

(19)



(11)

**EP 3 402 941 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:  
**16.08.2023 Bulletin 2023/33**

(51) International Patent Classification (IPC):  
**E04F 15/024<sup>(2006.01)</sup>**

(21) Application number: **17702015.3**

(52) Cooperative Patent Classification (CPC):  
**E04F 15/02447; E04F 15/02464**

(22) Date of filing: **16.01.2017**

(86) International application number:  
**PCT/EP2017/050817**

(87) International publication number:  
**WO 2017/121899 (20.07.2017 Gazette 2017/29)**

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

TRÄGERELEMENT FÜR ERHÖHTE OBERFLÄCHEN

ÉLÉMENT SUPPORT POUR DES SURFACES SURÉLEVÉES

(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**

(72) Inventor: **DEJANS, Olivier**  
**8930 Lauwe (BE)**

(30) Priority: **14.01.2016 BE 201600007**

(74) Representative: **BiiP cvba**  
**Engels Plein 3 bus 102**  
**3000 Leuven (BE)**

(43) Date of publication of application:  
**21.11.2018 Bulletin 2018/47**

(56) References cited:  
**EP-A2- 0 767 318 DE-A1- 2 457 743**  
**DE-A1- 2 457 743 FR-A1- 2 639 666**  
**FR-A1- 2 639 666 US-A- 4 953 658**

(73) Proprietor: **Solidor Rubber & Products BVBA**  
**8560 Wevelgem (BE)**

**EP 3 402 941 B1**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

**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 raised surfaces.

Background of the invention

**[0002]** Support elements for raised 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. DE2457743A1 shows an element showing the features of the preamble of claim 1. A common requirement when mounting such a raised surface is that a sufficiently level surface is obtained and a sufficiently stable surface.

**[0003]** Furthermore, an important requirement is that shocks or vibrations to which the raised surface is exposed can to a greater or lesser degree be absorbed so that (i) the load on the raised surface as a result of these shocks and vibrations can be reduced, and/or (ii) these shocks and vibrations can be transmitted maximally unamplified, and preferably weakened, to the underlying surface.

**[0004]** Furthermore, another common requirement is of course the durability of the support elements, since the majority of the raised surfaces are used for long term applications.

**[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 raised surfaces at a relatively large distance from the underlying surface. Since most conventional support elements, such as those described in the previously mentioned patent, 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 light of the above, it is a general object of the present invention to provide a support element that, in addition to sufficient stability and durability, has increased shock and/or vibration absorbing properties.

**[0007]** It is also an object of the present invention to provide a support element which, in combination with increased shock and/or vibration absorption, also offers increased height adjustability, such that applications where relatively large irregularities in the underlying surface must be accommodated and/or where the distance

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

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 according to the appended claim 1.

10 Brief description of the drawings

**[0009]** FIG. 1 to 8 illustrate different embodiments of a support element according to the present invention.

15 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 raised 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 from which an object, and in particular, tiles, beams, battens, etc. for the installation of raised surfaces must be installed.

**[0012]** The advantage of the present invention is that the shock and/or vibration absorbing connecting piece provides the support element with increased shock and/or vibration absorption, such that shocks or vibrations can to a greater or lesser degree be absorbed so that (i) the load on the raised surface as a result of these shocks and vibrations can be reduced, and/or (ii) these shocks and vibrations can be transmitted maximally unamplified, and preferably weakened, to the underlying surface. Furthermore, by integrating the shock and/or vibration absorbing properties in a connection piece as part of the support element, instead of as a separate element between the base and underlying surface, the durability of the shock and/or vibration absorbing element is increased.

**[0013]** Furthermore, installation of a shock and/or vibration absorbing support element according to the present invention takes less work and time than a conventional support element with unintegrated shock and/or vibration absorbing element to be installed separately.

**[0014]** Furthermore, by providing the shock and/or vibration absorbing connecting piece in combination with other connecting pieces, with or without different height, an increased height adjustability is obtained.

**[0015]** Furthermore, the shock and/or vibration absorbing connecting piece can also contribute to improved

sound absorption due to vibration of the raised surface or of the underlying surface.

**[0016]** The base, the connecting pieces, and the support plate can be made of metal or of any synthetic material that is suitable for extrusion or injection moulding, such as polypropylene, polyethylene (low and high density), polyvinyl chloride, polystyrene, ethyl vinyl acetate, acrylonitrile-butadiene-styrene or polyolefin, or a combination thereof.

