nut, with which the deformable portion (32) is solidly associated, preferably by means of weld.

[0022] With reference to the normal position of use of the protection device, the deformable portion (32) is arranged above the threaded seating (31) and overall it has an annular structure diverging upwards.

[0023] The protection device according to the present invention further comprises an annular body (4), designed to enter into contact with the deformable portion (32) of the first fixing element and with a rest base (21) of the barrier (2). The annular body (4) is substantially in

the form of a sleeve coupling and, under operating conditions of the protection device, it is positioned concentrically to the threaded seating (31) and to the deformable portion (32).

[0024] The annular body (4) exhibits a lower edge (4a) that may be substantially cylindrical, as shown in the embodiments appearing in Figures 2 and 3, or it may be tapered and converging towards the deformable portion (32), as in the embodiment illustrated in Figure 4. The lower edge (4a) of the annular body (4) is designed to be positioned in contact with the deformable portion (32). Furthermore, the lower edge (4a) of annular body (4) is preferably provided with grooves (41a) for enabling passage of cement. The grooves enable the cement to flow along the annular body (4) and come into contact with the deformable portion (32) even on the side facing the interior. In this manner, after the cement has cured, the deformable portion (32) constitutes a very strong obstacle preventing any sliding of the first fixing element (1). The protection device further comprises a threaded bar (5), which, at a first end thereof, is designed to screw into the threaded seating (31) of the fixing element (3), while at a second end thereof, it is designed to screw into a lock nut (6). The threaded bar (5) is arranged through the barrier (2) in such a manner that the lock nut (6) locks in contact with an upper abutting surface (22) of the barrier (2).

[0025] Locking the lock nut (6) thus brings about traction of the threaded bar (5), which tends to pull the first fixing element (3) upwards. This causes the deformable portion (32) to be pressed into contact with the annular body (4), particularly with the lower edge (4a) of annular body (4), which, in turn, is pressed into contact with the rest base (21) of the barrier (2).

[0026] As mentioned previously hereinabove, the deformable portion (32) is designed to deform and enter into contact with the walls of the housing seating (100). For this purpose, the deformable portion (32) has a conformation that diverges in an upwards direction. As can be seen in Figures 2, 3 and 4, the annular body (4), and particularly the lower edge (4a) thereof, is partly inserted inside the deformable portion (32), in contact with the internal surface of the deformable portion (32). As a result, a stress that presses the annular body (4) and the deformable portion (32) one against the other, as determined by the locking of the lock nut (6), brings about a broadening of the deformable portion (32), which tends to take on a conformation that is even more divergent.

[0027] More specifically, the deformable portion (32) exhibits an upper edge (32a), which, following the broadening of the deformable portion (32), is arranged pressed in contact with the walls of the housing seating (100). Locking the lock nut (6) thus brings about strong adhesion of the deformable portion (32), and particularly of the upper edge (32a), to the lateral wall of the seating (100). This results in the first fixing element (3) being strongly and effectively locked inside the housing seating (100).

[0028] The deformable portion (32) preferably comprises a plurality of appendages (321-323) that project superiorly of the threaded seating (31) of the first fixing element (3) and diverge from one another. This facilitates the broadening of the deformable portion following the locking of the lock nut (6). To further increase the adhesion and friction between the deformable portion (32) and the walls of the housing seating (100), each appendage (321-323) is provided with a projecting ribbing (321a-323a) designed to be arranged pressed in contact with the walls of the housing seating (100).

[0029] Advantageously, the first fixing element (3) can be inferiorly provided with an anchoring plate (33) that projects peripherally from the first fixing element (3). This anchoring plate is preferably cross-shaped, as is partially visible in Figure 1. The anchoring plate (33) allows for markedly increasing attachment of the first fixing element (3) to the mass of cement inserted in the housing seating (100). In particular, the anchoring plate (33), which projects laterally to the first fixing element (3), constitutes a strong obstacle to any translation movement of the first fixing element (3) with respect to the mass of cement.

