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(54) **LEVELLING SYSTEM**

NIVELLIERSYSTEM

SYSTÈME DE NIVELLEMENT

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(56) References cited:

EP-A1- 2 921 609 EP-A1- 2 952 652

WO-A1-2016/189423 WO-A1-2017/195155

CN-A- 107 366 421

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Description

FIELD OF THE INVENTION

[0001] The present disclosure relates to a levelling system for laying tiles, floor tiles and like with the interposition of gaps and a method of levelling tiles or floor elements using such a levelling system.

[0002] Document WO 2016/189423 A1 discloses a levelling system of this type according to the preamble of claim 1.

BACKGROUND OF THE INVENTION

[0003] The laying of tiles and coverings composed of tiles or more generally floor elements such as floor tiles, slabs of medium or large size with reduced or lowered thickness, wooden boards or such typically requires levelling the tiles or floor elements and ideally equally spacing the tiles in order to provide the regular gaps therebetween. Levelling systems are known for laying tiles, floor tiles and the like which are constituted by a base, to be arranged below two laterally adjacent tiles; optionally some spacing protrusions, extending from such base in order to define the width of the gaps and in fact define the abutments for the edges of the tiles.

[0004] By arranging for example two levelling spacers at each side of a tile, preferably proximate to each corner, one obtains for such tile the desired planarity, and at the same time correct placement is sought with respect to the tiles that surround it and also are laid with other identical levelling spacers.

[0005] A flat tab protrudes from the base of the levelling spacer, is extended so as to exit from the channel defined between the tiles in order to provide the gap, and is provided with an opening for insertion of a tile locking wedge between the surface of the tile and the upper edge of the opening.

[0006] Such wedge-type locking system has two functions: locking the edges of the laterally adjacent tiles between such wedge and the base of the levelling spacer, ensuring co-planner arrangement during the laying of the tiles, removing the tabs of the respective bases for the provision of the gaps by striking the wedge in the direction of insertion in the window of such tab.

[0007] Another similar levelling spacer has a toothed strap-like tab that extends from the base with spacers and is preset to be inserted in a locking body, which in turn is adapted to be pressed so as to straddle the two laterally adjacent edges of the nearby tiles.

[0008] Yet another similar levelling spacer comprises a base to be positioned under adjacent tiles and with stem provided extending between both tiles, wherein the stem comprises a threaded outer surface. The levelling system further comprises a pressure member made of a tubular body with an internal thread configured to cooperate with the thread on the stem and allowing turning the pressure body towards the base and hence adjusting

the plane of the tile by pressing the tile down on the base with the pressure member.

[0009] Such known levelling systems, although widely used, have some important drawbacks, such as damaging the upper surface of tiles, due to the rotation or sliding of the pressure body on the tile when levelling the tile, time consuming removal of the pressure body from the stem in case of a rotational pressure which discourages reuse of the pressure body and increases cost of the levelling system.

[0010] It follows that there remains a market need for user friendly, preferably ecological and in particular fool proof levelling systems that can be applied for levelling tiles or other floor elements without the risk of damaging the visible upper surface of the tiles or floor elements.

SUMMARY OF THE INVENTION

[0011] The present invention addresses the above market need by providing a levelling system for laying tiles or floor elements in a desired plane XY, comprising:

- a base extending in a plane A,
- a stem extending from the base in a longitudinal direction Z and fixed to said base by means of at least one pre-weakened zone, configured to allow separating the stem from the base, the stem comprising at least one first engagement member;
- a pressure member comprising a tubular body defining an inner slot configured to slide over the stem in the longitudinal direction Z, the slot defining guiding means mating with the stem, thereby preventing rotation of the pressure member around the stem, the pressure member comprising a pressure surface extending in a plane parallel to the XY plane and facing the base when the pressure member is positioned over the stem;
- a pressure adjustment member comprising a tubular body having at least one inwardly directed second engagement member configured to engage with the first engagement member,

wherein one of said first or second engagement members comprises at least one barb and the other engagement member comprises a thread configured to engage with the barb;

wherein the barb or barbs are flexible allowing movement of the pressure adjustment member over the stem in a direction to the pre-weakened point without or with limited rotation of the pressure adjustment member;

characterised in that

said first engagement member comprises said at least one barb and said second engagement member comprises said thread configured to engage with said at least one barb,

said first engagement member comprising a series of superposed barbs slantingly extending from the

stem in a direction of said plane A, said barbs defining free end portions;
and said second engagement member comprises said thread configured to engage with free end portions of the series of superposed barbs, allowing adjusting the position of the pressure member in said longitudinal direction Z.

