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(54) **HOUSING DEVICE FOR HOUSING FIXING ELEMENTS OF A CONNECTION BAR FOR CONNECTING LAYERS OF CONCRETE; FIXING SYSTEM FOR FIXING A CONNECTION BAR; AND PREFABRICATED PLINTH COMPRISING SUCH A FIXING SYSTEM**

GEHÄUSE ZUM AUFNEHMEN VON BEFESTIGUNGSELEMENTEN EINER VERBINDUNGSSTANGE ZUM VERBINDEN VON BETONSCHICHTEN; BEFESTIGUNGSSYSTEM ZUM BEFESTIGEN EINER VERBINDUNGSSTANGE UND VORGEFERTIGTER SOCKEL MIT EINEM SOLCHEN BEFESTIGUNGSSYSTEM

BOITIER DESTINÉ À RECEVOIR D'ÉLÉMENTS DE FIXATION D'UNE BARRE DE CONNEXION PERMETTANT DE RELIER DES ÉLÉMENTS EN BÉTON; SYSTÈME DE FIXATION D'UNE BARRE DE CONNEXION ET SOCLE PREFABRIQUÉ COMPRENANT CE SYSTÈME DE FIXATION

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Description

[0001] The present invention relates to a housing device for housing fixing elements and fixing system for fixing a connection bar for connecting layers of concrete and prefabricated plinth comprising such a fixing system. In particular, the present invention can be applied in plinths that support elevated structures.

[0002] The use of bars for connecting layers of blocks of concrete together so as to form a plinth is known.

[0003] At the time of writing, these bars are passed through tubes especially positioned in the layers. The bars are clamped at the two ends (upper and lower) by means of plates and nuts, thus creating a so-called sandwich assembly (upper connection, lower connection and layers in the middle). However, this assembly implies the entire load of the structure being shared across two end connections, with high strain on them. Furthermore, if one of these connections were to give way, the entire structure would collapse. Document DE102007033983 A shows through screws which are screwed into nuts housed in recesses, a shell around the body of each screw and a cap which receives the bottom end of the screw. A cavity is formed in the cap and is filled with compressable material.

[0004] In this context, the technical task underpinning the present invention is that of proposing a housing device for housing fixing elements and fixing system for fixing a connection bar for connecting layers of concrete and prefabricated plinth comprising such a fixing system, which obviate the drawbacks of the prior art cited above.

[0005] In particular, the object of the present invention is to propose a housing device for housing fixing elements for fixing a connection bar for connecting layers of concrete, which reduces the possibility of the formation of air bubbles in the concrete of the layer in which it is buried.

[0006] Another object of the present invention is to make available a housing device for housing fixing elements for fixing a connection bar for connecting layers of concrete, which remains in position in the layers during the movement thereof.

[0007] A further object of the present invention is to propose a fixing system for fixing a connection bar for connecting layers of concrete, which can perform its function regardless of the height of the blocks.

[0008] Another object of the present invention is to make available a fixing system for fixing a connection bar for connecting layers of concrete and a prefabricated plinth comprising such a fixing system, which enable the installation operations to be performed in total safety for the operators.

[0009] A further object of the present invention is to make available a fixing system for fixing a connection bar for connecting layers of concrete and a prefabricated plinth comprising such a fixing system, able to respond structurally to the tensile and compressive actions coming from the vertical connection bars of the blocks or from tie rods of a superstructure guaranteeing correct distribution of loads and reducing the possibility of collapse.

[0010] The stated technical task and specified aims are substantially achieved by a fixing system according to claim 1. The housing device for housing fixing elements for fixing a connection bar for connecting layers of concrete comprises a hollow body having a cylindrical extension between a first and a second end. The hollow body comprises a bottom portion at said second end having an opening towards the outside. The housing device comprises a hollow projection connected to the bottom portion so as to communicate with the opening and having an extension away from it.

[0011] Preferably, the housing device comprises a connecting portion originating from the bottom portion of the hollow body with an extension inclined towards the hollow projection.

[0012] Preferably, the housing device comprises an abutment means for positioning an extension tube in the hollow projection. The abutment means is at the opening.

[0013] According to an embodiment, the hollow projection has a through hole having greater dimensions than the opening so that a bottom portion area faces and projects inwards with respect to the hollow projection defining an abutment means for the extension tube.

[0014] The housing device comprises a plurality of flaps arranged around the hollow body. Preferably, the flaps are perforated. Preferably, the flaps are positioned towards the second end of the hollow body.

[0015] Preferably, the hollow body and the hollow projection are made of a single piece.

[0016] The fixing system for fixing a connection bar for connecting layers of concrete comprises:

- a housing device according to what has been disclosed;
- a first plate for sharing the compressive load arranged inside the hollow body of the housing device, with one side in contact with the bottom portion;
- a second plate for sharing the tensile load at an opposite side of the first plate with respect to the bottom portion;
- a nut interposed between the first and the second plate.

[0017] The fixing system comprises an extension tube having an end portion inserted into the hollow projection.

[0018] The fixing system comprises a further housing device the hollow projection of which is mounted at an opposite end of the extension tube. The fixing system comprises a screwing means from above of a connection bar arranged in the further housing device.

[0019] The screwing means from above comprises a thick washer and a threaded portion associated therewith for the screwing from above of the connection bar.

[0020] The stated technical task and specified aims are substantially achieved by a prefabricated plinth, comprising:

- a plurality of overlapped layers, each of them formed by a plurality of prefabricated reinforced concrete blocks;
- at least one connection bar having an extension between the layers for connecting them structurally to one another;
- at least one fixing system, according to what has been described, housed in each layer, the connection bar being screwed in each layer to the corresponding fixing system.

[0021] Additional features and advantages of the present invention will become more apparent from the illustrative and thus non-limiting description of a preferred but not exclusive embodiment of a housing device for housing fixing elements and fixing system for fixing a connection bar for connecting layers of concrete and a prefabricated plinth comprising such a fixing system, as illustrated in the appended drawings, in which:

- figure 1 illustrates a housing device for housing fixing elements for fixing a connection bar, according to the present invention, in perspective view;
- figure 2 shows a top view of the housing device of figure 1;
- figure 3 illustrates a front view of the housing device of figure 1;
- figure 4 illustrates the housing device of figure 1 to which an extension tube is applied, in a sectioned front view;
- figure 5 illustrates a sectioned front view of a first embodiment of a fixing system for fixing a connection bar for connecting layers of concrete, according to the present invention;
- figure 6 illustrates the fixing system of figure 5 to which a connection bar is applied, in a perspective view;
- figure 7 shows a sectioned front view of a second embodiment of a fixing system according to the present invention;
- figure 8 illustrates the fixing system of figure 7 to which a connection bar is mounted, in a perspective view;
- figure 9 shows an alternative embodiment of the screwing means from above of the fixing system according to the present invention;
- figures 10 and 11 illustrate a perspective view and a front view, respectively without and with the hidden lines, of an alternative embodiment of the fixing system, comprising the screwing means from above of figure 9;
- figure 12 illustrates a prefabricated plinth, according to the present invention, in a sectioned front view.

[0022] With reference to the figures, number 1 indicates a housing device for housing fixing elements for fixing a connection bar for connecting layers of concrete.

[0023] In the connection between overlapped layers 101 of concrete, for example in a plinth, a threaded connection bar 102 is used. Such bar crosses the various layers. The housing device 1 is designed to be positioned inside each layer to delimit an area in which to house and host fixing elements (in particular, screwing) for the bar.

[0024] The housing device 1 comprises a hollow body 2 having a cylindrical extension between a first and a second end 2a, 2b. The hollow body 2 comprises a bottom portion 3 at the second end 2b. In other words, the hollow body 2 is substantially cup or glass shaped.

[0025] The bottom portion 3 has an opening 4 towards the outside.

[0026] The housing device 1 comprises a hollow projection 5 connected to the bottom portion 3 so as to communicate with the opening 4. The hollow projection 5 originates from the bottom portion 3 and extends away therefrom. Preferably, the hollow projection 5 extends according to a substantially parallel direction to the extension direction of the hollow body 2.

