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(54) **WEDGE FOR A LEVELLING PIECE IN THE INSTALLATION OF CLADDING PLATES**

(57) The present invention relates to a wedge for a levelling piece, formed by a seating plane and an inclined work plane provided with two slopes having different inclinations, defining a gable shape, wherein each slope has a plurality of protrusions, generating two toothed rows, such that each pair of adjacent protrusions is connected to form a continuous ridge. The gable shape of the wedge allows the wedge to self-centre in an opening defined in the levelling piece and distributes the forces applied by the wedge on the levelling piece in different planes, preventing the inverted U-shaped element from bending with respect to the base, since the forces are compensated.

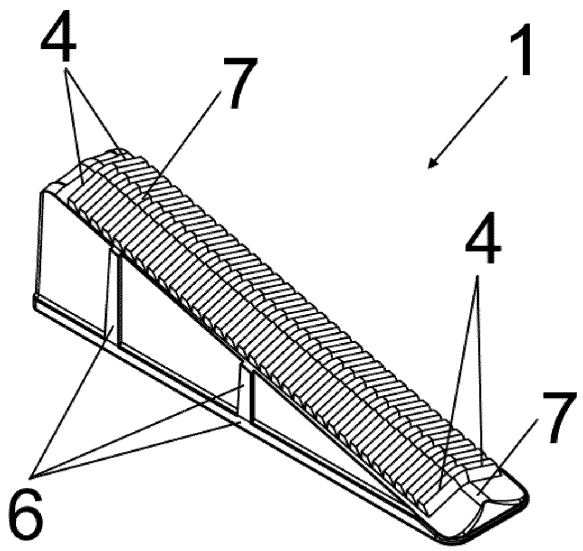

FIG.1

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a wedge for a levelling piece in the installation of cladding plates, such as wall tiles, floor tiles, or paving tiles, intended for facilitating the installation of constructive elements of this type, said wedge being defined by a seating plane and a work plane, wherein this work plane is inclined. Likewise, the work plane has two slopes having different inclinations defining a gable shape.

[0002] The object of the invention is to provide a wedge having a shape such that it allows transmitting a controlled force distributed in two different planes on a complementary levelling piece in order to generate a tractive force which separates the cladding plates, generating a minimum opening between them.

BACKGROUND OF THE INVENTION

[0003] Wedges which, when used in combination with levelling pieces, facilitate the placement of flat cladding plates, such as ceramic pieces, floor tiles, and other pieces with a substantially uniform thickness on floors, walls, or other surfaces, are known in the state of the art.

[0004] To that end, there is provided a bonding material, such as mortar or an adhesive, on which the plates for cladding the surface are placed. Said levelling operation involves as many levelling pieces as necessary for the perfect arrangement between a pair of cladding plates with the required surface flatness. Likewise, it is common to use a single wedge in different levelling operations which define each joint between cladding plates, since once a pair of plates has been levelled by means of the levelling pieces and a wedge, it is possible to remove said wedge for use in levelling another pair of cladding plates.

[0005] As shown in patent document number ES2598702T3, known wedges are defined by a seating face and a working face which is inclined with respect to the seating face. Levelling pieces having an inverted T shape with a flat base from which an inverted U-shaped element, commonly known as a separating horseshoe, with an opening, emerges perpendicularly, are also known. These levelling pieces are supported at their base on the bonding material on which the cladding plates are arranged.

[0006] Cladding plates are then arranged such that there are at least two levelling pieces on each side. The wedge is introduced into the opening of each levelling piece which separates two levelling plates. Upon hitting the wedge, a force is generated on the inverted U-shaped element tending to separate the levelling piece and the surface to be clad, which will also cause the separation of the cladding plates, with the plates being levelled out.

[0007] The major drawback of known wedges of this type is that, oftentimes, upon being introduced through the opening of the levelling piece a bending moment is generated and causes the inverted U-shaped element to buckle, i.e., maintaining the levelling piece in a vertical plane with respect to the cladding plates cannot be ensured when a force is applied on the wedge.

[0008] The inverted U-shaped element not being perpendicular with respect to the base of the levelling piece generates a larger separation between the cladding plates than originally designed, i.e., the levelling pieces often cause the joint to open in practice. Likewise, the work face of the wedge wears away readily because it is used repeatedly in levelling operations between the cladding plates upon coming into contact by pressure with the portion comprised between the arms of the levelling piece.