[0012] The present invention also aims at a method of levelling tiles, the method comprising the steps of

- A) providing a levelling system as identified in any of claims 1-4;
- B) positioning the base in a predetermined plane A and placing two adjacent tiles on said base at opposed sides of the stem;
- C) sliding a pressure member over said stem; and subsequently
- D) providing the pressure adjustment member over said stem and adjusting the position of the pressure adjustment member in the longitudinal direction Z until the tile or floor element is pressed between the base and the pressure surface of the pressure member in the XY plane;
- E) fixing the tile or floor element in place whilst maintained in position by the levelling element;
- F) breaking the pre-weakened zone between base and stem and removing of the stem from between two adjacent tiles or floor elements;
- G) removing the pressure member and the pressure adjustment member from the stem by a pure translation motion of both members over the stem.

DETAILED SUMMARY OF THE INVENTION

[0013] The present invention is defined in the appended independent claims. Preferred embodiments are defined in the dependent claims.

[0014] According to the present invention, the first engagement member comprises a series of superposed barbs slantingly extending from the stem in a direction of plane A, the barbs defining free end portions.

[0015] The second engagement member comprises a thread configured to engage with free end portions of the series of superposed barbs, allowing adjusting the position of the pressure element in a longitudinal direction Z.

[0016] The levelling system according to the present invention preferably has a stem that has a maximum diameter/dimension measured in the XY plane that is smaller than largest dimension of the slot of the pressure member.

[0017] The barb or barbs used as the first or second engagement members are flexible allowing movement of the pressure adjustment member over the stem in a direction to the pre-weakened point without or with limited rotation of the pressure adjustment member.

[0018] The stem may comprise a spacer portion positioned proximate to the base, said spacer portion having

a thickness corresponding to a desired gap between two adjacent tiles or floor elements.

[0019] The base and/or stem are preferably manufactured in a bio-degradable or recyclable material.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] A preferred embodiment of the levelling system according to the present invention will be disclosed below with reference to the appended drawings, illustrated as a non-limiting example of the present invention, wherein:

FIG. 1 shows the different parts of a levelling system according to the present invention;

FIG. 2-5 schematically show different steps of a method of levelling tiles with the levelling system of FIG 1.

DETAILED DESCRIPTION OF THE DRAWINGS

[0021] Fig. 1 shows a levelling system 1 according to the present invention in a disassembled state, with a base 2 and a stem 3 extending in a longitudinal direction Z from the base 2 and leaving part of the base exposed at two opposite sides of the stem; a pressure member 4 and a pressure adjustment member 5.

[0022] The base 2 in this case comprises two slightly wedged portions designed to be positioned under two adjacent tiles or floor elements substantially in a plane A, while the stem 3 comprises a lower portion 6 with which it is fixed to the base, said fixation comprising a pre-weakened zone 7 such as a score line or a thin film zone allowing breaking the stem off from the base. The lower portion 6 in this case is made from a relative thin plate like section, having a thickness in a range of 1 to 2 mm (corresponding to the typical dimensions of a gap between two adjacent tiles or floor elements). The stem further comprises a functional portion 8 distal from the base, where in this case the thickness of the stem is substantially larger than at the lower portion and may typically range between 4 and 10 mm. This functional zone comprises a first engagement member 9 that in this case comprises two series of superimposed barbs 9', each provided at an opposed side of the stem. The barbs are directed slantingly downward towards with free end portions facing or directed towards plane A. The barbs are made flexible such that the free end portions thereof can flex towards the stem which corresponds to a slight compression of the barbs in view of the longitudinal direction.

[0023] The width W1 of the functional portion preferably exceeds the width W2 of the lower portion of the stem 3.

[0024] The pressure member 4 comprises a tubular body defining an inner slot 10 configured to slide over the stem 2 in the longitudinal direction Z, the slot 10 defining guiding means 10' mating with the stem, thereby preventing rotation of the pressure member 4 around the

stem 2. The pressure member further comprises a pressure surface 11 that in an assembled state of the levelling system extends in a plane parallel to an XY-plane corresponding to the plane wherein the visible surface of the tiles or floor elements to be levelled extend and that faces the base when the pressure member is positioned over the stem.

[0025] The inner slot 10 of the pressure member is dimensioned to allow sliding the pressure member over both the functional portion and the lower portion of the stem without allowing substantive translation of the pressure member.

[0026] The pressure adjustment member 5 comprises a tubular body having at least one a inwardly directed second engagement member 12 configured to engage with the first engagement 9 member on the stem.

[0027] In the illustrated embodiment, the second engagement member 12 comprises a thread at the inner surface of the tubular body of the pressure adjustment member 5, whereby the inner diameter of the thread is just smaller than the distance between the free end portions of both opposed series of barbs on the stem (measured in a plane parallel to the XY plane), thereby allowing engagement of the thread with the free end portions of the barbs and hence preventing the pressure adjustment member from sliding upwards, in a direction Z and away from the base when applied on the stem.

[0028] Preferably at least the stem and the base of the levelling system are made of a recyclable material and/or a biodegradable polymer such as biodegradable polycondensates, in particular a biodegradable poly(lactic acid) which is defined herein as a thermoplastic aliphatic polyester derived from renewable resources, such as corn starch, cassava roots, chips or starch, or sugarcane. Clearly, also the pressure member and pressure adjustment member may be manufactured in such materials.

