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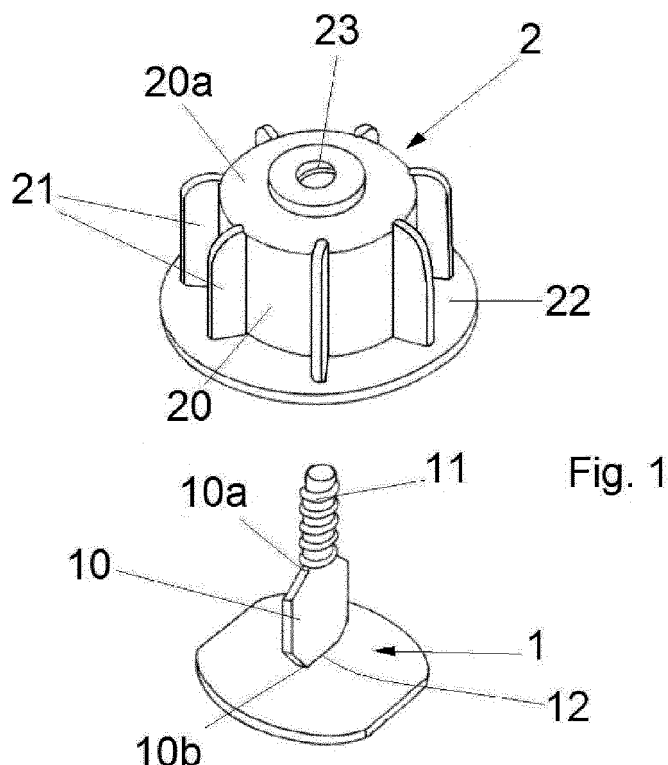
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(54) **A device for correct laying of floor tiles**

(57) The present invention relates to a device for correct laying of floor tiles, which comprises a knob (2) with threaded central cylindrical conduit (24) and a base (1)

from which a blade (10) centrally protrudes, supporting a threaded stem (11) in upper position, adapted to be screwed into said cylindrical conduit (24).



Description

[0001] The present patent application for utility model relates to a device for correct laying of floor tiles.

[0002] As it is known, large use is made of floors or coverings generally formed of a plurality of ceramic tiles.

[0003] During the preparation of similar floor surfaces, an important requirement consists in giving perfectly planarity to the floor.

[0004] Evidently, such a condition can be guaranteed only on condition that the upper surface of each tile is perfectly coplanar with the upper surface of all the other tiles in the same floor.

[0005] Therefore, the layer must respect the aforesaid condition when laying each tile with respect to the previously laid tiles.

[0006] In order to guarantee better accuracy and higher speed during laying, some "aligning" devices have been devised for use during laying of adjacent rows of tiles.

[0007] A typical expression of such a prior art is represented by the device disclosed in IT0001334260 patent.

[0008] The device claimed in such anteriority - which is provided with monolithic structure obtained from molding of plastic materials - basically consists in a plate provided on the upper side with a rectilinear bar, disposed along its axis of symmetry and provided with height lower than the thickness of the tiles used for the floor.

[0009] A small arch is pivoted at the ends of said bar, being adapted to rotate by approximately 180°; it being provided that the connection between the ends of said bar and the two vertical sections of said arch is obtained by means of two thinned sections of plastic molding material, which also act as tearing points.

[0010] When laying a tile floor, a fluid adhesive layer is applied on the screed acting as bed.

[0011] Then, each specimen of the device of the invention can be laid on the screed so that said plate is "drowned" in the adhesive layer, basically up to the height of its rectilinear bar.

[0012] Each specimen of said device is used to lay two adjacent tiles, meaning that the parallel adjacent edges of the two tiles are placed on opposite sites against said rectilinear bar provided on the central line of the plate of the device of the invention.

[0013] Evidently, in such a condition the two tiles are at least partially rested on the two halves of the plate, without guaranteeing, however, the perfect coplanarity of the upper surfaces.