[0009] When the bonding material is dry, an impact is applied on the inverted U-shaped element which, due to the presence of notches in the arms of the levelling piece, causes the breakage and separation thereof with respect to the base, with said inverted U-shaped element being disposed of and the base of the levelling piece being buried under the cladding plates and concealed when grout is applied to seal the joints.

[0010] In this sense, a wedge the shape of which enables the repeated levelling operation between the cladding plates without the work face thereof wearing away significantly, and which helps in the centred positioning thereof with respect to the levelling piece with which it works, is not known in the current state of the art.

DESCRIPTION OF THE INVENTION

[0011] The proposed wedge solves the problems set forth above and has an innovative shape which, by working together with a levelling piece in the installation of cladding plates, offers a highly durable device with minimum wear of its working surface.

[0012] To that end, the wedge of the present invention has a seating plane and a work plane, wherein the work plane is arranged with an inclination with respect to the seating plane, preferably forming an acute angle between the mentioned planes. Advantageously, the work plane is formed by two slopes having different inclinations, defining an angular arrangement or gable shape.

[0013] In this sense, precisely said gable end of the work plane allows guiding the wedge into a centred position with respect to the levelling piece, wherein said levelling piece also has a gable end in the portion comprised between its arms.

[0014] Advantageously, the gable shape of the wedge allows the wedge to self-centre in the opening defined in the levelling piece and distributes the forces applied by the wedge on the levelling piece in different planes, preventing the inverted U-shaped element from bending with respect to the base, since the forces are compensated.

[0015] Advantageously, the controlled distribution of forces defines a minimum space between cladding plates, which is defined by the thickness of the inverted

U-shaped element located between them, and causes minimum opening of the joint demarcated by the space between the cladding plates.

[0016] Likewise, the gable end of the work plane of the wedge offers a larger contact surface with the levelling piece and reduced wear of the work plane since forces are distributed in a compensated manner on said surface.

[0017] In summary, the wedge object of the present invention represents an optimum solution for the levelling of cladding plates which involves a levelling piece having a portion comprised between the arms thereof with a gable end, since the wedge of the invention enables the complete coupling between said elements, reduced wear of the contact surfaces having an angular shape, and a prolonged service life of the wedge.

DESCRIPTION OF THE DRAWINGS

[0018] To complete the description that will be made below and in order to help to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description in which the following is depicted in an illustrative and non-limiting manner:

Figure 1 shows a perspective view of a wedge according to the preferred embodiment object of the invention for use in combination with a levelling piece in the installation of cladding plates.

Figure 2 shows a side view according to the preferred embodiment of the invention depicted in the preceding figure.

Figure 3 shows a top view according to the preferred embodiment of the invention depicted in the preceding figures.

Figure 4 shows a perspective view of the wedge object of the invention depicted together with the levelling piece.

Figure 5 shows a section view of the wedge of the invention and the levelling piece depicted in the preceding figure.

PREFERRED EMBODIMENT OF THE INVENTION

[0019] In view of the indicated Figures 1 to 3, it can be seen that in the preferred embodiment thereof the wedge (1) of the invention is made up of a seating plane (5) and an inclined work plane (2) with respect to the seating plane (5). Advantageously, the work plane (2) is formed by two slopes (4) with different inclinations, defining a gable shape.

[0020] As can be seen in Figure 2, the preferred embodiment of the wedge (1) of the invention has on each slope (4) of the work plane (2) a plurality of protrusions (3) generating two toothed rows. In this sense, it can be seen in Figure 1 that each toothed row is arranged on a slope (4) of the work plane (2). The protrusions of each toothed row block the backward movement of the wedge (1) with respect to the levelling piece (12) as can be seen in Figures 4 and 5.

[0021] Precisely the levelling piece (12) depicted in Figures 4 and 5, which is preferably used in combination with the wedge (1) of the invention, has an inverted T-shaped profile with a flat base (11) from which an inverted U-shaped element emerges perpendicularly, and wherein the inverted U-shaped element is connected to the base (11) by respective arms (10) defining an opening with a gable end in the portion comprised between the arms (10) of the levelling piece (12).

