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(54) **Pedestal for an elevated floor assembly**

Stützfuss zum Abstützen eines überhöhten Fussbodenaufbaus

Support pour un plancher surélevé

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Description

Introduction

[0001] The present invention relates to a pedestal for supporting an elevated floor assembly on a substantially flat surface.

[0002] Such pedestals include a column, a supporting head fixed to the upper end of the column, so as to be capable of supporting the elevated floor assembly, and a base plate fixed to the lower end of the column for providing a support platform for the pedestal. The length of the column is generally adjustable, so that the height of the pedestal can be adjusted. In order to be capable of supporting heavy floor loads, all the supporting parts of the pedestal are generally made of metal, most often steel.

[0003] For fixing the column to the base plate, it is known to screw one end of the column in a threaded opening in the base plate. However, manufacturing such a screwed connection is rather expensive and the screwed connection constitutes a weak point of the pedestal, more particularly with regard its mechanical rigidity.

[0004] There are also prior art base plates comprising a substantially flat ground plate on which a tubular socket is welded. The free end of the column is then screwed in the tubular socket of the base plate. Reinforcing braces can be radially arranged around socket and welded to the socket and the ground plate. Such a welded base plate has of course a higher mechanical rigidity than the screwed base plate, but its manufacturing is also much more expensive. Same applies for prior art base plates that are cast.

[0005] It is also known to simply rest the column in a socket arranged in the base plate. German utility model DE-U-94 21 324 discloses such a pedestal, wherein the supporting head and/or the base plate of the pedestal has a socket with a cavity therein, projecting from the side of the base plate facing the column. The lower end of the column is received in the cavity. The base plate is obtained from a metal sheet by a process of deep drawing, wherein a cup like depression is worked in the centre of the side of the base plate facing the column so as to form the cavity surrounded by a collar. This allows for an easy and effortless connection of the column to the base plate, mechanical rigidity of the pedestal is however not guaranteed.

Object of the invention

[0006] A technical problem underlying the present invention is to provide a pedestal for an elevated floor assembly that is less expensive to manufacture and warrants nevertheless a high mechanical rigidity. This problem is solved by a pedestal as claimed in claim 1.

General description of the invention

[0007] Just as a prior art pedestal, a pedestal in accordance with the present invention includes a column, a supporting head fixed to the upper end of the column, so as to be capable of supporting the elevated floor assembly, and a base plate fixed to the lower end of the column for providing a support platform for the column on the surface. The base plate has an underside facing the surface on which the pedestal is to be supported and an opposite upper side facing the elevated floor assembly. A socket projecting from the upper side has a cavity therein, and the lower end of the column is received in this cavity. Reinforcing braces are radially arranged around the socket. A pedestal in accordance with the present invention distinguishes over prior art pedestals in that it is obtained from a metal sheet by a process of deep drawing. During this process a cup like depression is worked in the center of the upper side of the plate, so as to form the cavity surrounded by a collar, and cuneiform depressions are worked in the upper side of the collar, so that the undersides of the cuneiform depressions form substantially flat cuneiform support surfaces of the base plate. These cuneiform depressions are separated by radially extending U-shaped loops of the metal sheet, which form the reinforcing braces. It will be appreciated that such a base plate is inexpensive to manufacture and provides nevertheless a very high rigidity under high floor loads. It constitutes a very stable support platform for the pedestal and warrants a very even distribution of the load onto the surface on which it rests.

[0008] The lower end of the column is advantageously press fit into the cup like depression, so that no screwing, riveting or welding is necessary for fixing the base plate to the column. It will be appreciated in this context that the above described features of the base plate warrant a very solid and stable mechanical fit of the column in the base plate.

[0009] In a preferred embodiment of the pedestal, the underside of the cup like depression forms an additional, substantially flat support surface in the centre of the base plate and contributes thereby to a still better stability of the pedestal.

[0010] Mechanical rigidity of the base plate is even further increased, if the cuneiform depressions are arranged so that the metal sheet is doubled in their apex. In other words, the apexes of the cuneiform depressions form vertical reinforcements arranged around the cup receiving the lower end of the column. This feature has of course an advantageous effect on the press-fit-connection between the column and the base plate too.