[0027] In other words, the hollow projection 5 is a small tube.

[0028] The housing device 1 may be made of plastic material, ferrous and nonferrous material, polyamide (e.g. PA6, PA 6.6), first smelting aluminium, cast iron (e.g. hot dip galvanized spheroidal, grey cast iron...), steel, etc. The important point is that the material is able to reach a predefined resistance threshold.

[0029] Preferably, the housing device 1 comprises a connecting portion 6 between the hollow body 2 and the hollow projection 5. In particular, the connecting portion 6 originates from the bottom portion 3 of the hollow body 2 with an extension inclined towards the hollow projection 5.

[0030] In particular, the connecting portion 6 defines corners connected with surface portions having a parallel direction to the extension direction of the hollow body 2.

[0031] In this way, while the cement is being poured, air does not get trapped and so-called air bubbles which weaken the structure are not formed. Furthermore, the described geometry prevents the excessive use of material as would happen in the case of a direct connection between the hollow body 2 and the hollow projection 5.

[0032] Preferably, the inclination of the connecting portion 6 with respect to the horizontal is comprised between 5° and 20°. The optimal inclination is identified as 12°.

[0033] Preferably, the hollow body 2 and the hollow projection 5 are made of a single piece.

[0034] Preferably, the housing device 1 comprises an abutment means 7 for positioning an extension tube 8 in the hollow projection 5. The abutment means 7 is at the opening 4.

[0035] In the embodiment described and illustrated herein, the abutment means 7 is defined by a bottom portion area 3 which projects in a cantilever fashion at the opening 4. In particular, the hollow projection 5 has a through hole having greater dimensions than the opening 4 so as to define a bottom portion area 3 which faces and projects inwards with respect to the hollow projection

5 to offer an abutment for the tube 8. In other words, the abutment means 7 is defined by a circular tooth which projects inwards on the opening 4.

[0036] The housing device 1 comprises a plurality of flaps 9 arranged around the hollow body 2.

[0037] Preferably, the flaps 9 are uniformly distributed along the cylindrical surface of the hollow body 2. Preferably, the flaps 9 are arranged at the same height as the cylindrical hollow body 2. Preferably, the flaps 9 are arranged on the hollow body 2 so as to be circumferentially equidistant.

[0038] The flaps 9 prevent the housing device 1 from rotating and at the same time prevent detachment from the cement.

[0039] In the embodiment described and illustrated herein, the flaps 9 are perforated. In this way, the housing device 1 can still be anchored to the steel reinforcement.

[0040] Preferably, the flaps 9 are positioned on the hollow body 2 at a shorter distance from the second end 2b with respect to the distance from the first end 2a. In other words, the flaps 9 are arranged close to the second end 2b. Thus, they leave a suitable space for connection with the reinforcement, also the surface one.

[0041] A fixing system for fixing a connection bar for connecting layers of concrete, according to the present invention, is indicated by number 10 and described below.

[0042] The fixing system 10 comprises the housing device 1 according to what has been described above.

[0043] The fixing system 10 comprises a first plate 11 for sharing the compressive load arranged inside the hollow body 2 of the housing device 1. In particular, one side of the first plate 11 is in contact with the bottom portion 3.

[0044] A second plate 12 for sharing the tensile load is arranged at an opposite side of the first plate 11 with respect to the bottom portion 3.

[0045] The fixing system 10 comprises a nut 13 interposed between the first and the second plate 11, 12. Preferably, a washer 28 is interposed between the nut 13 and the first plate 11.

[0046] The two plates 11, 12 are perforated to enable the passage of the connection bar.

[0047] The fixing system 10 comprises an extension tube 8 having an end portion inserted into the hollow projection 5.

[0048] The extension tube 8 has a containment function, of a passage element. The extension tube 8 can have different heights for different heights of blocks. In this way, the fixing system 10 can be adapted to different slab formats.

[0049] Preferably, the extension tube 8 is made of PVC or PE or aluminium or steel or alloys. Any material able to contain concrete can be used, as the extension tube 8 does not have a structural function.

[0050] The extension tube 8 and the abutment means 7 are sized so that the extension tube 8 does not create any obstacles to the insertion of a connection bar 102.

[0051] Preferably, the assembly between the housing device 1 and the extension tube 8 only takes place by friction.

[0052] As illustrated in figures 5 and 6, the fixing system 10 comprises, as just described, a housing device 1.

[0053] The fixing system 10 is buried in a layer 101 of concrete and acts both as a tubular opening for the positioning of a connection bar 102 for connecting the layers and as an assembly point for the bar.

[0054] As illustrated in figures 7 and 8, the fixing system 10 comprises a further housing device 1. The hollow projection 5 of the further housing device 1 is mounted at an opposite end of the extension tube 8. In other words, the connection system 10 comprises two housing devices 1 facing towards each other (in particular, the hollow projections 5 face each other) and are spaced apart from the extension tube 8.

[0055] The fixing system 10 comprises a screwing means from above 14 of a connection bar. Such screwing means from above 14 is arranged in the further housing device 1.

[0056] In the embodiment described and illustrated herein, the screwing means from above 14 comprises a thick washer 15 and a threaded portion 16 associated therewith for the screwing of the connection bar.

[0057] The thick washer 15 has a through hole 18 for the passage of the connection bar between layers.

[0058] In an embodiment, illustrated in figures 5-8, the threaded portion 16 is afforded on a nut mounted on the thick washer 15. The through hole 18 of the thick washer 15 communicates with the through hole of the threaded nut so that the connection bar passes through the thick washer 15 and is screwed to the threaded nut, which is located below the thick washer 15 during use.

[0059] In an alternative embodiment, illustrated in figures 9-11, the threaded portion 16 is afforded directly on the thick washer 15. In this case, the through hole 18 of the thick washer 15 is threaded.

[0060] The presence of screwing means from above of the connection bar between layers greatly increases the safety of the operators and the assembly speed. In fact, in known solutions, it is necessary to connect the bars to the lower slab, fixing them in advance with nuts. Before the installation of the first (lower) layer. This takes place by suspending in the air (holding them with a crane or resting them on high capacity and weight trestles) the lower slabs in order to be able to insert the bars and with the operators who pass below the slabs themselves in order to tighten the nuts. It is clear that the operators are subject to a very high risk. With the implementation of the screwing means from above, the lower slabs are rested directly inside the already prepared excavation and then the bars are screwed into the provided housings operating directly from above (therefore without any need for trestles, without exposing the workers and therefore safely and quickly).

[0061] As is clear, the second part of the fixing system 10 is used in the lower layer.

[0062] The housing device 1 comprises one or more

markings 17 made on the hollow body 2 at predefined areas for the insertion during assembly of a mechanical fixing element, e.g. a screw or rivet. Such mechanical fixing elements operate to hold the thick washer 15 in position.

[0063] The thick washer 15 has two transverse holes 19. A transverse hole means a hole having an extension from a lateral surface of the thick washer 15 towards a central portion, in particular towards the through hole 18.

[0064] In particular, the two transverse holes 19 are not through holes. Preferably, the two transverse holes 19 are made on opposite sides with respect to the through hole 18. Preferably, the two transverse holes 19 have an extension according to two substantially parallel directions. Preferably, the two directions coincide, i.e. the holes are aligned.

[0065] In the embodiment described and illustrated herein, the thick washer 15 is substantially cylindrical.

[0066] In an assembled condition, the washer 15 is held in position by the insertion of a mechanical fixing element 20 through the marking 17 on the hollow body 2 and the transverse hole 19.

[0067] A prefabricated plinth, according to the present invention, is described below.

[0068] The plinth 100 comprises a plurality of overlapping layers 101. Each layer 101 is formed by a plurality of prefabricated reinforced concrete blocks.

[0069] The plinth 100 comprises at least one threaded connection bar 102 for structurally connecting the layers 101 to one another. Preferably, a plurality of connection bars 102 connects the layers 101 to one another structurally. The description provided below for a connection bar 102 is to be considered extended to every connection bar 102 present in the plinth 100.