[0014] In order to guarantee such perfect coplanarity, the device illustrated in the aforesaid anteriority cooperates with an element with tapered profile, basically consisting in a wedge with lower flat side and upper tilted side.

[0015] The function of the wedge is to be energetically inserted inside said small arch provided in the device of the invention, until the arch remains in "erected" position, perfectly contained in the vertical plane that also contains

the bar with respect to which it is pivoted.

[0016] In such a situation, the wedge is operated in such manner that the lower flat side interferes with the upper side of the two tiles positioned inside said device and the upper tilted side interferes with the small arch.

[0017] Evidently, during such insertion, the interference between the upper side of the wedge and the small arch gradually tends to increase, in view of the "increasing" inclination given to said upper side of the wedge.

[0018] In view of the above, a pulling tension with increasing intensity is created between the small arch and the plate of the device, that is to say between the top and the bottom element of the device.

[0019] Considering that the two tiles are partially rested on the plate, it appears evident that they tend to "rise" jointly towards the arch, until they are energetically engaged against the lower flat side of the wedge, which operates as flat backing surface.

[0020] Such a condition guarantees that perfect planarity is obtained between the two tiles, being an essential requirement for the correct laying of the tile floor.

[0021] Now, the operator must wait until tiles stabilize on the screed because of the setting of the adhesive layer, before removing the wedge from the arch of the device of the invention.

[0022] Because of the aforesaid operating steps, the rectilinear bar of the device is concealed inside the joint generated between the two adjacent tiles, whereas the arch pivoted on it protrudes upwards, outside the joint where the bar is contained.

[0023] Therefore, the operator must remove the arch from the bar, by cutting off the thinned sections made of plastic material that act as connection and hinge points between the arch and the bar.

[0024] Such cutting is generated by wear, by means of repeated alternate rotations of said arch with respect to the axis of the bar, and therefore also with respect to the axis of the joint where the bar is contained.

[0025] Nevertheless, it must be noted that such a prior art is impaired by some considerable drawbacks related with the structural configuration and the operating mode of the device.

[0026] Referring to the structure of said device, said drawback consists in its high complexity due to the necessary cooperation between the plate and the oscillating arch.

[0027] It is worthless saying that such a structural complexity results in higher costs and difficulties during the preparation of the mold.

[0028] Moreover, no parts of the device can be reused (with the only exception of the wedge, which is not, however, an integral part of the device), given the fact that, after cutting the arch off from the bar, said arch cannot be reused, is disposed of and recycled.

[0029] Referring to the operating modes of the device, a great effort is required from the operator, in rather uncomfortable conditions, to insert the wedge in the arch of the device.

[0030] Such an insertion of the wedge is strongly opposed by the gradual contrast action exerted by the two tiles against the flat side of the wedge, when the two tiles rise jointly.

[0031] Additional operating problems are encountered when cutting off the arch from the pivoting bar, when the operator is certain that the floor has set and the wedge has been removed from the arch.

[0032] In fact, the lower ends of the vertical elements of the arch are connected to the ends of the bar by means of said thinned sections acting as hinge and tearing points.

[0033] Therefore, when the device is operated between two adjacent tiles, the two tearing points are inserted in the joint between the two tiles, at lower height than the upper surface of the tiles.

[0034] In view of the above, during the alternate oscillations of the arch with respect to the pivoting bar, the lower ends of the vertical sections of the arch are subject to interference of the edges of the adjacent tiles that generate the joint. Because of such interference, the traumatic separation of the arch with respect to the part of the device drowned in the joint is a difficult time-consuming operation.

[0035] The specific purpose of the present invention is to provide a device for correct laying of floor tiles, which is free from the aforesaid drawbacks of the prior art.

[0036] In fact, the present invention, which is likewise provided with a structure obtained from molding of plastic materials, has a less complex and more cost-effective structure than the device illustrated in the aforesaid Italian anteriority. Moreover, the present invention is characterized by practical and rational operating modes. Finally, the present invention makes it possible to reuse one of its main parts, thus considerably reducing the consumption of plastic materials.

