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(54) **SUPPORT ELEMENT FOR ELEVATED SURFACES**

TRÄGERELEMENT FÜR ERHÖHTE OBERFLÄCHEN

ÉLÉMENT DE SUPPORT POUR DES SURFACES ÉLEVÉES

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a support element for holding an object at a distance from an underlying surface, and in particular, for the support of elevated surfaces.

BACKGROUND OF THE INVENTION

[0002] Support elements for elevated surfaces are commonly used for all types of applications such as raised roofs, terraces or technical flooring for outdoor and indoor applications. An example can be found in GB2378457, in which a support element for floors, ceilings, and walls is disclosed.

[0003] A general requirement when mounting such a raised surface is that a sufficiently level surface is obtained and a sufficiently stable surface.

[0004] Since the majority of elevated surfaces are used for long term applications, another general requirement is of course the durability of the support elements.

[0005] An additional requirement is sufficient height adjustability of the support elements, not only to accommodate irregularities, such as bumps and level differences, in the underlying surface, but also to be able to mount elevated surfaces at a relatively large distance from the underlying surface. Since most conventional support elements, such as those described in the previously mentioned patent and in FR2702506 (which discloses an element according to the preamble of appended claim 1), do possess some form of height adjustment, for example, by means of an intermediate piece with thread, but this height adjustment is quite limited with a view to stability, the applications of conventional support elements are limited to elevated surfaces where only relatively minor irregularities have to be bridged, and/or where the distance between the raised surface and the underlying surface is relatively small.

[0006] In the light of the above, it is a general object of the present invention to provide a support element which, in addition to sufficient stability and durability, provides increased height adjustability, such that applications where relatively large irregularities in the underlying surface need to be bridged and/or where the distance between the raised surface and the underlying surface is relatively large are among the possibilities.

[0007] Furthermore, it is also an object of the present invention to provide a support element with increased stability and durability.

BRIEF SUMMARY OF THE INVENTION

[0008] The present invention relates to a support element for holding an object at a distance from an underlying surface, in particular for elevated surfaces such as raised roofs, terraces or technical flooring for outdoor and indoor applications the support element comprising the features of appended claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 to 4 illustrate different embodiments of a support element according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The support elements according to the present invention are generally suited for holding an object at a distance from an underlying surface. In particular, these support elements are suitable for holding tiles, beams, battens, etc. for installing elevated surfaces, such as an elevated roof terrace, elevated apartment terrace, elevated garden terrace, a stage, a raised technical floor for indoor or outdoor, a raised floor for indoor or outdoor, and the like.

[0011] In the context of the present invention, the underlying surface means the ground, the roof, the platform, the conventional building floor between floors, or any other structure at a distance of which an object, and in particular, tiles, beams, battens, etc. for the installation of elevated surfaces must be installed.

[0012] According to a first embodiment of the present invention, and as illustrated in FIG. 1, a support element for holding an object at a distance from an underlying surface is provided, the support element comprising the following parts:

(a) a base (1) which allows the support element to be placed in an upright position on an underlying surface,
(b) on the base, an intermediate piece (2), consisting of two or more stackable connecting pieces (3), and
(c) on the intermediate piece, a supporting plate (4), suitable as a support of an object at a distance from the underlying surface,

whereby the two or more stackable connecting pieces exhibit a relief parallel to the underlying surface on both sides of one or more projections and/or one or more cavities that make it possible to stack several connecting pieces so that the projecting portions of one connecting piece fit in the cavities of an upper or underlying connecting piece.

[0013] An advantage of the present invention is that the use of connecting pieces with a relief that allows different connecting pieces to be fit to each other provides increased stability because the connecting pieces cannot slide out of each other due to the relief. A second advantage is that such relief is a passive and therefore durable system to link connecting pieces to each other. A third advantage of the present invention is that the connecting pieces provide increased height adjustability, such that applications where relatively large irregularities in the underlying surface need to be bridged and/or where the

distance between the raised surface and the underlying surface is relatively large are among the possibilities.

[0014] The relief of one or more projections and/or one or more cavities may comprise any combination of projections and/or cavities. The relief on both sides of the connecting piece parallel with the underlying surface may be identical or may be different.

[0015] In accordance with the present invention, the support element is characterised by connecting pieces with a relief on one side, parallel with the underlying surface, which is complementary to the relief on the opposite side.

