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(54) **A TOOL FOR LEVELING A CONCRETE LAYER OR THE LIKE IN CONSTRUCTION WORK**
PLANIEREINRICHTUNG
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Description

[0001] The present invention relates to a tool for leveling a concrete layer or the like in construction work.

[0002] Currently, the task of leveling the concrete layer, so-called screed, especially in balconies, on which to lay tiles, is not always easy and quick to implement. The operator manually maneuvers a straightedge above the concrete layer, and this operation is quite difficult and often executed with improvised systems, as it is necessary to ensure a constant and regular leveling of this layer depending on the thickness of the tiles to be laid. In the case of balconies, the leveling must also be carried out in relation to the pre-existing outer perimeter marble edging in order to ensure that the tiles are coplanar with perimeter edging.

[0003] US2010202831-A1 discloses a screed for contouring cementitious material according to the preamble of claim 1. The screed includes a drain pivot element adapted and constructed to be rotatably secured in a drain depression. An elongated material contact element adapted and constructed to uniformly contour the surface of cementitious material is provided. A height adjustment element connects the drain pivot element to the material contact element. The height adjustment element is used to set the operating height of the material contact element.

[0004] The present invention aims to provide a tool for leveling, in a constant and regular manner, a concrete layer or the like, for construction work and to enable this operation to be quick and reliable, as well as easy and convenient for the operator, thus providing a practical, simple and advantageous solution, both in implementation and convenience of use.

[0005] Another object is to allow the tool to be used for producing plasterwork for walls in general, in this case facilitating the required leveling of the plaster layer, thus constituting an effective solution of use.

[0006] These objects are achieved by a tool as defined in claim 1.

[0007] Characteristics of the invention and the advantages that derive from it will become evident from the detailed description of an embodiment of the invention that follows, illustrated simply by way of example, with reference to the attached drawings, wherein:

- Figure 1 illustrates a tool according to the invention, in exploded perspective view;
- Figure 2 illustrates the same tool, in exploded front view;
- Figure 3 is a view of the same tool in perspective view illustrating the application of the straightedge element;
- Figure 4 is a side view of the region of the movable part intended to be coupled with the straightedge;
- Figure 5 illustrates, in front view, the tool in the leveling position of use with the straightedge applied.

[0008] With reference to the figures, in the illustrated embodiment, the tool according to the invention comprises a fixed part 10 intended to be supported on a reference surface M, for example, the outer perimeter marble edging of a balcony, with respect to which the required leveling of a concrete layer of application of an article to be laid is established, for example tiles, slabs or the like.

[0009] The tool further comprises a movable part 11 movable with respect to the fixed part 10, which is able to move along the body of the fixed part 10 from a rest position up to a position of maximum stroke, and capable of adjusting and defining the desired height L of leveling.

[0010] Said movable part 11 is intended to be associated with a straightedge S in order to achieve the leveling of the concrete layer or the like.

[0011] Locking means 12, 13 of the movable part 11 to the fixed part 10 are also provided in the position that defines the required leveling height.

[0012] The fixed part 10 has a region 101, longitudinally, which is coupled, in a complementary and movable manner, within a corresponding seat 111 of the movable part 11, so that said region 101 of the fixed part 10 constitutes a guide for the translatory motion of said movable part 11 with respect to the fixed part 10.

[0013] The said locking means 12, 13 of the movable part 11 to the fixed part 10 comprise, for the illustrated embodiment, two screws 12, 13, which can be inserted from the outside into transverse through-holes, respectively, 14 and 15, so that with their tip they adhere and press against an inner wall 112 of the sliding seat 111 of the movable part 11, thereby causing the locking.

[0014] The movable part 11 can assume a rest position wherein at least one of its sides parallel to the reference surface M is aligned with an adjacent side of the fixed part 10 and an operative position wherein the movable part 11 is projecting with respect to the fixed part 10, towards the working plane and with respect to the reference surface M, by a length L, which defines and establishes the required leveling height.

[0015] The straightedge S can be provided as a single piece with the movable part 11, from the manufacturing step, or said straightedge S can be provided with a detachable and interchangeable coupling with respect to the movable part 11.

[0016] According to the invention, the movable part 11, on the side opposite to that which slides on the fixed part 10, has a region intended to be detachably and interchangeably coupled with the straightedge element S, providing the section of that region complementary with that of the straightedge S.

[0017] According to the invention, the detachable and interchangeable coupling of the region of the movable part 11 with the straightedge element S, is envisaged by providing this region with a box-like structure whose walls 113 are independent and elastically-deformable, and free to expand outwards by the effect of a frustoconical

wedge-shaped element 16 when it penetrates within said box-like structure, with which cooperating radial fins 114 adhere to the walls 113, and of overall conformation complementary to the frustoconical element 16, so that advancing of this element 16, caused by a screw 17, which can be inserted from the outside on the inner wall 112 of the sliding seat 111 of the movable part 11 and engaging in a through-hole 19 in the frustoconical element 16, causes outward expansion of the walls 113 of said box-like structure, which press against the walls of the straightedge S inserted on that region, thereby causing the locking of the straightedge S to said region of movable part 11.

