



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.03.2017 Bulletin 2017/13

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

(21) Application number: **16190030.3**

(22) Date of filing: **22.09.2016**

(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:
MA MD

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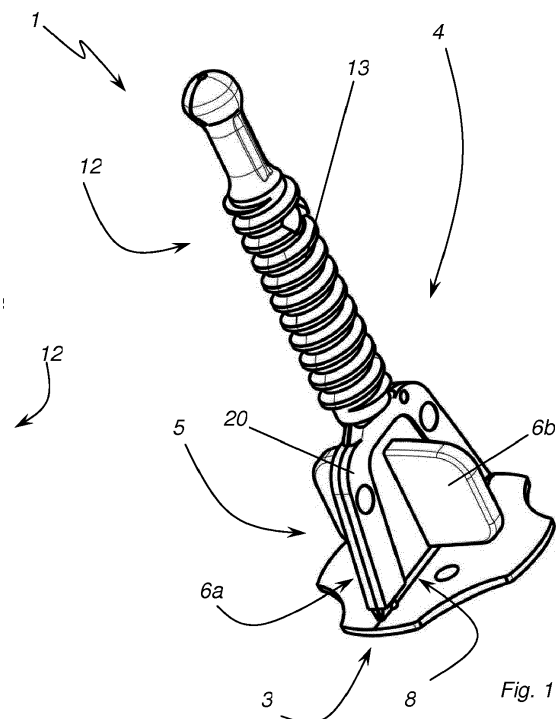
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(30) Priority: **25.09.2015 IT UB20153890**

(54) **A DEVICE FOR THE LAYING OF TILES OR THE LIKE**

(57) A device for the laying of tiles or the like comprising: a tie-rod (1; 101) having a support base (3) for adjacent tiles and a projecting element (4) from said base (3) and susceptible to project from the level of the tiles through the escape hatch, between the base (3) and the projecting element (4) being interposed at least one breakage portion (8) to promote the total separation of the projecting element (4) from the base (3); a pressure element (10) removably coupled to the tie-rod (1; 101) on adjacent tiles so as to keep them coplanar. The projecting element (4) comprises a first portion (5; 105) susceptible to be arranged into the escape hatch between adjacent tiles and having a portion with increased thickness (20) to constitute a spacer for such tiles, the first portion (5; 105) comprising a first plate (6a; 106a) whereon a portion with increased thickness (20) is formed, and a second plate (6b; 106b) incident on the first plate (6a; 106a) and whereon a portion with increased thickness is formed.



Description

Field of the invention

[0001] The present invention is applicable to the building industry and, in particular, it relates to the equipment for the laying of flooring and building works.

[0002] More in detail, the present invention relates to the equipment for the laying of tiles or the like.

Background of the invention

[0003] In the building industry a relevant aspect is the finishing of the spaces, whether internal or external. In fact, such details are of great importance not only from a functional point of view, but also aesthetic.

[0004] To the objects, flooring and walls are often covered with tiles and floor tiles, namely with architectural elements able to properly finish the surfaces and to give also a pleasant aesthetic appearance to the space.

[0005] Typically, for the laying of tiles, one proceeds by providing a layer of adhesive material whereon they are placed. Typically, they are levelled with craft by stressing them with a hammer on various parts of the surface thereof.

[0006] It is evident that this way of proceeding is not only operationally expensive in terms of time spent, but it also requires great skill and, anyway, it rarely ensures optimal results. Generally, in fact, the tiles laid in this way are not perfectly coplanar not only because of the laying technique, but also because the solidification of the adhesive material may induce small movements that make it lose the arrangement.

[0007] Therefore, specific levelling devices are known that help the layer in his work. In particular, such devices comprise a tie-rod and a thrust element that is coupled to the tie-rod. Typically, the tie-rod consists of a base that is placed on the glue and whereon the edges of adjacent tiles are placed, and of a projecting element that projects from the level of the tiles by the escape hatch. Such a projecting element is associated with the thrust element that presses the edge of the tiles toward the base. The use of a high number of such devices with their correct adjustment allows to act in pressure on more points of each of the laid tiles thus ensuring a perfect coplanarity thereof even after the solidification of the glue.

