

(19)



(11)

EP 2 952 648 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
12.01.2022 Bulletin 2022/02

(51) Int Cl.:
E04F 11/18 ^(2006.01)

(21) Application number: **15169639.0**

(22) Date of filing: **28.05.2015**

(54) CLAMPING ARRANGEMENT FOR A PLATE-SHAPED BODY

KLEMMANORDNUNG FÜR EINEN PLATTENFÖRMIGEN KÖRPER

DISPOSITIF DE SERRAGE POUR UN CORPS EN FORME DE PLAQUE

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **04.06.2014 NL 2012944**

(43) Date of publication of application:
09.12.2015 Bulletin 2015/50

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Description

[0001] This present invention concerns a clamping arrangement for clamping a plate-shaped body, for example, a glass plate.

[0002] Such a clamping arrangement has meanwhile become generally known. The problem with the known clamping arrangements is that the set-up, in practice, is often a vertical set up and the possible readjustment after setting and assembly, if this is possible, as well as the clamped holding of the plate-shaped body, leaves to be desired.

[0003] A clamping arrangement according to the preamble of claim 1 is disclosed by EP 1 160 411.

[0004] The known clamping arrangement comprises

- a profile that is constructed from profile parts which are inseparable from each other, having between them an opening for the plate shaped body, and
- two pressure elements each on opposite sides of the applied plate-shaped body, whereby a first pressure element faces against a first profile part in said opening for support, whereby a second pressure element faces against a second profile part in said opening for support, whereby said first and second profile parts are on two opposite sides of the applied plate shaped body,

whereby the second pressure element has a projecting wedge-shaped part, and

whereby the second profile part has an inclined clamping surface on its side facing the second pressure element.

[0005] The object of this invention is to provide an improved adjustable, but still solid clamping arrangement for plate-shaped bodies.

[0006] For this purpose, the clamping arrangement, in accordance with the invention, is characterized in that

at least said second profile part is equipped with one or more clamping organs, which exercise a clamping force on the facing second pressure element and the plate shaped body, and

whereby the projecting wedge-shaped part of the pressure element which is at the bottom of the opening, in the case the plate-shaped body is inserted in the opening, makes frictional contact with the inclined clamping surface of the second profile part at the foot of the body in a vertical set up of said plate shaped body.

[0007] The advantage of clamping arrangement according to the invention is that for the benefit of good stability of the clamping arrangement, the profile parts are inseparable from each other and connected to the profile of the clamping arrangement, and, in this way intrinsically solid, which border the opening in which the

plate-shaped body is located. The body is fixed in the opening while it is located therein between the pressure elements on opposite sides which support the fixed profile parts. Setting the clamping force, and also of the often vertical position or angle of the solid clamped plate-shaped body takes place by means of at least one clamping organ applied in or onto both profile parts.

[0008] In the clamping arrangement of the invention, one or more of the clamping organs are constructed as clamping organs which produce an adjustable clamping force. Advantageously the clamping organs are constructed as adjustable clamping organs, but the clamping organs may also be constructed as fixed organs. The clamping organs comprise an inclined clamping surface, which supports or forms an integral part of one or both profile parts. There, one wedge-shaped constructed part of the pressure element which operates at the bottom of the opening makes frictional contact with the inclined clamp surface, as a result of which the plate-shaped body is clamped in fixed position.

[0009] A further embodiment of the clamping arrangement is characterized in that at least the pressure element not equipped with clamping organs has a side facing its pressure element which side exhibits a convexity.

[0010] The advantage of the application of such a convexity is that by means of the pressing clamping organs on the other side of the plate-shaped body, it is possible to affect the degree of clamping and the current position or angle of the plate-shaped body which is clamped in the opening.

[0011] Further detailed possible embodiments which are applied separately are mentioned together with the examples related thereto in the following description.

[0012] At least, the clamping arrangement, according to this invention, will be further explained based of the following figures, in which corresponding parts are labeled with the same reference numbers. Thereby:

- Figure 1 shows a clamping arrangement outside the scope of the invention; and
- Figure 2 shows a clamping arrangement according to the invention.

