(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 722 537 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
14.10.2020 Bulletin 2020/42

(51) Int Cl.:
E04F 21/00 *(2006.01)* ***E04F 21/18*** *(2006.01)*

(21) Application number: **19472003.3**

(22) Date of filing: **21.10.2019**

(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
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **12.04.2019 BG 430519**

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(54) **SYSTEM FOR LEVELLING TILES**

(57) The utility model relates to a system for leveling tiles and finds application in construction.

The tiles levelling system comprises a retainer (1) and a tensioning key (2). The retainer (1) contains a base (3) and a locking plate (4) vertically mounted on the base (3). At the point of connection of the base (3) and the locking plate (4) a weak tearing zone (5) is formed to allow separation of the base (3) from the locking plate (4). In the lower part of the locking plate (4) are formed stabilizing arms (14), on which are longitudinally positioned ribs (15). On both sides in the upper part of the locking plate (4) is installed a guide (6) of cylindrical shape to place the tensioning key (2). The tensioning key (2) has a head (8) consisting of two identical arches (17) placed at a distance from each other and connected to a common handle (7). The inner diameter (d) of each arch (17) corresponds to the outer diameter of the guide (6) and on the outer surface (11) of each arch (17) are formed transverse ribs (13) that allow the tensioning key (2) to engage the tiles (16). On the outer surfaces (11) of the arches (17) are provided protruding sections (12). The thickness (C) of the locking plate (4) corresponds to the distance between the two arches (17) and is functionally dependent on the width of the joint between the tiles. The distance (F) between the center of the hole (10) on the guide (6) and the base (3) is functionally dependent on the thickness of the tiles. In an alternate embodiment, in the uppermost part of the locking plate (4) is formed a transition section (18) and on the circumference of the locking plate (4), on both sides of its vertical axis are formed teeth (19) inclined down to the base (3). The base (3) and the locking plate (4) are made of plastic material.

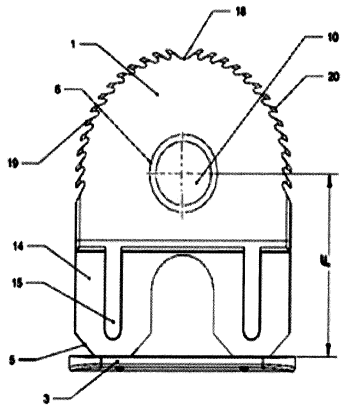

Fig.6

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Description

Technical field

[0001] The utility model relates to a system for leveling tiles and finds application in construction.

Prior art

[0002] Known from WO/2018/136171 is an assembly and method for aligning and leveling tiles. That assembly includes a retainer and a tensioning key. The retainer consists of a base and a locking plate vertically connected to that base. At the point of connection between the base and the retainer plate there is a weakened section designed to tear-off and detach the plate from the base. On both sides of the locking plate is installed a guide, which is solid and has a cylindrical shape for inserting the tensioning key. The tensioning key has a head consisting of two identical arches located at a distance from each other forming a groove in which the retainer is place, and the two arches are connected to a single handle. The inner diameter of each arch corresponds to the outer diameter of the guide (6). On the outer surface of each arch, bevels are shaped to engage the tensioning key to the tiles.

[0003] The known system is too complex and impractical in real-world conditions and requires the installer to have special qualification. The outer surface of the arches is difficult to manufacture. If adhesive mixture enters between the base of the retainer and the lower part of the tile, there is a risk of premature rupture of the locking plate, as there will be no elastic buffer to offset these altered differences in surface heights.

Summary of the utility model

[0004] The mission of the utility model is to create a tile leveling system that has a simplified construction, is lightweight and reliable in operation.

[0005] The mission is fulfilled by a tile leveling system that includes a retainer and a tension key. The retainer comprises a base and a locking plate mounted vertically to the base, and a weakened tear zone is formed at the place of connection of the base with the locking plate. A guide is mounted on both sides at the top of the locking plate, having a cylindrical shape for inserting the tensioning key. The tensioning key has a head made up of two identical arches spaced apart from each other, wherein a groove is formed in which the latch is placed, the two arches being connected to a common handle. The inner diameter (d) of each arch corresponds to the outer diameter of the guide.

[0006] According to the utility model, stabilizing arms are formed at the bottom of the locking plate, on which ribs are longitudinally positioned. Transverse ribs are formed on the outer surfaces of the arches.