[0016] In the context of the present invention, a 'complementary relief means that the relief on one side parallel to the underlying surface would theoretically fit on the relief on the opposite side parallel to the underlying surface. In this way, any connecting piece will fit on any other connecting piece, and connecting pieces can be exchanged with connecting pieces with a different height. The support element can therefore be built up with exchangeable connecting pieces of different heights depending on the desired distance between the underlying surface and the object which is to be supported.

[0017] The one or more projections and/or one or more cavities can have any form.

[0018] In a specific embodiment and as illustrated in FIG. 2, the one or more projections (5) in the relief taper towards their free end, and the cavities (6) are defined by side walls and a base, the side walls of a cavity tapering towards the base. In this case, the protrusions are therefore mastaba-shaped or even pyramid-shaped, while the cavities are in the form of an inverted mastaba or even an inverted pyramid.

[0019] Another particular embodiment as already shown in FIG. 1 (see circle) is characterised in that each of the connecting pieces include one projection that is carried out annularly in the vicinity of the outer circumference of one side parallel with the underlying surface, and includes one cavity that is carried out annularly in the vicinity of the outer circumference of the opposite side parallel with the underlying surface. In this case, the projection is disc-shaped, and the cavity is also disc-shaped.

[0020] The above specific geometries increase the stability of the connecting pieces stacked on one another relative to other geometries and also increase the durability of the connecting pieces relative to other geometries, thus resulting in a support element with increased stability and durability.

[0021] In another embodiment according to the present invention, the connecting pieces can be provided with means allowing the connecting pieces to be interconnected, for example, by means of click systems or snap-fit clips.

[0022] Each connecting piece may have a height, measured in the vertical direction of the upright support element, between 5 and 150 mm, preferably 15 mm, 50 mm and 100 mm.

[0023] In accordance with the present invention as illustrated in FIG. 3a and FIG. 3b, the base (1) of the support element includes a disc-shaped cavity in which a ring-shaped element (7) with internal screw thread fits engaging with a control piece (8) with corresponding external screw thread, the control piece exhibiting a relief on the highest side parallel with the underlying surface of one or more projections and/or one or more cavities complementary to the relief of a connecting piece of the one or more connecting pieces (see circle). In constructing the support element, the ring-shaped element consequently enters the disc-shaped cavity of the base. The control piece is fastened by screwing it into the internal screw thread of the ring-shaped element. When the control piece (8) is minimally screwed in the circular element (7), the base has its maximum height (FIG. 3b) measured in the vertical direction of the upright support member. When the control piece (8) is completely screwed in, the base has its minimum height (FIG. 3a) measured in the vertical direction of the upright support member. In this way, a support elements according to the present invention provides stepless height control which, in combination with the stackable connecting pieces (3), can bridge a very large difference in height.

[0024] In a specific embodiment, the screw thread of the control piece has such a length, measured in the vertical direction of the upright support element, that it can bridge a difference in height which is at least equal to the height of the connecting piece with the lowest height among the connecting pieces. To give an example: if the connecting piece with the lowest height has a height of 50 mm, then the screw thread of the control piece has to be able to bridge at least 50 mm, so that the support element obtains a stepless height control from 0 to 150 mm depending on whether no, one or two connecting pieces of 50 mm are used. If, on the other hand, the screw thread would measure only 40 mm, then the support element would obtain a stepless height control of 0 to 40 mm without connecting piece, of 50 to 90 mm with one connecting piece, and from 100 to 140 mm with two such connecting pieces, but without the possibility of adjusting between 40 and 50 mm and between 90 and 100 mm. FIG. 4 shows a support element according to the present invention that can hold an object at a distance of between 70 and 327 mm from an underlying surface, and which is infinitely variable if use is made of a circular element (7) and a control piece (8) with screw thread of 57 mm in height and provided the connecting pieces of 50 mm (3') and 100 mm (3") in height are used correctly.

[0025] In an embodiment according to the present invention, the underside of the supporting plate has a relief complementary to the relief of the one or more connecting pieces so that the supporting plate can also be placed on the intermediate piece in a stable and durable manner.

[0026] Furthermore, the highest side of the control piece parallel to the underlying surface and viewed according to the vertical direction of the upright support element, can possess a relief complementary to the relief

of the one or more connecting pieces so that the one or more connecting pieces can be placed on the control piece in a stable and durable manner.