[0011] In the preferred embodiment of the base plate, the height of the U-shaped loops linearly diminishes from the rim of the cavity, where they have a height substantially equal to the depth of the cavity, to the rim of the collar, where they have a height substantially equal to zero. In other words, the braces formed by the U-shaped loops have in a side view the form of a rectan-

gular triangle.

[0012] The collar of the base plate has a rim which is preferably substantially flat. The depth of the cup like depression is preferably about the same as its diameter.

[0013] In the preferred embodiment of the pedestal, the column comprises a threaded rod, a bearing nut screwed on the threaded rod and a support tube. A first end of the support tube is placed over a first end of the threaded rod and supported thereon by the bearing nut. The second end of the support tube is fixed to the supporting head, whereas the second end of the threaded rod is axially received within the cup like depression in the centre of the base plate.

[0014] The base plate is preferably square shaped and has at least six cuneiform depressions separated by six reinforcing braces.

Detailed description with reference to the Figures

[0015] The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1: is a side view of a pedestal in accordance with the present invention, comprising a base plate which is shown as a section;

Figure 2: is a top view of the base plate shown in Figure 1;

Figure 3: is a section along section line 3-3 in Figure 2;

Figure 4: is a section along section line 4-4 in Figure 2; and

Figure 5: is a section along section line 5-5 in Figure 2.

[0016] Figure 1 shows a pedestal 10 in accordance with the present invention, which is mounted on a surface 12 to support thereon an elevated floor assembly, of which only a single panel stringer 14 is shown. The pedestal 10 comprises a column, which is globally identified with reference number 16, a supporting head 17 fixed to the upper end of the column 16, and a base plate 18 fixed to the lower end of the column 16. The column 16 consists of a threaded rod 20, a bearing nut 22 screwed on the threaded rod 20 and a hollow support tube 24. The lower end of the support tube 24 is placed over the upper end of the threaded rod 20 and supported thereon by the bearing nut 22. It follows that the support tube 24 can be raised or lowered by screwing the bearing nut 22 on the threaded rod 20, so that the height of the pedestal can be freely adjusted. The upper end of the support tube 24 is welded to the supporting head 17. The latter includes normally four or eight supporting arms to which the panel stringers 14 are screwed. On Figure 1 only two supporting arms 26, 28 are seen. The floor panels are not shown on Figure 1. They rest on the panel stringers 14. In order to immobilise the support tube 24 in rotation until the panel stringers 14 are fixed to the supporting arms 26, the lower end of the tube 24 is crimped to have peripheral indentations 30 co-operating with protrusions 32 on the nut 22. It will be appreciated that crimping of the lower end of the support tube 24 is not only an inexpensive method to provide a high number of equally spaced peripheral indentations 30 to be engaged by the protrusions 32, thus providing a high degree of height adjustment flexibility, but it improves rigidity and axial stability of the support tube 24 and minimises axial play between the support tube and the threaded rod 20 too.

[0017] An important aspect of the present invention is the newly conceived base plate 18, which will now be described in detail with reference to Figures 2 to 5.

[0018] This base plate 18 is obtained by a process of deep drawing from a metal sheet. A cup like depression 34 is worked in the center of the upper side of the square shaped plate, so as to form a central cavity surrounded by a peripheral collar. The depth of the central depression 34 is about the same as its diameter. Six cuneiform depressions 36_1 ... 36_6, are worked in the upper side of the collar, so that the undersides of the cuneiform depressions 36_1 ... 36_6 form substantially flat cuneiform support surfaces 38_1 ... 38_6 of the base plate 18. Figure 4 shows a longitudinal section through the cuneiform depressions 36_3 and 36_6 defining the support surfaces 38_3 and 38_6. An additional support surface 38_7 is formed in the centre of the base plate by the underside of the cup like depression 34. As seen on Figure 1, the cuneiform depressions 36_1 ... 36_6 are separated by upstanding U-shaped loops 40_1 ... 40_6 of the metal sheet, which extend radially from the central cup 34 to the border of the plate. Figure 5 shows a cross-section through the loop 40_1, which is separating the cuneiform depressions 36_3 and 36_4 from one another. Figure 3 shows a longitudinal section through U-shaped loops 40_1 and 40_4, whereas an elevation of U-shaped loops 40_3 and 40_5 is seen on Figure 4. The height of the U-shaped loops 40_1 ... 40_6 linearly diminishes from the rim of the cavity 34, where the loops have a height substantially equal to the depth of the cavity 34, to a substantially flat rim 44 of the collar, where they have a height substantially equal to zero. It will be appreciated that the U-shaped loops 40_1 ... 40_6 have the effect of reinforcing braces of a central socket in which the cavity 34 is located. Each of these reinforcing braces has the form of a rectangular triangle in a side view.