**[0017]** The shock and/or vibration absorbing material in the shock and/or vibration absorbing connecting piece can be any material that can to a greater or lesser degree absorb shocks and/or vibrations, such as, for example, rubber, foam, fibres, air cushions, chambers or cells with enclosed liquid or gas. The shock and/or vibration absorbing connecting piece can consist of a frame that comprises a shock and/or vibration absorbing material (for example, a more or less supple casing filled with fibres or gas, cf. a tennis ball), or a frame that is at least partly enveloped by the shock and/or vibration absorbing material (for example, a metal or synthetic skeleton enveloped by rubber or foam).

**[0018]** The shock and/or vibration absorbing connecting piece can preferably also consist completely of shock and/or vibration absorbing material. It can be made of any shock and/or vibration absorbing synthetic material which is suitable for extrusion or injection moulding, such as polystyrene, polyurethane, polyester, polyethylene, etc., or it may be made of rubber, synthetic or natural, and preferably recycled rubber, or a combination of rubber and a synthetic material. In the case of rubber, the shock and/or vibration absorbing connecting piece can be made by compression moulding of rubber (whether recycled or granulated) and a polymer, for example, polyurethane.

**[0019]** The shock and/or vibration absorbing connecting piece should preferably have a compression of just a few millimetres, less than 5 mm, or even less than 3 mm, at a load which is common for all kinds of applications such as elevated roofs, terraces, or technical flooring for outdoor and indoor applications, and this depending on the chosen shock and/or vibration absorbing material. The shock and/or vibration absorbing material can be chosen according to the maximum desired or permitted compression set (which is a measure of the permanent deformation when a compressive force is removed) according to standard ASTM D395, the foregoing according to the shock and/or vibration absorbing capacity of the connecting piece.

**[0020]** According to the present invention, the shock and/or vibration absorbing connecting piece can be provided with means allowing it to be attached to the underlying and/or overlying connecting pieces, or in the absence of multiple connecting pieces, to the base and/or the support plate, for example, click systems or snap-fit clips. The shock and/or vibration absorbing connecting piece can also be attached by means of gluing or welding.

**[0021]** According to of the present invention, the shock

and/or vibration absorbing connecting piece can have a geometry that engages the underlying and/or overlying connecting pieces, if any, or in the absence of multiple connecting pieces, the base and/or the support plate.

5 The aforementioned geometry can, for example, be a raised edge at the periphery, such that the shock and/or vibration absorbing connecting piece cannot slide or be pressed out of the support element.

**[0022]** The geometry can also exhibit a relief on at least one side parallel with the underlying surface, having one or more projections and/or one or more cavities, which fit into a complementary relief of an overlying or underlying connecting piece, or in the absence of multiple connecting pieces, into a complementary relief on the base and/or the support plate. FIG. 1 illustrates such a shock and/or vibration absorbing connecting piece with a pronounced relief that engages and/or is complementary with other parts of the support element, the foregoing in combination with snap-fit clips (x and x').

10 **[0023]** FIG. 2 and 3 illustrate two shock and/or vibration absorbing connecting pieces as described in the previous section, with different height, such that the height of the support element can be changed according to the desired application, by choosing a different height of shock and/or vibration absorbing connecting piece.

20 **[0024]** According to the present invention, and as illustrated in FIG. 4, the one or more stackable connecting pieces, including the shock and/or vibration absorbing connecting piece, exhibit a relief parallel to the underlying surface on both sides, having one or more projections and/or one or more cavities allowing several connecting pieces to be stacked such that the projecting portions of one connecting piece fit into the cavities of an overlying or underlying connecting piece.

30 **[0025]** An advantage of the invention is that the use of connecting pieces with a relief that allow different connecting pieces to fit on each other provides increased stability because the connecting pieces cannot slide out of each other due to the relief, which is particularly important for the shock and/or vibration absorbing connecting piece since this will tend to be pushed out of the support element by compression. A second advantage is that such relief is a passive and therefore durable system to link connecting pieces to each other. A third advantage is that the connecting pieces provide increased height adjustability such that applications where relatively large irregularities in the underlying surface need to be accommodated and/or where the distance between the raised surface and the underlying surface is relatively large are among the possibilities.

40 **[0026]** The relief of one or more projections and/or one or more cavities can comprise any combination of projections and/or cavities. The relief on both sides of the connecting piece parallel with the underlying surface can be identical or can be different.