[0027] In a further embodiment, the control piece can be provided with means which make it possible to fix the lower connecting piece to the control piece, for example, by means of click systems or snap-fit clips.

[0028] The base, the connecting pieces, and the supporting plate may be made of any plastic that is suitable for extrusion or injection moulding, such as polypropylene, polyethylene (low and high density), polyvinyl chloride, polystyrene, ethyl vinyl acetate, acrylonitrile-butadienestyrene or polyolefin, or a combination thereof.

[0029] The ring-shaped element and the control piece may be made of any plastic that is suitable for extrusion or injection moulding, or of metal.

Claims

1. Support element for elevated surfaces such as raised floors, terraces or technical floors for outdoor and indoor applications, the support element comprising the following parts:

   (a) a base (1) which allows the support element to be placed in an upright position on an underlying surface,
   (b) on the base (1), an intermediate piece (2), consisting of two or more stackable connecting pieces (3), the two or more connecting pieces (3) exhibit on both sides parallel to the underlying surface, a relief of one or more projections and/or one or more cavities, whereby the relief on one side of a connecting piece is complementary to the relief on the opposite site of that connecting piece (3), such that two or more of said connecting pieces (3) can be stacked so that the projections at one side of a connecting piece fit in the cavities of an upper or underlying connecting piece; and
   (c) on the intermediate piece (2) a supporting plate (4), suitable as a support of an object at a distance from the underlying surface,

   characterised in that the base (1) includes a disc-shaped cavity in which a ring-shaped element (7) with internal screw thread fits engaging with a control piece (8) with corresponding external screw thread, the control piece (8) exhibiting a relief on the highest side parallel with the underlying surface of one or more projections and/or one or more cavities complementary to the relief of the two or more connecting pieces (3).

2. Support element according to Claim 1, **characterised in that** the projections taper towards their free end.

3. Support element according to Claims 1 to 2, **characterised in that** the cavities are defined by side walls and a base, the side walls of a cavity tapering towards the base.

4. Support element according to any of the preceding claims, **characterised in that** each of said one or more connecting pieces include one projection that is carried out annularly in the vicinity of the outer circumference of one side parallel with the underlying surface, and includes one cavity that is carried out annularly in the vicinity of the outer circumference of the opposite side parallel with the underlying surface.

5. Support element according to any of the preceding claims, **characterised in that** one or more of said connecting pieces is/are provided with means allowing the connecting pieces to be interconnected.

6. Support element according to any of the preceding claims, **characterised in that** each connecting piece has a height, measured in the vertical direction of the support element, between 5 and 150 mm.

7. Support element according to any of the preceding claims, **characterised in that** the screw thread of the control piece can bridge a difference in height which is at least equal to the height of the connecting piece with the lowest height among the connecting pieces.

Patentansprüche

1. Stützelement für erhöhte Flächen wie Doppelböden, Terrassen oder technische Böden für Außen-und Innenanwendungen, wobei das Stützelement folgende Teile umfasst:

   (a) eine Basis (1), der es ermöglicht, das Stützelement in aufrechter Position auf einer Unterlage zu platzieren,
   (b) auf der Basis (1), ein Zwischenstück (2), bestehend aus zwei oder mehr stapelbaren Verbindungsstücken (3), wobei die zwei oder mehr Verbindungsstücke (3) auf beiden Seiten parallel zur Basisfläche ein Relief aus einem oder mehreren Vorsprüngen und/oder einem oder mehreren Hohlräumen besitzen, wobei das Relief auf einer Seite eines Verbindungsstücks komplementär zu dem Relief auf der gegenüberliegenden Seite dieses Verbindungsstücks (3) ist, so dass zwei oder mehr der Verbindungsstücke (3) so gestapelt werden können, dass die Vorsprünge auf einer Seite eines Verbindungsstücks in die Hohlräume eines oberen oder darunter liegenden Verbindungsstücks passen;

und
(c) auf dem Zwischenstück (2), eine Stützplatte (4), die als Stütze für einen Gegenstand in einem Abstand von der darunter liegenden Fläche geeignet ist,

dadurch gekennzeichnet, dass die Basis (1) einen scheibenförmigen Hohlraum einschließt, in den ein ringförmiges Element (7) mit Innengewinde passt, das in ein Steuerteil (8) mit entsprechendem Außengewinde eingreift, wobei das Steuerteil (8) auf der höchsten Seite ein Relief besitzt, das parallel zu der darunter liegenden Oberfläche eines oder mehrerer Vorsprünge und/oder eines oder mehrerer Hohlräume verläuft, die komplementär zu dem Relief der zwei oder mehreren Verbindungsstücke (3) sind.