[0018] This advantageously allows the interchangeability of the straightedge S, of different lengths depending on the various contingent needs of use.

[0019] It is understood, however, that according to non-illustrated embodiment variants, the detachable and interchangeable coupling between the said region of the movable part 11 and the straightedge element S may be obtained in any other suitable manner, so that their association allows, in any case, the removability and interchangeability of the straightedge S.

[0020] The screw 17 is provided through a hole 18 in the movable part 11 and whose head can be arranged to disappear within a relative seat formed in the wall 112 of the movable part 11, so as not to obstruct the sliding of the movable part 11 on the guide 101 of the fixed part 10.

[0021] For the illustrated embodiment, the cross-section of said region 101 of the fixed part 10 intended to be coupled with the movable part 11 has a T-shaped cross-section, while the seat 111 of the movable part 11 with which the region 101 is coupled has an essentially U-shaped cross-section, with the ends facing inwards, with two sliding sections that engage within two corresponding lateral grooves 102 formed in the intermediate part of said T, so as to form, together, a sliding guide for the movable part 11.

[0022] The section of the movable part 11 which is projecting with respect to the fixed part 10 towards the working plane and with respect to the reference surface M, for example, marble edging for the illustrated embodiment example, which defines and establishes the leveling height L, corresponds to the thickness of an article to be laid on the leveled application layer, this article consisting of tiles, slabs, or the like, or any other article to be laid, for example self-locking, on the leveled application layer.

[0023] The tool can be used to level application layers of the article to be laid, which can consist of any suitable material for application of the article to be laid and suitable for this object, such as concrete, mortar, sand, substrate or other suitable material, for example adhesive or the like.

[0024] The tool can be used to level a concrete layer, for example so-called screed, especially balconies, or floorings in general, in this case, the fixed part 10 refers,

for example, to the marble perimeter edging M, of the balcony.

[0025] According to an advantageous characteristic of the invention, the tool can also be used to produce plasterwork for walls in general, by moving the fixed part 10 to rest against a suitable reference surface, for example, counterframes in the case of plasterwork at the side stiles of window frames, or other suitable reference surfaces in the case of plasterwork on other walls, thus allowing the required leveling of the plaster layer.

[0026] It is therefore understood that the present invention can be varied and modified, in its entirety and in its details, depending on the specific requirements and manufacturing and application needs, especially constructively and within the technical and functional equivalents, without abandoning the innovative concept described above and according to the following claims.

Claims

1. A tool for leveling a concrete layer or the like in construction work, comprising:

- a fixed part (10) intended to be placed against a reference surface (M) with respect to which the required leveling is established;
- a movable part (11), able to move with respect to the fixed part (10) from a rest position up to a position of maximum stroke, and configured to adjust and define a required leveling height (L), the movable part (11) being configured to be associated with a straightedge (S) for leveling concrete layers or the like;
- locking means (12, 13) for locking the movable part (11) to the fixed part (10) in the position that defines the required leveling height (L),

wherein the movable part (11), on the side opposite to that which slides on the fixed part (10), has a coupling region intended to be coupled in a detachable and interchangeable manner with the straightedge (S), with the cross-section of said coupling region complementary to that of the straightedge (S),

characterized in that said coupling region comprises a box-like structure with independent and elastically-deformable walls (113) that are free to expand outwardly due to the movement of a frustoconical wedge-shaped element (16), which penetrates within said box-like structure, wherein said walls (113) are provided with radial fins (114) complementary to the frustoconical element (16), so that the movement of said frustoconical element (16) determined by a screw (17) inserted from the outside through the inner wall (112) of the sliding seat (111) of the movable part (11) and engaging in a hole (19) within the frustoconical element (16), causes the outward expansion of the walls (113) of said box-like structure,

which press against the walls of the straightedge (S), thus causing the locking of the straightedge (S) to said coupling region.