55 **[0027]** According to the invention, the support element is characterised by connecting pieces, including the shock and/or vibration absorbing connecting piece, with

a relief on one side, parallel with the underlying surface, which is complementary to the relief on the opposite side.

**[0028]** 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.

**[0029]** The one or more projections and/or one or more cavities can have any form.

**[0030]** In a particular embodiment and as illustrated in FIG. 5, 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.

**[0031]** The invention as already shown in FIG. 4 (see circle) is thus characterised in that each of the connecting pieces, including the shock and/or vibration absorbing connecting piece, 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.

**[0032]** 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, the foregoing in combination with increased shock and/or vibration absorption.

**[0033]** 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.

**[0034]** Each connecting piece can 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.

**[0035]** In another embodiment of the present invention as illustrated in FIG. 6 and FIG. 7, 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. 7) 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. 6) measured in the vertical direction of the upright support member. In this way, a support element 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.

**[0036]** In a particular 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 must 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. 8 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, the foregoing being 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.

**[0037]** In an embodiment according to the present invention, the underside of the support plate has a relief complementary to the relief of the one or more connecting pieces such that the support plate can also be placed on the intermediate piece in a stable and durable manner.

**[0038]** 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 such that the one or more connecting pieces can be placed on the control piece in a stable and durable manner.

**[0039]** 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.

**[0040]** The ring-shaped element and the control piece may be made of any synthetic material that is suitable

for extrusion or injection moulding, or of metal.

### Claims

1. Support element for a raised surface, the support element comprising the following parts:

(a) a base allowing the support element to be placed in an upright position on an underlying surface,

(b) on the base, an intermediate piece, consisting of one or more stackable connecting pieces exhibiting a relief on at least one side parallel with the underlying surface, having one or more projections and/or one or more cavities, which fit into a complementary relief of an overlying or underlying connecting piece, or in the absence of multiple connecting pieces, into a complementary relief on the base and/or the support plate, and

(c) on the intermediate piece, a support plate, suitable as a support of an object at a distance from the underlying surface,

whereby the one or more stackable connecting pieces include a shock and/or vibration absorbing connecting piece consisting at least partly of shock and/or vibration absorbing material wherein the one or more stackable connecting pieces, including the shock and/or vibration absorbing connecting piece, exhibit a relief parallel to the underlying surface on both sides, having one or more projections and/or one or more cavities allowing several connecting pieces to be stacked such that the projecting portions of one connecting piece fit into the cavities of an overlying or underlying connecting piece, **characterized in that** each of said one or more connecting pieces, including the shock and/or vibration absorbing connecting piece, includes 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.

2. Support element according to claim 1, **characterised in that** the shock and/or vibration absorbing connecting piece consists fully of shock and/or vibration absorbing material.
3. Support element according to claims 1 or 2, **characterised in that** the shock and/or vibration absorbing connecting piece is provided with means allowing it to be attached to the underlying and/or overlying connecting pieces, if any, or in the absence of multiple connecting pieces, to the base and/or the support plate.

4. Support element according to claim 1, **characterised in that** the relief on one side is complementary to the relief on the opposite side.

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 base includes a disc-shaped cavity in which a ring-shaped element with internal screw thread fits engaging with a control piece 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.

8. 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 eine erhöhte Oberfläche, wobei das Stützelement die folgenden Teile umfasst:

(a) eine Basis, die es ermöglicht, das Stützelement in aufrechter Position auf einer Unterlage zu platzieren,

(b) auf der Basis ein Zwischenstück, das aus einem oder mehreren stapelbaren Verbindungsstücken besteht, die auf mindestens einer Seite parallel zu der darunter liegenden Fläche ein Relief aufweisen, das einen oder mehrere Vorsprünge und/oder einen oder mehrere Hohlräume hat, die in ein passendes Relief eines darüber oder darunter liegenden Verbindungsstücks oder, wenn es keine mehreren Verbindungsstücke gibt, in ein passendes Relief auf der Basis und/oder der Trägerplatte passen, und

(c) auf dem Zwischenstück eine Stützplatte, die als Stütze eines Objekts in einem Abstand von der darunter liegenden Oberfläche geeignet ist, wobei dass das eine oder die mehreren stapelbaren Verbindungsstücke ein stoß- und/oder