[0029] In some cases, it may be desired to manufacture the base and stem in different materials. An example of a stem and base manufactured in different materials, is a base made in a polyolefinic material such as polypropylene, a polyester such as PA6 or PLA; block copolymers such as ABS or admixtures thereof that are known to have a relatively long life-time (more than ten years) similar to or even longer than the average life-time of floor tiles, whereas the stem can be made of a biodegradable and/or recyclable material, allowing breakdown thereof in a couple of months or even weeks when placed in appropriate biodegradation conditions such as in warm (+20°C) and humid conditions typically found in a compost heap. Such embodiment allows for using the levelling system of the invention whereby the base remains present under the tiles for an extended period of time, preferably during the entire life-time of the tiles, while the stem can be easily disposed off. When manufacturing the base and stem in different materials, it is preferred that both materials can be either welded together to achieve the fixation between both parts or co-injection moulded, in case both parts can not be welded

or co-injection moulded together, mechanical attachment means or gluing can be applied.

[0030] Turning now to the figures 2 to 5, the use of the levelling system according to the present invention will be disclosed here below.

[0031] In a first step, the base of the system is positioned on a support surface, with the stem extending in an upright position (upright here indicating that the stem faces away from the support surface, which for a wall might be horizontally), with the wedged portions of the base positioned under two adjacent tiles (the base is thus extending between the support surface and a lower surface of the tiles).

[0032] Once in position the pressure member is applied over the free end of the stem, followed by the pressure adjustment member. As the barbs are made flexible, both members are pressed downward towards the base until the pressure surface of the pressure member abuts the visible upper surface of at least one of the tiles as is illustrated in figure 3.

[0033] Next both tiles can be accurately levelled by turning the pressure adjustment member, thereby forcing the pressure member down over the stem and adjusting the tiles by a clamping action between base and pressure surface of the levelling system. As the pressure member is blocked from rotation over the stem, the pressure surface does not move or slide in a direction in the XY plane over the surface of the tiles, thereby preventing damaging the tiles especially when small particles of dirt might be present on the tile surfaces.

[0034] When both tiles are levelled in the XY plane, the tiles can be fixed in place either by a mechanical fixation or by waiting until an adhesive applied between the support surface and tiles cures. Once the fixation of the tiles is sufficiently secured, the stem can be broken off from the base of the levelling system, by applying a force on the stem, eg by kicking on it or knocking it over with a hammer.

[0035] Finally, the pressure member and pressure adjustment member can both be removed from the stem by a sliding motion towards the end of the stem broken free from the base. As the barbs are made flexible, such removal of the pressure adjustment member does not require rotation thereof versus the base, but a simple and fast sliding action suffices.

[0036] Both the pressure body and pressure adjustment body can be re-used with a new stem and base assembly.

Claims

1. A levelling system for laying tiles or floor elements in a desired plane XY, comprising:
 - a base (2) extending in a plane A,
 - a stem (3) extending from the base in a longitudinal direction Z and fixed to said base (2) by

means of at least one pre-weakened zone (7), configured to allow separating the stem (3) from the base (2), the stem (3) comprising at least one first engagement member (9);

- a pressure member (4) comprising a tubular body defining an inner slot configured to slide over the stem in the longitudinal direction Z, the slot defining guiding means (10') mating with the stem (3), thereby preventing rotation of the pressure member (4) around the stem (3), the pressure member (4) comprising a pressure surface (11) extending in a plane parallel to the XY plane and facing the base (2) when the pressure member (4) is positioned over the stem (3);

- a pressure adjustment member (5) comprising a tubular body having at least one inwardly directed second engagement member (12) configured to engage with the first engagement member (9),

wherein one of said first or second engagement members (9, 12) comprises at least one barb (9') and the other engagement member comprises a thread (12) configured to engage with the barb (9');

wherein the barb or barbs (9') are flexible allowing movement of the pressure adjustment member (5) over the stem in a direction to the pre-weakened point (7) without or with limited rotation of the pressure adjustment member (5);

characterised in that

said first engagement member (9) comprises said at least one barb (9') and **in that** said second engagement member (12) comprises said thread (12) configured to engage with said at least one barb (9');

wherein said first engagement member (9) comprises a series of superposed barbs slantingly extending from the stem (3) in a direction of said plane A, said barbs (9') defining free end portions; and said

second engagement member (12) comprises said thread (12) configured to engage with free end portions of the series of superposed barbs (9'), allowing adjustment of the position of the pressure member (4) in said longitudinal direction Z.

2. The levelling system according to any of the preceding claims, wherein the stem (3) has a maximum diameter/dimension measured in the XY plane that is smaller than largest dimension of the slot of the pressure member (4).
3. The levelling system according to any of the preceding claims, wherein the stem (3) comprises a spacer portion positioned proximate to the base, said spacer portion having a thickness corresponding to a desired gap between two adjacent tiles or floor elements.

ments.