[0070] The plinth 100 comprises, for each connection bar 102, at least one fixing system 10, according to what is described above, housed in each layer 101. The connection bar 102 is mounted, i.e. screwed, to each fixing system 10. In particular, each layer 101 comprises a fixing system 10 in a first embodiment thereof (or of a first type), comprising a housing device 1, whereas in the lower layer 101 a fixing system 10 is arranged in the second embodiment thereof (or of a second type). The fixing systems 10 of the first type are arranged in an upper portion of the layer 101 so that during assembly by overlapping the blocks, the operators can easily fix the connection bar 102 step by step to the housing device 1 of each layer with plates 11, 12 and nuts 13.

[0071] The fixing system 10 of the second type is instead arranged in a lower portion of the lower layer 101. The further housing device 1 of the fixing system 10 faces downwards.

[0072] The connection bar 102 is fixed at a (lower) end to the screwing means from above 14 of the fixing system 10 of the lower layer 101.

[0073] In other words, the connection bar 102 crosses the layers 101 meeting a housing device 1 for each layer 101 at which it is screwed. In the lower layer 101 it crosses two housing devices 1, one facing upwards like the previous ones and the other facing downwards, in which the screwing means from above 14 is contained.

[0074] From the description given, the features of the housing device for housing fixing elements and fixing system for fixing a connection bar for connecting layers of concrete and of the prefabricated plinth comprising such a fixing system according to the present invention appear clear, as do the advantages thereof.

[0075] In particular, the connected and inclined geometry of the connection portion proposed for the housing device prevents the formation of bubbles of concrete.

[0076] Furthermore, the presence of flaps prevents the accidental movement of the housing device positioned inside the layer. In particular, the presence of the holes on the flaps enables the fixing of the reinforcement device, guaranteeing precise positioning thereof.

[0077] Furthermore, the provision in the fixing system of the lower layer of screwing means from above, once the lower slab is already laid, of the connection bar, greatly facilitates the work of the operators, notably increasing the safety thereof.

[0078] Furthermore, the configuration of the fixing systems described for the plinth makes it possible to easily overcome any yielding of an assembly point. If a connection or fixing element (e.g. the lower nut placed on the first buried block) fails (e.g. due to natural oxidation over time, considering that it is in direct contact with the ground) the other fixing elements, which remain solidly connected to the other overlapping concrete elements, immediately enter into tension. This happens because the transverse connection bar has various assembly points which cooperate, in particular one per layer. In known solutions, instead, the bar is only mounted at the upper and lower end, crossing the intermediate layers without any further assembly points. It follows that the yielding of one of the two connected ends causes the structure to collapse. Furthermore, this arrangement promotes the transmission of the load and its distribution in the elements themselves. The choice to interconnect at every layer the transverse elements and the combination between nuts and plates (which completely fill the internal space of every single housing device) ensures that the tensile/compressive action that a post exerts on every foundation bolt is shared across every single layer. In essence, the tension is shared between the various layers making them cooperate to support the strain and therefore there is relatively low pressure around each fixing element (with a clear structural advantage).

Claims

1. A fixing system (10) for fixing a connection bar (102) for connecting layers (101) of concrete, comprising:

   an upper, first housing device (1) comprising:

- a hollow body (2) having a cylindrical extension between a first and a second end (2a, 2b) and comprising a bottom portion (3) at said second end (2b), said bottom portion (3) having an opening (4) towards the outside;
- a hollow projection (5) connected to said bottom portion (3) so as to communicate with the opening (4) and having an extension away from it;
- a plurality of flaps (9) arranged around the hollow body (2);

a first plate (11) for sharing the compressive load arranged inside the hollow body (2) of the first housing device (1), one side of said first plate (11) being in contact with the bottom portion (3);
a second plate (12) for sharing the tensile load at an opposite side of the first plate (12) with respect to the bottom portion (3);
a nut (13) interposed between the first and the second plate (11, 12);
an extension tube (8) having an end portion inserted into the hollow projection (5);
a further housing device (1), a hollow projection (5) of which is mounted at an opposite end of the extension tube (8),
said fixing system (10) comprising a screwing means from above (14) of a connection bar (102) arranged in the further housing device (1), wherein said screwing means from above (14) comprises a thick washer (15) and a threaded portion (16) associated therewith for the screwing from above of the connection bar, wherein said threaded portion (16) is made in a through hole (18) of the thick washer (15), said thick washer (15) comprising two blind transverse holes (19), said hollow body (2) of the further housing device (1) comprising two markings (17) to enable the insertion of corresponding mechanical fixing elements (20) in the transverse holes (19) so as to keep the thick washer (15) in position.

2. The fixing system (10) according to claim 1, wherein the first housing device (1) comprises a connecting portion (6) originating from the bottom portion (3) of the hollow body (2) with an extension inclined towards the hollow projection (5).

3. The fixing system (10) according to claim 1 or 2, wherein the first housing device (1) comprises an abutment means (7) for positioning the extension tube (8) in the hollow projection (5), said abutment means (7) being at said opening (4).

4. The fixing system (10) according to claim 3, wherein the hollow projection (5) has a through hole having greater dimensions than said opening (4) so that a bottom portion area (3) faces and projects inwards with respect to the hollow projection (5) defining an abutment means (7) for the extension tube (8).

5. The fixing system (10) according to claim 1, wherein the flaps are perforated.

6. The fixing system (10) according to any one of the preceding claims, wherein the hollow body (2) and the hollow projection (5) are made of a single piece.

7. A prefabricated plinth (100), comprising:

a plurality of overlapped layers (101), each of them formed by a plurality of prefabricated reinforced concrete blocks;
at least one connection bar (102) having an extension between the layers (101) for connecting them structurally to one another;
at least one fixing system (10) according to any one of the preceding claims housed in each layer (101), said connection bar (102) being screwed in each layer (101) to the corresponding fixing system (10).

Patentansprüche

1. Befestigungssystem (10) zum Befestigen einer Verbindungsstange (102) zum Verbinden von Betonschichten (101), umfassend:

ein oberes, erstes Gehäuse (1), umfassend:

- einen hohlen Körper (2), aufweisend eine zylindrische Verlängerung zwischen einem ersten und einem zweiten Ende (2a, 2b) und umfassend einen Bodenabschnitt (3) an dem zweiten Ende (2b), wobei der Bodenabschnitt (3) eine Öffnung (4) nach außen aufweist;
- einen hohlen Vorsprung (5), der mit dem Bodenabschnitt (3) verbunden ist, um mit der Öffnung (4) zu kommunizieren, und eine Verlängerung davon wegführend aufweist;
- eine Vielzahl von Klappen (9), die um den hohlen Körper (2) herum angeordnet sind;

eine erste Platte (11) zum Teilen der Drucklast, die innerhalb des hohlen Körpers (2) des ersten Gehäuses (1) angeordnet ist, wobei eine Seite der ersten Platte (11) in Kontakt mit dem Bodenabschnitt (3) steht;
eine zweite Platte (12) zum Teilen der Zuglast an einer gegenüberliegenden Seite der ersten Platte (12) in Bezug auf den Bodenabschnitt (3);
eine Mutter (13), die zwischen der ersten und

der zweiten Platte (11, 12) angeordnet ist;
ein Verlängerungsrohr (8), aufweisend einen Endabschnitt, der in den hohlen Vorsprung (5) eingesetzt ist;
ein weiteres Gehäuse (1), von dem ein hohler Vorsprung (5) an einem gegenüberliegenden Ende des Verlängerungsrohrs (8) montiert ist,
wobei das Befestigungssystem (10) Schraubmittel von oben (14) einer im weiteren Gehäuse (1) angeordneten Verbindungsstange (102) umfasst, wobei die Schraubmittel von oben (14) eine dicke Unterlegscheibe (15) und einen damit assoziierten Gewindeabschnitt (16) zum Schrauben der Verbindungsstange von oben umfasst, wobei der Gewindeabschnitt (16) in einem Durchgangsloch (18) der dicken Unterlegscheibe (15) ausgebildet ist, wobei die dicke Unterlegscheibe (15) zwei Sackquerlöcher (19) umfasst, wobei der hohle Körper (2) des weiteren Gehäuses (1) zwei Markierungen (17) umfasst, um das Einsetzen entsprechender mechanischer Befestigungselemente (20) in die Querlöcher (19) zu ermöglichen, um die dicke Unterlegscheibe (15) in Position zu halten.