2. A tool according to claim 1, **characterized in that** the fixed part (10) has a region (101), longitudinally, which is coupled, in a complementary and movable manner, within a corresponding sliding seat (111) of the movable part (11), so that said region (101) of the fixed part (10) constitutes a guide for the translatory motion of said movable part (11) with respect to the fixed part (10). 5
3. A tool according to one or more of the preceding claims, **characterized in that** said locking means (12, 13) comprise at least one screw (12, 13), which can be inserted from the outside into a respective transverse through-hole (14, 15) of the fixed part (10), so that the tip presses against an internal wall (112) of the sliding seat (111) of the movable part (11), thus resulting in the locking. 10
4. A tool according to one or more of the preceding claims, **characterized in that** the movable part (11) can assume a rest position wherein at least one of its sides parallel to the reference surface (M) is aligned with an adjacent side of the fixed part (10), and an operative position wherein the movable part (11) is projecting with respect to the fixed part (10), towards the working plane and with respect to the reference surface (M), by a length (L) defining the required leveling height (L). 15
5. A tool according to one or more of the preceding claims, **characterized in that** the straightedge (S) is provided as a single piece with the movable part (11), or said straightedge (S) is provided with a detachable and interchangeable coupling with respect to the movable part (11). 20
6. A tool according to claim 1, **characterized in that** said screw (17) extends into a through-hole (18) formed in the movable part (11) and whose head is housed within a relative seat formed in the wall (112) of the movable part (11), in order not to hinder the sliding of the movable part (11) on said region (101) of the fixed part (10). 25
7. A tool according to claim 2, wherein the cross-section of said region (101) of the fixed part (10) intended to be coupled with the movable part (11) has a T-shaped cross-section, while the seat (111) of the movable part (11) with which the region (101) is coupled has an essentially U-shaped cross-section, with the ends facing inwards, with two sliding sections that engage within two corresponding lateral grooves (102) formed in the intermediate part of said T, so as to form a sliding guide for the movable part 30

(11).

8. A tool according to claim 4, wherein the section of the movable part (11) projecting with respect to the fixed part (10) towards the working plane and with respect to the reference surface (M) that defines the leveling height (L), corresponds to the thickness of an article to be laid on the levelled application layer. 35

Patentansprüche

1. Werkzeug zum Ebnet einer Betonschicht oder dergleichen im Bau, umfassend: 40
 - einen feststehenden Teil (10), der dafür vorgesehen ist, an eine Bezugsfläche (M) angelegt zu werden, bezüglich welcher die erforderliche Ebnung hergestellt wird,
 - einen beweglichen Teil (11), der in der Lage ist, sich in Bezug auf den feststehenden Teil (10) aus einer Grundstellung bis in eine Stellung mit maximalem Hubweg zu bewegen, und der dafür ausgelegt ist, eine erforderliche Ebnungshöhe (L) einzustellen und zu definieren, wobei der bewegliche Teil (11) dafür ausgelegt ist, mit einem Richtscheit (S) verbunden zu werden, um Betonschichten oder dergleichen zu ebnet,
 - Verriegelungsmittel (12, 13) zum Verriegeln des beweglichen Teils (11) an dem feststehenden Teil (10) in der Position, welche die erforderliche Ebnungshöhe (L) definiert,
 - wobei der bewegliche Teil (11) auf der Seite, die der an dem feststehenden Teil (10) gleitenden Seite gegenüberliegt, einen Kopplungsbereich aufweist, der dafür vorgesehen ist, lösbar und auswechselbar mit dem Richtscheit (S) gekoppelt zu werden, wobei der Querschnitt des Kopplungsbereichs zu dem des Richtscheits (S) komplementär ist, 45

dadurch gekennzeichnet, dass der Kopplungsbereich eine kastenartige Struktur mit unabhängigen und elastisch verformbaren Wänden (113) umfasst, die sich aufgrund der Bewegung eines keilförmigen Kegelstumpfelements (16), welches in die kastenartige Struktur eindringt, nach außen aufweiten können, wobei die Wände (113) mit zu dem Kegelstumpfelement (16) komplementären radialen Rippen (114) versehen sind, so dass die Bewegung des Kegelstumpfelements (16), bestimmt durch eine Schraube (17), die von außen durch die Innenwand (112) der Gleitaufnahme (111) des beweglichen Teils (11) eingeführt ist und in eine Öffnung (19) innerhalb des Kegelstumpfelements (16) eingreift, die nach außen gerichtete Aufweitung der Wände (113) der kastenartigen Struktur bewirkt, welche gegen die Wände des Richtscheits (S) drücken und dadurch 50

die Verriegelung des Richtscheits (S) an dem Kopplungsbereich bewirken.