4. The levelling system according to any of the preceding claims, wherein at least the base (2) and/or stem (3) are manufactured in a bio-degradable or recyclable material.

5. A method of levelling tiles or floor elements, the method comprising the steps of

A) providing a levelling system as identified in any of claims 1 to 4;

B) positioning the base in a predetermined plane A and placing two adjacent tiles on said base at opposed sides of the stem;

C) sliding a pressure member over said stem; and subsequently

D) providing the pressure adjustment member over said stem and adjusting the position of the pressure adjustment member in the longitudinal direction Z until the tile or floor element is pressed between the base and the pressure surface of the pressure member in the XY plane;

E) fixing the tile or floor element in place whilst maintained in position by the levelling system;

F) breaking the pre-weakened zone between base and stem and removing of the stem from between two adjacent tiles or floor elements;

G) removing the pressure member and the pressure adjustment member from the stem by a pure translation motion of both members over the stem.

6. The method according to claim 5, comprising re-using the pressure member and/or pressure adjustment member for levelling subsequent tiles or floor members.

Patentansprüche

1. Nivelliersystem zum Verlegen von Fliesen oder Bodenelementen in einer gewünschten Ebene XY, umfassend:

- eine Basis (2), die sich in einer Ebene A erstreckt,

- einen Bolzen (3), der sich von der Basis in einer Längsrichtung Z erstreckt und mittels mindestens eines vorab geschwächten Bereichs (7) an der Basis (2) fixiert ist, der ausgelegt ist, um zu ermöglichen, den Bolzen (3) von der Basis (2) zu trennen, wobei der Bolzen (3) mindestens ein erstes Eingriffsteil (9) umfasst;

- ein Druckteil (4), das einen röhrenförmigen Körper umfasst, der einen inneren Schlitz definiert, der ausgelegt ist, um in der Längsrichtung Z über den Bolzen zu gleiten, wobei der Schlitz

Führungsmittel (10') definiert, die zu dem Bolzen (3) passen, wodurch eine Drehung des Druckteils (4) um den Bolzen (3) herum verhindert wird, wobei das Druckteil (4) eine Druckfläche (11) umfasst, die sich in einer Ebene parallel zu der XY-Ebene erstreckt und der Basis (2) zugewandt ist, wenn das Druckteil (4) über dem Bolzen (3) positioniert ist;

- ein Druckeinstellungsteil (5), das einen röhrenförmigen Körper umfasst, der mindestens ein nach innen gerichtetes zweites Eingriffsteil (12) aufweist, das ausgelegt ist, um mit dem ersten Eingriffsteil (9) in Eingriff zu kommen, wobei eines von dem ersten oder dem zweiten Eingriffsteil (9, 12) mindestens einen Widerhaken (9') umfasst und das andere Eingriffsteil ein Gewinde (12) umfasst, das ausgelegt ist, um mit dem Widerhaken (9') in Eingriff zu kommen; wobei der oder die Widerhaken (9') flexibel sind und so eine Bewegung des Druckeinstellungsteils (5) über dem Bolzen in einer Richtung zu dem vorab geschwächten Punkt (7) ohne oder mit begrenzter Drehung des Druckeinstellungsteils (5) zu ermöglichen;

dadurch gekennzeichnet, dass

das erste Eingriffsteil (9) mindestens einen Widerhaken (9') umfasst und dadurch, dass das zweite Eingriffsteil (12) das Gewinde (12) umfasst, das ausgelegt ist, um mit dem mindestens einen Widerhaken (9') in Eingriff zu kommen; wobei das erste Eingriffsteil (9) eine Reihe von überlagerten Widerhaken umfasst, die sich geneigt von dem Bolzen (3) in einer Richtung der Ebene A erstrecken, wobei die Widerhaken (9') freie Endabschnitte definieren; und das zweite Eingriffsteil (12) das Gewinde (12) umfasst, das ausgelegt ist, um mit freien Endabschnitten der Reihe von überlagerten Widerhaken (9') in Eingriff zu kommen und so eine Einstellung der Position des Druckteils (4) in der Längsrichtung Z ermöglicht.

2. Nivelliersystem nach einem der vorstehenden Ansprüche, wobei der Bolzen (3) in der XY-Ebene gemessen einen maximalen Durchmesser/Abmessung aufweist, der/die kleiner ist als eine größte Abmessung des Schlitzes des Druckteils (4).
3. Nivelliersystem nach einem der vorstehenden Ansprüche, wobei der Bolzen (3) einen Abstandhalterabschnitt umfasst, der in der Nähe der Basis positioniert ist, wobei der Abstandhalterabschnitt eine Dicke aufweist, die einem gewünschten Spalt zwischen zwei benachbarten Fliesen oder Bodenelementen entspricht.
4. Nivelliersystem nach einem der vorstehenden Ansprüche, wobei mindestens die Basis (2) und/oder

der Bolzen (3) aus einem biologisch abbaubaren oder recycelbaren Material hergestellt sind.