[0013] Figures 1 and 2 each show a clamping arrangement 1 which is suitable for clamping a plate-shaped body 2. The plate-shaped body 2 may be a glass, metal, or plastic plate. In the case of a glass plate, it can be considered, as being or not being composed of multiple layers, possibly toughened glass, including, among other things, such as used in a fence or railing along hand rails, balconies, stairs, etc. Therein, for safety reasons, reduced back-lash clamping of the plate-shaped body 2 is of great importance. After all, a small clearance at the clamping side, usually the bottom, of the body 2 already leads to a swing which is observable and experienced by users to be unsafe, or greater clearance on its opposite, upper, unclamped side. The plate-shaped body 2 comprises a profile 3 which is constructed from profile

parts which are inseparable from each other 3-1, 3-2 having there between an opening 4 for introducing the plate-shaped body 2 therein. Also, the clamping arrangement 1 comprises two supporting pressure elements 5-1, 5-2, each on opposite sides of the introduced plate-shaped body 2, against the profile parts 3-1, 3-2 in the opening 4. At least one of the two profile parts 3-1, 3-2 is equipped with one or more clamping organs, a clamping force on the pressure elements concerned 5-1, 5-2, and thus exercised on the plate-shaped body 2, to be further explained hereinafter as clamping organs 6-1, 6-2, 6-3; also referred to as 6.

[0014] The pressure elements 5-1, 5-2, as shown in both figures are flat, somewhat flexible elements which are at least applied on opposite sides of the plate-shaped body 2 in the opening 4. By means of the pressure elements 5-1 and 5-2, clamp force exerted by the various clamping organs 6 on the body 2 is spread over a larger area of the part of the body 2, which is located in the opening 4. Preferably, the lower, or short side of the clamped part of the body 2 is supported by a supporting part 5-3, whereby the pressure part concerned, in this case 5-1, is L-shaped. The supporting part 5-3 can form a whole with the pressure element 5-1.

[0015] Figure 1, which does not relate to the invention, shows a construction of the clamping arrangement 1 in which only the profile parts 3-2 are equipped with two clamping members 6-1, 6-2, and in this case, placed above each other, each of which is constructed as a pressure clamping screw against the pressure element 5-2. The clamping screws concerned can, for this purpose, be turned from the inside, i.e. as seen from the right in the figure, in the threaded openings in the element 5-2 in order to exert an adjustable clamping force on the plate-shaped body 2. This is particularly important when the clamping arrangement is applied at the edge of a patio or balcony, the outer side of which, in particular, after the application of the plate-shaped body 2 is not easily accessible or is not accessible without tools.

[0016] In this construction it is also shown that, at least, that the side facing the pressure element 5-1 of the profile part 3-1 not equipped with clamping organs has introduced a convexity in its outer surface. Pressure elements 5-1, and the part of the body 2 located in the opening 4 can tilt subsequently to this convexity 7. The tilting takes place by turning at least one of the two clamping screws of the clamping organs 6-1 and 6-2. A symmetrical position adjustment of the body 2 occurs when the top T of the convexity 7 is located approximately at the halfway point of the height of the opening 4. In practice, the radius of curvature of the convexity is such that the clearance existing at the bottom and / or at the top of the opening 4 is approximately 1 mm to each side in relation to the vertical.

[0017] Figure 2 shows a construction of the clamping arrangement 1 according to the invention, in which the side facing the pressure elements 5-2 of the clamping organs 6-1, 6-3 3-2, profile part 3-2 is equipped with

clamping organ 6-3 constructed as inclined clamping surface. In such a case, a projecting wedge-shaped part of the pressure element 5-2 at the bottom of opening 4 makes frictional contact with the inclined clamp surface by striking that pressure element 5-2 the foot at the bottom in opening 4 of the body 4 is moved to the left in Figure 2 and it is also clamped more firmly. When the clamping organ 6-1 which is equipped with a clamping screw is located above the inclined clamping surface of the profile part 3-2, therewith the position of the plate-shaped body 2 can be further adjusted. Also in this execution, the convexity 7 can be introduced in the side facing pressure element 5-1 of the profile part 3-1 which is not equipped with clamping organs.