- schwingungsabsorbierendes Verbindungsstück umfassen, das zumindest teilweise aus stoß- und/oder schwingungsabsorbierendem Material besteht, wobei das eine oder die mehreren stapelbaren Verbindungsstücke, einschließlich des stoß- und/oder schwingungsabsorbierenden Verbindungsstücks, auf beiden Seiten ein Relief parallel zur darunter liegenden Oberfläche aufweisen, mit einem oder mehreren Vorsprüngen und/oder einem oder mehreren Hohlräumen, die es ermöglichen, mehrere Verbindungsstücke so zu stapeln, dass die vorstehenden Teile eines Verbindungsstücks in die Hohlräume eines darüber oder darunter liegenden Verbindungsstücks passen, **dadurch gekennzeichnet, dass** jedes der ein oder mehreren Verbindungsstücke, einschließlich des stoß- und/oder schwingungsdämpfenden Verbindungsstücks, einen Vorsprung aufweist, der ringförmig in der Nähe des Außenumfangs einer Seite parallel zur darunter liegenden Oberfläche ausgeführt ist, und einen Hohlraum aufweist, der ringförmig in der Nähe des Außenumfangs der gegenüberliegenden Seite parallel zur darunter liegenden Oberfläche ausgeführt ist.
2. Stützelement nach Anspruch 1, **dadurch gekennzeichnet, dass** das stoß- und/oder schwingungsdämpfende Verbindungsstück vollständig aus stoß- und/oder schwingungsdämpfendem Material besteht.
3. Stützelement nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das stoß- und/oder schwingungsdämpfende Verbindungsstück mit Mitteln versehen ist, die es erlauben, es an den darunter liegenden und/oder darüber liegenden Verbindungsstücken, falls vorhanden, oder in Ermangelung mehrerer Verbindungsstücke, an der Basis und/oder der Stützplatte zu befestigen.
4. Stützelement nach Anspruch 1, **dadurch gekennzeichnet, dass** das Relief auf einer Seite komplementär zu dem Relief auf der gegenüberliegenden Seite ist.
5. Stützelement nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** eines oder mehrere der Verbindungsstücke mit Mitteln versehen ist/sind, die es ermöglichen, die Verbindungsstücke miteinander zu verbinden.
6. Stützelement nach einem der vorhergehenden 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 vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Basis einen scheibenförmigen Hohlraum aufweist, in den ein ringförmiges Element mit Innengewinde passt, das in ein Steuerteil mit entsprechendem Außengewinde eingreift, wobei das Steuerteil auf der höchsten Seite ein Relief aufweist, das parallel zu der darunter liegenden Oberfläche eines oder mehrerer Vorsprünge und/oder eines oder mehrerer Hohlräume verläuft, die komplementär zu dem Relief eines Verbindungsstücks des einen oder der mehreren Verbindungsstücke sind.
8. Stützelement nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Schraubgewinde des Steuerteils einen Höhenunterschied überbrücken kann, der mindestens gleich der Höhe des Verbindungsstücks mit der geringsten Höhe unter den Verbindungsstücken ist.

#### Revendications

1. Élément de support pour une surface surélevée, comprenant les parties suivantes :

(a) une base permettant à l'élément de support d'être placé en position verticale sur une surface sous-jacente,

(b) sur la base, une pièce intermédiaire constituée d'une ou plusieurs pièces de liaison empilables présentant un relief sur au moins un côté parallèle à la surface sous-jacente, comportant une ou plusieurs saillies et/ou une ou plusieurs cavités, qui s'insèrent dans un relief complémentaire d'une pièce de liaison sus-jacente ou sous-jacente, ou en l'absence de pièces de liaison multiples, dans un relief complémentaire de la base et/ou de la plaque de support, et

(c) sur la pièce intermédiaire, une plaque de support, convenant comme support d'un objet à une certaine distance de la surface sous-jacente, **caractérisée par le fait que** la ou les pièces de liaison empilables comprennent une pièce de liaison absorbant les chocs et/ou les vibrations, constituée au moins en partie d'un matériau absorbant les chocs et/ou les vibrations, dans laquelle la ou les pièces de liaison empilables, y compris la pièce de liaison absorbant les chocs et/ou les vibrations, présentent un relief parallèle à la surface sous-jacente sur les deux côtés, comportant une ou plusieurs saillies et/ou une ou plusieurs cavités. Celles-ci permettent d'empiler plusieurs pièces de liaison de telle sorte que les parties saillantes d'une pièce de liaison s'insèrent dans les cavités d'une pièce de liaison sus-jacente ou sous-jacente, **caractérisée par le fait que** chacune de ces pièces de liaison, y