5. Verfahren zum Nivellieren von Fliesen oder Bodenelementen, wobei das Verfahren die folgenden Schritte umfasst

A) Bereitstellen eines Nivelliersystems, wie in einem der Ansprüche 1 bis 4 identifiziert;
 B) Positionieren der Basis in einer vorbestimmten Ebene A und Platzieren von zwei benachbarten Fliesen auf der Basis an entgegengesetzten Seiten des Bolzens;
 C) Gleiten eines Druckteils über den Bolzen; und anschließend
 D) Bereitstellen des Druckeinstellungsteils über dem Bolzen und Einstellen der Position des Druckeinstellungsteils in der Längsrichtung Z, bis die Fliese oder das Bodenelement zwischen der Basis und der Druckfläche des Druckteils in der XY-Ebene gedrückt ist;
 E) ortsfestes Fixieren der Fliese oder des Bodenelements, zugleich Halten in Position durch das Nivelliersystem;
 F) Brechen des vorab geschwächten Bereichs zwischen Basis und Bolzen und Entfernen des Bolzens von zwischen zwei benachbarten Fliesen oder Bodenelementen;
 G) Entfernen des Druckteils und des Druckeinstellungsteils von dem Bolzen durch eine reine Verschiebungsbewegung beider Teile über den Bolzen.

6. Verfahren nach Anspruch 5, umfassend Wiederverwenden des Druckteils und/oder Druckeinstellungsteils zum Nivellieren von nachfolgenden Fliesen oder Bodenteilen.

Revendications

1. Système de nivellement pour poser des carreaux ou des éléments de sol dans un plan XY souhaité, comprenant :
 - une base (2) s'étendant dans un plan A,
 - une tige (3) s'étendant à partir de la base dans une direction longitudinale Z et fixée à ladite base (2) au moyen d'au moins une zone pré-affaiblie (7), configurée pour permettre une séparation de la tige (3) de la base (2), la tige (3) comprenant au moins un premier élément de mise en prise (9) ;
 - un élément de pression (4) comprenant un corps tubulaire définissant une fente intérieure configurée pour glisser sur la tige dans la direction longitudinale Z, la fente définissant des moyens de guidage (10') s'accouplant avec la

tige (3), empêchant ainsi une rotation de l'élément de pression (4) autour de la tige (3), l'élément de pression (4) comprenant une surface de pression (11) s'étendant dans un plan parallèle au plan XY et faisant face à la base (2) lorsque l'élément de pression (4) est positionné sur la tige (3) ;

- un élément de réglage de pression (5) comprenant un corps tubulaire présentant au moins un second élément de mise en prise dirigé vers l'intérieur (12) configuré pour venir en prise avec le premier élément de mise en prise (9), dans lequel un desdits premier ou second éléments de mise en prise (9, 12) comprend au moins une barbe (9') et l'autre élément de mise en prise comprend un filet (12) configuré pour venir en prise avec la barbe (9') ; dans lequel la barbe ou les barbes (9') sont flexibles, permettant un déplacement de l'élément de réglage de pression (5) sur la tige dans une direction du point préaffaibli (7) sans ou avec une rotation limitée de l'élément de réglage de pression (5) ;

caractérisé en ce que

ledit premier élément de mise en prise (9) comprend ladite au moins une barbe (9') et **en ce que** ledit second élément de mise en prise (12) comprend ledit filet (12) configuré pour venir en prise avec ladite au moins une barbe (9') ; dans lequel ledit premier élément de mise en prise (9) comprend une série de barbes superposées s'étendant de manière inclinée à partir de la tige (3) dans une direction dudit plan A, lesdites barbes (9') définissant des parties d'extrémités libres ; et ledit second élément de mise en prise (12) comprend ledit filet (12) configuré pour venir en prise avec des parties d'extrémités libres de la série de barbes superposées (9'), permettant un réglage de la position de l'élément de pression (4) dans ladite direction longitudinale Z.

2. Système de nivellement selon l'une quelconque des revendications précédentes, dans lequel la tige (3) présente un diamètre/une dimension maximaux mesurés dans le plan XY qui sont plus petits que la plus grande dimension de la fente de l'élément de pression (4).
3. Système de nivellement selon l'une quelconque des revendications précédentes, dans lequel la tige (3) comprend une partie d'espacement positionnée à proximité de la base, ladite partie d'espacement présentant une épaisseur correspondant à un interstice souhaité entre deux carreaux ou éléments de sol adjacents.
4. Système de nivellement selon l'une quelconque des

revendications précédentes, dans lequel au moins la base (2) et/ou la tige (3) sont fabriquées dans un matériau biodégradable ou recyclable.