[0037] The innovative characteristics of the invention are defined in the attached claims.

[0038] The device of the invention comprises a base from which a vertical blade centrally protrudes, supporting a threaded stem in upper position and being connected on the bottom with said base by means of a lower end with thinned section suitable to act as tearing line. The device of the invention comprises a knob, consisting in a cylindrical cover provided, starting from its upper closing wall, with a central cylindrical conduit with internal threaded walls, adapted to exactly receive, by means of a helical coupling, said threaded stem provided in upper position on said base.

[0039] For explanatory reasons, the description of the invention continues with reference to attached drawings, which only have an illustrative, not limiting value, wherein:

- Figure 1 is an axonometric view of the parts of the device of the invention before being assembled;
- Figure 2 is an axonometric view of the parts of the device of the invention positioned between two tiles;

- Figure 3 is a sectional view of Fig. 2 with plane II-II;
- Figure 4 is a partial view of Fig. 3 referred to an alternative part of the device of the invention;
- Figures 5 and 6 are axonometric views of two additional constructive embodiments of the device of the invention.

[0040] Referring to Figs. 1 to 3, the device of the invention is composed of a first part with monolithic structure obtained from molding of plastic materials, consisting in a basically elliptical base (1), from the center of which a vertical element protrudes, basically consisting in a blade (10) with tapered ends.

[0041] The tapered upper end (10a) of said blade (10) supports a threaded stem (11), whereas the tapered lower end (10b) is directly joined with said base (1).

[0042] As illustrated hereinafter, the tapered lower end (10b) is configured as tearing section to obtain the traumatic separation of the blade (10) from the base (1).

[0043] The second part of the device of the invention, which is likewise provided with a monolithic structure obtained from molding of plastic materials, consists in a knob (2) basically composed of a cylindrical cover (20) externally provided for the entire height with a series of radial partitions (21) joined at the base with a flange (22) that surrounds the lower opening of said cover (20).

[0044] Said partitions (21) are used to hold the knob (2).

[0045] The upper closing wall (20a) of said cover (20) is centrally provided with a hole (23) that provides access to a threaded cylindrical conduit (24) radially extending inside said cover (20).

[0046] Said cylindrical conduit (24) has size and shape compatible with said threaded stem (11) of the base (1) to obtain perfect helical coupling.

[0047] In view of the above, said cylindrical conduit (24) is provided in lower position with a conical opening (25) that favors centering of said threaded stem (11) when the entire knob (2) is splined above it.

[0048] Referring to Figs. 2 and 3, the laying and operation modes of the device of the invention are illustrated with reference to the installation of a tile floor.

[0049] After preparing the screed with fluid glue surface layer, said base (1) is rested on the screed, in such manner that the base (1) is impregnated in said adhesive layer.

[0050] Now, the blade (10) that protrudes vertically from said base (1) is used as stop for two adjacent tiles (P) disposed in horizontal position.

[0051] More precisely, said two tiles (P) are positioned in such manner that their "interfaced" parallel edges are disposed on opposite sides against said vertical blade (10), in such manner that the tiles (P) are shortly rested also on the corresponding halves of the base (1).

[0052] In view of the above, said blade (10) of the base (1) is engaged in the traditional joint (F) provide between two adjacent tiles (P), whereas the threaded stem (11) remains above said joint.

[0053] In such a condition, said knob (2) is splined above said threaded stem (11) protruding between two adjacent tiles (1), in such manner that the stem (11) is inserted into said threaded conduit (24) of said knob (2).

[0054] Now, the knob (2) is rotated, gradually favoring the helical coupling between its internal cylindrical conduit (24) and the threaded stem (11) of the base (1).

[0055] As shown in Fig. 3, because of such a helical coupling, the flange (22) provided at the base of the knob (2) is engaged against the upper surface of the two adjacent tiles (P).