[0022] Moreover, it can be seen in Figures 1 and 3 that each pair of adjacent protrusions (3) of the wedge (1) are connected to form a continuous ridge (7). In this sense, two protrusions (3), each of them arranged on a slope (4) of the work plane (2) of the wedge (1), which are located in the same plane, generate a continuous ridge (7) to serve as a continuous projection-like surface extending in a transverse plane of the wedge (1).

[0023] The shape which has been described in detail serves as a larger bonding surface of the wedge (1) with respect to the levelling piece (12), in comparison with the bonding surface offered by known wedges which are not provided with a gable end.

[0024] As can be seen in Figure 2 of the preferred embodiment of the invention, each protrusion (3) of the wedge (1) optionally has a bevelled surface (3') which facilitates the coupling between the wedge (1) and the levelling piece (12). In fact, the mentioned bevelled surface (3') offers the possibility of a tighter fitting between the wedge (1) and the levelling piece (12).

[0025] In order to serve as a support surface for the user who performs the cladding plate levelling operation, the wedge (1) has in the preferred embodiment thereof a groove (8) at the end of the work plane (2) with a greater height, as can be seen in Figures 2 and 3. Said groove (8) imparts greater ergonomics to the wedge (1) of the present invention, which must necessarily be manipulated for the pressure coupling thereof in the opening defined by the levelling piece (12), so the groove (8) serves as means for facilitating a comfortable pressure surface on which the user applies a relevant force.

[0026] Finally, as depicted in Figures 1 and 2, the wedge (1) of the preferred embodiment of the invention has on its side surfaces struts (6) or staves which impart rigidity and increase the mechanical strength of the wedge (1). In this way, the incorporation of said struts (6) allows ensuring that the wedge (1) does not collapse and offers the required mechanical strength when coupling with the levelling piece (12) and levelling the cladding plates.

[0027] In this sense, it can be seen in Figure 5 that the wedge (1) is introduced into the opening defined by the levelling piece (12), and after the coupling thereof, both

elements keep their shape, such that the levelling piece (12) keeps the inverted T shape, with the inverted U-shaped element forming a right angle with the base (11) of the levelling piece (12).

Claims

1. A wedge (1) for a levelling piece in the installation of cladding plates, **characterized in that** it has a seating plane (5) and an inclined work plane (2) with respect to the seating plane (5), and wherein the work plane (2) is formed by two slopes (4) with different inclinations, defining an angular arrangement or gable shape, and wherein each slope (4) of the work plane (2) has a plurality of protrusions (3) generating two toothed rows, each toothed row being arranged on a slope (4) of the work plane (2) such that each pair of adjacent protrusions (3) which are arranged on a slope (4) of the work plane (2) are connected to form a continuous ridge (7).

2. The wedge (1) according to claim 1, **characterized in that** each protrusion (3) has a bevelled surface (3').

3. The wedge (1) according to claim 1, **characterized in that** has a groove (8) at the end of the work plane (2) with a greater height.