5. Procédé de nivellement de carreaux ou d'éléments de sol, le procédé comprenant les étapes consistant à
 - A) fournir un système de nivellement tel qu'identifié dans l'une quelconque des revendications 1 à 4 ;
 - B) positionner la base dans un plan A prédéterminé et placer deux carreaux adjacents sur ladite base sur des côtés opposés de la tige ;
 - C) glisser un élément de pression sur ladite tige ; et par la suite
 - D) fournir l'élément de réglage de pression sur ladite tige et régler la position de l'élément de réglage de pression dans la direction longitudinale Z jusqu'à ce que le carreau ou l'élément de sol soit pressé entre la base et la surface de pression de l'élément de pression dans le plan XY ;
 - E) fixer le carreau ou l'élément de sol en place tandis qu'il est maintenu en position par le système de nivellement ;
 - F) casser la zone pré-affaiblie entre la base et la tige et retirer la tige d'entre deux carreaux ou éléments de sol adjacents ;
 - G) retirer l'élément de pression et l'élément de réglage de pression de la tige par un mouvement de translation pure des deux éléments sur la tige.
6. Procédé selon la revendication 5, comprenant une réutilisation de l'élément de pression et/ou de l'élément de réglage de pression pour niveler des carreaux ou des éléments de sol suivants.