[0030] Assembly of the protection device according to the present invention is extremely simple. In fact, it is sufficient to realise the housing seating (100) at the desired point, preferably by means of wet core drilling so as to prevent raising dust. It is then sufficient to preassemble the shockproof protection device, by connecting the first fixing element (3), the annular body (4), the threaded bar (5), the tubular body (7) and the barrier (2) together, and inserting it inside the housing seating 100, the latter having been previously filled with cement. Lastly, one proceeds by locking the lock nut (6), thereby locking the shockproof protection device without any need to wait for the cement to cure. To permit subsequent disassembly of the barrier (2), a tubular body (7) can be arranged concentrically in a contiguous position to the threaded seating (31) and concentrically internally of the annular body (4), for the purpose of preventing the cement from penetrating internally of the threaded seating (31) and from curing in direct contact with the threaded bar (5).

Claims

1. . A shockproof protection device, comprising a barrier (2) and fixing means predisposed for fixing the barrier (2) to the ground, **characterised in that** said fixing means comprise: a first fixing element (3), provided with a threaded seating (31) and a deformable portion (32) destined to deform and enter into contact with the walls of a housing seating (100); an annular body (4), destined to enter into contact with the deformable portion (32) of the first fixing element and with a rest base (21) of the barrier (2); a threaded bar (5), which, at a first end thereof, is destined to screw into the threaded seating (31) of the fixing element (3), while at a second end thereof, it is des-

tined to screw into a lock nut (6); said threaded bar (5) is arranged through the barrier (2) in such a manner that the lock nut (6) locks in contact with an upper abutting surface (22) of the barrier (2), causing traction of the threaded bar (5), which presses the deformable portion (32) and the annular element (4) into contact.

2.) The device according to claim 1, wherein the deformable portion (32) is conformed so as to broaden following the locking of the lock nut (6), taking on a diverging conformation in a distancing direction from the threaded seating (31).

3.) The device according to claim 2, wherein the deformable portion (32) exhibits an upper edge (32a), which, following the broadening of the deformable portion (32), is suitable for being arranged pressed in contact with the walls of the housing seating (100).

4.) The device according to claim 1, wherein the deformable portion (32) comprises a plurality of appendages (321-324) that project superiorly of the first fixing element (3) and diverge from one another.

5.) The device according to claim 4, wherein each appendage (321-324) is provided with a projecting ribbing (321a-324a) destined to be arranged pressed in contact with the walls of the housing seating (100) in a deformed configuration of the deformable portion (32).

6.) The device according to claim 1, wherein the annular body (4) exhibits a tapered lower edge (4a) that converges towards the deformable position (32) and is destined to be positioned in contact with the deformable portion (32).

7.) The device according to claim 6, wherein the lower edge (4a) of the annular body (4) is provided with grooves for enabling passage of cement.

8.) The device according to claim 1, wherein the first fixing element (3) is inferiorly provided with an anchoring plate (33) that projects peripherally from the first fixing element (3).

9.) The device according to claim 1, comprising a tubular body (7) arranged concentrically in a contiguous position to the threaded seating (31) and concentrically internally of the annular body (4) so as to prevent the cement from penetrating internally of the threaded seating (31).