[0018] This figure 2 further shows that the profile 3 has a continuous ground profile 3-3 beyond the profile part 3-2 in which openings have been introduced in order to fix therein or thereto, respectively, adjustment bolts 8-1, or locknuts 8-2, respectively, in order to be able to anchor the clamping arrangement in one go to the surface. Thereto, at some distance, from the profile part 3-2, a concrete floor can be molded. If desired, the upright profile part 3-2, together with the pressure element 5-2, can be covered by a corner plate 9.

[0019] As outlined above the clamping organ 6-1 may be equipped with a clamping screw located above the inclined clamping surface of the profile part 3-2. For adjustment purposes it may be desired to have a clamping screw, but then the screw will have to be accessible from the right side in the figures and need not be buried under cement or concrete. The left side may be the exposed outer side of for example a balcony, gallery or stand, which are generally not easily accessible without scaffolding. In an alternative the clamping organ may be comprise a serration or a series of serrations also for preventing the pressure element 5-2 from moving upward. Thereto the serration's ridges and valleys extend longitudinally along the preferably continuous pressure strip element 5-2, so that they can be fastened by exerting a force from above by means of for example a soft hammer. In that case the pressure element 5-2 is firmly secured and clamps the plate shape body 2, while the cement or concrete may be poured on said right side to a higher level than in cases where a clamping screw is used, without the use of the corner plate 9 being necessary. Advantage of the use of the longitudinal continuous pressure strip elements 5-1, 5-2 and 5-3 is further that complete lower part of the plate shaped body 2 is being clamped, that is on and along all its three clamped sides, thus preventing peak loads therein. For that reason separate wedges or keys are less advisable, because they tend to increase the chances of breaking the clamped plates 2.

Claims

1. Clamping arrangement (1) for clamping a plate-

shaped body (2) comprising:

- a profile (3) that is constructed from profile parts (3-1, 3-2, 3-3) which are inseparable from each other, having between them (3-1, 3-2) an opening (4) for the plate shaped body (2), and
 - two pressure elements (5-1, 5-2) each on opposite sides of the applied plate-shaped body (2), whereby a first pressure element (5-1) faces against a first profile part (3-1) in said opening (4) for support, whereby a second pressure element (5-2) faces against a second profile part (3-2) in said opening (4) for support, whereby said first and second profile parts (3-1, 3-2) are on two opposite sides of the applied plate shaped body (2), whereby the second pressure element (5-2) has a projecting wedge-shaped part, whereby the second profile part (3-2) has an inclined clamping surface (6-3) on its side facing the second pressure element (5-2);

characterized in that

at least said second profile part (3-2) is equipped with one or more clamping organs (6-1, 6-2, 6-3), which exercise a clamping force on the facing second pressure element (5-2) and the plate shaped body (2), and

whereby the projecting wedge-shaped part of the pressure element (5-2) which is at the bottom of the opening (4), in the case the plate-shaped body (2) is inserted in the opening (4), makes frictional contact with the inclined clamping surface (6-3) of the second profile part (3-2) at the foot of the body (2) in a vertical set up of said plate shaped body (2).

2. Clamping arrangement (1) according to claim 1, **characterised in that** only one of the two profile parts (3-2) is equipped with clamping organs (6-1, 6-3).
3. Clamping arrangement (1) according to claim 1 or 2, **characterised in that** one or more of the clamping organs are constructed as adjustable clamping force producing clamping organs (6-1, 6-2, 6-3).
4. Clamping arrangement (1) according to one of the claims 1-3, **characterised in that** at least the profile part (5-1) not equipped with clamping organs has a side facing its pressure element which side exhibits a convexity.
5. Clamping arrangement (1) according to claim 4, **characterised in that** the top of the convexity is located approximately at the halfway point of the height of the opening (4) into which the plate-shaped body (2) is to be introduced.