- compris la pièce de liaison absorbant les chocs et/ou les vibrations, comporte une saillie de forme annulaire à proximité de la circonférence extérieure d'un côté parallèle à la surface sous-jacente, et comporte une cavité de forme annulaire à proximité de la circonférence extérieure du côté opposé parallèle à la surface sous-jacente. 5
2. Élément de support selon la revendication 1, **caractérisé par le fait que** la pièce de liaison absorbant les chocs et/ou les vibrations est entièrement constituée d'un matériau absorbant les chocs et/ou les vibrations. 10
3. Élément de support selon les revendications 1 ou 2, **caractérisé par le fait que** la pièce de liaison absorbant les chocs et/ou les vibrations est pourvue de moyens lui permettant d'être fixée aux pièces de liaison sous-jacentes et/ou sus-jacentes, le cas échéant, ou, en l'absence de pièces de liaison multiples, à la base et/ou à la plaque de support. 15 20
4. Élément de support selon la revendication 1, **caractérisé par le fait que** le relief d'un côté est complémentaire au relief du côté opposé. 25
5. Élément de support selon l'une quelconque des revendications précédentes, **caractérisé par le fait qu'**une ou plusieurs desdites pièces de liaison sont pourvues de moyens permettant d'interconnecter les pièces de liaison. 30
6. Élément de support selon l'une quelconque des revendications précédentes, **caractérisé par le fait que** chaque pièce de liaison a une hauteur, mesurée dans le sens vertical de l'élément de support, comprise entre 5 et 150 mm. 35
7. Élément de support selon l'une quelconque des revendications précédentes, **caractérisé par le fait que** la base comprend une cavité en forme de disque dans laquelle un élément en forme d'anneau avec filetage intérieur s'adapte par emboîtement dans une pièce de commande avec filetage extérieur correspondant, la pièce de commande 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 complémentaires au relief d'une pièce de liaison de la ou des pièces de liaison. 40 45 50
8. Élément de support selon l'une quelconque des revendications précédentes, **caractérisé par le fait que** le filetage de la pièce de commande peut combler une différence de hauteur au moins égale à la hauteur de la pièce de liaison dont la hauteur est la plus faible parmi les pièces de liaison. 55