[0019] The lower end of the rod 20 is press fit into the cup like depression 34 of the base plate 18, so that no screwing, riveting or welding is necessary for fixing the base plate 18 to the column 16. It will be appreciated that the special design of the bases plate 18 warrants an especially strong mechanical connection between the base plate 18 and the column 16.

[0020] Referring to Figure 4 it will be noted that the cuneiform depressions 36_1 ... 36_6 are arranged so that the metal sheet is doubled in their apex. In other words, the apexes of the cuneiform depressions 36_1 ... 36_6 form vertical reinforcements 46 arranged around the cup 34 receiving the lower end of the rod 20.

[0021] The base plate 18 is preferably a square shaped plate with holes 48 in the four corners for screwing the base plate 18 to the surface 12. The size of the square shaped plate may for example be about 100 x 100 mm and its wall thickness about 2 mm.

Claims

1. A pedestal for supporting an elevated floor assembly (14) on a substantially flat surface (12), said pedestal (10) including:

a column (16);
a supporting head (17) fixed to the upper end of said column (16), so as to be capable of supporting said elevated floor assembly (14); and
a base plate (18) fixed to the lower end of said column (16) for providing a support platform for said column (16) on said surface (12);

wherein said base plate (18) has:

an underside facing the surface (12) on which the pedestal (10) is to be supported and an opposite upper side facing the elevated floor assembly (14);
a socket projecting from said upper side, said socket having a cavity therein, and the lower end of said column (16) being received in said cavity; and
reinforcing braces that are radially arranged around said socket;

wherein said base plate (18) is obtained from a metal sheet by a process of deep drawing,
: a cup like depression (34) being worked in the centre of the upper side of said plate, so as to form said cavity surrounded by a collar,
characterised in that
cuneiform depressions (36_1 ... 36_6) are worked in the upper side of said collar, so that the undersides of said cuneiform depressions (36_1 ... 36_6) form substantially flat cuneiform support surfaces (38_1 ... 38_6) of the base plate (18), said cuneiform depressions (36_1 ... 36_6) being separated by radially extending U-shaped loops (40_1 ... 40_6) of said metal sheet, which form said braces.

2. The pedestal as claimed in claim 1, **characterised in that** the lower end of the column (16) is press fit into said cup like depression (34).

3. The pedestal as claimed in claim 1 or 2, **characterised in that** the underside of said cup like depression (34) forms an additional substantially flat support surface (38_7) in the centre of said base plate (18).

4. The pedestal as claimed in any one of claims 1 to 3, **characterised in that** said cuneiform depressions (36_1 ... 36_6) are arranged around the central cup (34) so that said metal sheet is doubled in the apex of each cuneiform depression (36_1 ... 36_6).

5. The pedestal as claimed in any one of claims 1 to 4, **characterised in that** the height of said U-shaped loops (40_1 ... 40_6) linearly diminishes from the rim (42) of said cup like depression (34), where they have a height substantially equal to the depth of said cup like depression (34), to the border of said collar, where they have a height substantially equal to zero.

6. The pedestal as claimed in any one of claims 1 to 5, **characterised in that** said collar of the base plate (18) has a rim (44) which is substantially flat.

7. The pedestal as claimed in any one of claims 1 to 6, **characterised in that** the depth of said cup like depression (34) is about the same as its diameter.

8. The pedestal as claimed in any one of claims 1 to 7, **characterised in that** said column (16) comprises a threaded rod (20), a bearing nut (22) screwed on said threaded rod (20) and a support tube (24), wherein:

the support tube (24) is placed with a first end over a first end of the threaded rod (20) and supported thereon by the bearing nut (22);

the second end of said support tube (24) is fixed to said supporting head (17); and

the second end of said threaded rod is axially received within said cup like depression in the centre of said base plate (18).