2. Werkzeug nach Anspruch 1, **dadurch gekennzeichnet, dass** der feststehende Teil (10) in Längsrichtung einen Bereich (101) aufweist, der komplementär und beweglich innerhalb einer entsprechenden Gleitaufnahme (111) des beweglichen Teils (11) gekoppelt ist, so dass der Bereich (101) des feststehenden Teils (10) eine Führung für die translatorische Bewegung des beweglichen Teils (11) in Bezug auf den feststehenden Teil (10) darstellt. 5
3. Werkzeug nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Verriegelungsmittel (12, 13) mindestens eine Schraube (12, 13) umfassen, die von außen in eine jeweilige quergerichtete Durchgangsöffnung (14, 15) des feststehenden Teils (10) eingeführt werden kann, so dass die Spitze gegen eine Innenwand (112) der Gleitaufnahme (111) des beweglichen Teils (11) drückt, was die Verriegelung zur Folge hat. 10
4. Werkzeug nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der bewegliche Teil (11) eine Grundstellung, in der mindestens eine seiner parallel zu der Bezugsfläche (M) verlaufenden Seiten mit einer angrenzenden Seite des feststehenden Teils (10) ausgerichtet ist, und eine Arbeitsstellung einnehmen kann, in welcher der bewegliche Teil (11), zur Arbeitsebene hin und in Bezug auf die Bezugsfläche (M), in Bezug auf den feststehenden Teil (10) um eine Länge (L) übersteht, welche die Ebnungshöhe (L) definiert. 15
5. Werkzeug nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Richtscheit (S) mit dem beweglichen Teil (11) einstückig bereitgestellt ist oder das Richtscheit (S) in Bezug auf den beweglichen Teil (11) mit einer lösbaren und auswechselbaren Kopplung versehen ist. 20
6. Werkzeug nach Anspruch 1, **dadurch gekennzeichnet, dass** sich die Schraube (17) in eine in dem beweglichen Teil (11) gebildete Durchgangsöffnung (18) erstreckt und deren Kopf in einer entsprechenden, in der Wand (112) des beweglichen Teils (11) gebildeten Aufnahme untergebracht ist, um das Gleiten des beweglichen Teils (11) an dem Bereich (101) des feststehenden Teils (10) nicht zu behindern. 25
7. Werkzeug nach Anspruch 2, wobei der Querschnitt des zur Kopplung mit dem beweglichen Teil (11) vorgesehenen Bereichs (101) des feststehenden Teils (10) einen T-förmigen Querschnitt aufweist, während die Aufnahme (111) des beweglichen Teils (11), 30

mit welcher der Bereich (101) gekoppelt ist, einen im Wesentlichen U-förmigen Querschnitt mit nach innen weisenden Enden aufweist, wobei zwei Gleitabschnitte in entsprechende seitliche Nuten (102) eingreifen, die im Mittelteil des T gebildet sind, um eine Gleitführung für den beweglichen Teil (11) zu bilden.

8. Werkzeug nach Anspruch 4, wobei der Abschnitt des in Bezug auf den feststehenden Teil (10) zur Arbeitsebene hin und in Bezug auf die Bezugsfläche (M) überstehenden beweglichen Teils (11), der die Ebnungshöhe (L) definiert, der Dicke eines Gegenstands entspricht, der auf der geebneten Auftragsschicht ausgelegt werden soll. 35

Revendications

1. Outil pour niveler une couche de béton ou autre analogue dans les travaux de construction, comprenant :

- une partie fixe (10) destinée à être placée contre une surface de référence (M) par rapport à laquelle le nivellement requis est établi ;
- une partie mobile (11), pouvant se déplacer par rapport à la partie fixe (10) à partir d'une position de repos jusqu'à une position de course maximale, et configurée pour ajuster et définir une hauteur de nivellement requise (L), la partie mobile (11) étant configurée pour être associée à une règle d'arase (S) pour niveler des couches de béton ou autre analogue ;
- des moyens de verrouillage (12, 13) pour verrouiller la partie mobile (11) sur la partie fixe (10) dans la position qui définit la hauteur de nivellement requise (L), 40

dans lequel la partie mobile (11), du côté opposé à celui qui glisse sur la partie fixe (10), a une région d'accouplement destinée à être couplée de manière détachable et interchangeable à la règle d'arase (S), avec la section transversale de ladite région d'accouplement complémentaire à celle de la règle d'arase (S),

caractérisé en ce que ladite région d'accouplement comprend une structure en forme de boîte avec des parois indépendantes et élastiquement déformables (113) qui sont libres de s'étendre vers l'extérieur en raison du mouvement d'un élément en forme de coin tronconique (16), qui pénètre à l'intérieur de ladite structure en forme de boîte, où lesdites parois (113) sont pourvues d'ailettes radiales (114) complémentaires à l'élément tronconique (16), de sorte que le mouvement dudit élément tronconique (16) déterminé par une vis (17) insérée de l'extérieur à travers la paroi interne (112) du siège coulissant (111) de la

partie mobile (11) et s'engageant dans un trou (19) à l'intérieur de l'élément tronconique (16), provoque l'extension vers l'extérieur des parois (113) de ladite structure en forme de boîte, qui appuie contre les parois de la règle d'arase (S), provoquant ainsi le verrouillage de la règle d'arase (S) sur ladite région d'accouplement.