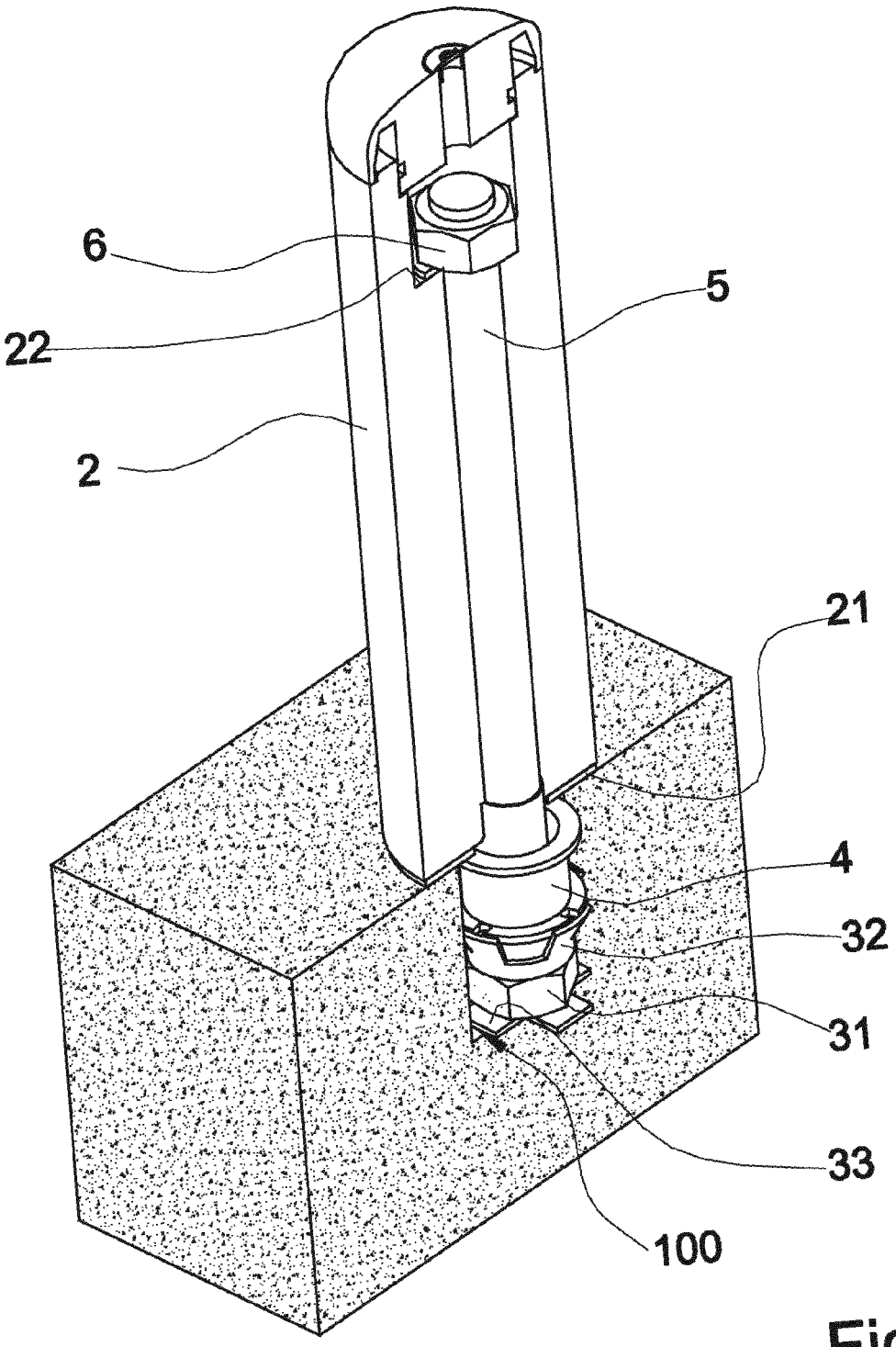


Fig.1

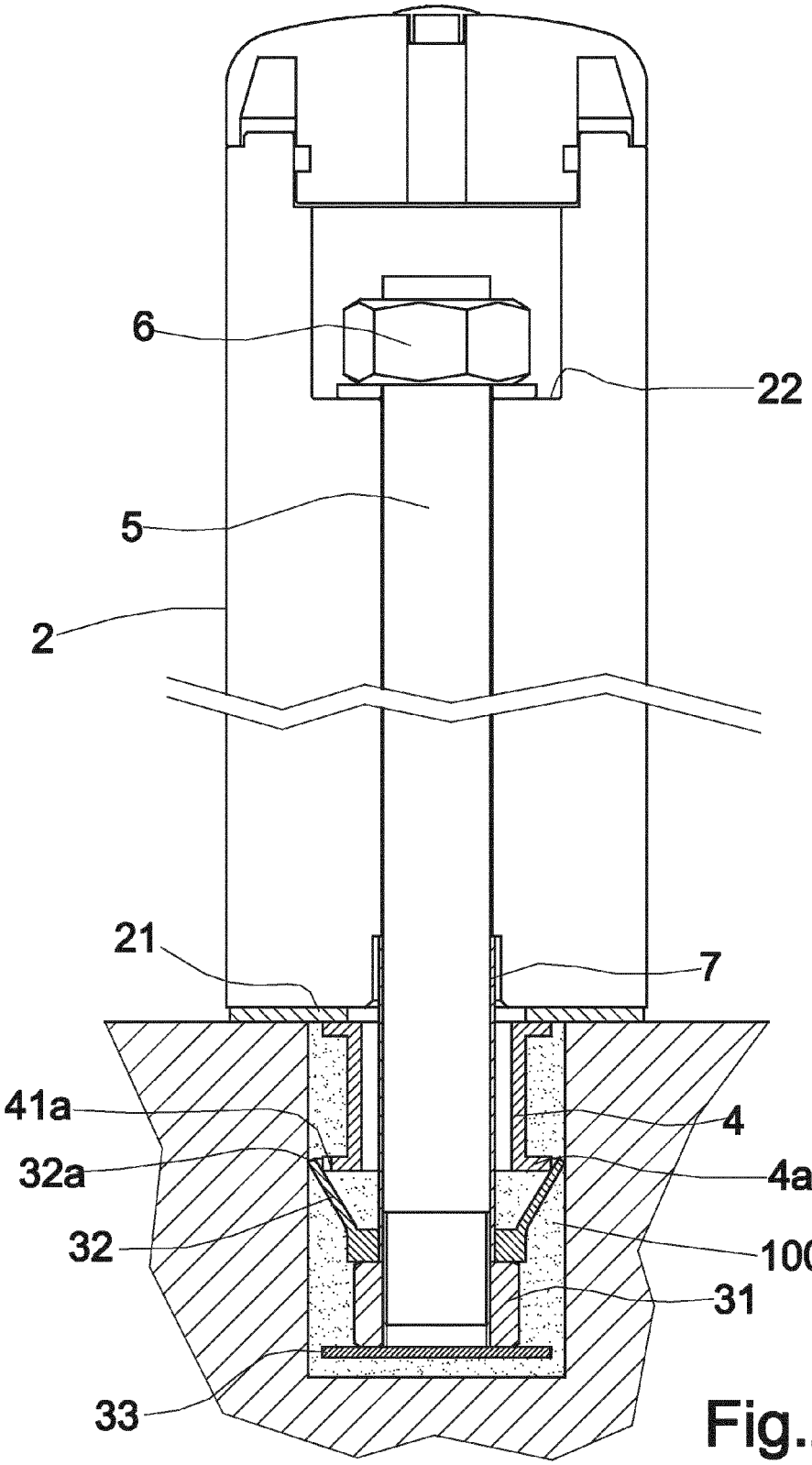


Fig.2

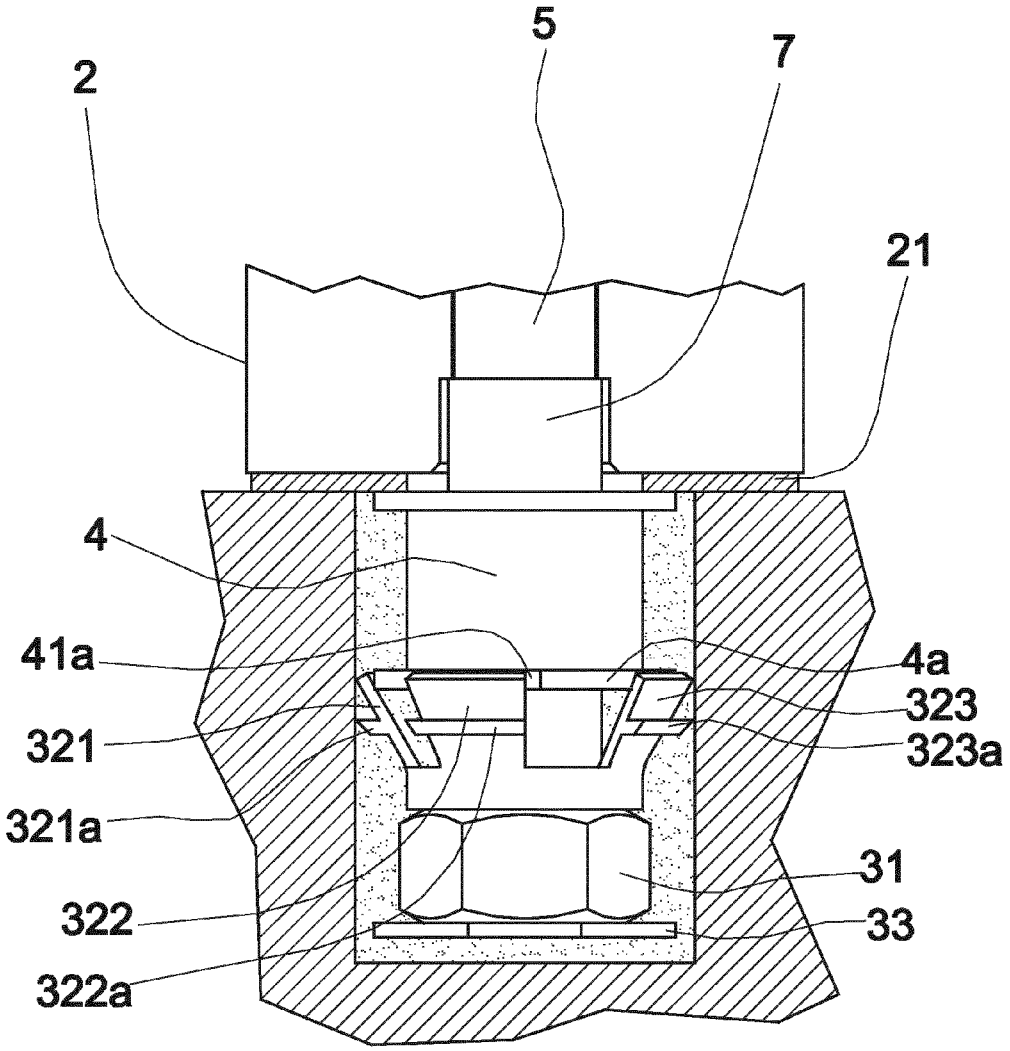