2. Befestigungssystem (10) nach Anspruch 1, wobei das erste Gehäuse (1) einen vom Bodenabschnitt (3) des hohlen Körpers (2) ausgehenden Verbindungsabschnitt (6) mit einer zum hohlen Vorsprung (5) hin geneigten Verlängerung umfasst.

3. Befestigungssystem (10) nach Anspruch 1 oder 2, wobei das erste Gehäuse (1) Anschlagmittel (7) zum Positionieren des Verlängerungsrohrs (8) in den hohlen Vorsprung (5) umfasst, wobei sich die Anschlagmittel (7) an der Öffnung (4) befinden.

4. Befestigungssystem (10) nach Anspruch 3, wobei der hohle Vorsprung (5) ein Durchgangsloch mit größeren Abmessungen als die Öffnung (4) aufweist, so dass ein Bodenabschnittbereich (3) in Bezug auf den hohlen Vorsprung (5), der Anschlagmittel (7) für das Verlängerungsrohr (8) definiert, nach innen weist und vorsteht.

5. Befestigungssystem (10) nach Anspruch 1, wobei die Klappen perforiert sind.

6. Befestigungssystem (10) nach einem der vorhergehenden Ansprüche, wobei der hohle Körper (2) und der hohle Vorsprung (5) aus einem einzigen Stück hergestellt sind.

7. Vorgefertigter Sockel (100), umfassend:

eine Vielzahl von überlappenden Schichten (101), von denen eine jede durch eine Vielzahl von vorgefertigten Stahlbetonblöcken gebildet ist;
mindestens eine Verbindungsstange (102), aufweisend eine Verlängerung zwischen den Schichten (101), um sie strukturell miteinander zu verbinden;
mindestens ein Befestigungssystem (10) nach einem der vorhergehenden Ansprüche, das in einer jeden Schicht (101) aufgenommen ist, wobei die Verbindungsstange (102) in einer jeden Schicht (101) mit dem entsprechenden Befestigungssystem (10) verschraubt ist.

Revendications

1. Système de fixation (10) pour fixer une barre de raccordement (102) pour relier des couches (101) de béton, comprenant :

un premier boîtier (1) supérieur, comprenant :

- un corps creux (2) ayant une extension cylindrique entre une première et une deuxième extrémité (2a, 2b) et comprenant une partie inférieure (3) à ladite deuxième extrémité (2b), ladite partie inférieure (3) comportant une ouverture (4) vers l'extérieur ;
- une saillie creuse (5) reliée à ladite partie inférieure (3) de manière à communiquer avec l'ouverture (4) et ayant une extension éloignée de celle-ci ;
- une pluralité d'ailettes (9) disposées autour du corps creux (2) ;

une première plaque (11) pour répartir la charge de compression disposée à l'intérieur du corps creux (2) du premier boîtier (1), un côté de ladite première plaque (11) étant en contact avec la partie inférieure (3) ;
une deuxième plaque (12) pour répartir la charge de traction en correspondance d'un côté opposé de la première plaque (12) par rapport à la partie inférieure (3) ;
un écrou (13) interposé entre la première et la deuxième plaque (11, 12) ;
un tube d'extension (8) comportant une partie d'extrémité introduite dans la saillie creuse (5) ;
un boîtier (1) supplémentaire, dont une saillie creuse (5) est montée à une extrémité opposée du tube d'extension (8),
ledit système de fixation (10) comprenant des moyens de vissage par le haut (14) d'une barre de raccordement (102) disposée dans le boîtier (1) supplémentaire, dans lequel lesdits moyens de vissage par le haut (14) comprennent une rondelle épaisse (15) et une partie filetée (16) associée à celle-ci pour le vissage par le haut

de la barre de raccordement, dans lequel ladite partie filetée (16) est réalisée dans un trou traversant (18) de la rondelle épaisse (15), ladite rondelle épaisse (15) comprenant deux trous transversaux borgnes (19), ledit corps creux (2) du boîtier (1) supplémentaire comprenant deux marquages (17) pour permettre l'introduction d'éléments de fixation mécaniques (20) correspondants dans les trous transversaux (19) afin de maintenir la rondelle épaisse (15) en position.

2. Système de fixation (10) selon la revendication 1, dans lequel le premier boîtier (1) comprend une partie de raccordement (6) provenant de la partie inférieure (3) du corps creux (2) ayant une extension inclinée vers la saillie creuse (5).

3. Système de fixation (10) selon la revendication 1 ou 2, dans lequel le premier boîtier (1) comprend des moyens de butée (7) pour positionner le tube d'extension (8) dans la saillie creuse (5), lesdits moyens de butée (7) se trouvant en correspondance de ladite ouverture (4).

4. Système de fixation (10) selon la revendication 3, dans lequel la saillie creuse (5) comporte un trou traversant dont les dimensions sont supérieures à celles de ladite ouverture (4), de sorte qu'une zone de la partie inférieure (3) fait face et fait saillie vers l'intérieur par rapport à la saillie creuse (5) définissant des moyens de butée (7) pour le tube d'extension (8).

5. Système de fixation (10) selon la revendication 1, dans lequel les ailettes sont perforées.

6. Système de fixation (10) selon l'une quelconque des revendications précédentes, dans lequel le corps creux (2) et la saillie creuse (5) sont constitués d'une seule pièce.

7. Socle préfabriqué (100), comprenant :

une pluralité de couches superposées (101), chacune d'entre elles étant formée par une pluralité de blocs de béton armé préfabriqués ;
au moins une barre de raccordement (102) comportant une extension entre les couches (101) pour les relier structurellement les unes aux autres ;
au moins un système de fixation (10) selon l'une quelconque des revendications précédentes reçu dans chaque couche (101), ladite barre de raccordement (102) étant vissée dans chaque couche (101) au système de fixation (10) correspondant.