[0007] On the outer surfaces of the arches there are sections protruding outwards. An opening is formed in the guide. The thickness of the retainer plate corresponds to the distance between the two arches and is functionally dependent on the width of the joint between tiles. The distance from the center of the guide opening to the base is functionally dependent on the thickness of the tiles.

[0008] In another embodiment, a transition section is formed in the uppermost part of the locking plate wherein around the circumference of the retainer plate, on both sides of its vertical axes teeth are formed with inclination downwards to the base.

[0009] The base and the locking plate of the retainer are made of plastic material.

[0010] The utility model system has a simple and lightweight design. When working with it, smooth and precise pressure is exercised thanks to the longitudinal locking ribs of the locking plate, which engage the tiles. The teeth formed on both sides of the vertical axis allow the key to be inserted on one or the other side of the retainer, which is for the convenience of the worker. The teeth are tilted down to the base and serve to provide a stepped and gradual tension of the key when rotated around the guide by the worker, while preventing the key from turning in the opposite direction and preventing it from slipping.

[0011] The guide of the locking plate allows for plasticity and deformation after the tensioning key is mounted on it. The driver prevents premature rupture in the weakened area and separation of the base and the fixing plate during installation. In addition, under heavy tension (when the tiles are pressed stronger against each other) the base is sufficiently elastic, so that the adhesive that is below the tiles and is stuck in the joints is automatically pushed to the inside of the tile without filling the joint with adhesive. The material of which the base is made allows it to deform and adhere tightly to two adjacent tiles, which have a thickness difference of 0.5 to 1 mm. Thanks to the ribs formed on the outer surface of the head of the tensioning key, a gradual and smooth tension is achieved, without any risk of tearing and detachment of the base and the fixing plate before the tiles are leveled.

Description of the drawings

[0012] The utility model is explained in the drawings where:

Figure 1 is a general view of the tile leveling system

Figure 2 is a general view of the tensioning key

Figure 3 is a front view of the retainer

Figure 4 is a side view of the retainer

Figure 5 is a general view of the system, with the retainer with teeth

Figure 6 is a front view of the retainer with teeth

Examples of embodiments of the utility model

[0013] As can be seen on the enclosed drawings, the tiles leveling system comprises a retainer 1 and a tensioning key 2. The retainer 1 comprises a base 3 and a vertically mounted to the base 3 locking plate 4. At the point of connection of the locking plate 4 to the base 3, the locking plate 4 is of reduced thickness D wherein a weak tearing zone 5 is formed to allow for easy separation of the base 3 from the locking plate 4. In the lower part of the locking plate 4 are formed stabilizing arms on which are longitudinally positioned the ribs 15. On both sides in the upper part of the locking plate 4 is mounted a guide 6 of cylindrical shape for putting to the tensioning key 2. A through hole 10 is made in the guide 6. The tensioning key 2 has a head 8, consisting of two identical arches 17 placed at a distance from each other, wherein groove 21 is formed to hold the retainer 1, whereas the two arches 17 are connected to a common handle 7. The inner diameter (d) of each arch 17 corresponds to the outer diameter of the guide 6 and transverse ribs 13 are formed on each arch 17 to engage the tensioning key 2 to the tiles. On the outer surfaces 11 of the arches 17 are provided protruding sections 12. The thickness C of the locking plate 4 corresponds to the distance between the two arches 17 and is functionally dependent on the width of the joint between the tiles.

[0014] In another embodiment (fig. 5 and fig. 6), along the circumference of the locking plate 4 there are teeth 19 formed on both sides of its vertical axis, separated by a transitional section 18 formed at the top of the locking plate 4. The teeth 19 are inclined downward to the base 3 and allow for inserting the key 2 on one or the other side of the retainer 1, which is for the convenience of the worker. The teeth 19 serve to exert a stepped and gradual tension on the key 2 as it is rotated about the guide 6 by the worker, while preventing the key 2 from rotating in the opposite direction and preventing it from sliding.

[0015] The distance F from the center of the hole 10 of the guide 6 to the base 3 is functionally dependent on the thickness of the tiles, whereby four variants are possible:

- for tiles with thickness between 3 mm and 7 mm
- for tiles with thickness between 8 mm and 12 mm
- for tiles with thickness between 13 mm and 17 mm
- for tiles with thickness between 18 mm and 22 mm

[0016] The base and locking plate are made of plastic material.