[0056] The consequence of the additional rotation of the knob (2) is that the base (1) is raised towards the flange (22), just like the jaws of a vice.

[0057] It is easily understood that the lifting force imposed on the base (1) is also exerted on the two tiles (P) rested on the base (1), in such manner that said two tiles (P) are strictly tightened between base (1) and flange (22).

[0058] It must be noted that in such an operating step the lower planar side of the flange (2) acts as backing surface for the upper side of the two adjacent tiles (P), guaranteeing the perfect planarity of the tiles (P).

[0059] After obtaining such tightening, the device of the invention can be maintained in operation until the setting of the glue used to stabilize the position of the tiles (P).

[0060] Now, the operator must carry out two additional operations.

[0061] The first operation consists in unscrewing the knob (2) from the threaded stem (11) of the base (1).

[0062] The second operation consists in the "final finishing" of the floor, by removing the threaded stem (11) still protruding from the joint (F) provided between the adjacent pair of tiles (P).

[0063] In particular, the removal of the stem (11) is carried out jointly and simultaneously with the removal of the supporting blade (10).

[0064] Such an operation can be easily carried out by imposing repeated alternate oscillations to said blade (10) with respect to the supporting base (1).

[0065] Such alternate oscillations along the axis of the joint (F) that contains the blade (10) produce the weakening of the plastic material that joins the base (1) with the lower end (10b) of the blade, until it is completely broken.

[0066] So, the threaded stem (11) can be detached from the base (1) together with said blade (10).

[0067] In view of the above, the peculiarities and advantages of the present invention are evident.

[0068] The first advantage is represented by the constructive simplicity of the two parts of the new device of the invention, with special reference to the base (1).

[0069] Another advantage is related to the fact that, when used in combination with a base (1), the knob (2) can be reused for an endless number of times in similar specimens of the base.

[0070] Moreover, the separation of the vertical blade

(10) from the base (1) is very simple.

[0071] In fact, such an operation can be carried out by imposing alternate oscillations along the axis of the joint (F) on the blade (10), without encountering any obstacle or interference.

[0072] Such a condition is certainly more favorable than the one encountered by the operator during the traumatic separation of the arch of the device illustrated in the Italian anteriority IT0001334260.

[0073] In such a case, the separation of the arch is obtained further to alternate rotations perpendicular to the axis of the joint where it is contained, encountering the adverse interference exerted by the adjacent edges of the two tiles against the lower ends of the vertical sections of the arch.

[0074] The last, and possibly the most significant advantage of the present technology consists in the way in which the new device of the invention provides leveling between the two tiles.

[0075] In such a case, this operation can be carried out by imposing a simple rotation to the knob (2), with a balanced effort that is reduced by the fact that the operator can comfortably hold the knob (2).

[0076] This operation is certainly much more comfortable than the one required by the technology illustrated in IT0001334260, according to which the operator must forcedly insert the wedge inside the device provided with arch.

[0077] Moreover, it must be noted that alternative constructive embodiments are possible within the scope of the present invention.

[0078] First of all, said threaded cylindrical conduit (24) of the knob (2) is preferably obtained with the molding material of the knob (2), as shown in Fig. 3.

[0079] Alternatively, said threaded cylindrical conduit (24) is obtained inside a metal bush (26) adapted to be incorporated in the molding material of the knob (2), as shown in Fig. 4.

[0080] According to another embodiment of the present invention, the base (1) is provided with a crossed pair of identical rectilinear ribs (100) that define four quadrants at right angle.

[0081] According to this embodiment, the vertical blade (10) protrudes from one of said two ribs (100), with respect to which it is perfectly centered and parallel.

[0082] Also in this embodiment the blade (10) is provided with a tapered lower end (10b), as shown in Fig. 5.

[0083] It is well understood that this embodiment of the base (1) is adapted to be placed in operation in the convergent point of four tiles (P), in such a condition that the corner of each tile is exactly inserted inside one of said quadrants defined by the crossed pair of ribs (100).