9. The pedestal as claimed in any one of claims 1 to 8, **characterised in that** the lower end of said support tube (24) is crimped to have several peripheral indentations (30), and said nut (22) has several protrusions (32) engaging said indentations (30) to prevent a relative rotation of the nut (22) and the support tube (24).

10. The pedestal as claimed in any one of claims 1 to 9, **characterised in that** said base plate (18) is square shaped.

11. The pedestal as claimed in any one of claims 1 to 10, **characterised in that** said base plate (18) has at least six cuneiform depressions (36_1 ... 36_6) separated by six U-shaped loops (40_1 ... 40_6).

Patentansprüche

1. Stützfuß zum Abstützen eines überhöhten Fußbodenaufbaus (14) auf einer im Wesentlichen flachen Fläche (12), wobei dieser Stützfuß (10) folgende Teile umfaßt:

eine Säule (16);

einen Tragkopf (17), der am oberen Ende dieser Säule (16) derart befestigt ist, daß er in der Lage ist, den überhöhten Fußbodenaufbau (14) zu tragen;

eine Grundplatte (18), die am unteren Ende dieser Säule (16) derart befestigt ist, daß sie eine Tragplattform für die Säule (16) auf der Fläche (12) ausbildet;

wobei diese Grundplatte (18) aufweist:

eine Unterseite, die der Fläche (12), auf welcher der Stützfuß (10) getragen werden soll, zugekehrt wird, und eine gegenüberliegende Oberseite, die dem überhöhten Fußbodenaufbau (14) zugekehrt wird;

einen Stutzen, der von der Oberseite hervorsteht, wobei dieser Stutzen einen Hohlraum aufweist, in dem das untere Ende der Säule (16) aufgenommen ist; und

Verstärkungsstreben, die radial um den Stutzen herum angeordnet sind;

wobei die Grundplatte (18) aus einer Metallplatte durch Tiefziehen hergestellt ist,
wobei eine napfförmige Vertiefung (34) im Zentrum in die Oberseite der Platte derart eingearbeitet wird, daß der Hohlraum umgeben von einem Kragen ausgebildet wird;
dadurch gekennzeichnet, daß
keilförmige Vertiefungen (36_1 ... 36_6) in die Oberseite dieses Kragens derart eingearbeitet werden, daß die Unterseiten dieser keilförmigen Vertiefungen (36_1 ... 36_6) im Wesentlichen flache, keilförmige Auflageflächen (38_1 ... 38_6) der Grundplatte (18) ausbilden, wobei diese keilförmigen Vertiefungen (36_1 ... 36_6) durch radial verlaufende, U-förmige Schleifen (40_1 ... 40_6) der Metallplatte getrennt sind, welche die Streben ausbilden.

2. Stützfuß nach Anspruch 1, **dadurch gekennzeichnet, daß** das untere Ende der Säule (16) einen Preßsitz in der napfförmigen Vertiefung (34) aufweist.

3. Stützfuß nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Unterseite der napfförmigen Vertiefung (34) eine zusätzliche, im Wesentlichen flache Auflagefläche (38_7) im Zentrum der Grundplatte (18) ausbildet.

4. Stützfuß nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, daß** die keilförmigen Vertiefungen (36_1 ... 36_6) um die zentrale napfförmige Vertiefung (34) derart angeordnet sind, daß die Metallplatte im Scheitelpunkt jeder einzelnen keilförmigen Vertiefung (36_1 ... 36_6) doppelwandig ist.

5. Stützfuß nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, daß** die Höhe der U-förmigen Schleifen (40_1 ... 40_6) vom Rand (42) der napfförmigen Vertiefung (34), wo sie eine Höhe aufweisen, die im Wesentlichen der Tiefe der napfförmigen Vertiefung (34) entspricht, zum Rand des Kragens, wo sie eine Höhe aufweisen, die im Wesentlichen gleich Null ist, linear abnimmt.

6. Stützfuß nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, daß** der Kragen der Grundplatte (18) einen im Wesentlichen flachen Rand (44) aufweist.