FIG. 1

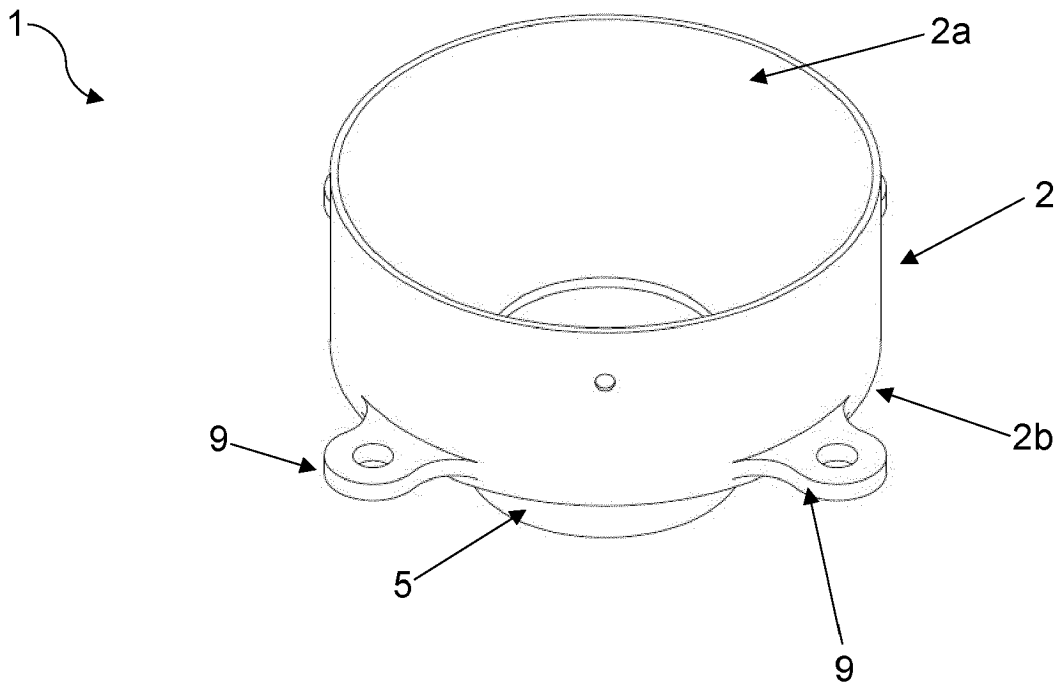


FIG. 2

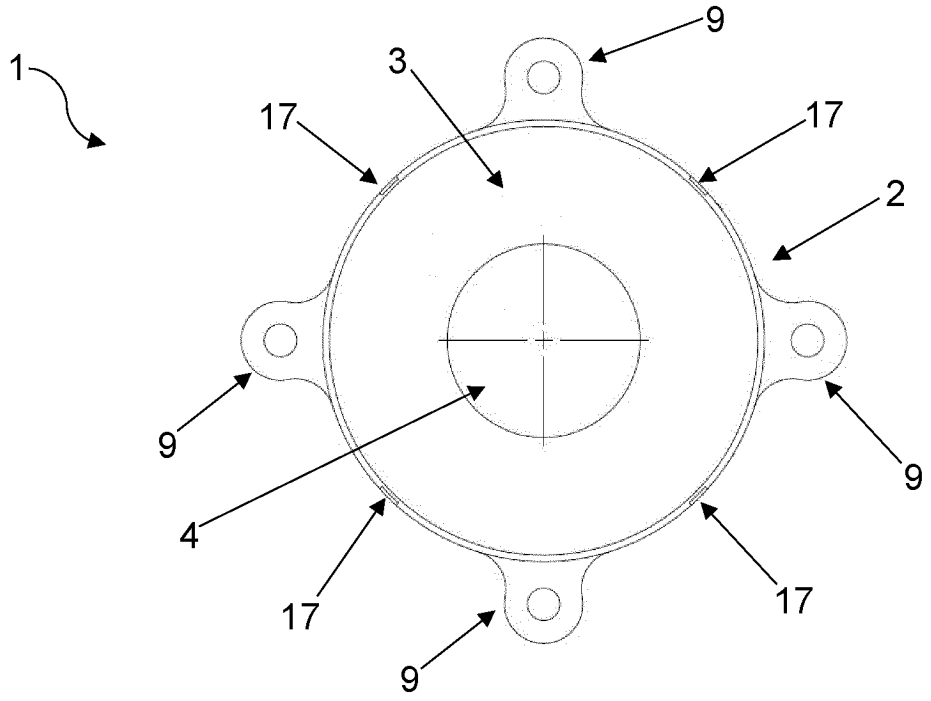


FIG. 3

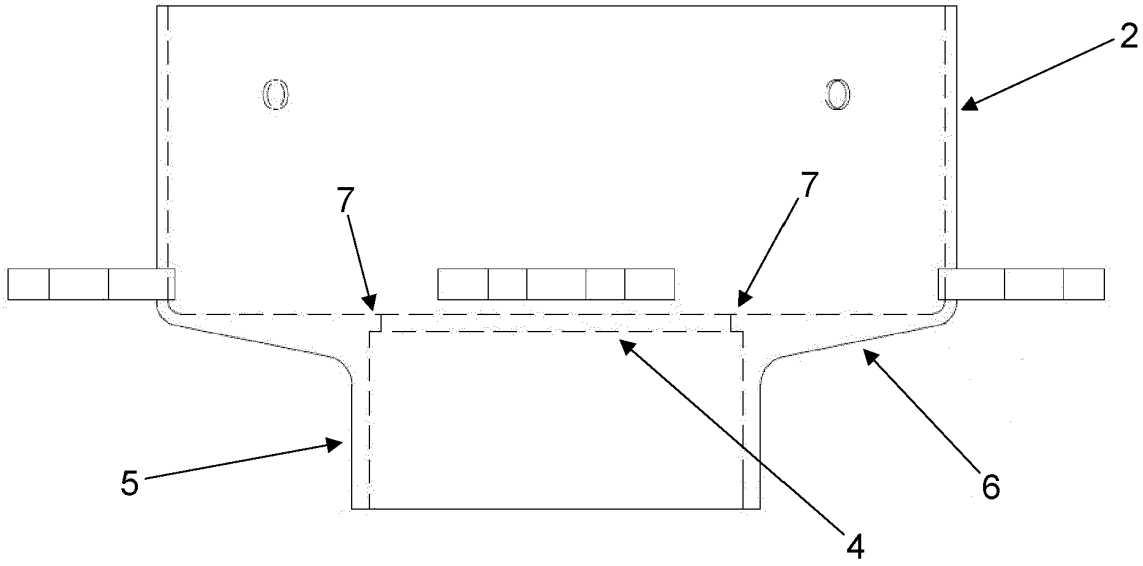


FIG. 4

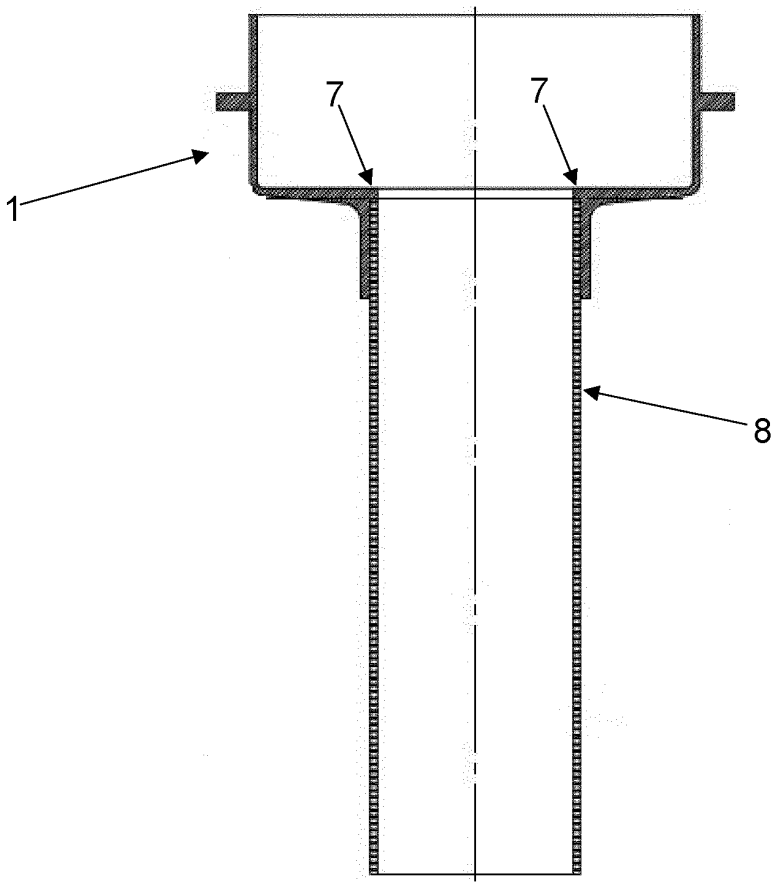