[0084] Moreover, in such a situation, the knob (2), which is normally screwed on the threaded stem (11) protruding from the blade (10), is simultaneously engaged on the adjacent corners of the four tiles (P).

[0085] Fig. 6 is a view of an additional constructive embodiment of the base (1) that differs from the one of Fig.

5 only in that it is provided with two different ribs (101, 102) with T-shaped profile, which define two adjacent 90° quadrants and one half plane.

[0086] The blade (10) is disposed in central parallel position to the rib (101) representing the head wing of said T-shaped profile.

[0087] Such a version of the base (1) is positioned in the joint between three tiles, if the tiles positioned against one side of the blade (10) must have a staggered position with respect to the tile engaged on the opposite side of the blade (10).

[0088] Finally, it must be noted that, although reference has been made to the fact that the new device of the invention is used for tiling of horizontal surfaces, the same device can be advantageously used also for tiling of vertical or tilted surfaces.

Claims

1. A device for correct laying of tiles, **characterized in that** it is composed of the following parts provided with monolithic structure obtained from molding of plastic materials:

- a base (1) from which a vertical blade (10) centrally protrudes, being adapted to be housed in the joint (F) obtained between two or more adjacent tiles (P); it being provided that said vertical blade (10) supports a threaded stem (11) in upper position and is connected on the bottom with said base (1) by means of a lower end (10b) with thinned section suitable to act as tearing line; it being also provided that said base (1) is adapted to support the sections of two or more tiles (P) resting on it.;

- a knob (2) consisting in a cylindrical cover (20) provided, starting from its upper closing wall (20a), with a central cylindrical conduit (24) with internal threaded walls, adapted to exactly receive, by means of a helical coupling, said threaded stem (11) provided in upper position on said base (1).

2. The device of claim 1, **characterized in that** said cylindrical cover (20) of the knob (2) is externally provided with radial partitions (21).
3. The device of the first or both preceding claims, **characterized in that** said cylindrical conduit (24) internally provided in the knob (2) has a conical opening (25) on the bottom.
4. The device of one or more preceding claims, **characterized in that** said central cylindrical conduit (24) of the knob (2) is made with the molding material used for the knob (2).

5. The device of one or more of claims 1 to 3, **characterized in that** said central cylindrical conduit (24) of the knob (2) is obtained in a metal bush (26) integrated in the molding material of the knob (2).

6. The device of one or more of the preceding claims, **characterized in that** the base (1) is provided with a crossed pair of identical ribs (100), from one of which said blade (10) protrudes, being disposed in parallel central position to the rib (100).

7. The device of one or more of claims 1 to 5, **characterized in that** said base (1) is provided with a pair of different ribs (101 and 102) with T-shaped profile; said blade (10) being disposed in parallel central position to the rib (101) representing the head wing of said T-shaped profile.

8. The device of one or more of the preceding claims, **characterized in that** said cylindrical cover (20) is provided with a flange (22) at the height of its lower opening.

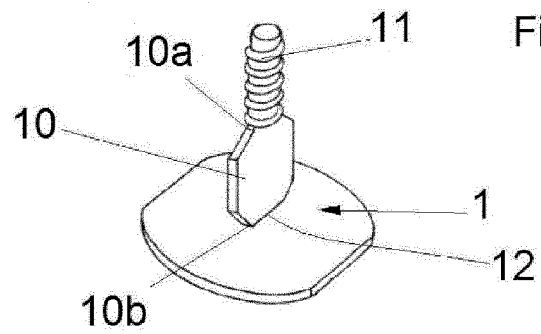
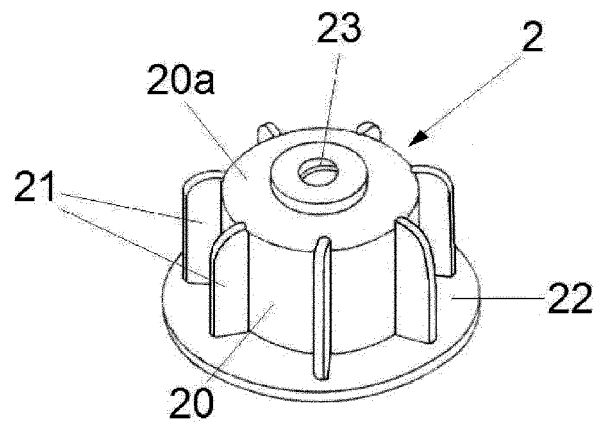