4. The wedge (1) according to claim 1, **characterized in that** the side surfaces thereof are provided with struts (6).

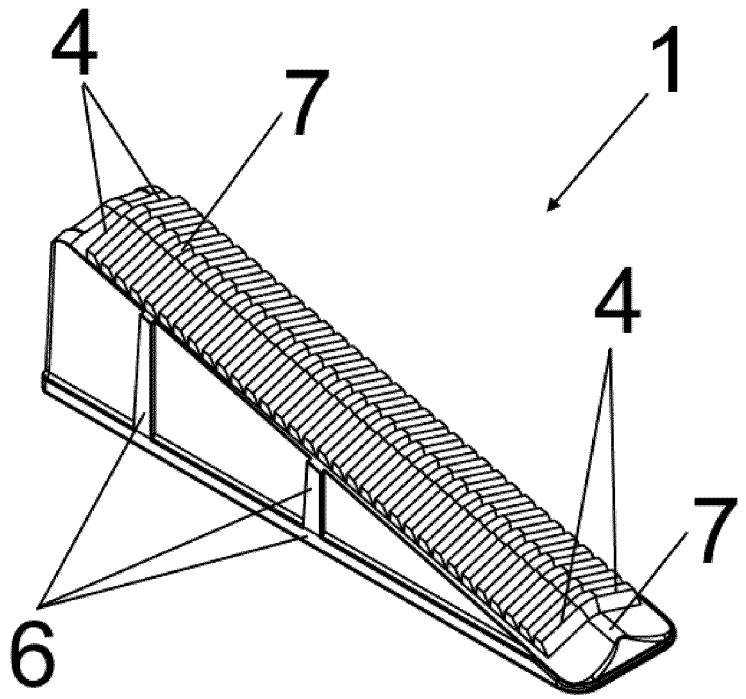

FIG.1

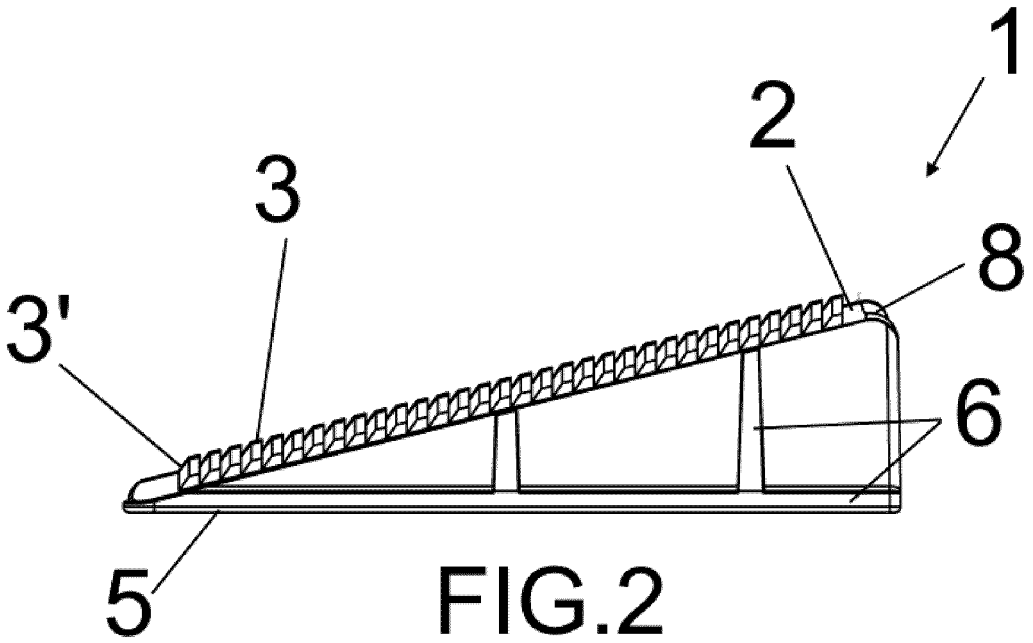

FIG.2

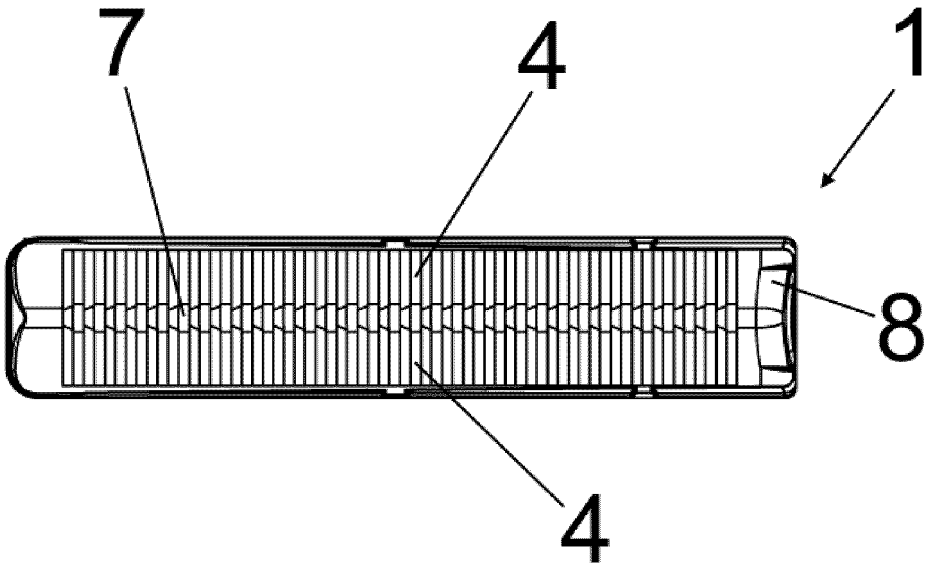

FIG.3

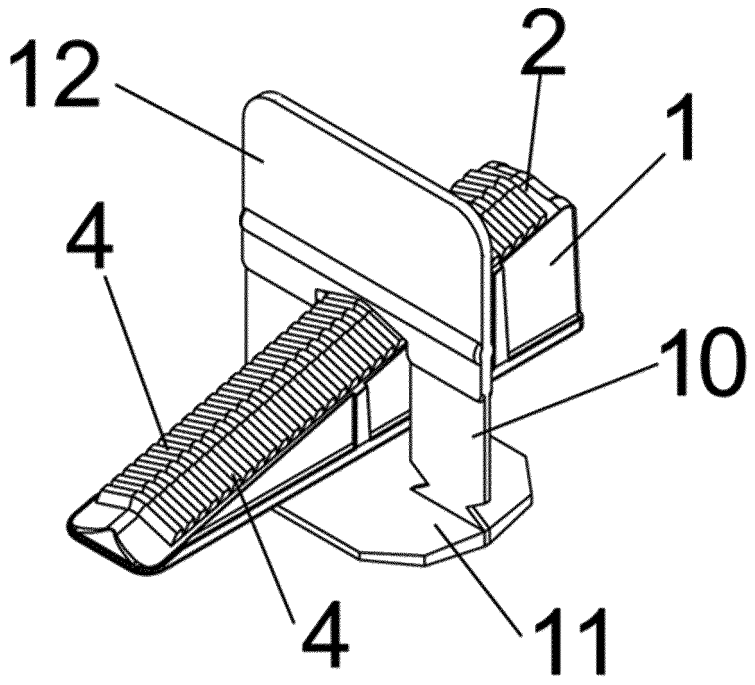

FIG.4

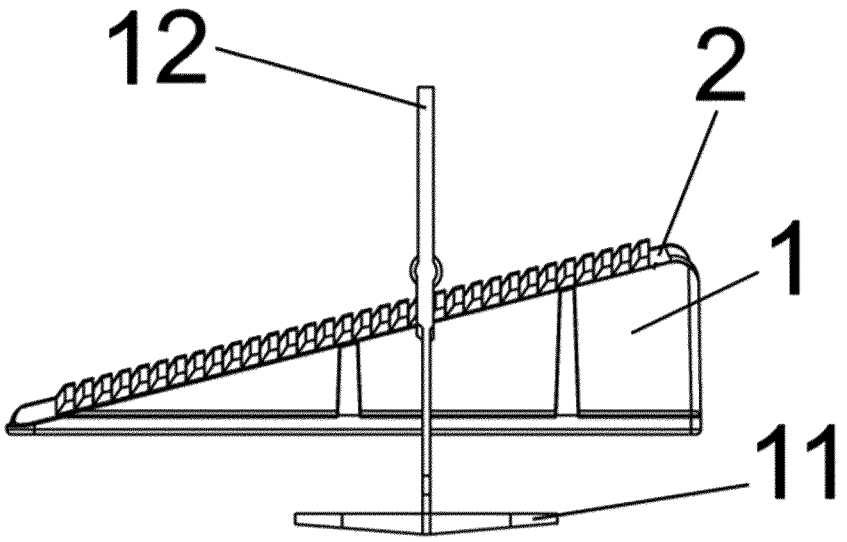

FIG.5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2022/070344

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 3492671 A1 (TORRENTS RES S L CORTAG IND E COMERCIO LTDA) 05/06/2019, the whole document.	1-4
A	US 2014116001 A1 (GHELFI STEFANO) 01/05/2014, the whole document.	1-4
A	PL 122002U U1 (WYROBEK JERZY ET AL.) 10/11/2014, the whole document.	1-4
A	US 2015308130 A1 (BIEC EDMUND) 29/10/2015, the whole document.	1-4

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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Date of the actual completion of the international search	Date of mailing of the international search report
20/09/2022	**(20/09/2022)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer M. Castañón Chicharro Telephone No. 91 3493261

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2022/070344

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		AU2015251522B B2	31.10.2019
		US9534403 B2	03.01.2017
		WO2015161366 A1	29.10.2015

Form PCT/ISA/210 (patent family annex) (January 2015)

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E04F21/00 (2006.01)
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E04F13/08 (2006.01)
E04F15/02 (2006.01)

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REFERENCES CITED IN THE DESCRIPTION

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