6. Clamping arrangement (1) according to claim 4 or 5, **characterised in that** the radius of curvature of the convexity is such that the clearance existing at the bottom and / or at the top of the opening (4) is approximately 1 mm.
7. A clamping arrangement (1) according to one of the claims 1-6, **characterised in that** at least one of the two pressure elements (5-1, 5-2) has a falling supporting part (5-3) up to the bottom of the short side of the plate-shaped body (2).
8. A clamping arrangement (1) according to claim 7, **characterised in that** the at least one pressure element (5-1, 5-2) with the support part (5-3) is L-shaped.
9. Clamping arrangement (1) according to claim 7 or 8, **characterised in that** at least one pressure element (5-1, 5-2) forms a whole with its supporting part (5-3).
10. Clamping arrangement (1) according to any one of the claims 1-9, **characterised in that** the clamping organ (6-1) is located above the inclined clamping surface (6-3) of the profile part (3-2).
11. Clamping arrangement (1) according to one of the claims 1-10, **characterised in that** at least one clamping organ is a clamping screw (6-1).
12. Clamping arrangement (1) according to one of the claims 1-11, **characterised in that** the profile (3) has one continuous ground profile (3-3) beyond at least one of the two profile parts (3-1, 3-2) into which openings are introduced in order to fix the clamping arrangement to a surface.
13. Clamping arrangement (1) according to claim 12, **characterised in that** the clamping arrangement is equipped in or on the opening for fixing with adjustment bolts (8-1) or lock nuts (8-2).
14. Clamping arrangement (1) according to one of the claims 1-13, **characterised in that** at least one clamping organ (6-1, 6-2, 6-3) is embodied by a serration or a series of serrations for preventing the pressure element (5-2, 5-2) from moving upward.
15. Clamping arrangement (1) according to one of the claims 1-14, **characterised in that** at least one of the pressure elements (5-1, 5-2, 5-3) are longitudinally continuous pressure elements.

Patentansprüche

1. Klemmanordnung (1) zum Klemmen eines platten-

förmigen Körpers (2) umfassend:

- ein Profil (3), das aus voneinander untrennbaren Profiltteilen (3-1, 3-2, 3-3) aufgebaut ist, zwischen welchen (3-1, 3-2) eine Öffnung (4) für den plattenförmigen Körper (2) besteht, und
 - zwei Druckelemente (5-1, 5-2) jeweils auf gegenüberliegenden Seiten des angebrachten plattenförmigen Körpers (2), wobei ein erstes Druckelement (5-1) dem ersten Profiltteil (3-1) in der Öffnung (4) zur Abstützung gegenüberliegt, wobei ein zweites Druckelement (5-2) dem zweiten Profiltteil (3-2) in der Öffnung (4) zur Abstützung gegenüberliegt, wobei die ersten und zweiten Profiltteile (3-1, 3-2) auf zwei gegenüberliegenden Seiten des angebrachten plattenförmigen Körpers (2) liegen,

wobei das zweite Druckelement (5-2) einen hervorstehenden keilförmigen Teil aufweist,

wobei das zweite Profiltteil (3-2) auf seiner dem zweiten Druckelement (5-2) zugewandten Seite eine geneigte Klemmfläche (6-3) aufweist;

dadurch gekennzeichnet,

dass zumindest das zweite Profiltteil (3-2) mit einem oder mehreren Klemmorganen (6-1, 6-2, 6-3) ausgestattet ist, die eine Klemmkraft auf das gegenüberliegende zweite Druckelement (5-2) und den plattenförmigen Körper (2) ausüben,

wobei der hervorstehende keilförmige Teil des Druckelements (5-2), der sich an der Unterseite der Öffnung (4) befindet, im Falle des Einsetzens des plattenförmigen Körpers (2) in die Öffnung (4) in Reibungskontakt mit der geneigten Klemmfläche (6-3) des zweiten Profiltteils (3-2) am Fuß des Körpers (2) bei einer vertikalen Aufstellung des plattenförmigen Körpers (2) gelangt.