Fig. 1

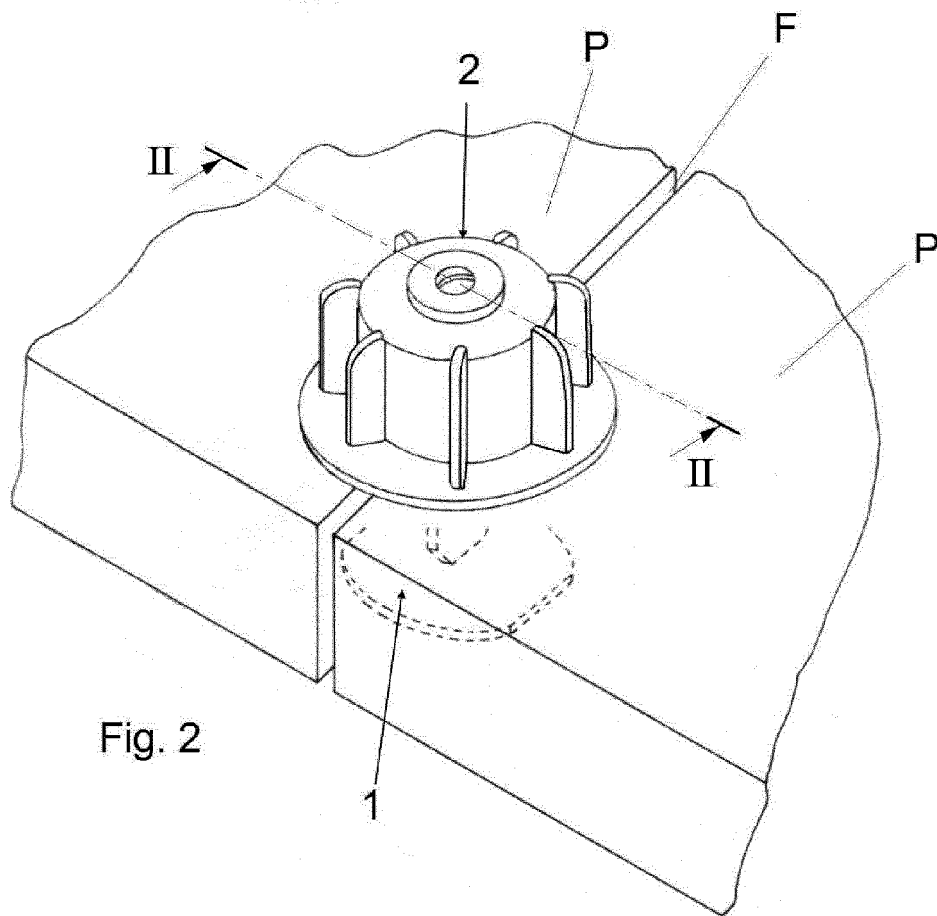


Fig. 2

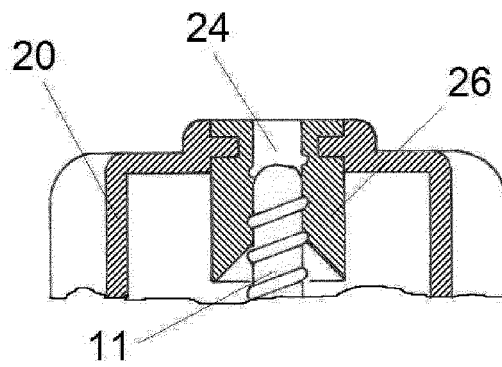


Fig. 4

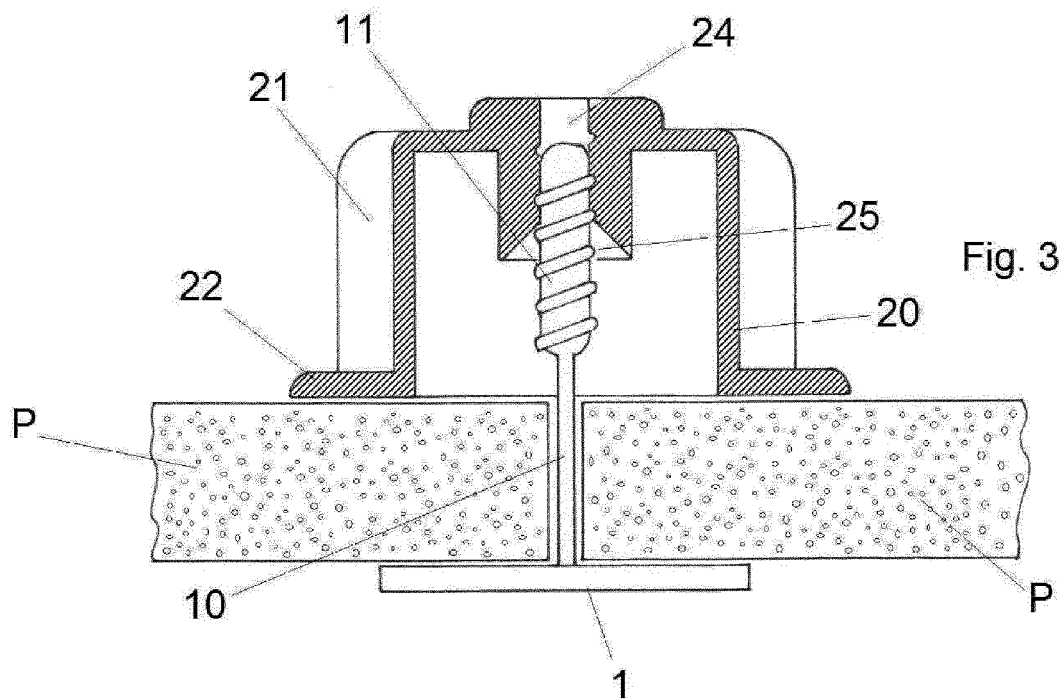


Fig. 3