[0008] Subsequently, it is sufficient to remove the thrust element and to remove, as soon as possible, the projecting element. Since in the escape hatch between the tiles is inserted the plaster that has a function not only of closing, but also of elastic element for movements of the tiles due, for example, to thermal expansion thereof, it is evident the importance of the removal of all the projecting element to prevent that it interferes with the expansion of the covering. Moreover, the plastic material of which the tie rods are made does not allow compression of the escape hatch thus compromising the necessary expansion of the floor better ensured by the plaster

alone. The protruding element presence interferes with the plaster, that tends in that contact point to break away due to the inadequate quantity and the incompatibility of adhesion between the materials.

[0009] In this sense, tie-rods are known having a reduced thickness on the end of the projecting element that is connected to the base so as to achieve a break point that allows the removal of all the projecting element.

[0010] However, as previously mentioned the tiles after laying may also move parallel to the substructure. Since the installation has important aesthetic aspects, it is important to guarantee constant rectilinear escape hatch.

[0011] In this sense, in the prior art they are typically used plastic spacers that are interposed between the tiles to keep them aligned during the hardening of the glue. They are rectilinear shaped, T-shaped or cross shaped.

[0012] Such spacers, after the hardening of the glue, should be removed. Since, however, they are typically arranged in contact to the floor, their removal is complicated or impossible and, in any case, it require an additional costly operation in terms of time.

[0013] In the case of use of levelling devices, however, they are also known tie-rods which have protrusions emerging from the base rectilinear shaped or T-shaped or cross shaped to constitute a spacer. Some examples are observed in the patents EP 2549030 B1 and EP 2573296 B1. In these cases it is evident that the projections that realize the spacer necessarily remain embedded between the tiles.

[0014] There is, therefore, the problem of a plastic element having a thermal expansion coefficient different from that of the stucco. Moreover, it is interposed between the tiles reducing the amount of stucco.

[0015] In the cases of the tie-rods, however, this drawback has worst effects because, thanks to the functionality of the spacer, the plastic element is in contact with both tiles compromising the stability of the stucco as well as the sealing of the tile on the glue. The low elasticity of the plastic material with which is made the spacer, in fact, causes the sum of all the dilator movements of the tiles multiplying the efforts on glue that tend, in time and with strong dilator movements, to lose his grip on the tiles that can also be subjected to cracks.

[0016] Moreover, the portions of the tie-rods that also perform the function of spacers, while having a height generally less than the normal tile, poorly cooperate with the subsequent grouting so reducing the amount of stucco and favoring the detachment at that point.

[0017] Moreover, new generation very thin tiles may has higher thickness then the spacer portion of the tie-rods. This is obviously unacceptable and it is therefore a cause of inhibition of use of levellers with spacers.

Summary of the invention

[0018] Object of the present invention is to at least partially overcome the above mentioned drawbacks, by pro-

viding a levelling device which can also be used as a spacer.

[0019] Another object is that such levelling device allows the complete removal of the tie-rod portion which stay on the escape hatch between the tiles.

[0020] A further object is that the levelling device also includes a portion that acts as a spacer and that this portion is almost totally removable with the tie-rod after the drying of the glue so as to leave totally clear the escape hatch between the tiles.

[0021] In other words, an object of the invention is to provide a levelling device that is also a spacer and that, after use, leave totally clear the escape hatch between the tiles.

[0022] Such objects, and others that will appear more clearly hereinafter, are fulfilled by a device for the laying of tiles or similar in accordance with the following claims that are an integral part of this patent.

[0023] In particular, the device comprises at least one tie-rod having a support base to the edge portions of one or more adjacent tiles. The same tie-rod also has at least one element projecting from the base and which can emerge from the tile floor through the escape hatch.

[0024] Between the base and the projecting element is interposed at least one breakage portion to allow the mutual separation of these parts with predetermined stress.

[0025] According to an aspect of the invention, the device also comprises at least one pressure element removably coupled to the tie-rod for exerting a thrust towards the base on the edge portions of adjacent tiles so as to maintain them coplanar.