Fig.3

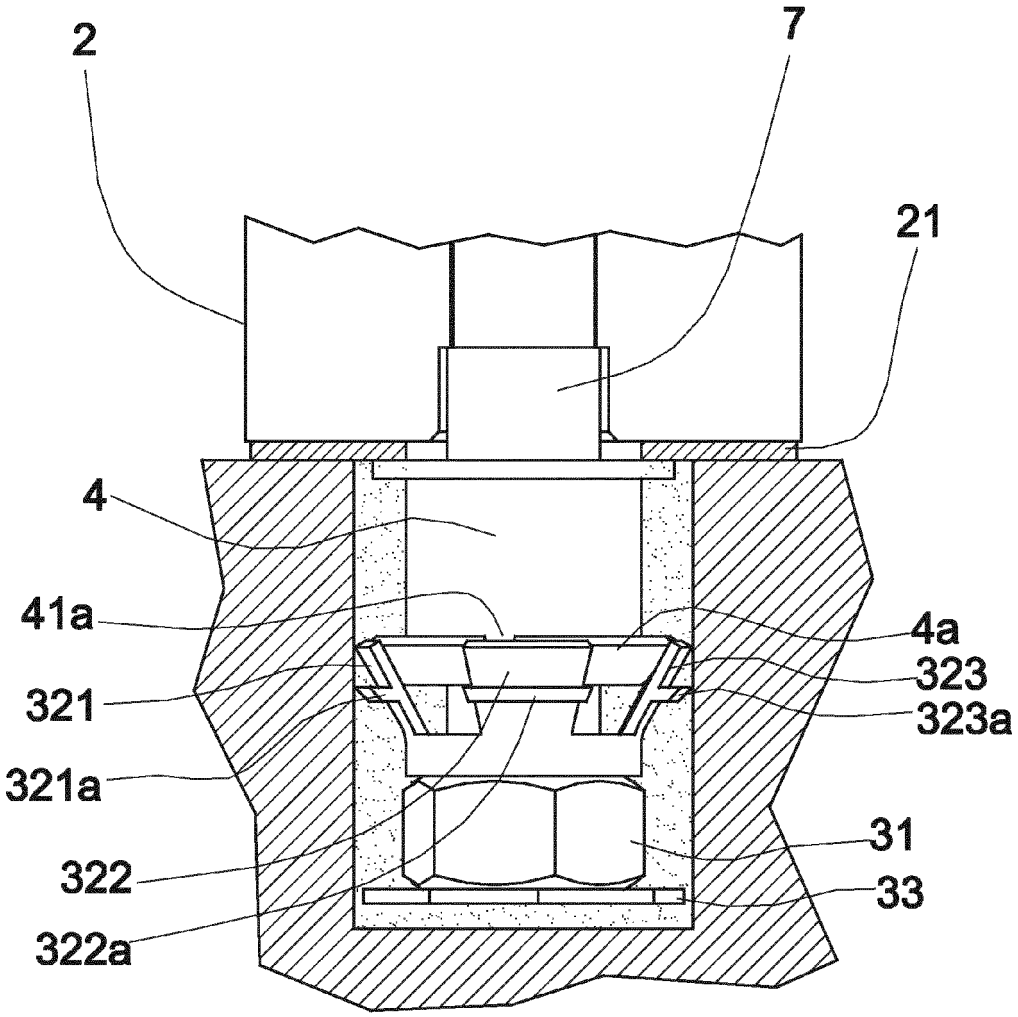
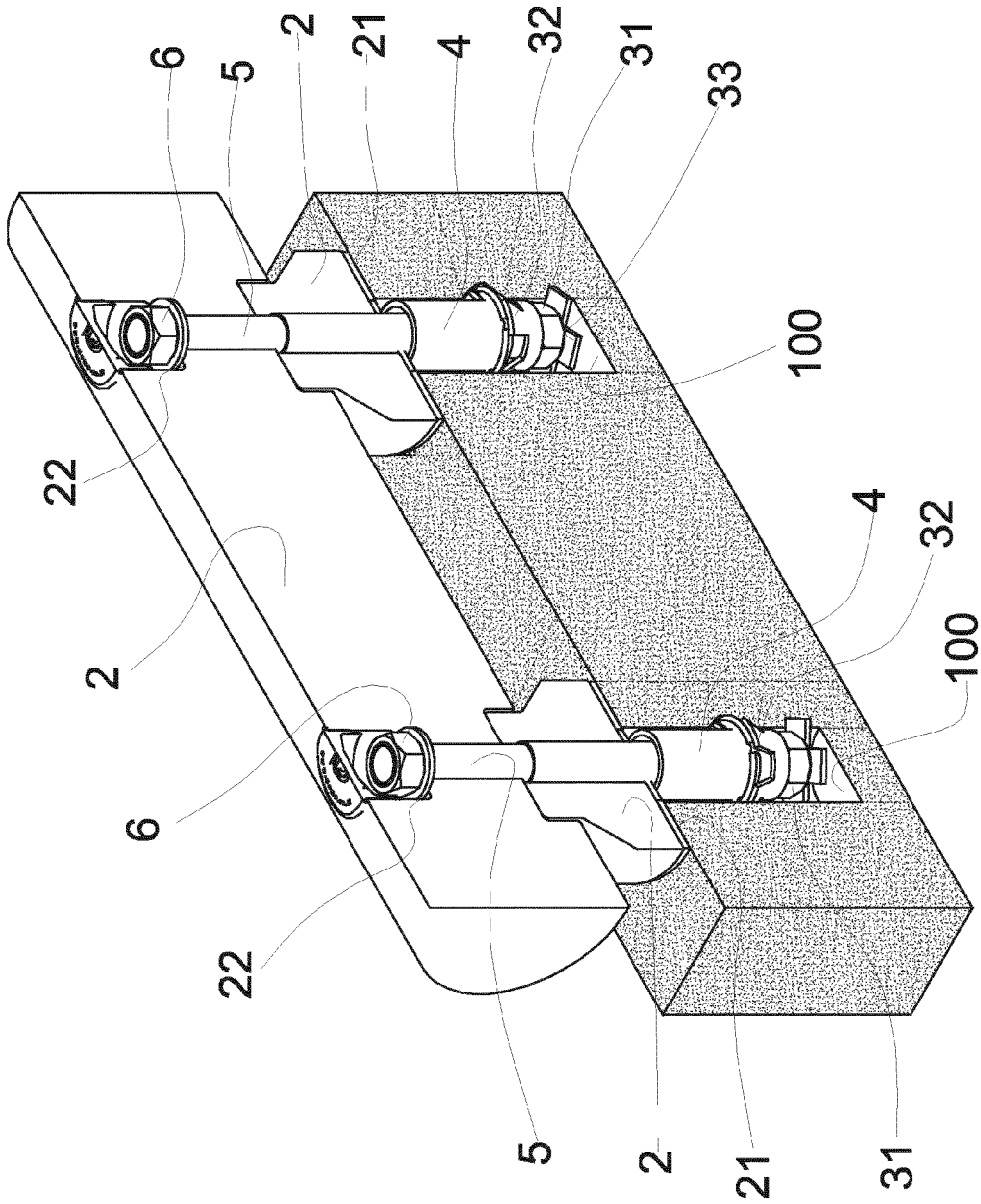


Fig.4

Fig.5



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EUROPEAN SEARCH REPORT

Application Number
EP 13 17 3873

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 September 2013	Kremsler, Stefan

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