2. Stützelement nach Anspruch 1, **dadurch gekennzeichnet, dass** sich die Vorsprünge zu ihrem freien Ende hin verjüngen.

3. Stützelement nach einem der Ansprüche 1 bis 2, **dadurch gekennzeichnet, dass** die Hohlräume durch Seitenwände und einen Boden definiert sind, wobei sich die Seitenwände eines Hohlraums zum Boden hin verjüngen.

4. Stützelement nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** jedes der einen oder mehreren Verbindungsstücke einen Vorsprung einschließt, der ringförmig in der Nähe des Außenumfangs einer Seite parallel zur darunter liegenden Fläche ausgeführt ist, und einen Hohlraum einschließt, der ringförmig in der Nähe des Außenumfangs der gegenüberliegenden Seite parallel zur darunter liegenden Fläche ausgeführt ist.

5. Stützelement nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** eines oder mehrere der Verbindungsstücke mit Mitteln bereitgestellt ist/sind, die es ermöglichen, die Verbindungsstücke miteinander zu verbinden.

6. Stützelement nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** jedes Verbindungsstück eine Höhe, gemessen in vertikaler Richtung des Stützelements, zwischen 5 und 150 mm aufweist.

7. Stützelement nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** das Schraubgewinde des Steuerteils einen Höhenunterschied überbrücken kann, der mindestens gleich der Höhe des Anschlussstücks mit der geringsten Höhe unter den Anschlussstücken ist.

Revendications

1. Élément de support pour des surfaces élevées telles que des planchers surélevés, des terrasses ou des planchers techniques pour des applications extérieures et intérieures, l'élément de support comprenant les parties suivantes :

(a) une base (1) qui permet à l'élément de support d'être placé dans une position verticale sur une surface sous-jacente,
(b) sur la base (1), une pièce intermédiaire (2), constituée de deux pièces de connexion empilables (3) ou plus, les deux pièces de connexion (3) ou plus présentant sur les deux côtés parallèles à la surface sous-jacente un relief d'une ou plusieurs saillies et/ou d'une ou plusieurs cavités, le relief sur un premier côté d'une pièce de connexion étant complémentaire du relief sur le site opposé de cette pièce de connexion (3), de sorte que deux desdites pièces de connexion (3) ou plus peuvent être empilées de sorte que les saillies sur un premier côté d'une pièce de connexion s'ajustent dans les cavités d'une pièce de connexion supérieure ou sous-jacente ; et
(c) sur la pièce intermédiaire (2), une plaque de support (4), adaptée comme support d'un objet à une certaine distance de la surface sous-jacente,

caractérisé en ce que la base (1) inclut une cavité en forme de disque dans laquelle un élément en forme d'anneau (7) avec un filetage interne vient en prise avec une pièce de commande (8) avec un filetage externe correspondant, la pièce de commande (8) présentant un relief sur le côté le plus élevé parallèle à la surface sous-jacente d'une ou plusieurs saillies et/ou d'une ou plusieurs cavités complémentaire au relief des deux pièces de connexion (3) ou plus.

2. Élément de support selon la revendication 1, **caractérisé en ce que** les saillies sont effilées vers leur extrémité libre.

3. Élément de support selon les revendications 1 à 2, **caractérisé en ce que** les cavités sont définies par des parois latérales et une base, les parois latérales d'une cavité étant effilées vers la base.

4. Élément de support selon l'une quelconque des revendications précédentes, **caractérisé en ce que** chacune desdites une ou plusieurs pièces de connexion inclut une saillie qui est réalisée de manière annulaire au voisinage de la circonférence extérieure d'un premier côté parallèle à la surface sous-jacente, et inclut une cavité qui est réalisée de manière annulaire au voisinage de la circonférence ex-

térieure du côté opposé parallèle à la surface sous-jacente.

5. Élément de support selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**une ou plusieurs desdites pièces de connexion est/sont munie(s) de moyens permettant aux pièces de connexion d'être interconnectées.

6. Élément de support selon l'une quelconque des revendications précédentes, **caractérisé en ce que** chaque pièce de connexion présente une hauteur, mesurée dans la direction verticale de l'élément de support, comprise entre 5 et 150 mm.