[0026] According to another aspect of the invention, the projecting element comprises at least one first portion susceptible to be arranged into the escape hatch between adjacent tiles and having at least one portion increased in thickness to constitute a spacer for such adjacent tiles.

[0027] Advantageously, therefore, the device performs both the function of leveller and spacer.

[0028] Still advantageously, the increased thickness portions designed to perform the function of spacer element they are made on the projecting element. In this sense, the detachment of that from the base along the breaking portion allows to totally remove from the escape hatch the tie rod, also including the spacer portions.

[0029] In this sense, it is evident the advantage to have an escape hatch totally free in which to insert the stucco which may be arranged on all the space interposed between the tiles. With this tie-rod, therefore, it is guaranteed not only the correct position of the tiles also after the drying of the glue, but it is also guaranteed a uniform elasticity of material in the escape hatch so that the stucco remains intact over time and the glue and the tiles are not excessively exposed to dilator movements.

[0030] According to a further aspect of the invention, the first portion of the tie-rod, ie the part of the tie-rod designed to be placed into the escape hatches between

adjacent tiles, has dimensions such as to guarantee its emerging from the tile floor. In other words, the tie-rod is made in such a way that the first tract emerges by the escape hatch whatever is the thickness of the tiles so facilitating the subsequent detachment because it is not compromised by the possible flooding of the glue during the laying.

[0031] This allows, advantageously, to guarantee that the glue, if flooding from the escape hatches, not submerge the first portion of the tie-rod constituting an obstacle to the subsequent detachment of it from the base.

Brief description of the drawings

[0032] Further features and advantages of the invention will become more evident by reading the detailed description of some preferred, but not exclusive, embodiments of a device for the laying of tiles according to the invention, shown as not limitative example with the help of the annexed figures, wherein:

FIG. 1 shows a tie-rod of a device according to the invention in an axonometric view;

FIG. 2 shows the tie-rod of FIG. 1 in a lateral view;

FIG. 3 shows another embodiment of a tie-rod of a device according to the invention in an axonometric view;

FIG. 4 shows the tie-rod of FIG. 3 in a lateral view;

FIG. 5 shows a detail of a device according to the invention in an axonometric view.

Detailed description of some preferred embodiments

[0033] With reference to the above mentioned figures, and particularly to FIGs. 1 and 2, it is described a device for the laying of tiles or similar.

[0034] This device comprises, as known, a tie-rod **1** having a support base **3** for the edge portions of adjacent tiles. From the base **3** emerges a projecting element **4** which is, in use, into the escape hatches between adjacent tiles so as to emerge from their level.

[0035] In this sense, according to the describing embodiment which is represented in the figures, a first portion **5** of the projecting element **4** is shaped to be placed in such escape hatches. In particular, the first portion **5** is constituted by a first thin plate **6a** and a second thin plate **6b** cross connected each other. Such a tie-rod **1** is then designed for being arranged at the intersection of four tiles.

[0036] This should not be considered limiting for different embodiments of the invention according to which, as in the example of FIGS. 3 and 4, the first portion **105** is composed of two plates **106a** and **106b** incidents each other and connected to form a T in order to make the tie rod **101** suitable to be arranged between the side of a tile and the edges of two adjacent tiles. In particular, according to different embodiments not represented in the figures, the incidence angle can be anyone, the two

plates can be connected each other anywhere (an intermediate point or an end point).

[0037] According to an aspect of the invention, between the base **3** and the projecting element **4** is interposed a breakage portion **8** to facilitate the separation of these two elements.

[0038] In the particular embodiment that is described, the breakage portion **8** comprises a decreased in section line **9** made on the bottom of the projecting element **4**. This allows to provide a weakening which, subjecting it to an appropriate stress, is "ripping" allowing to separate the two above elements.

[0039] In the figures, however, it is observed that only a first plate **6a** of the two plates **6a** and **6b** is joined to the base **3** by means of the breakage portion **8**, the second plate **6b** being detached from the base **3** and stably coupled only to the first plate **6a**. This fact advantageously allows to make easier the detachment of the projecting element **4** from the base **3** for structural failure of the breakage portion **8** since it is limited only to the first plate **6a**.