7. Stützfuß nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, daß** die Tiefe der napfförmigen Vertiefung (34) ungefähr gleich ihrem Durchmesser ist.

8. Stützfuß nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, daß** die Säule (16) eine Gewindestange (20), eine Tragmutter (22), die auf die Gewindeschraube aufgeschraubt ist, und ein Tragrohr (24) umfaßt, wobei:

das Tragrohr (24) mit einem ersten Ende über ein erstes Ende der Gewindestange (20) gesetzt ist und mittels der Tragmutter (22) von dieser getragen wird; und

das zweite Ende des Tragrohrs (24) an dem Tragkopf (17) befestigt ist; und das zweite Ende der Gewindestange axial in der napfförmigen Vertiefung im Zentrum der Grundplatte (18) aufgenommen ist.

9. Stützfuß nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, daß** in das untere Ende des Tragrohrs (24) mehrere periphere Auszackungen (30) eingepresst sind, und die Mutter (22) meh-

rere Vorsprünge (32) aufweist, welche in die Auszackungen (30) zum Verhindern einer relativen Verdrehung von Mutter (22) Tragrohr (24) eingreifen.

10. Stützfuß nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, daß** die Grundplatte (18) quadratisch ist.

11. Stützfuß nach einem der Ansprüche 1 bis 10, **dadurch gekennzeichnet, daß** die Grundplatte (18) mindestens sechs keilförmige Vertiefungen (36_1 ... 36_6) aufweist, die durch sechs U-förmige Schleifen (40_1 ... 40_6) von einander getrennt sind.

Revendications

1. Socle pour supporter un ensemble plancher surélevé (14) sur une surface substantiellement plane (12), ledit socle (10) comprenant :

une colonne (16);
une tête de support (17) fixée à l'extrémité supérieure de ladite colonne (16), de façon à pouvoir supporter ledit ensemble plancher surélevé (14); et
une plaque de base (18) fixée à l'extrémité inférieure de ladite colonne (16) pour constituer une plate-forme de support pour ladite colonne (16) sur ladite surface (12);

dans lequel ladite plaque de base (18) possède :

un côté inférieur face à la surface (12) sur laquelle doit être supporté le socle (10) et un côté supérieur opposé face à l'ensemble plancher surélevé (14);
une douille faisant saillie dudit côté supérieur, ladite douille possédant une cavité en son sein, et l'extrémité inférieure de ladite colonne (16) étant reçue dans ladite cavité; et
des étais de renforcement qui sont disposés radialement autour de ladite douille;

dans lequel ladite plaque de base (18) est obtenue à partir d'une tôle par un procédé d'emboutissage profond,

un creux en forme de godet (34) étant façonné au centre du côté supérieur de ladite plaque, de façon à former ladite cavité entourée par un collier,

caractérisé en ce que

des creux cunéiformes (36_1 ... 36_6) sont façonnés dans le côté supérieur dudit collier, de sorte que les côtés inférieurs desdits creux cunéiformes (36_1 ... 36_6) forment des surfaces de support cunéiformes substantiellement planes (38_1 ... 38_6) de la plaque de base (18), lesdits creux cunéiformes (36_1 ... 36_6) étant séparés par des boucles en forme de U s'étendant radialement (40_1 ... 40_6) de ladite tôle, qui forment lesdits étais.

2. Socle selon la revendication 1, **caractérisé en ce que** l'extrémité inférieure de la colonne (16) est ajustée de façon serrée dans ledit creux en forme de godet (34).

3. Socle selon la revendication 1 ou 2, **caractérisé en ce que** le côté inférieur dudit creux en forme de godet (34) forme une surface de support substantiellement plane supplémentaire (38_7) au centre de ladite plaque de base (18).

4. Socle selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** lesdits creux cunéiformes (36_1 ... 36_6) sont disposés autour du godet central (34) de sorte que ladite tôle est doublée au sommet de chaque creux cunéiforme (36_1 ... 36_6).

5. Socle selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** la hauteur desdites boucles en forme de U (40_1 ... 40_6) diminue linéairement depuis le bord (42) dudit creux en forme de godet (34), où elles ont une hauteur substantiellement égale à la profondeur dudit creux en forme de godet (34), jusqu'à la bordure dudit collier, où elles ont une hauteur substantiellement égale à zéro.