2. Klemmanordnung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** nur eines der beiden Profiltteile (3-2) mit Klemmorganen (6-1, 6-3) ausgestattet ist.
3. Klemmanordnung (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** eines oder mehrere der Klemmorgane als einstellbare, Klemmkraft erzeugende Klemmorgane (6-1, 6-2, 6-3) ausgebildet sind.
4. Klemmanordnung (1) nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** zumindest das nicht mit Klemmorganen versehene Profiltteil (5-1) eine seinem Druckelement zugewandte Seite hat, die eine Wölbung aufweist.

5. Klemmanordnung (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** die Oberseite der Wölbung sich ungefähr in der Mitte der Höhe der Öffnung (4) befindet, in die der plattenförmige Körper (2) eingeführt werden soll.
6. Klemmanordnung (1) nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** der Krümmungsradius der Wölbung derart ausgebildet ist, dass der Freiraum an der Unterseite und/oder an der Oberseite der Öffnung (4) etwa 1 mm beträgt.
7. Klemmanordnung (1) nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** mindestens eines der beiden Druckelemente (5-1, 5-2) ein fallendes Stützteil (5-3) bis zur Unterseite der kurzen Seite des plattenförmigen Körpers (2) aufweist.
8. Klemmanordnung (1) nach Anspruch 7, **dadurch gekennzeichnet, dass** das mindestens eine Druckelement (5-1, 5-2) mit dem Stützteil (5-3) L-förmig ist.
9. Klemmanordnung (1) nach Anspruch 7 oder 8, **dadurch gekennzeichnet, dass** das mindestens eine Druckelement (5-1, 5-2) integral mit seinem Stützteil (5-3) ausgebildet ist.
10. Klemmanordnung (1) nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** das Klemmorgan (6-1) sich oberhalb der geneigten Klemmfläche (6-3) des Profiltteils (3-2) befindet.
11. Klemmanordnung (1) nach einem der Ansprüche 1 bis 10, **dadurch gekennzeichnet, dass** mindestens ein Klemmorgan eine Klemmschraube (6-1) ist.
12. Klemmanordnung (1) nach einem der Ansprüche 1 bis 11, **dadurch gekennzeichnet, dass** das Profil (3) über mindestens eines der beiden Profiltteile (3-2) hinaus ein durchgehendes Bodenprofil (3-3) aufweist, in das Öffnungen eingebracht sind, um die Klemmanordnung an einer Oberfläche zu befestigen.
13. Klemmanordnung (1) nach Anspruch 12, **dadurch gekennzeichnet, dass** die Klemmanordnung in oder an der Öffnung mit Stellschrauben (8-1) oder Kontermuttern (8-2) zur Befestigung ausgestattet ist.
14. Klemmanordnung (1) nach einem der Ansprüche 1 bis 13, **dadurch gekennzeichnet, dass** mindestens ein Klemmorgan (6-1, 6-2, 6-3) durch eine Verzahnung oder eine Reihe von Verzahnungen verkörpert ist, um das Druckelement (5-2, 5-2) an einer Aufwärtsbewegung zu hindern.
15. Klemmanordnung (1) nach einem der Ansprüche 1 bis 14, **dadurch gekennzeichnet, dass** mindestens

eines der Druckelemente (5-1, 5-2, 5-3) ein in Längsrichtung durchgehendes Druckelement ist.

Revendications

1. Agencement de serrage (1) pour serrer un corps en forme de plaque (2) comprenant:

- un profilé (3) qui est fabriqué à partir de parties de profilé (3-1, 3-2, 3-3) qui sont inséparables les unes des autres, ayant entre elles (3-1, 3-2) une ouverture (4) destinée au corps en forme de plaque (2), et