[0040] This embodiment, however, should not be considered limitative for different embodiments where the breakage portion is made by different methods such as, for example, a plurality of holes formed on the base near the projecting element. This allows to limit the gripping of the projecting element to the base so that, as a result of stresses, such gripping fails allowing to separate the two above elements.

[0041] However, according to a further embodiment both plates are connected to the base by means of a respective breakage portion. In fact, what matters is that the connection between the base and the projecting element allows, in case of special stress, the total separation of the projecting element so that it is totally removable from the escape hatch.

[0042] According to another aspect of the invention, the device also comprises a pressure element **10**, represented in Fig. 5, removably coupled to the tie-rod **1** for exerting a thrust towards the base **3** on the edge portions of adjacent tiles so as to maintain them coplanar. The same pressure element **10** is also generally, but not necessarily, used to urge the tie-rod **1** and to obtain the detachment of the projecting element **4** from the base **3** for the failure of the breakage portion **8**.

[0043] In the drawings it is observed that the pressure element **10** comprises a knob **11**, as happens in many known executions. Moreover, the projecting element **4** comprises a free end **12** having a thread **13** for the coupling of the knob **11**. The latter, suitably, includes a female screw portion **14** shaped to be screwed onto the thread **13** of the free end **12** of the projecting element **4**.

[0044] In this sense, advantageously, the pressure exerted on the tiles can be easily adjusted by screwing or unscrewing the knob **11**. However, this embodiment should not be considered limitative for the invention. The pressure element, in particular, is irrelevant for the invention and can be realized in any form.

[0045] According to a further aspect of the invention, on the plates **6a** and **6b** are made increased thickness portions **20** to allow the plates **6a** and **6b** to constitute spacers. In other words, on the plates **6a** and **6b**, which are generally very thin, emerge said increased thickness portions **20** to fix the distance between the adjacent tiles.

[0046] Advantageously, therefore, the device of the invention not only performs the leveling function, but also that of spacer between the tiles.

[0047] Still advantageously, because the spacer part is carried by portions of the plates **6a** and **6b**, it is removed from its position with the detachment of the projecting element **4** from the base **3**. In other words, advantageously, with the device of the invention the spacer portion is totally and easily removed from the escape hatches between the tiles. They are therefore overtake all of the prior art drawbacks listed above.

[0048] In the particular embodiment that is described, the second plate **6b** has a uniform and increased thickness so totally constituting a spacer element, but this should not be considered limiting for different embodiments in which it is like the first plate, ie generally of thin thickness and with only some portion increased in thickness.

[0049] Furthermore, in the same figures it is observed that the increased thickness portions **20** are made on each of the plates **6a** and **6b**, but also such detail should not be considered limiting for the invention.

[0050] According to another aspect of the invention, the first portion **5** of the projecting element **4** has dimensions such as to guarantee its emerging from the tile level. In other words, the size of the first portion **5** are such as to guarantee its emerging from the escape hatches between the tiles, whatever thickness of the latter.

[0051] As previously mentioned, this allows, advantageously, to guarantee that the glue, if flooding from the escape hatches, not submerge the first portion **5** of the tie-rod **1** constituting an obstacle to the subsequent detachment of the projecting element **4** from the base **3**.

[0052] Operatively, the user acts by placing the glue on the surface to be tiled and placing the tie-rods **1**. Next, the user acts laying the tiles placing their edges in contact with the thickness increased portions **20**. Next, the user screw the knob **11** on the tie-rod **1** up to press the tiles.

[0053] When the glue is dry, the user acts on the knob **11** to cause the breaking of the breakage portion **8** so as to obtain the separation of the projecting element **4** from the base **3**. In this way the escape hatches between the tiles remains clear from fractions of the device.

[0054] To the aforementioned, it is evident that the device of the invention overcomes the drawbacks of the prior art being a leveller and a spacer.

[0055] Thanks to the easy and almost total removal of the projecting element it leaves totally clear the escape hatches unlike what happens using known levelling or spacer devices.