6. Socle selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** ledit collier de la plaque de base (18) possède un bord (44) qui est substantiellement plat.

7. Socle selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** la profondeur dudit creux en forme de godet (34) est à peu près identique à son diamètre.

8. Socle selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** ladite colonne (16) comprend une tige filetée (20), un écrou support (22) vissé sur ladite tige filetée (20) et un tube de support (24), dans lequel:

le tube de support (24) est placé avec une première extrémité sur une première extrémité de la tige filetée (20), supportée sur celle-ci par l'écrou support (22);
la deuxième extrémité dudit tube de support (24) est fixée à ladite tête de support (17); et
la deuxième extrémité de ladite tige filetée est reçue axialement dans ledit creux en forme de godet au centre de ladite plaque de base (18).

9. Socle selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** l'extrémité inférieure du-

dit tube de support (24) est sertie de façon à posséder plusieurs indentations périphériques (30), et ledit écrou (22) possède plusieurs saillies (32) coopérant avec lesdites indentations (30) pour empêcher une rotation relative de l'écrou (22) et du tube de support (24).

10. Socle selon l'une quelconque des revendications 1 à 9, **caractérisé en ce que** ladite plaque de base (18) est de forme carrée.

11. Socle selon l'une quelconque des revendications 1 à 10, **caractérisé en ce que** ladite plaque de base (18) possède au moins six creux cunéiformes (36_1 ... 36_6) séparés par six boucles en forme de U (40_1 ... 40_6).