Application of the utility model

[0017] When using the tiles leveling system, adhesive mixture is first applied on the surface where the tiles will be laid. The first tile is placed and a level is used to check that it is horizontal. Between the adhesive mixture and the bottom of the tile 16 is inserted the base 3 with the locking plate 4 perpendicular to the surface of the tiles, and the width of the joint is (between 1 and 4 mm) determined. After that, on the other side of the locking plate 4 is placed a second tile 16 (see fig. 1 and fig. 5) and then the tensioning key 2 is placed on the guide 6. Using the handle 7 and the tensioning key 2, pressure is exercised in the direction of the tile 16 until the two adjacent tiles 16 are levelled against each other. For the worker's convenience, the teeth 19 on both sides of the vertical axis allow the key 2 to be place on one or the other side of the retainer 4 (fig. 5 and fig. 6), whereas the teeth 19 inclined down to the base 3 ensure stepped and gradual tensioning of the key 2 while the worker turns it around the guide 6 and in the same prevent the key 6 from returning in the opposite direction and from sliding. A significant role in exercising such pressure is played by the transverse ribs 13 of the tensioning key 2, which in contact with the tile 16 achieves a double effect: precision tensioning and preventing the switch 2 from returning to its original position. This action prevents the subsequent displacement of the tiles 16 relative to each other, both horizontally in the joint direction and vertically in the direction of the levels. This is repeated with all subsequent tiles 16 laid. The configuration thus created between the key 2 and the locking plate 4 remains stationary for 7 to 24 hours, the time required for the initial adhesive mixture to harden. After the adhesive has hardened, the locking plate 4, together with the key 2, is removed by means of a rubber hammer, leaving only the base 3, which is detached from the locking plate 4, in the tear zone 5, under the tiles 16.

Claims

1. Tiles levelling system comprising a retainer (1) and a tensioning key (2), wherein the retainer (1) contains a base (insert) (3) and a locking plate (4) vertically mounted on the base (3), whereas at the point of connection of the base (3) and the locking plate (4) a weak tearing zone (5) is formed and on both sides in the upper part of the locking plate (4) is installed a guide (6) of cylindrical shape to place the tensioning key (2), whereas the tensioning key (2) has a head (8) consisting of two identical arches (17), and between the two arches (17) a groove (21) is formed to hold the retainer (1) and they are connected to a common handle (7), wherein the inner diameter (d) of each arch (17) corresponds to the outer diameter of the guide (6) and the outer surface (11) of each arch (17) allows the tensioning key (2) to engage the tiles, **characterized by that** in the lower part of the locking plate (4) are formed stabilizing arms (14) on which are longitudinally positioned ribs (15), wherein on the outer surfaces (11) of the arches (17) are

formed transverse ribs (13), and on the outer surfaces (11) of the arches (17) are provided protruding sections (12), on the guide (6) is made a through hole (10), and the thickness (C) of the locking plate (4) corresponds to the distance between the two arches (17) and is functionally dependent on the width of the joint between the tiles, whereas the distance F between the center of the hole (10) on the guide (6) and the base (3) is functionally dependent on the thickness of the tiles.

2. Tiles levelling system according to claim 1, **characterized by that** in the uppermost part of the locking plate (4) is formed a transition section (18) and on the circumference of the locking plate (4) on both sides of its vertical axis are formed teeth (19) inclined down to the base (3).

3. Tiles levelling system according to claims 1 and 2, **characterized by that** the base (3) and the locking plate (4) are made of plastic material.