FIG. 5

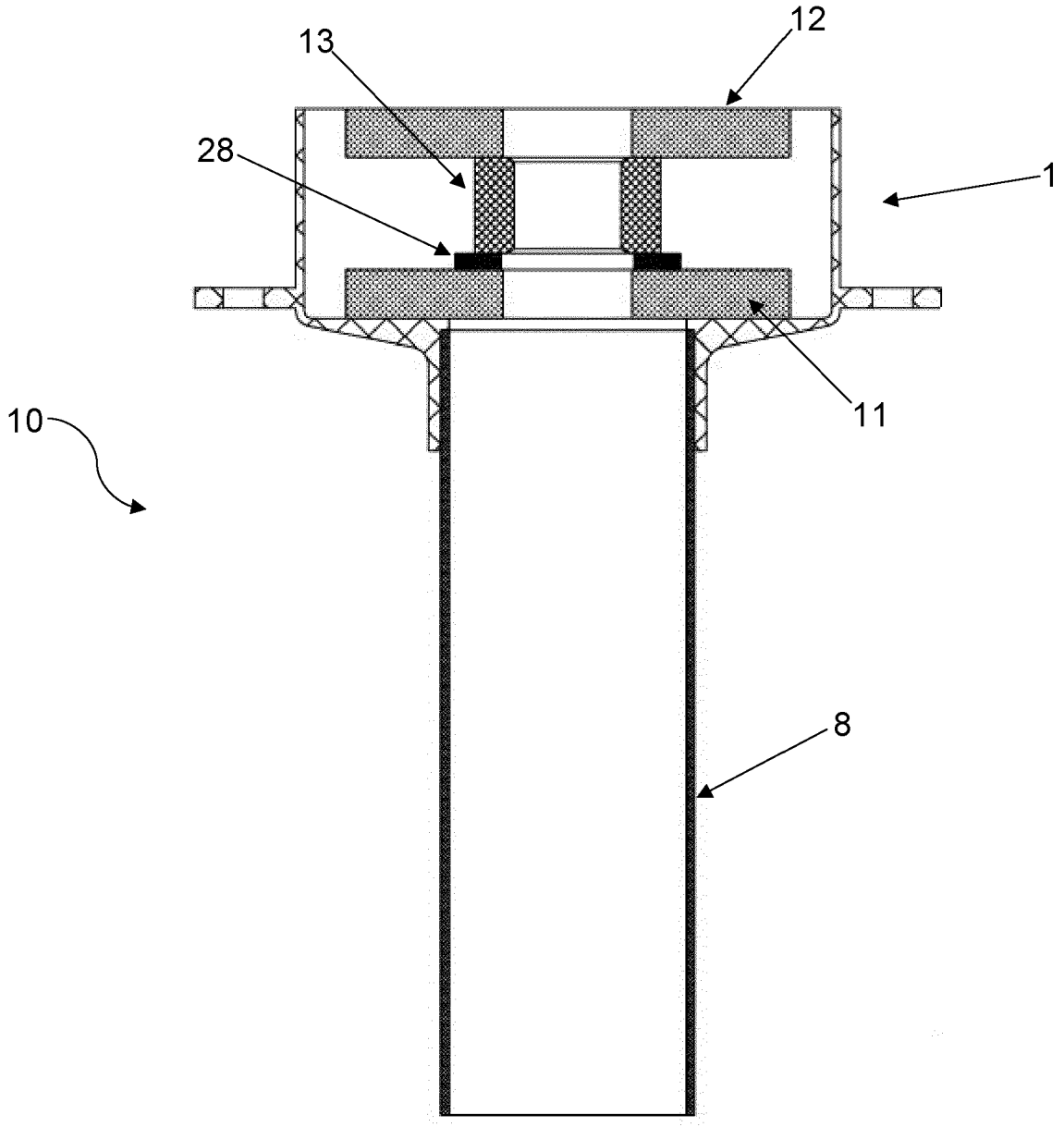


FIG. 6

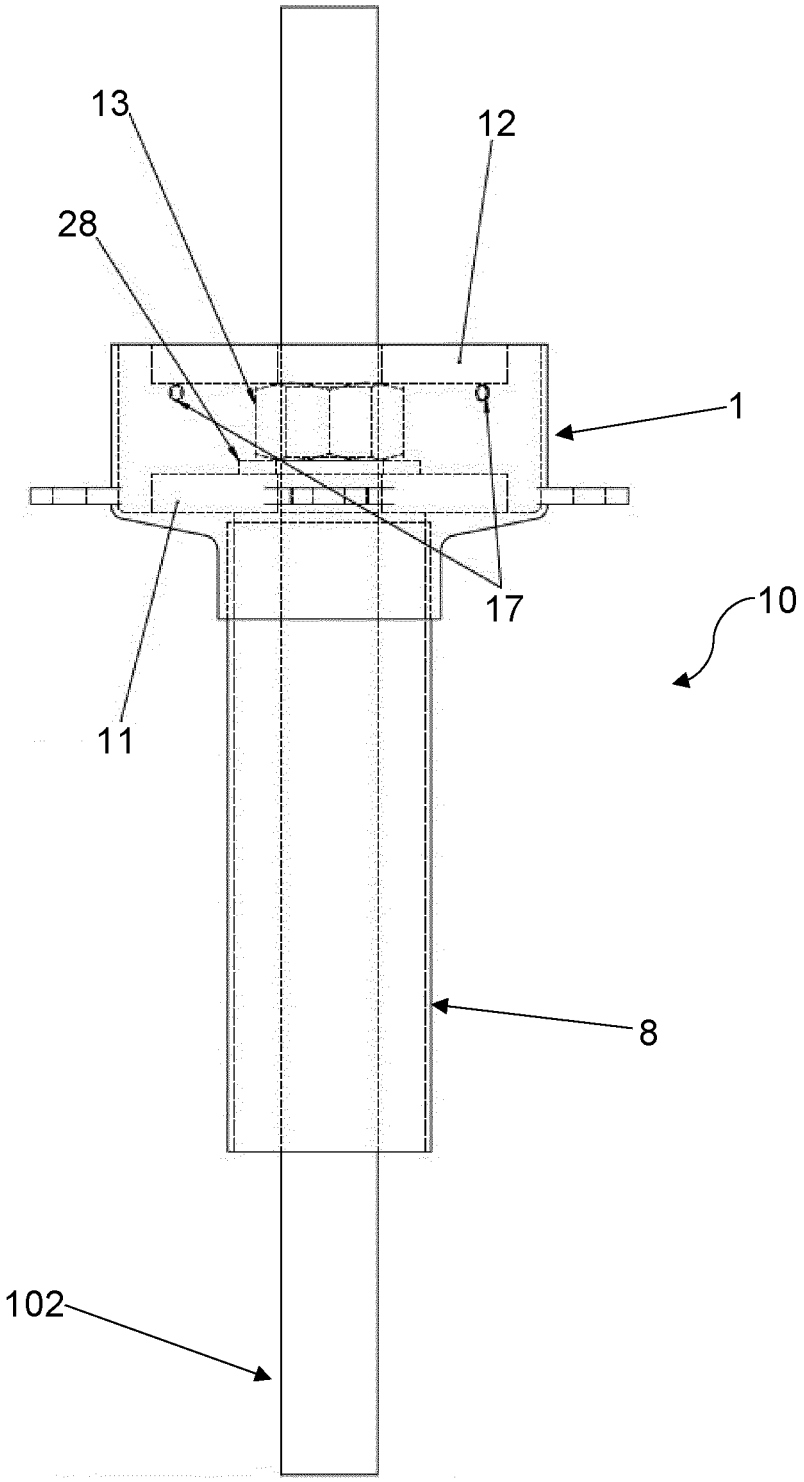


FIG. 7

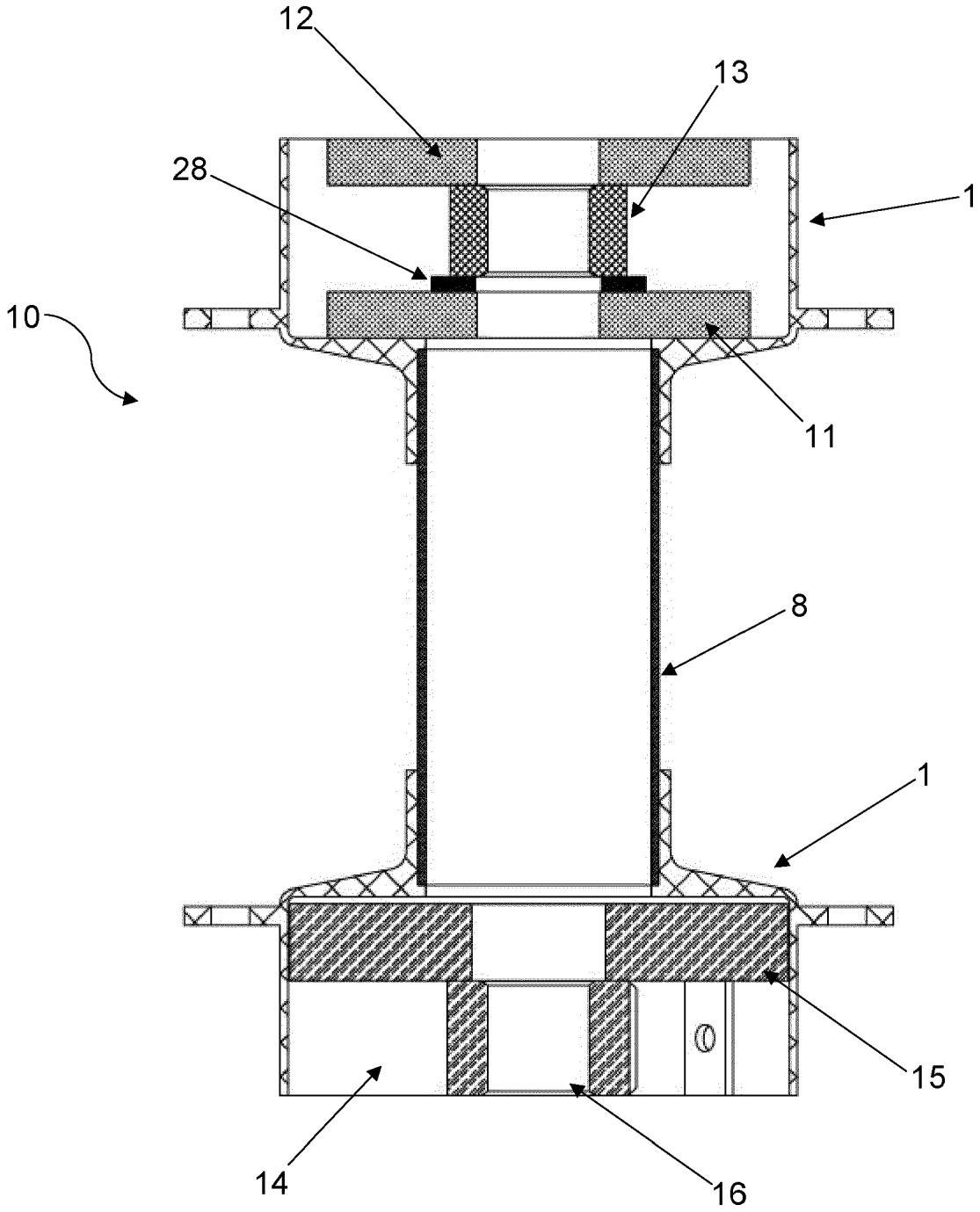


FIG. 8