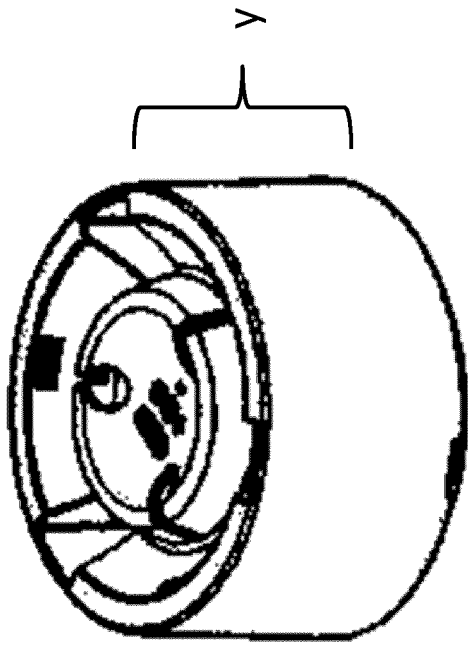


FIG 2

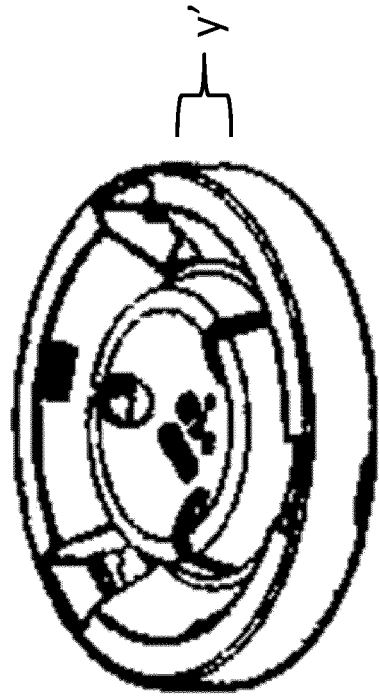


FIG 3

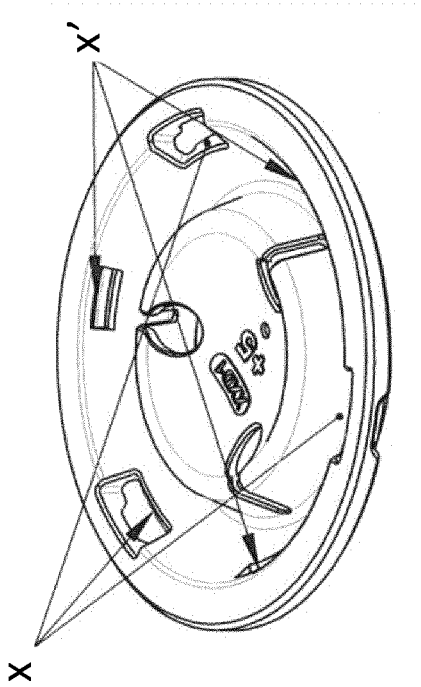


FIG 1

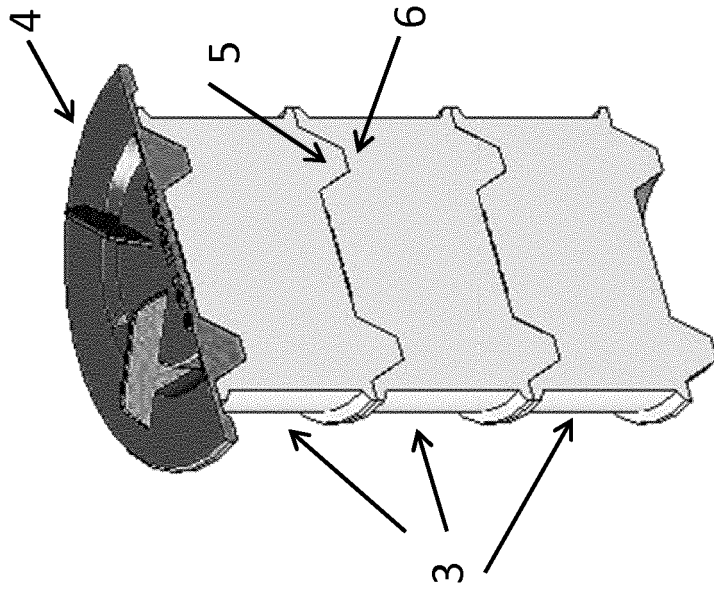


FIG 5

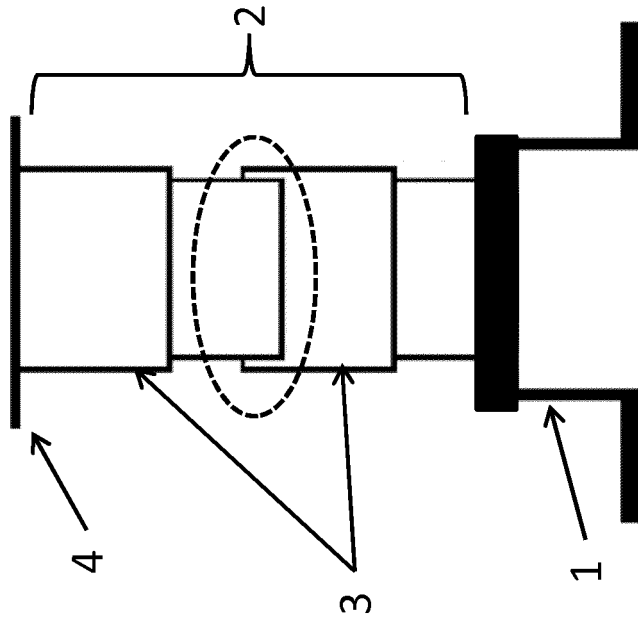