7. Élément de support selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le filetage de la pièce de commande peut combler une différence de hauteur qui est au moins égale à la hauteur de la pièce de connexion avec la hauteur la plus basse parmi les pièces de connexion.

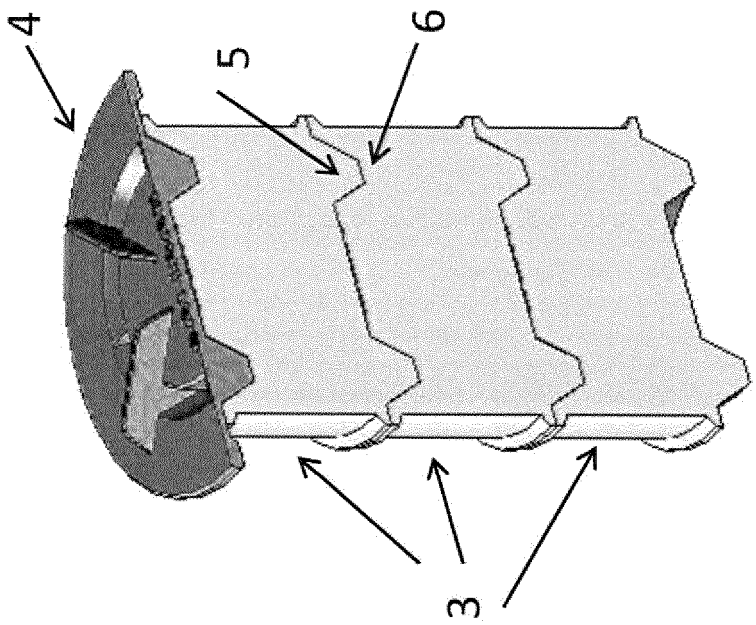

FIG 2

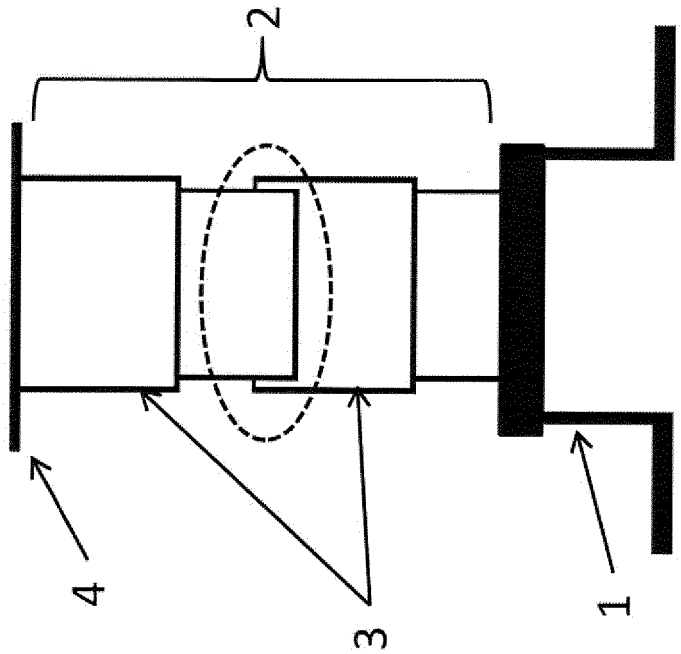

FIG 1

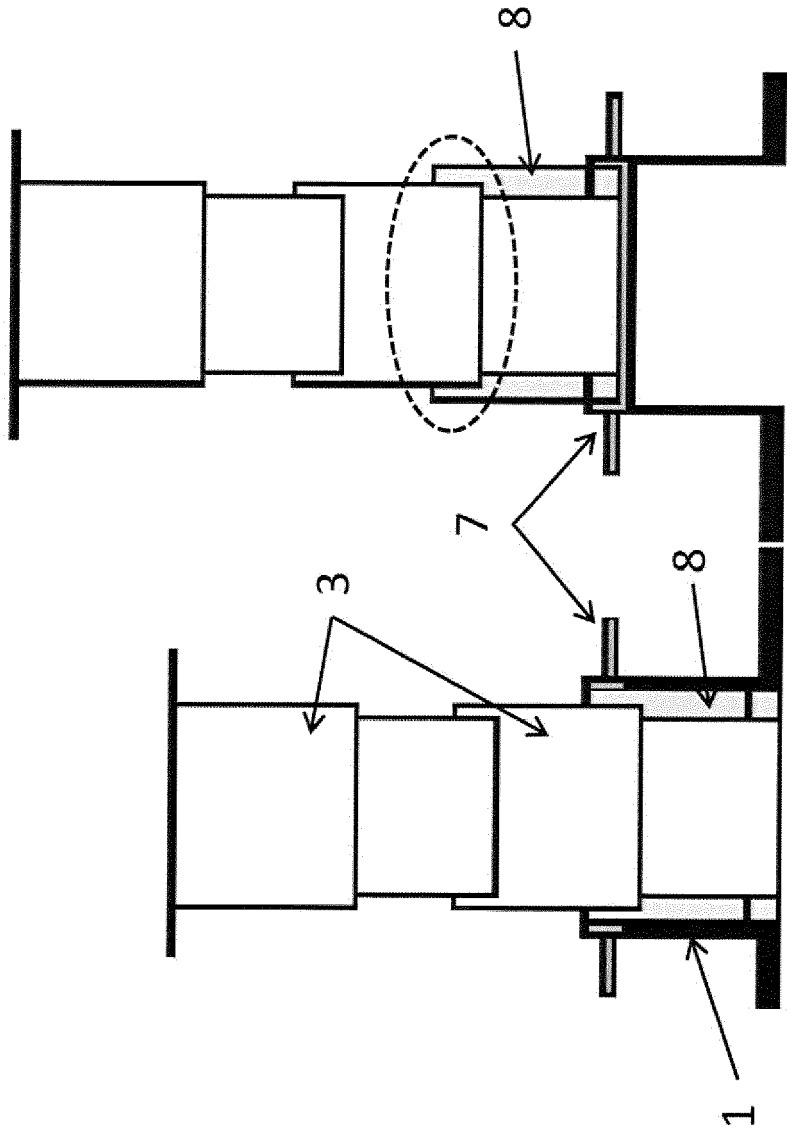

FIG 3b

FIG 3a

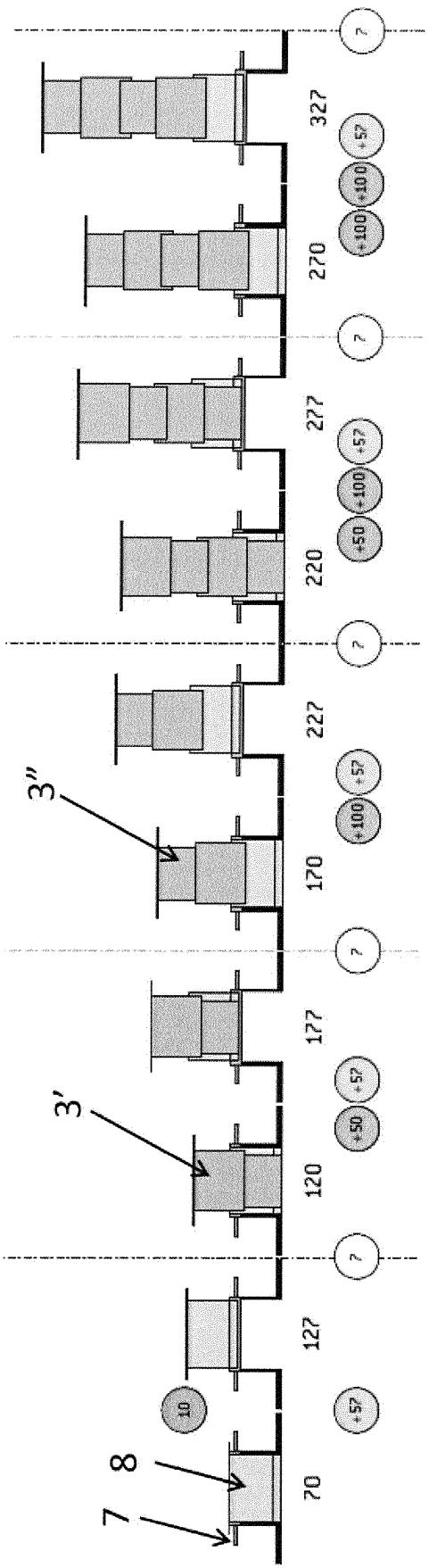

FIG 4

REFERENCES CITED IN THE DESCRIPTION

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