2. Outil selon la revendication 1, **caractérisé en ce que** la partie fixe (10) a une région (101), qui est couplée, longitudinalement, de manière complémentaire et mobile, à l'intérieur d'un siège coulissant (111) correspondant de la partie mobile (11), de sorte que ladite région (101) de la partie fixe (10) constitue un guide pour le mouvement de translation de ladite partie mobile (11) par rapport à la partie fixe (10). 5
3. Outil selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** lesdits moyens de verrouillage (12, 13) comprennent au moins une vis (12, 13), qui peut être insérée de l'extérieur dans un trou traversant transversal respectif (14, 15) de la partie fixe (10), de sorte que la pointe appuie contre une paroi interne (112) du siège coulissant (111) de la partie mobile (11), entraînant ainsi le verrouillage. 10 15 20 25
4. Outil selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** la partie mobile (11) peut prendre une position de repos dans laquelle au moins l'un de ses côtés parallèles à la surface de référence (M) est aligné avec un côté adjacent de la partie fixe (10), et une position opérationnelle dans laquelle la partie mobile (11) fait saillie par rapport à la partie fixe (10), vers le plan de travail et par rapport à la surface de référence (M), d'une longueur (L) définissant la hauteur de nivellement requise (L). 30 35
5. Outil selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** la règle d'arase (S) est formée d'un seul tenant avec la partie mobile (11), ou ladite règle d'arase (S) est munie d'un accouplement détachable et interchangeable par rapport à la partie mobile (11). 40
6. Outil selon la revendication 1, **caractérisé en ce que** ladite vis (17) s'étend dans un trou traversant (18) formé dans la partie mobile (11) et dont la tête est reçue dans un siège relatif formé dans la paroi (112) de la partie mobile (11), afin de ne pas empêcher le glissement de la partie mobile (11) sur ladite région (101) de la partie fixe (10). 45 50
7. Outil selon la revendication 2, dans lequel la section transversale de ladite région (101) de la partie fixe (10) destinée à être couplée à la partie mobile (11) a une section transversale en forme de T, tandis que le siège (111) de la partie mobile (11) à laquelle la région (101) est couplée a une section transversale 55

essentiellement en forme de U, avec les extrémités orientées vers l'intérieur, avec deux sections coulissantes qui s'engagent dans deux rainures latérales correspondantes (102) formées dans la partie intermédiaire dudit T, de manière à former un guide couissant pour la partie mobile (11).

8. Outil selon la revendication 4, dans lequel la section de la partie mobile (11) faisant saillie par rapport à la partie fixe (10) vers le plan de travail et par rapport à la surface de référence (M) qui définit la hauteur de nivellement (L), correspond à l'épaisseur d'un article à poser sur la couche d'application nivelée.