- deux éléments de pression (5-1, 5-2), chacun sur les côtés opposés du corps en forme de plaque (2) appliqué, moyennant quoi un premier élément de pression (5-1) est orienté contre une première partie de profilé (3-1) dans ladite ouverture (4) pour le support, moyennant quoi un second élément de pression (5-2) est orienté contre une seconde partie de profilé (3-2) dans ladite ouverture (4) pour le support, moyennant quoi lesdites première et seconde parties de profilé (3-1, 3-2) sont sur deux côtés opposés du corps en forme de plaque (2) appliqué,

moyennant quoi le second élément de pression (5-2) a une partie en forme de cale en saillie,

moyennant quoi la seconde partie de profilé (3-2) a une surface de serrage inclinée (6-3) sur son côté faisant face au second élément de pression (5-2);

caractérisé en ce que,

au moins ladite seconde partie de profilé (3-2) est équipée avec un ou plusieurs organes de serrage (6-1, 6-2, 6-3) qui exercent une force de serrage sur le second élément de pression (5-2) en vis-à-vis et le corps en forme de plaque (2), et

moyennant quoi la partie en forme de cale en saillie de l'élément de pression (5-2) qui est au fond de l'ouverture (4), dans le cas dans lequel le corps en forme de plaque (2) est inséré dans l'ouverture (4), réalise un contact de friction avec la surface de serrage inclinée (6-3) de la seconde partie de profilé (3-2) au pied du corps (2) dans une configuration verticale dudit corps en forme de plaque (2).

2. Agencement de serrage (1) selon la revendication 1, **caractérisé en ce que** seule une des deux parties de profilé (3-2) est équipée avec des organes de serrage (6-1, 6-3).

3. Agencement de serrage (1) selon la revendication 1

ou 2, **caractérisé en ce qu'un** ou plusieurs organes de serrage sont fabriqués sous forme d'organes de serrage de production de force de serrage ajustable (6-1, 6-2, 6-3).

4. Agencement de serrage (1) selon l'une des revendications 1 à 3, **caractérisé en ce qu'au** moins la partie profilée (5-1) non équipée avec les organes de serrage a un côté faisant face à son élément de pression, lequel côté présente une convexité.

5. Agencement de serrage (1) selon la revendication 4, **caractérisé en ce que** le sommet de la convexité est positionné approximativement au point à mi-chemin de la hauteur de l'ouverture (4) dans laquelle le corps en forme de plaque (2) doit être introduit.

6. Agencement de serrage (1) selon la revendication 4 ou 5, **caractérisé en ce que** le rayon de courbure de la convexité est tel que le jeu existant au fond et/ou au sommet de l'ouverture (4) est approximativement de 1 mm.

7. Agencement de serrage (1) selon l'une des revendications 1 à 6, **caractérisé en ce qu'au** moins l'un des deux éléments de pression (5-1, 5-2) a une partie de support de chute (5-3) jusqu'au fond du côté court du corps en forme de plaque (2).

8. Agencement de serrage (1) selon la revendication 7, **caractérisé en ce que** l'au moins un élément de pression (5-1, 5-2) avec la partie de support (5-3) est en forme de L.

9. Agencement de serrage (1) selon la revendication 7 ou 8, **caractérisé en ce qu'au** moins un élément de pression (5-1, 5-2) forme un tout avec sa partie de support (5-3).

10. Agencement de serrage (1) selon l'une quelconque des revendications 1 à 9, **caractérisé en ce que** l'organe de serrage (6-1) est positionné au-dessus de la surface de serrage inclinée (6-3) de la partie profilée (3-2).

11. Agencement de serrage (1) selon l'une des revendications 1 à 10, **caractérisé en ce qu'au** moins un organe de serrage est une vis de serrage (6-1).

12. Agencement de serrage (1) selon l'une des revendications 1 à 11, **caractérisé en ce que** le profilé (3) a un profilé de sol continu (3-3) au-delà d'au moins l'une des deux parties de profilé (3-1, 3-2) dans lequel des ouvertures sont introduites afin de fixer l'agencement de serrage sur une surface.

13. Agencement de serrage (1) selon la revendication 12, l'agencement de serrage étant **caractérisé en**

ce qu'il est équipé dans ou sur l'ouverture pour la fixation avec des boulons d'ajustement (8-1) ou des écrous de verrouillage (8-2).