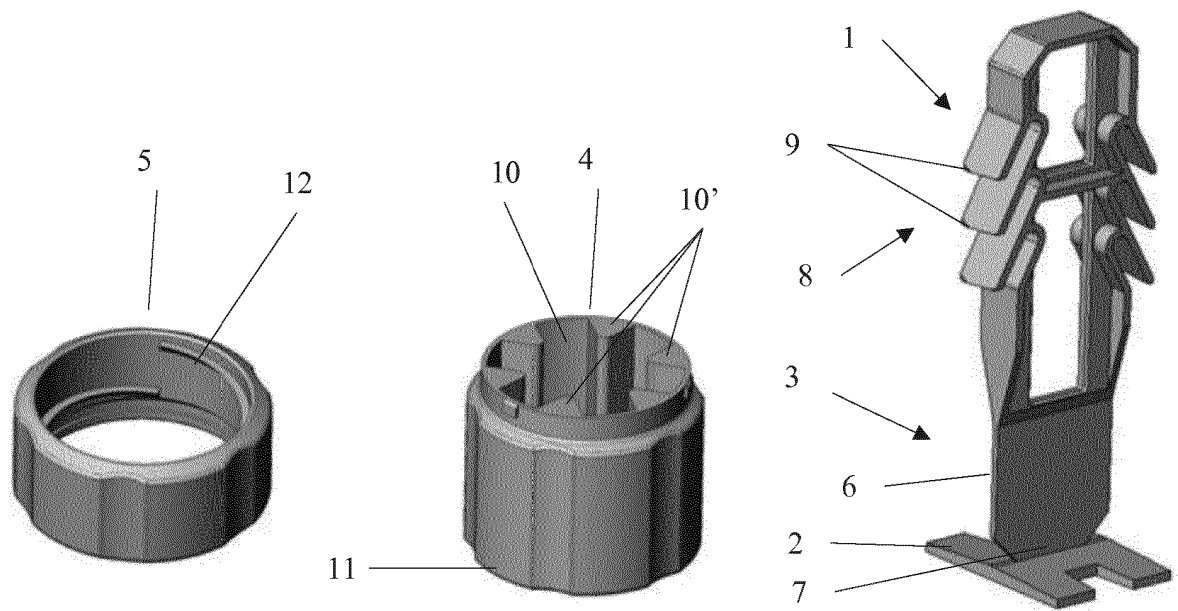


FIG 1

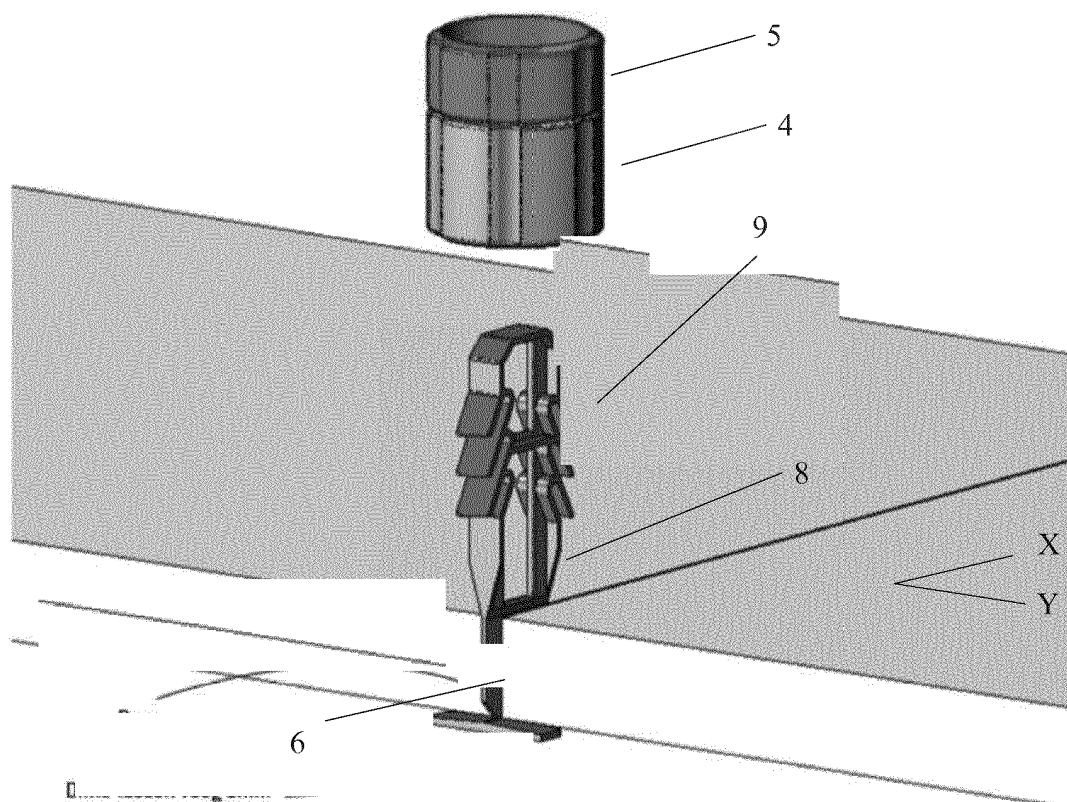


FIG 2

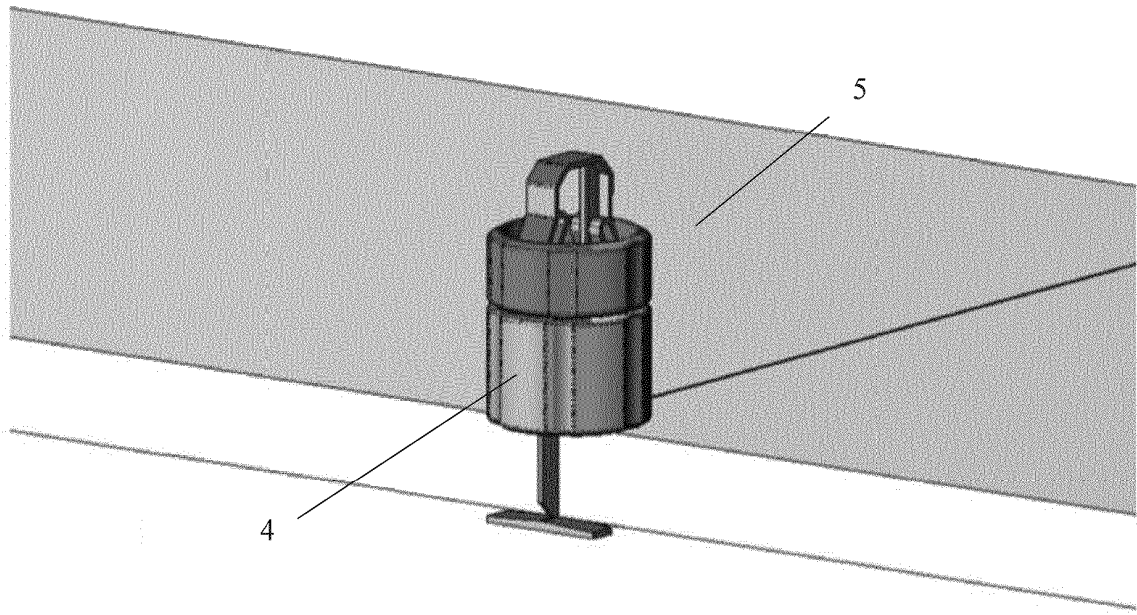


FIG 3