Fig. 1

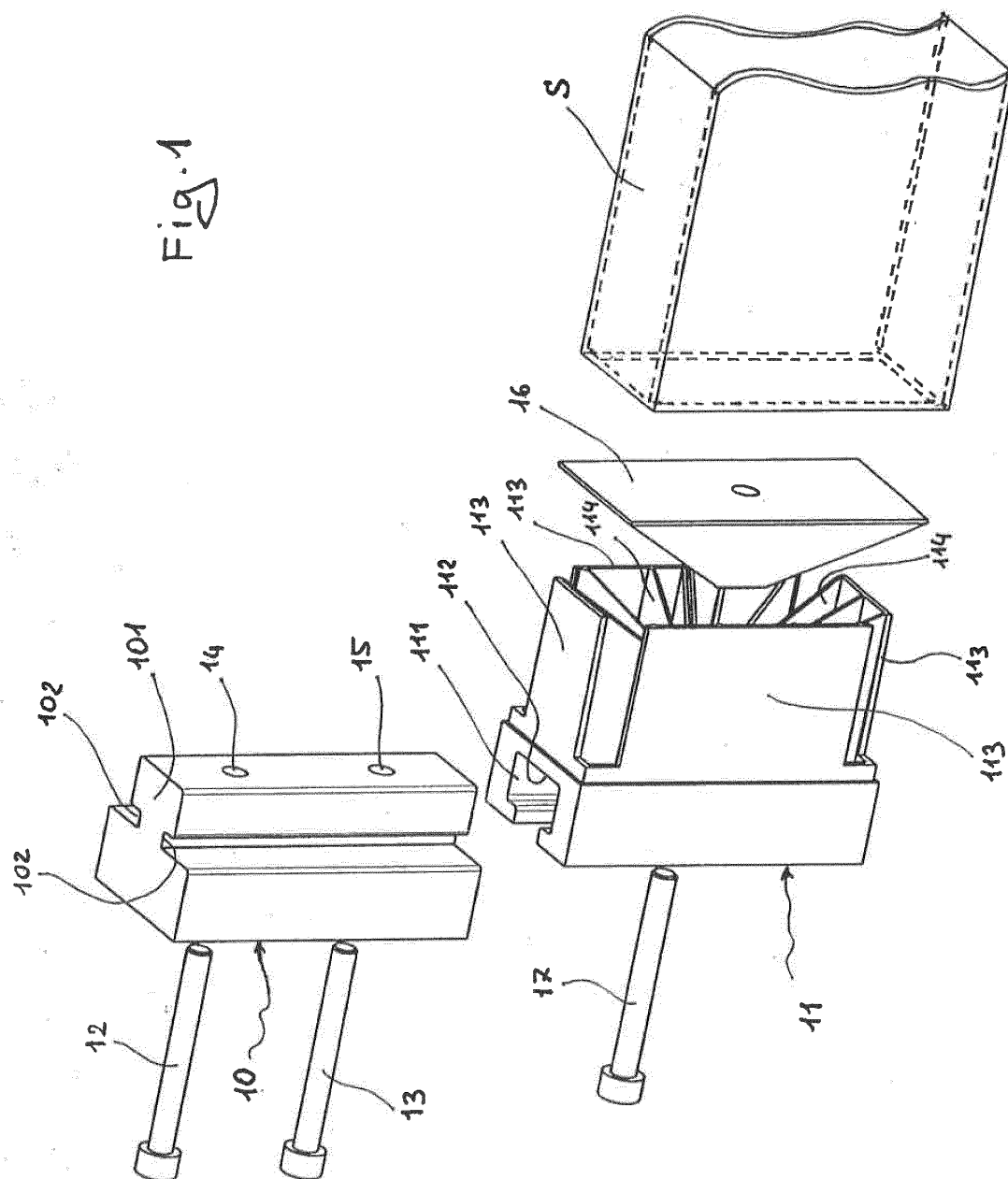


Fig. 2

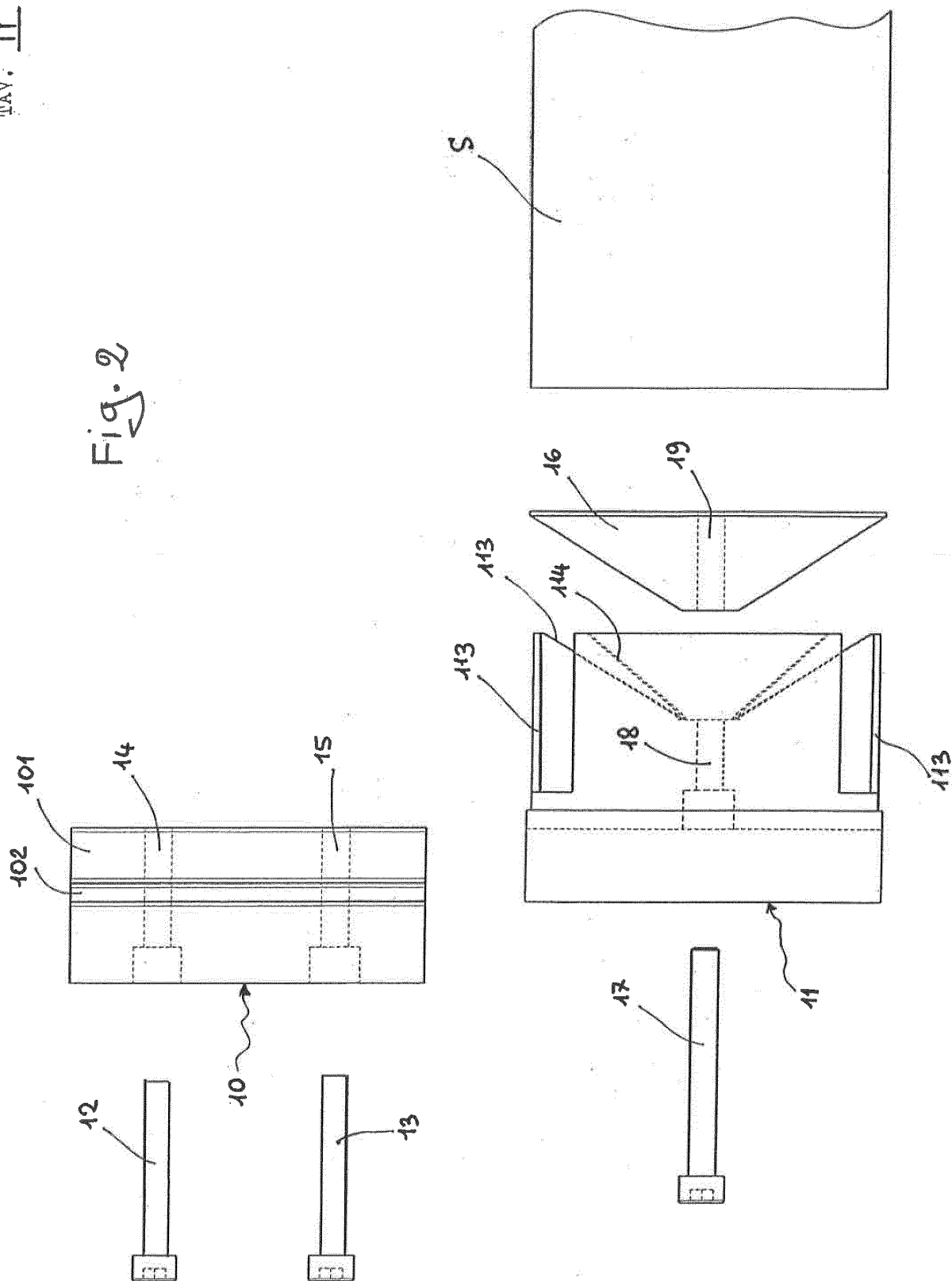