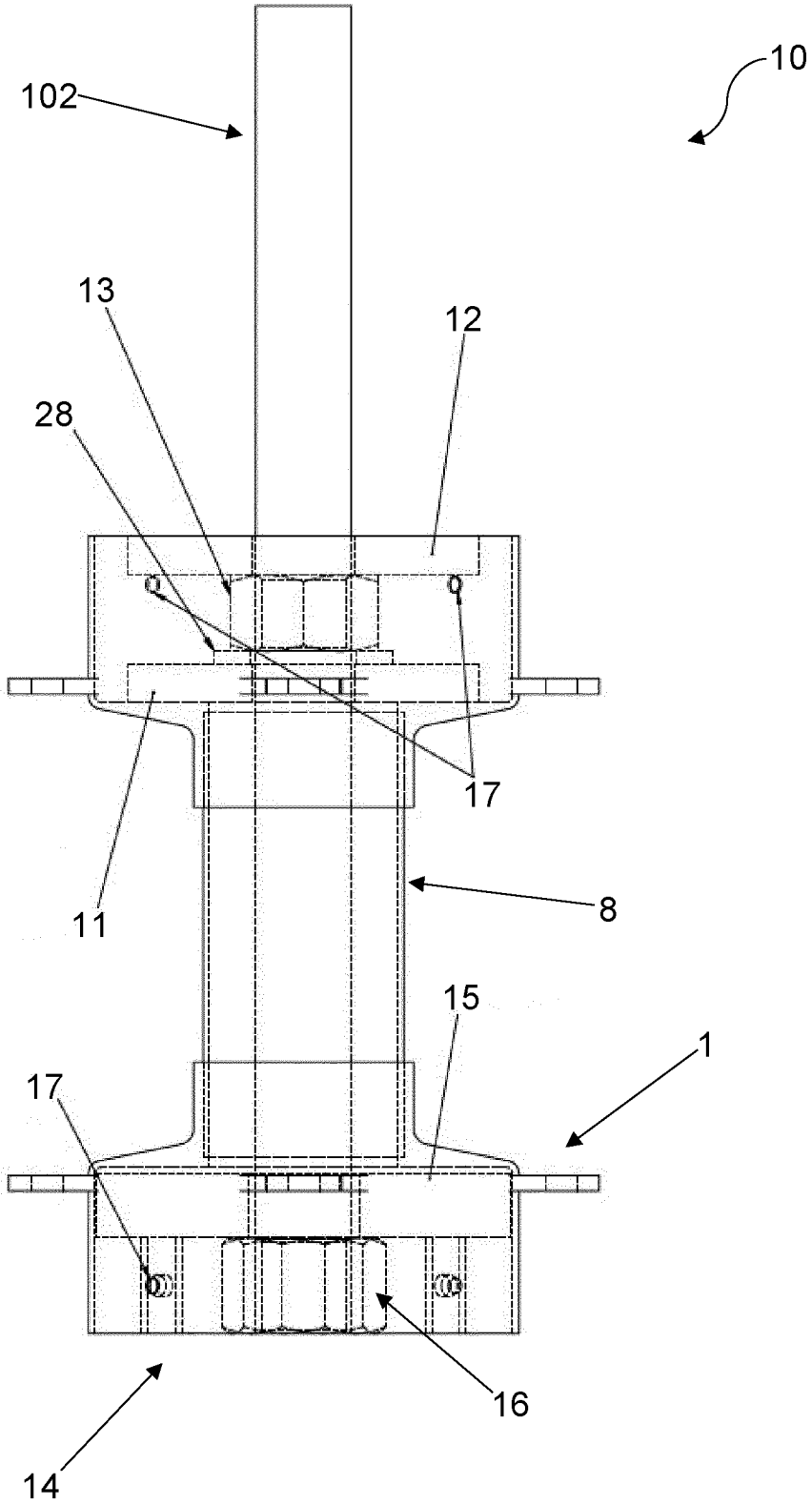


FIG. 9

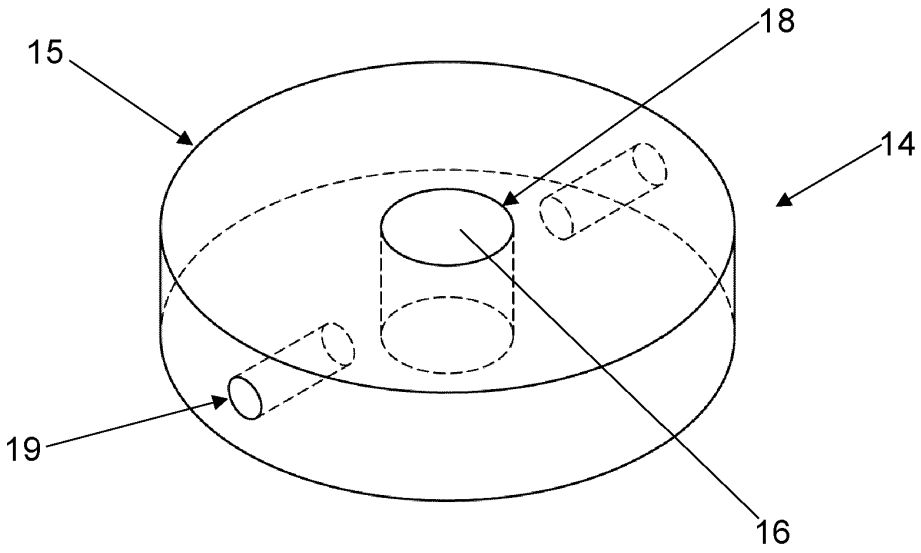


FIG. 10

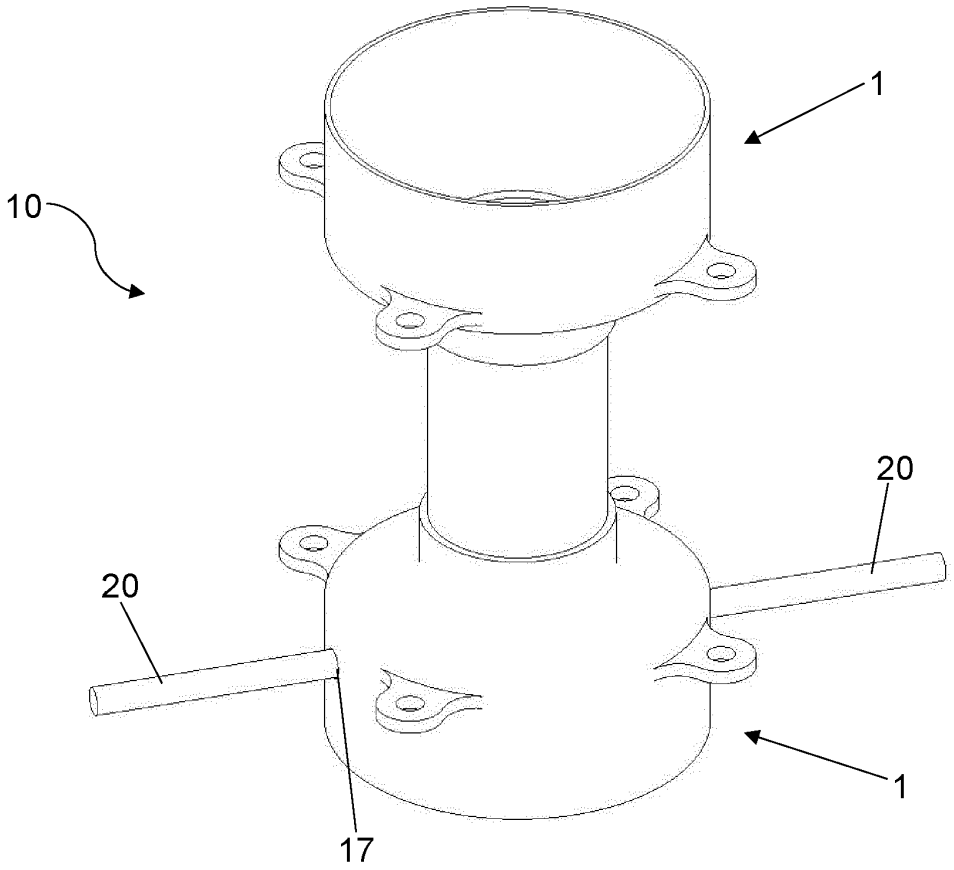


FIG. 11

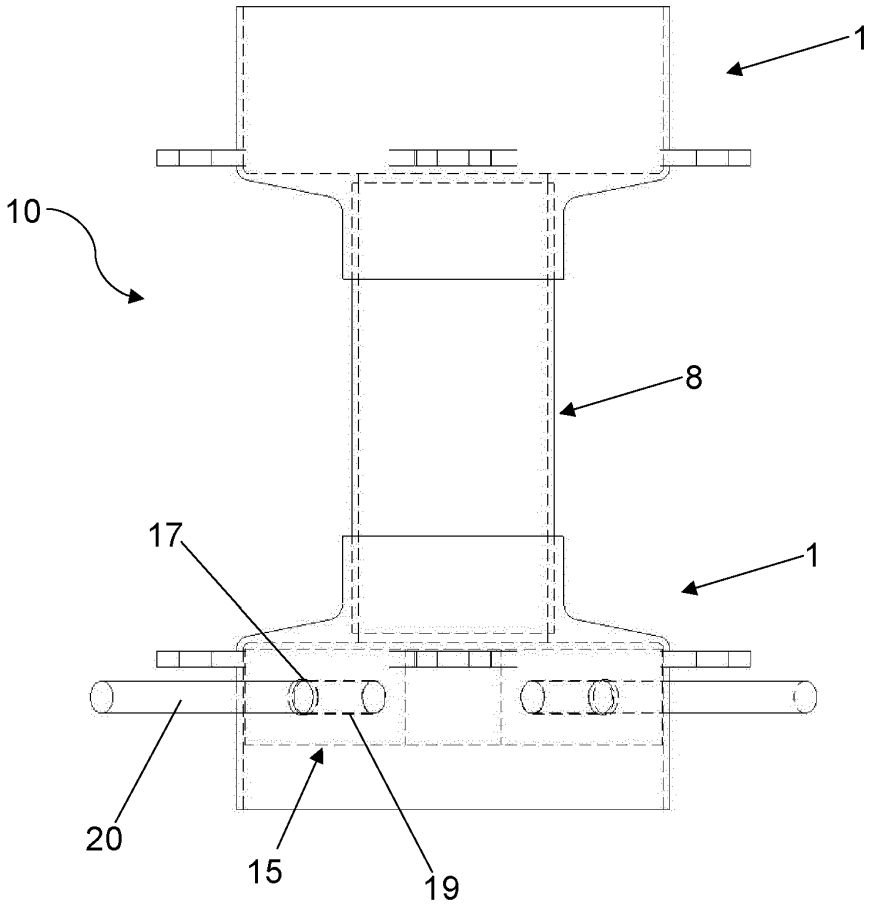