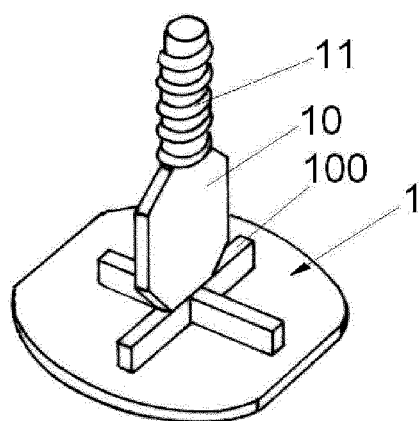


Fig. 5

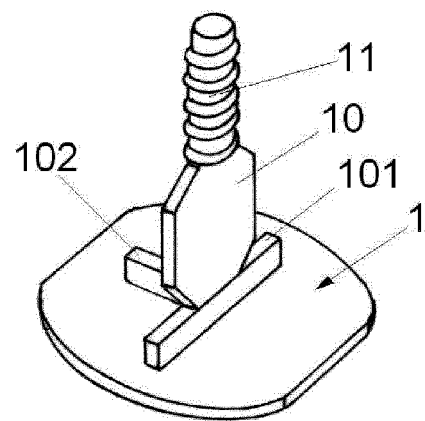


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT 0001334260 [0007] [0072] [0076]