[0056] The invention is susceptible of numerous modifications and variations, all falling within the appended

claims. All the details may be replaced with other technically equivalent elements, and the materials may be different according to requirements, without departing from the scope of protection of the invention defined by the appended claims.

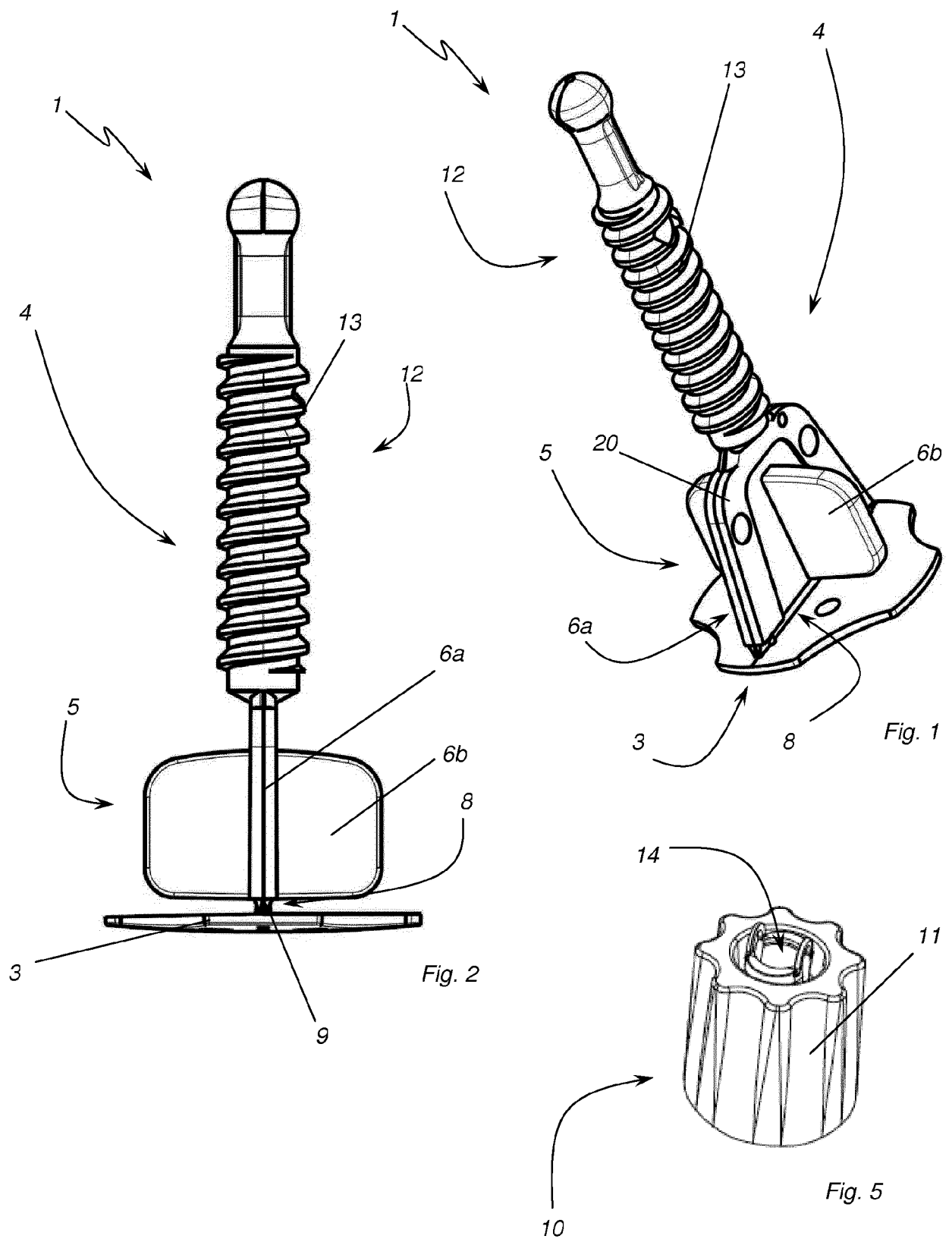
Claims

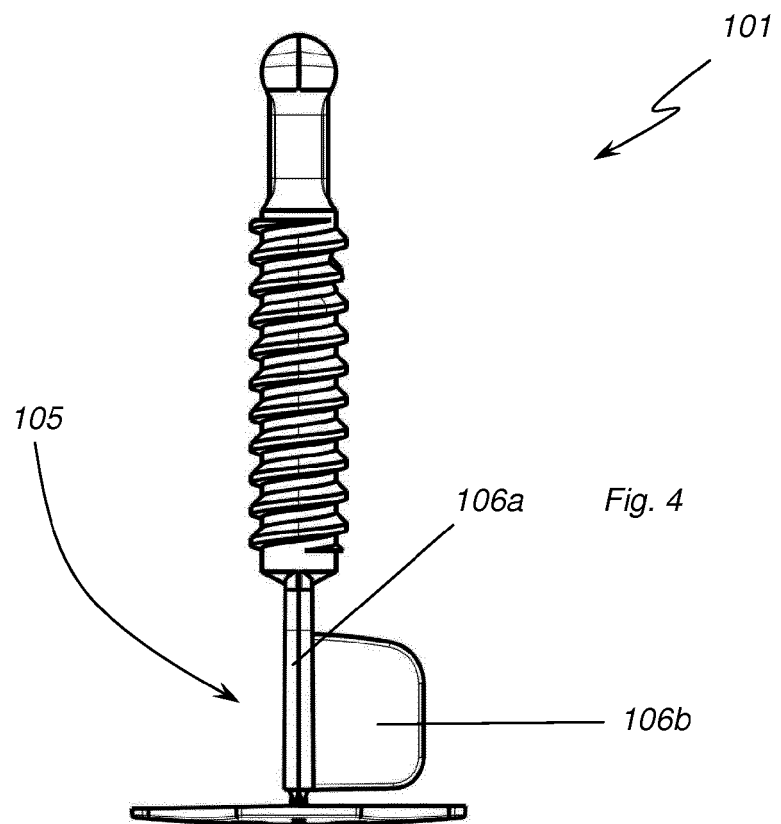
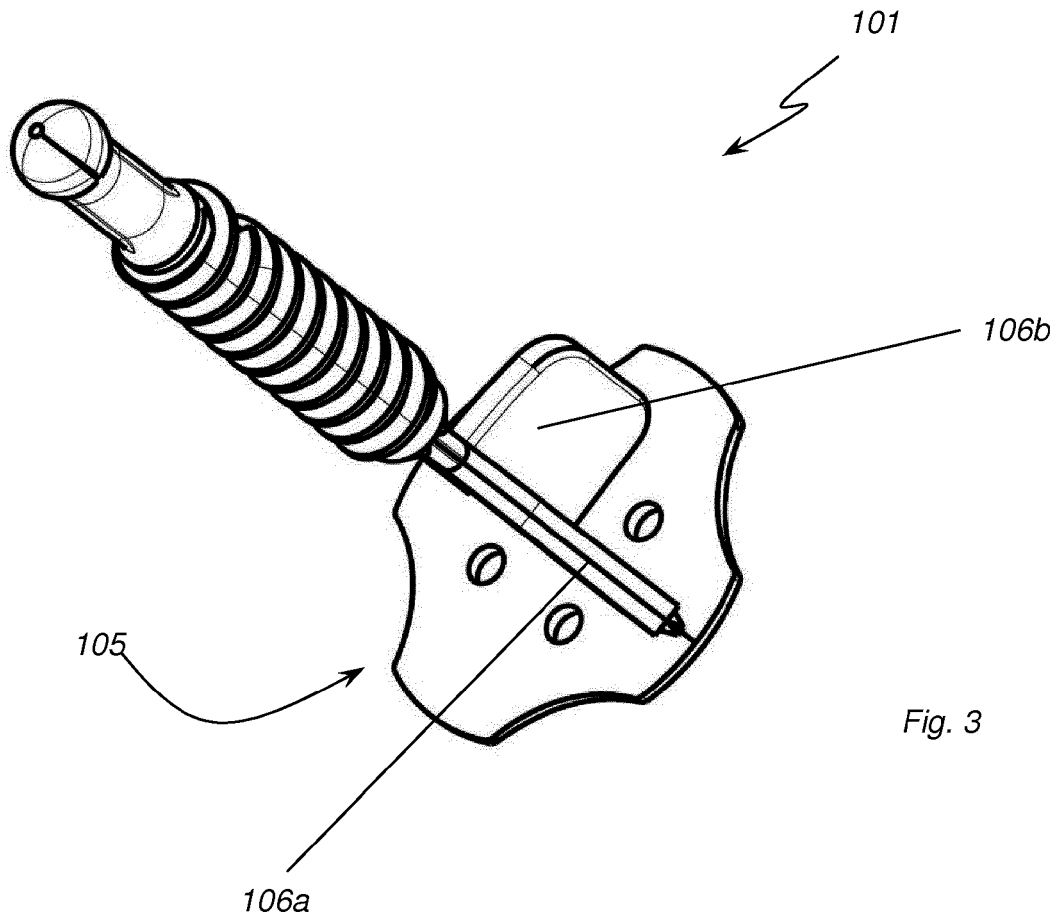
1. A device for the laying of tiles or the like comprising:
 - at least one tie-rod (1; 101) having a support base (3) for the edge portions of one or more adjacent tiles and at least one projecting element (4) from said base (3) and susceptible to project from the level of the tiles through the escape hatch, between said base (3) and said projecting element (4) being interposed at least one breakage portion (8) to promote the total separation of said projecting element (4) from said base (3) in the presence of predetermined stresses so as said base (3) remains free of any projecting scrap;
 - at least one pressure element (10) removably coupled to said tie-rod (1; 101) to exert a thrust towards said base (3) on the edge portions of adjacent tiles so as to keep them coplanar,