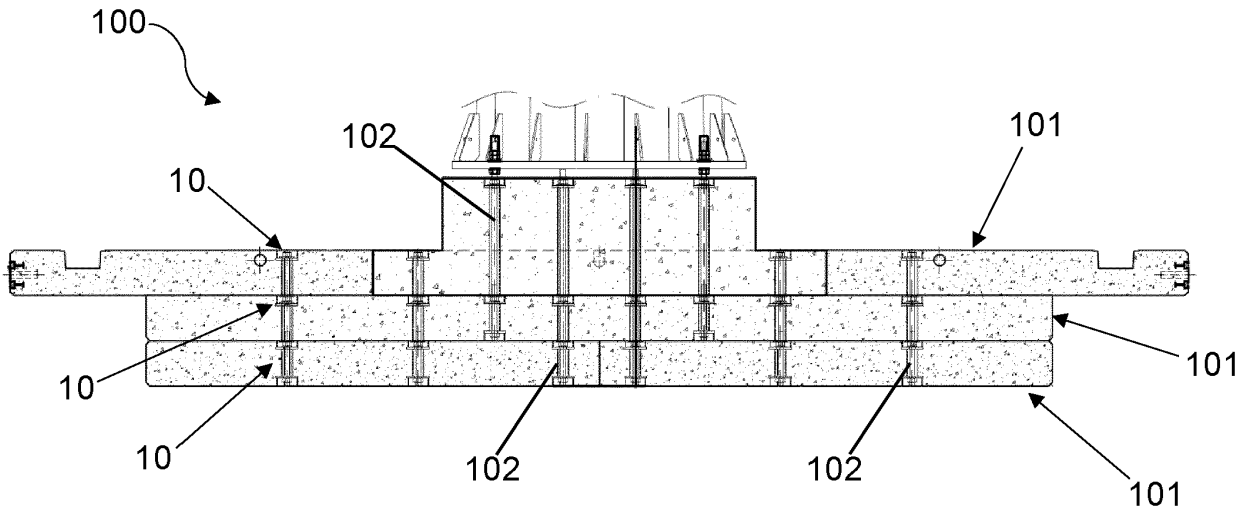


FIG. 12



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Patent documents cited in the description

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