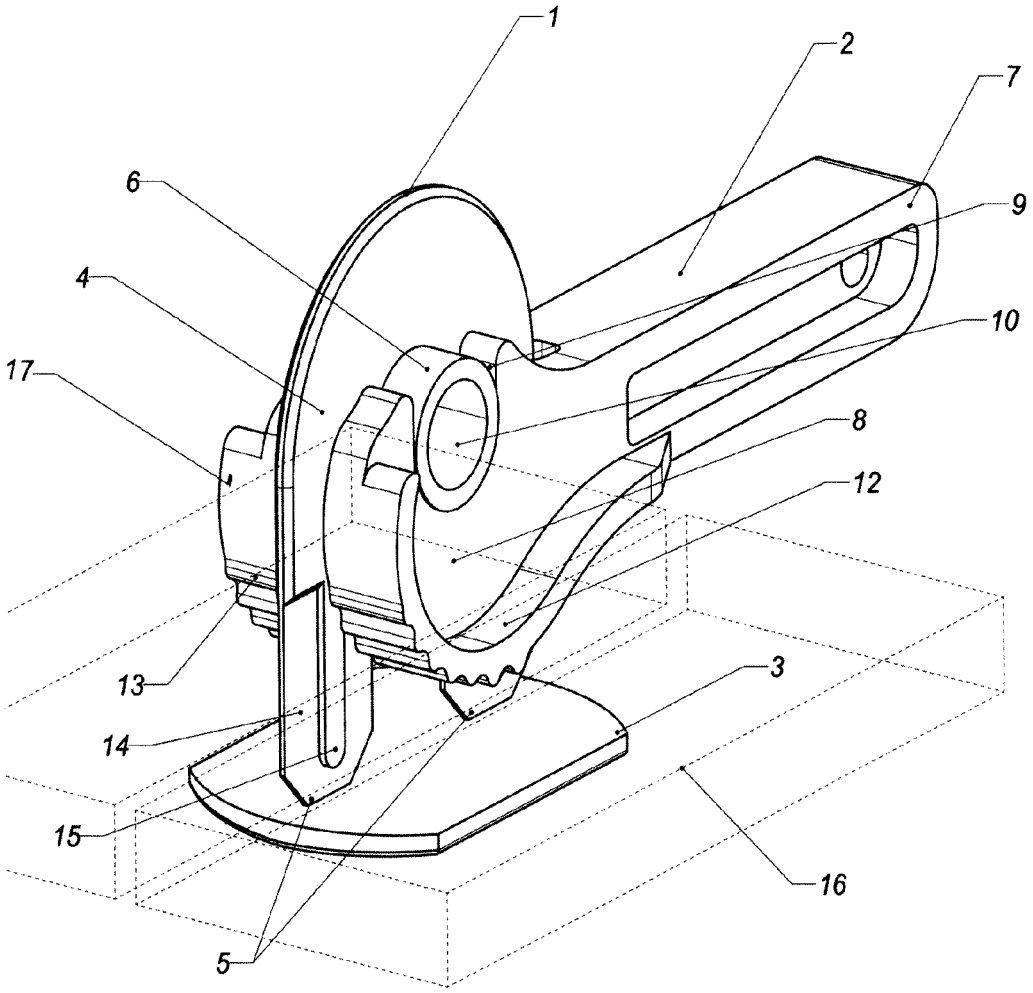

Fig.1

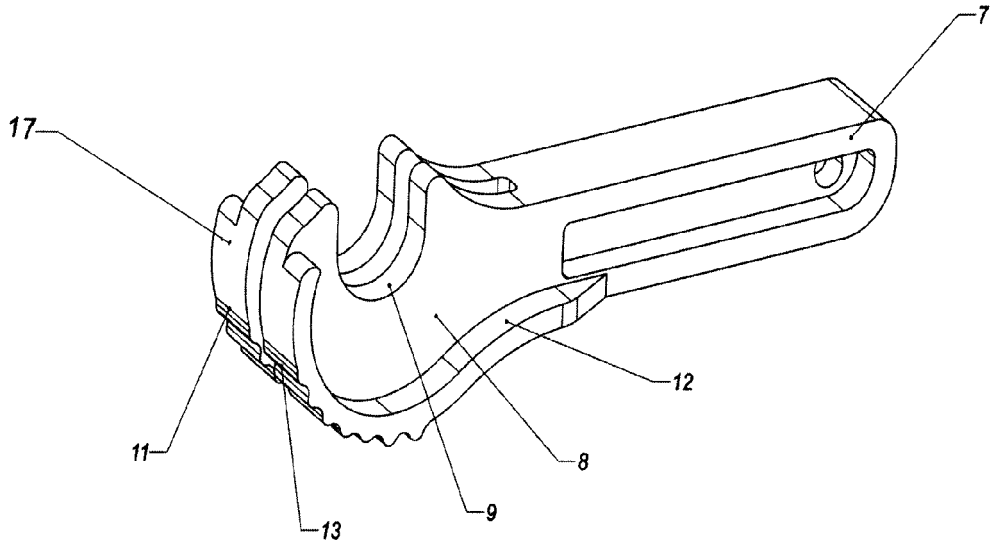

Fig.2

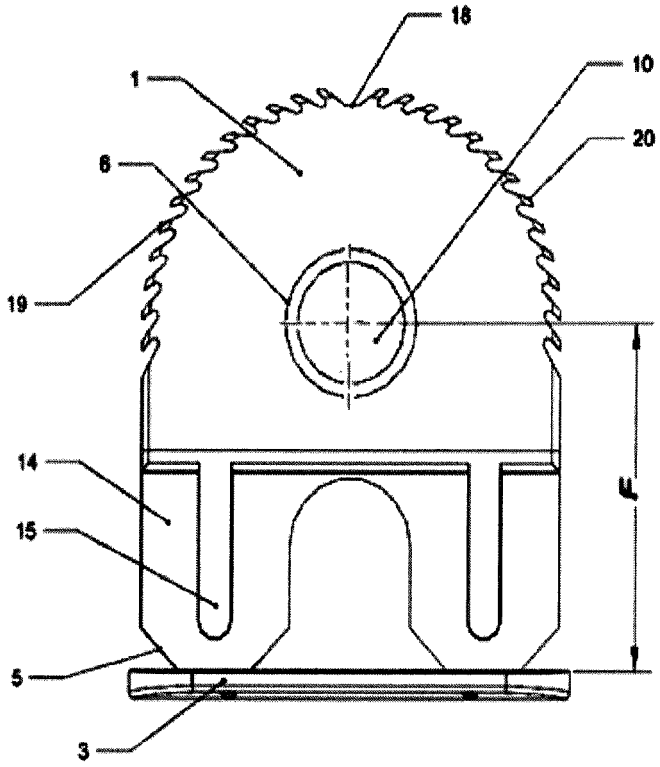

Fig.3

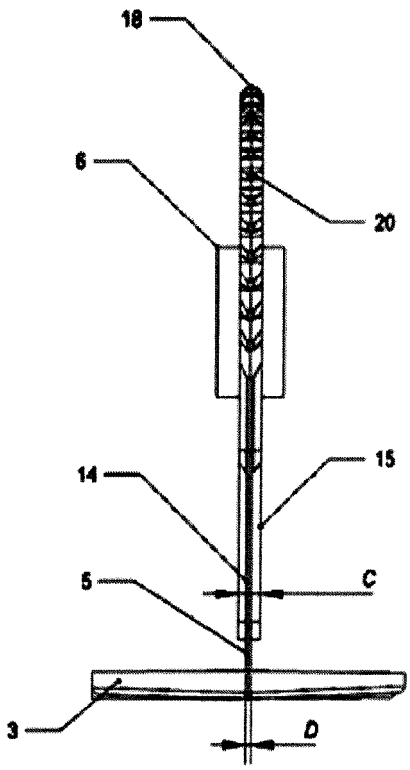

Fig.4

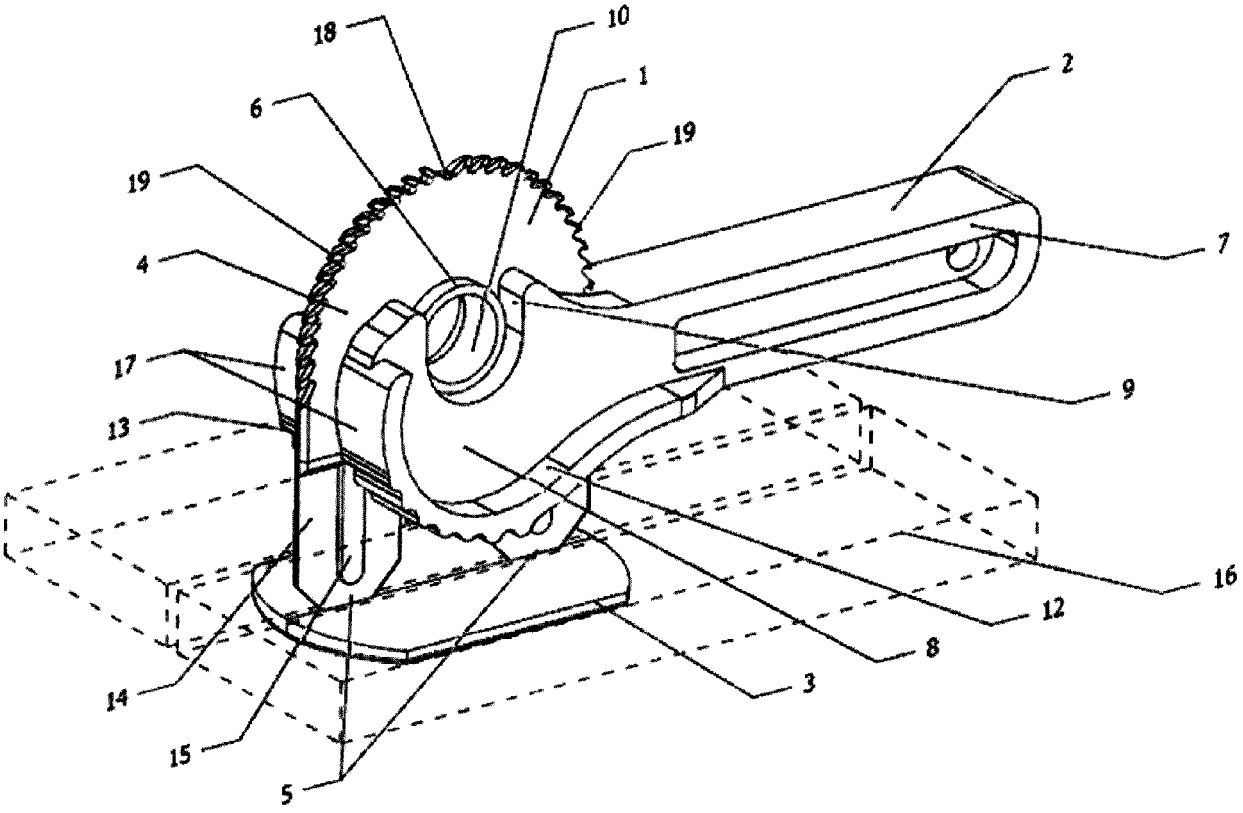

Fig. 5

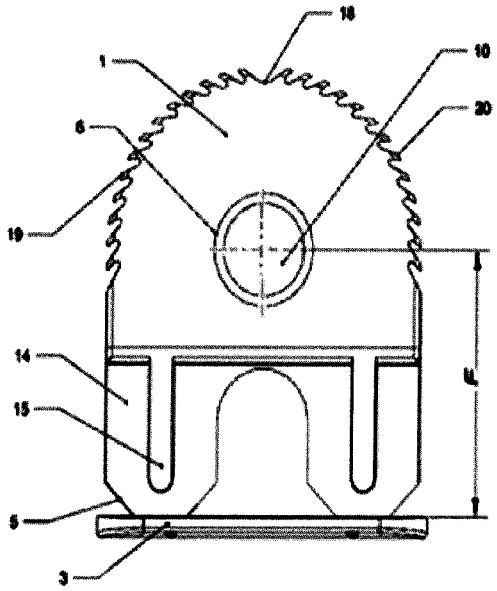

Fig.6

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EUROPEAN SEARCH REPORT

Application Number
EP 19 47 2003

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	WO 2018/136171 A1 (DAVINCI ITALIA/USA GROUP LLC [US]) 26 July 2018 (2018-07-26) * page 8, line 1 - page 9, line 3 * * page 16, line 14 - line 21 * * figures 3,4,8,13 *	1-3	INV. E04F21/00 E04F21/18