FIG 4

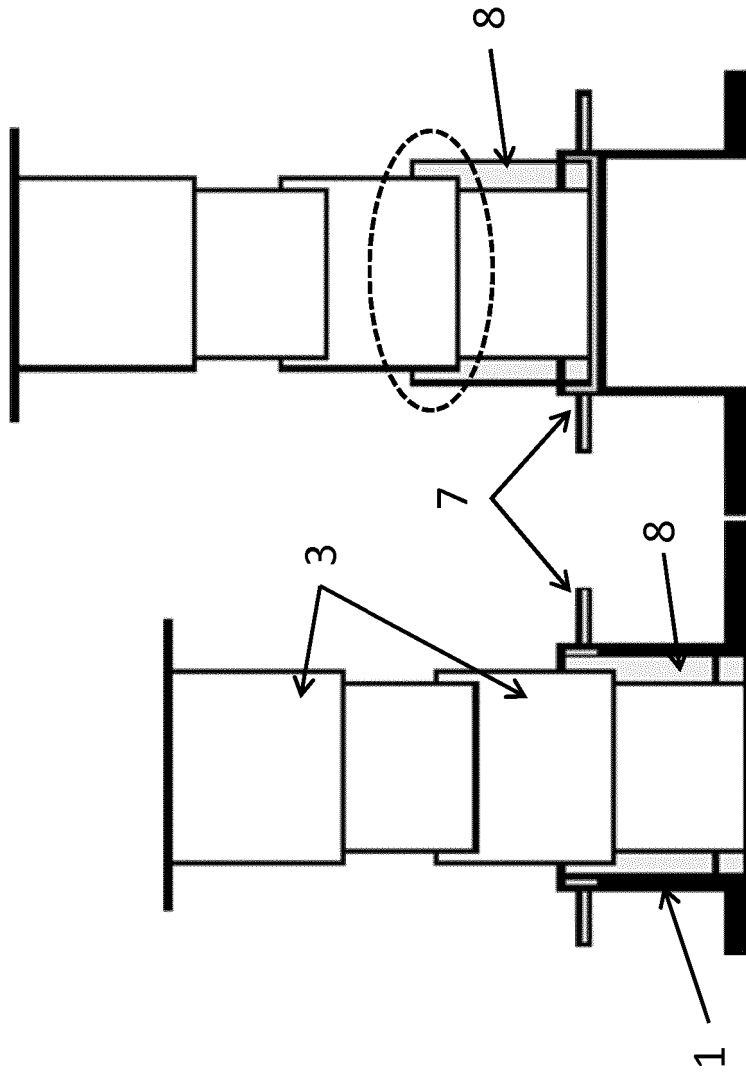


FIG 7

FIG 6

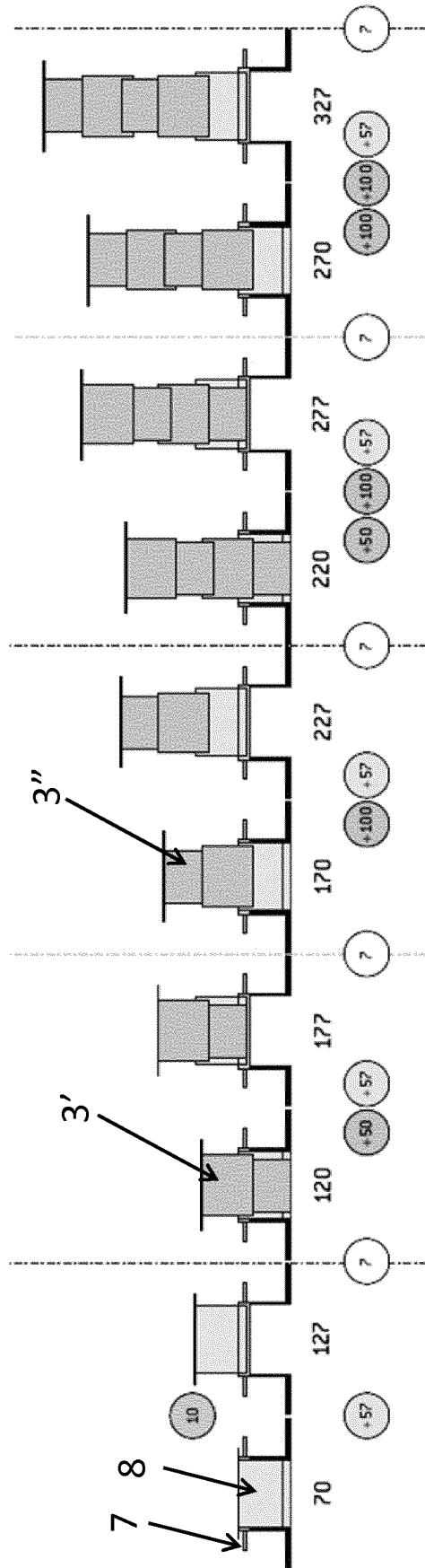


FIG 8

**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- GB 2378457 A [0002]
- DE 2457743 A1 [0002]