14. Agencement de serrage (1) selon l'une des revendications 1 à 13, **caractérisé en ce qu'**au moins un organe de serrage (6-1, 6-2, 6-3) est mis en œuvre par une dentelure ou une série de dentelures pour empêcher le déplacement vers le haut de l'élément de pression (5-2, 5-2). 5 10
15. Agencement de serrage (1) selon l'une des revendications 1 à 14, **caractérisé en ce qu'**au moins l'un des éléments de pression (5-1, 5-2, 5-3) sont des éléments de pression longitudinalement continus. 15

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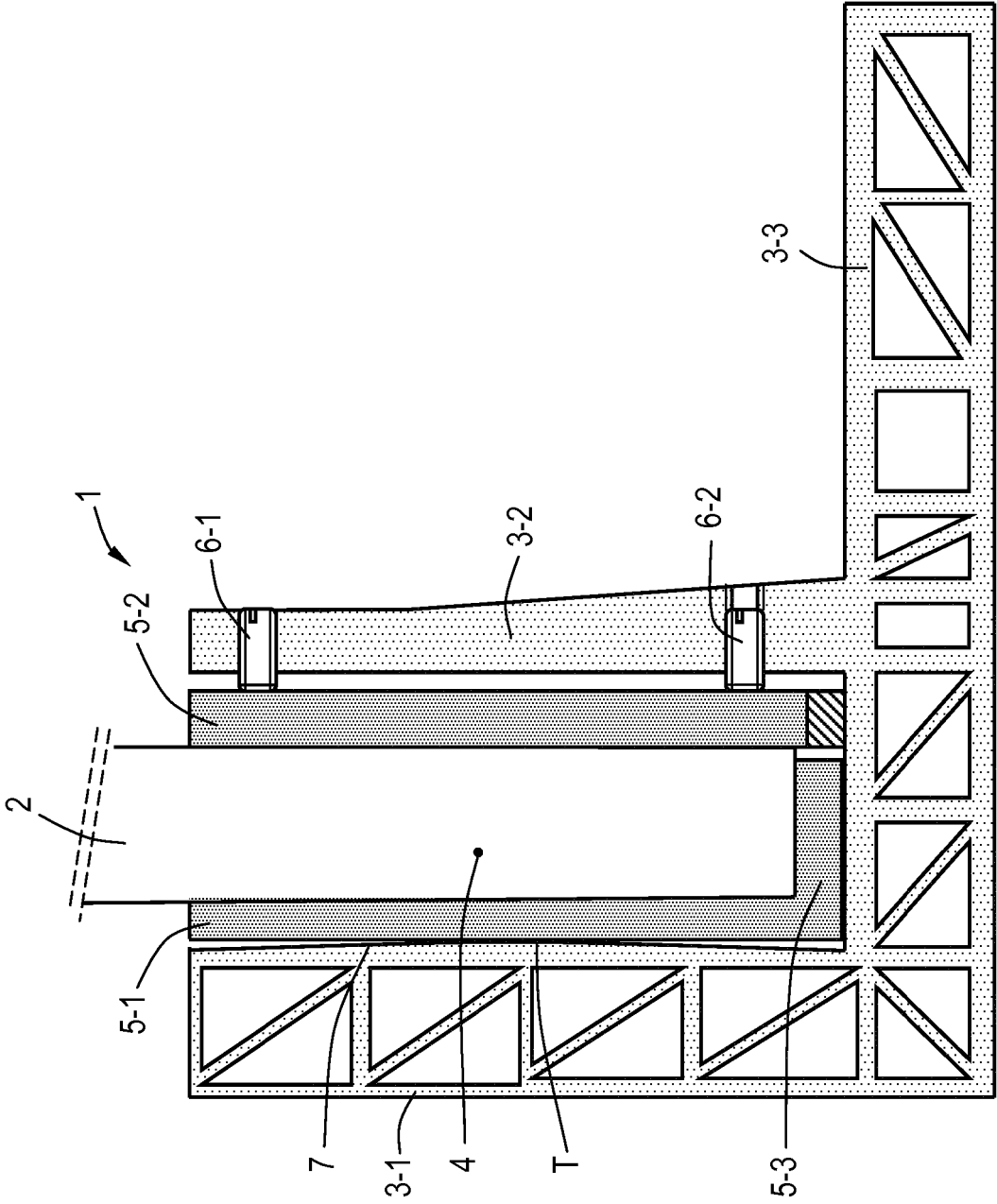
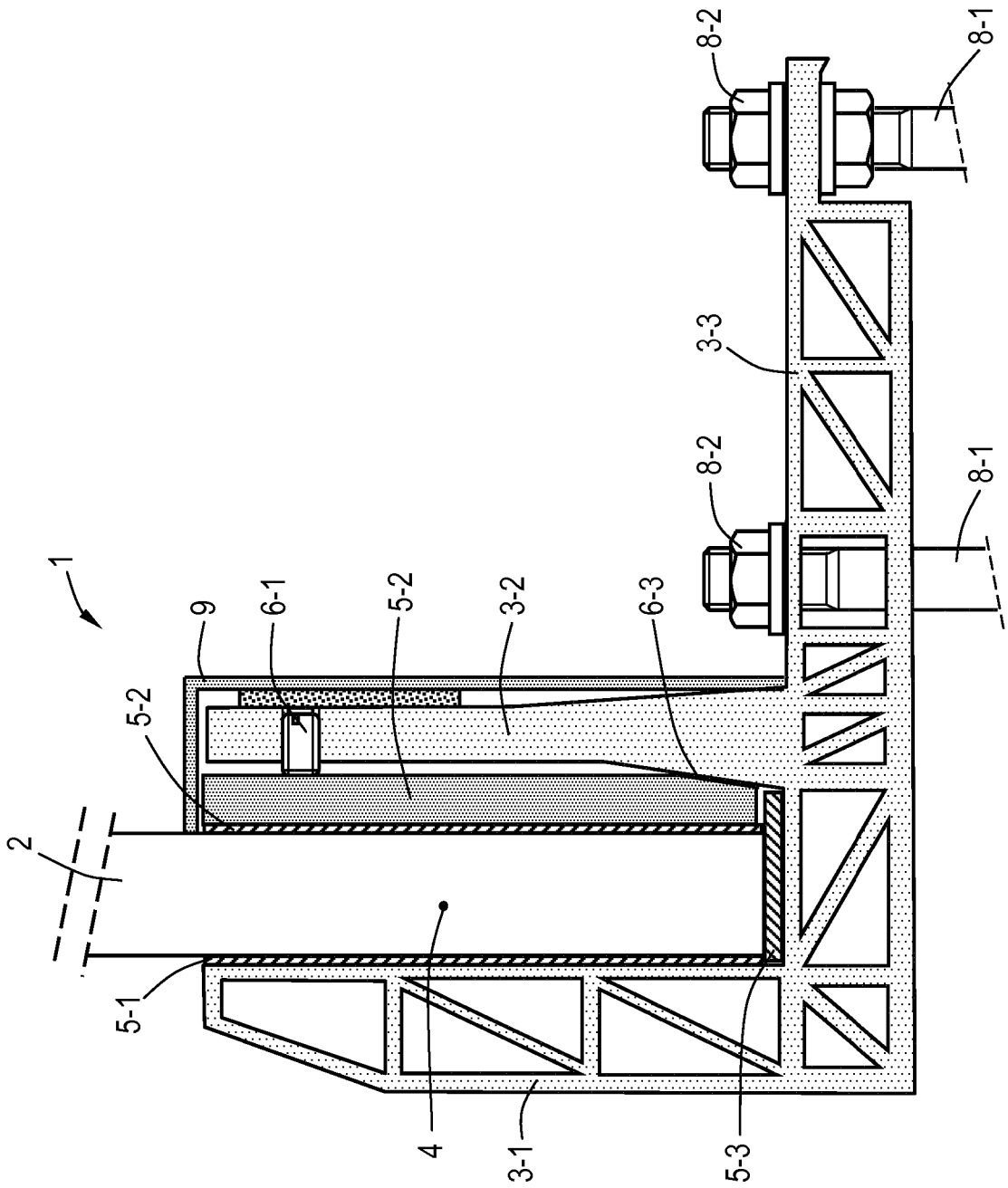


Fig.1



REFERENCES CITED IN THE DESCRIPTION

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