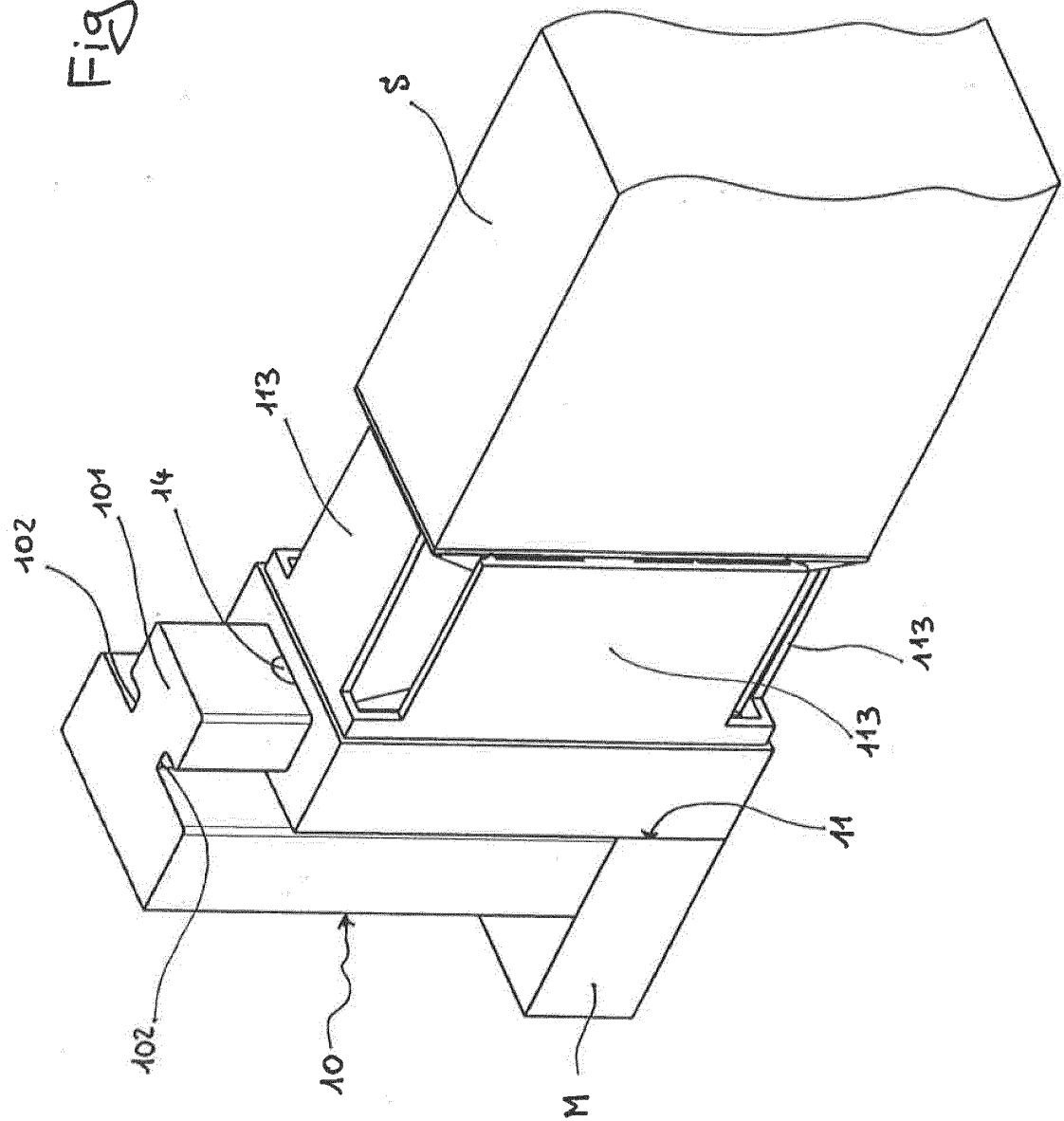
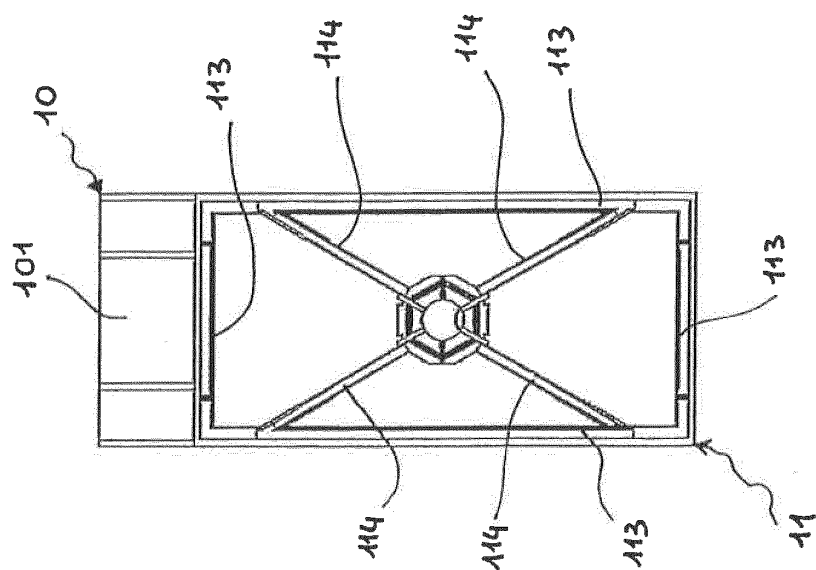