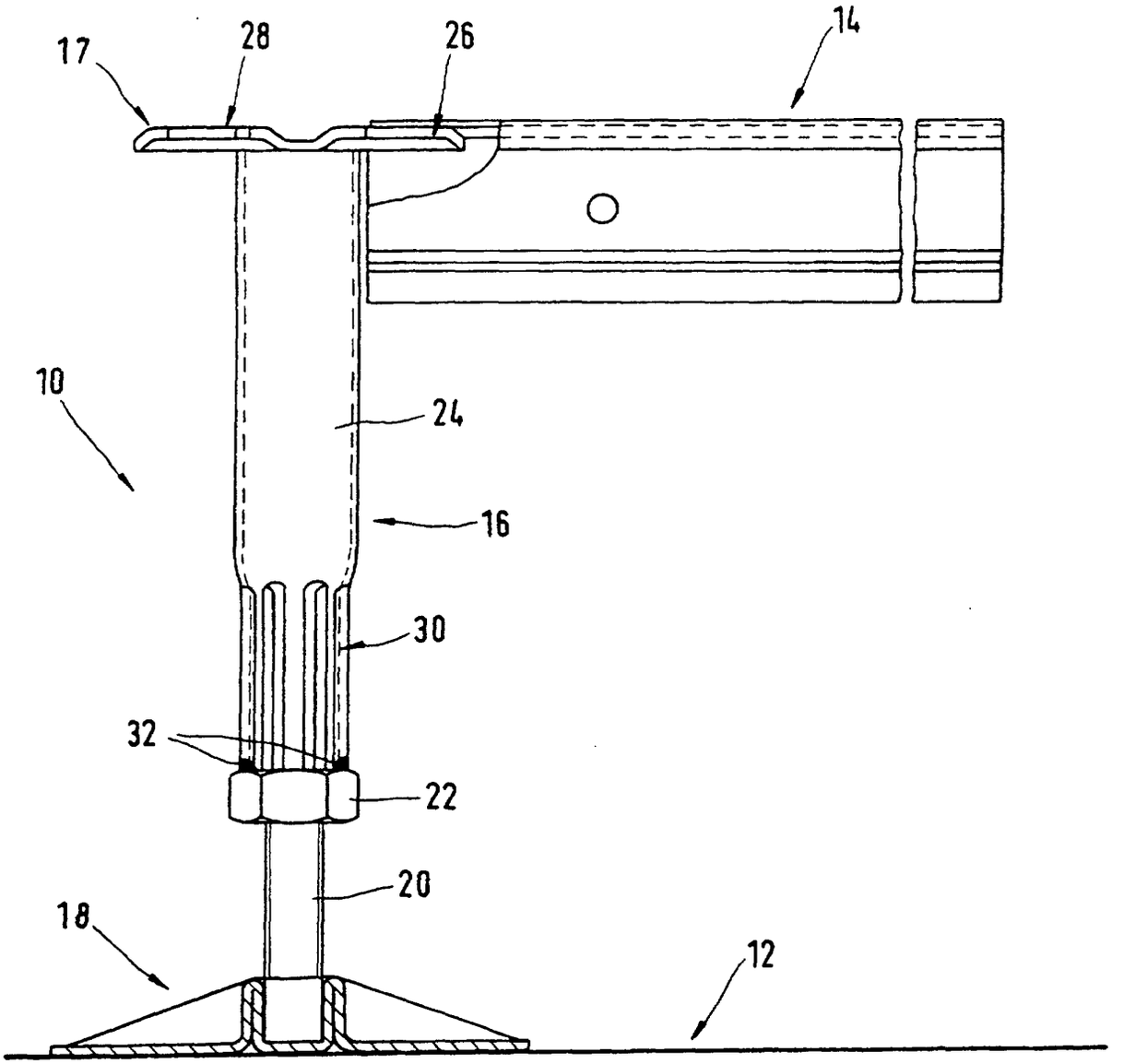

Fig.1

Fig.2

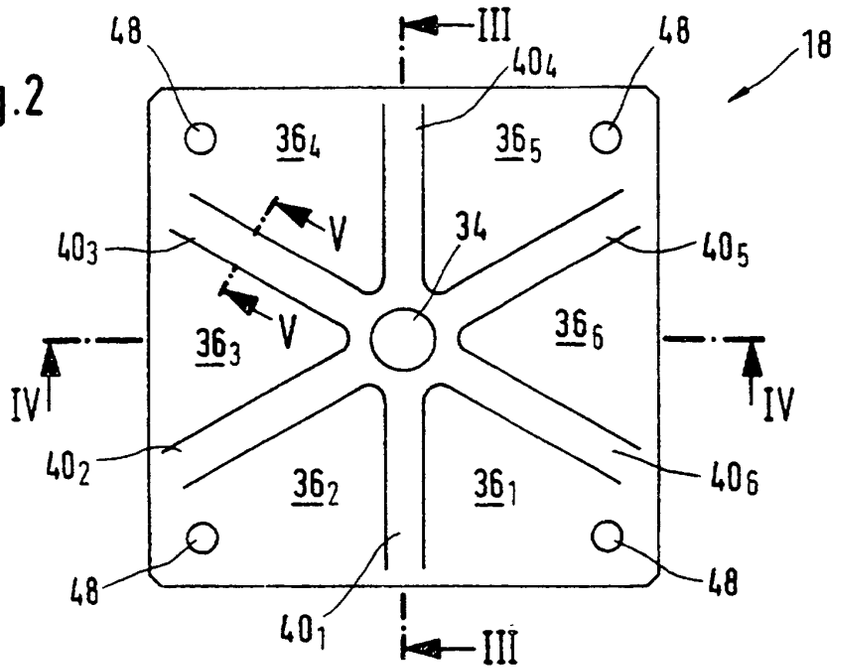

Fig.3

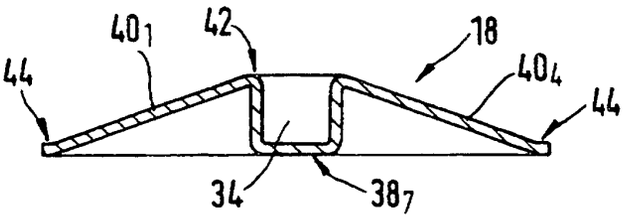

Fig.4

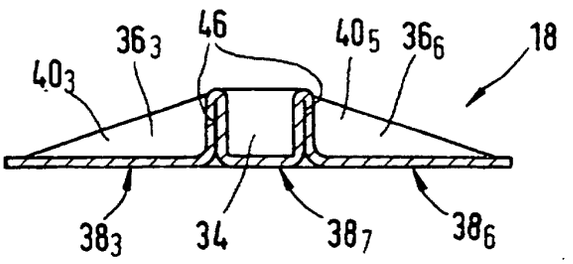

Fig.5