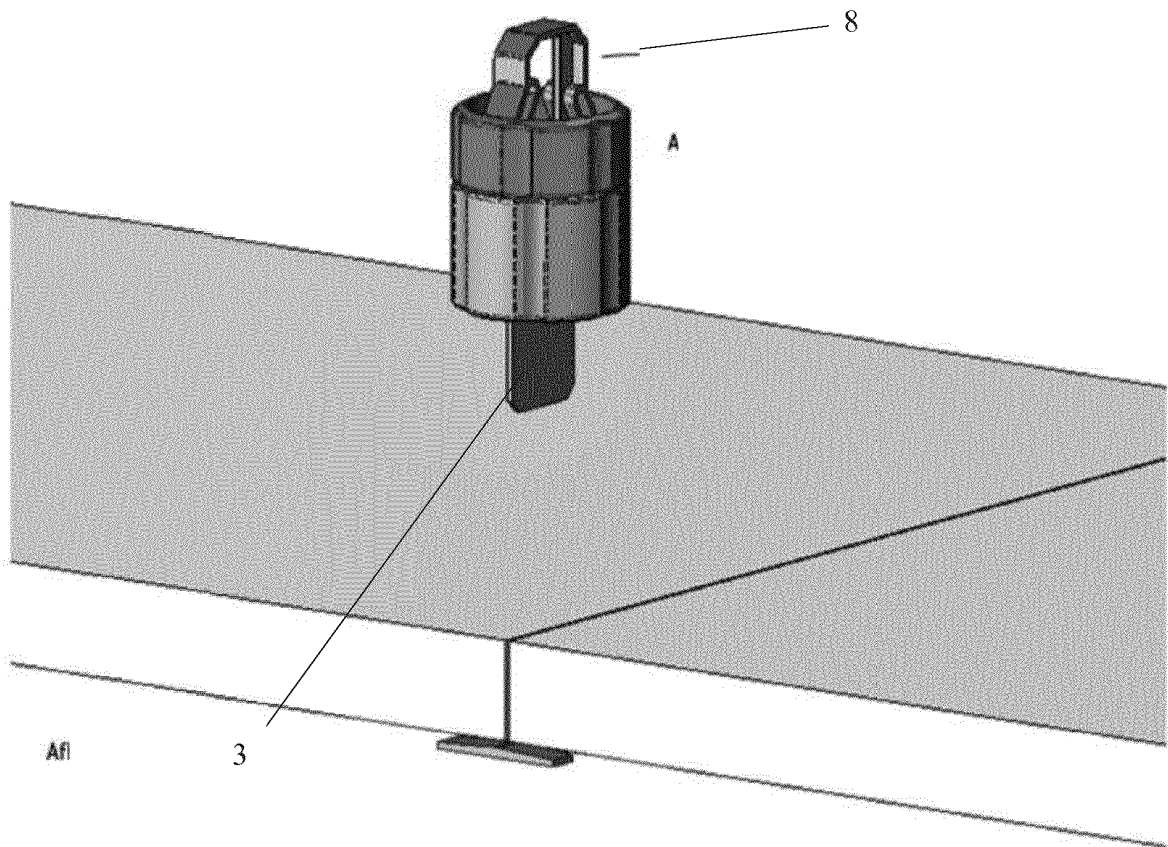


FIG 4

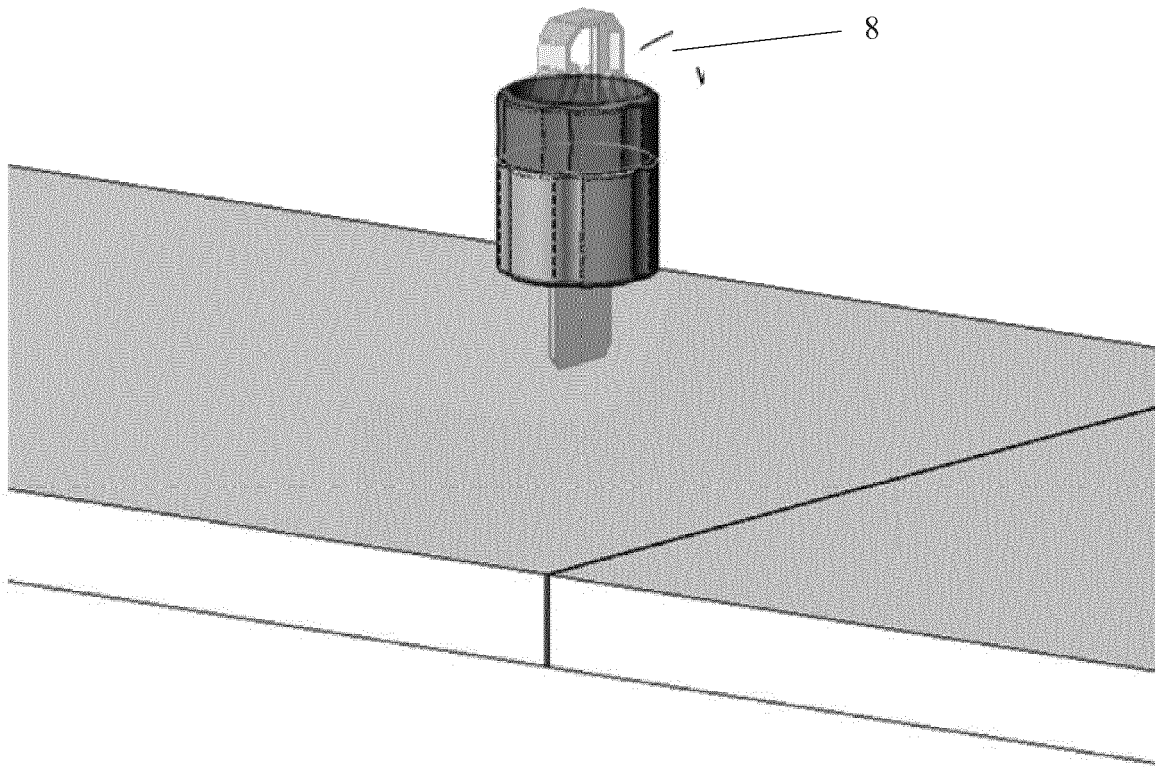


FIG 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2016189423 A1 [0002]