A	US 2014/325935 A1 (HOFFMAN JAMES P [US] ET AL) 6 November 2014 (2014-11-06) * figures 1-8 *	1-3	
A	US 2015/184355 A1 (WANG PING-KUN [TW]) 2 July 2015 (2015-07-02) * figures 1-9 *	1-3	
A	JP 2013 204318 A (KAWASHIMA SELKON TEXTILES CO; STONE OFFICE MORISHITA KK [JP]) 7 October 2013 (2013-10-07) * figures 1-3 *	1-3	

TECHNICAL FIELDS SEARCHED (IPC)

E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 May 2020	Arsac England, Sally

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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25-05-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2018136171 A1	26-07-2018	AU 2017394859 A1	08-08-2019
		BR 112019014728 A2	10-03-2020
		CA 3050121 A1	26-07-2018
		CN 110462147 A	15-11-2019
		EP 3559372 A1	30-10-2019
		JP 2020514598 A	21-05-2020
		US 9834943 B1	05-12-2017
		US 2018202174 A1	19-07-2018
		WO 2018136171 A1	26-07-2018
US 2014325935 A1	06-11-2014	US 2014325935 A1	06-11-2014
		US 2015337546 A1	26-11-2015
		US 2017009464 A1	12-01-2017
US 2015184355 A1	02-07-2015	NONE	
JP 2013204318 A	07-10-2013	JP 5546051 B2	09-07-2014
		JP 2013204318 A	07-10-2013

EPO FORM P0459

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Patent documents cited in the description

- WO 2018136171 A **[0002]**