characterized in that said projecting element (4) comprises at least one first portion (5; 105) susceptible to be arranged into the escape hatch between adjacent tiles and having at least one portion with increased thickness (20) to constitute a spacer for such adjacent tiles, said first portion (5; 105) comprising at least one first plate (6a; 106a) whereon at least one said portion with increased thickness (20) is made, and at least one second plate (6b; 106b) incident on said first plate (6a; 106a) and whereon at least one said portion with increased thickness is made.
2. Device according to claim 1, **characterized in that** said first portion (105) is, in section, substantially T molded.
3. Device according to claim 1, **characterized in that** said first portion (5) is, in section, substantially cross molded.
4. Device according to any of the preceding claims, **characterized in that** said first and said second plate are connected to said base by means of said breakage portion.
5. Device according to any of claims 1 to 3, **characterized in that** said first plate (6a; 106a) is connected to said base (3) by means of said breakage portion (8), said second plate (6b; 106b) and said base (3)

being spaced apart.

6. Device according to any one of the preceding claims, **characterized in that** said first portion (5; 105) has dimensions such as to ensure the projection thereof from the level of the tiles.
7. Device according to any of the preceding claims, **characterized in that** said breakage portion comprises a plurality of through holes formed on said base at the junction to said projecting element.
8. Device according to any of the preceding claims, **characterized in that** said pressure element (10) comprises a knob (11).
9. Device according to claim 8, **characterized in that** said projecting element (4) comprises at least one free end portion (12) having a thread (13) to hold said knob (11), said knob (11) comprising at least one screw portion (14).







EUROPEAN SEARCH REPORT

Application Number
EP 16 19 0030

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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	EP 2 573 296 A1 (PROGRESS PROFILES SPA [IT]) 27 March 2013 (2013-03-27) * figures 1-3,7,9 *	1-9	INV. E04F21/00
A	EP 2 728 088 A1 (GHELFI S R L [IT]) 7 May 2014 (2014-05-07) * figure 12 *	1-9	
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			TECHNICAL FIELDS SEARCHED (IPC)
			E04F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 January 2017	Examiner Bourgoin, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 16 19 0030

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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