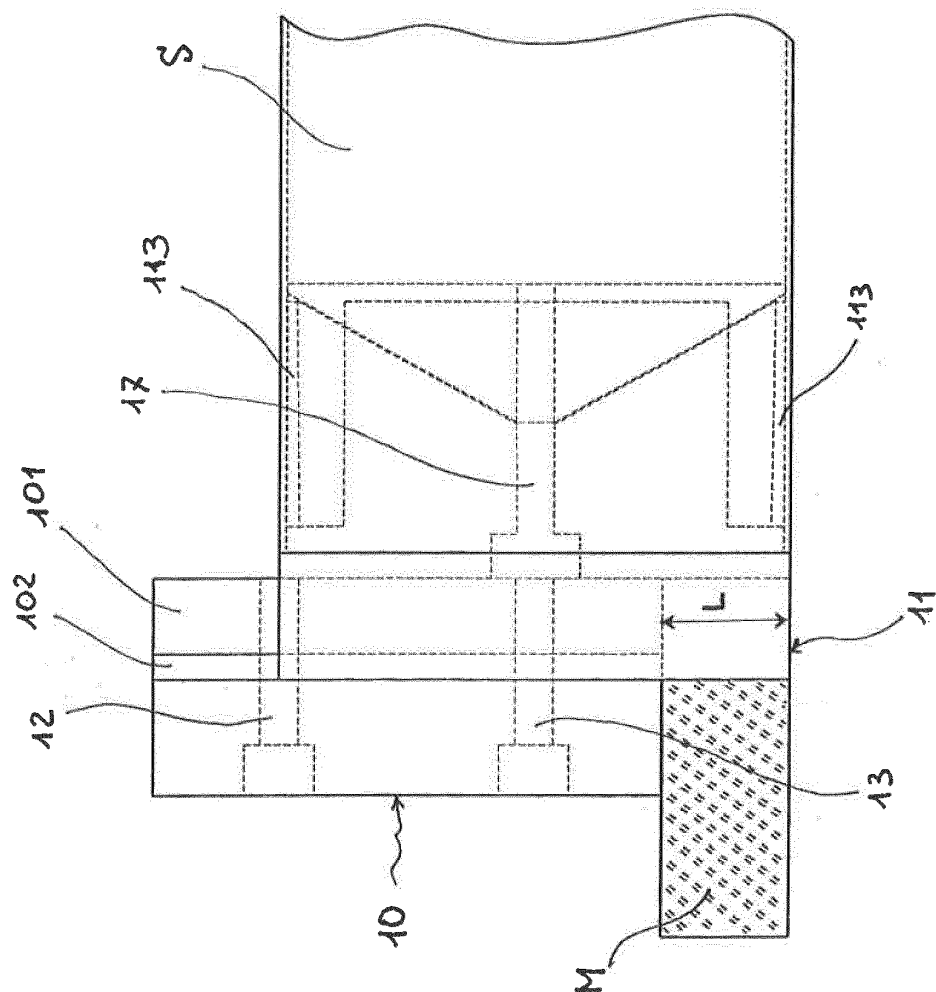
Fig. 3



4. 03
F.



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REFERENCES CITED IN THE DESCRIPTION

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