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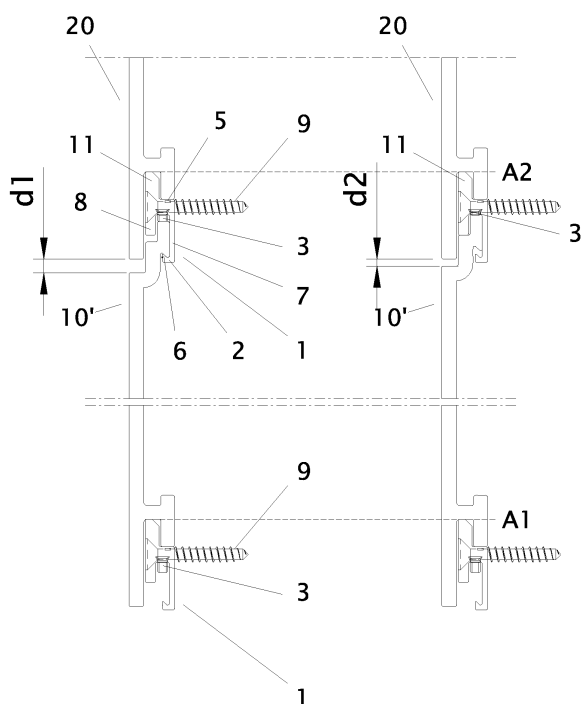
(71) Applicant: **Deceuninck NV**  
**8830 Hooglede-Gits (BE)**

(72) Inventors:  
• **De Maeyer, Erik**  
**8810 Lichtervelde (BE)**  
• **Marcinkowski, Jean-Marc**  
**59510 Forest sur Marque (FR)**  
  
(74) Representative: **Mooij, Johannes Jacobus**  
**Brevec BVBA**  
**Postbus 1514**  
**5200 BN 's-Hertogenbosch (NL)**

(54) **Fixing device and wall panel**

(57) The invention relates to a fixing device (1) for fixing wall panels (10,20) on a structure, the device comprising a body adapted to be connected to the structure, first engaging means connected to the body for engaging a first border part of a first wall panel and second engaging means connected to the body for engaging a second border part of a second wall panel, wherein the first en-

gaging means comprise a sleeve (2) defined by two guidance parts (7,8) and wherein spring means (3) are present for urging the first border part of the first wall panel away from the fixing device in the direction perpendicular to the rim of the first border part. The spring means in particular serve to lock the wall panel around an upper edge zone. The invention also relates to a wall panel (10,20), adapted to be fixed by the fixing device (1).



**FIG. 1**

## Description

**[0001]** The invention relates to a fixing device for wall panels e.g. cladding planks and in particular to a device for fixing wall panels.

**[0002]** Cladding planks are normally fixed to a building wall by brackets, which provide a hook, or clip on which the planks can be hung. Different styles of brackets have been designed to suit different types of cladding installations, and they differ in relation to the weight of the cladding and the level of security with which the cladding is to be attached to the building wall. Heavy cladding requires more robust bracket support than lighter cladding, while cladding that is to be supported high on building walls is required to be supported in an extremely secure manner against dislodgement, for obvious safety reasons. Other issues relate to the requirement or otherwise to secure the cladding against vibration, so as to minimize or eliminate noise generation, to nesting requirements between adjacent tiles to prevent ingress of rain, snow, dust etc. into the cavity between the cladding and the building wall, and to the ease with which the cladding is installed.

**[0003]** A device for fixing planks to a wall is known from e.g. Kovallex®. Kovallex describes a device for mounting a cladding plank on a wall by screwing a bracket over a ridge on top of a cladding plank, wherein the bracket also is adapted to engage the lower ridge of a cladding plank to be provided above the first cladding plank.

**[0004]** The Kovallex fixing device for fixing wall panels on a structure comprises a body adapted to be connected to the structure, first gripping means connected to the body for gripping a first border part of a first wall panel and second gripping means connected to the body for gripping a second border part of a second wall panel.

**[0005]** A known alternative for fixing façade panels to a wall is by means of screw holes or sleeves provided in the top-part of the façade panels. These panels can be fixed against a wall by screwing through those holes or sleeves. The top part of a lower façade panel is often used as a support for the next higher panel.

**[0006]** A disadvantage of the known fixing methods or elements is, that the panels are fixed in such away that transversal expansion or shrinkage is limited or even not possible at all. Transversal expansion can e.g. be caused by dilatation by increasing temperatures or, in e.g. wood comprising panels, by water absorption. Such limited possibilities for transversal expansion or shrinkage may cause a distortion of the façade formed by the panels.

**[0007]** A purpose of the present invention is to provide an element for fixing wall panels that allows transversal expansion or shrinkage of the panels.

**[0008]** This purpose is solved by the present invention in that the first gripping means comprise a sleeve defined by two guidance parts and that spring means are present for urging the first border part of the first wall panel away from the fixing device in the direction perpendicular to the rim of the first border part.

**[0009]** The fixing device according to the present invention can be used for fixing wall panels in any position; the wall panels may be fixed in a horizontal position, parallel to an oblique plane or in a vertical position. In the last mentioned position, the longitudinal direction of the wall panels may be vertical, oblique or horizontal. When the wall panels have their longitudinal direction horizontal, it is attractive when the device according to the invention fixes the transversal position of the second border part, usually the lower border part of a wall panel to be mounted above the device, herein after called the upper panel, but allows a longitudinal movement parallel to the length direction of the upper wall panel and further provides a grip around a top part of a wall panel to be mounted below the device, herein after called the lower panel, such that the lower panel is free to move parallel to the length or horizontal direction of the panel and the first border part, usually the upper border part of the lower panel is also free to move perpendicular to the length direction of the panel. The spring means in particular serve to lock the wall panel around an upper edge zone of the lower panel. This part can be a protrusion or any other shape that fits in a channel like sleeve in the fixing device. An essential part of the channel like grip is the spring system that allows the grip to be clicked around the top part of the lower panel.

**[0010]** A preferred embodiment provides the feature that the spring elements comprise resilient toe elements connected to the body and located opposite the open side of the sleeve. Although the springs may be embodied as separate spring elements, for instance as leaf spring elements or even helical spring elements, this embodiment leads to a simple production as the spring elements can be produced in one piece with the rest of the fixing element. The location opposite the open side of the sleeve provides a resilient force urging the wall element in the directions towards its other border part.

**[0011]** Although installation in other directions is not excluded, the advantages of the invention appear mostly if the first gripping means are adapted to grip the upper border part of the rim extending substantially horizontal, as the direction of the force produced by the spring elements is the same as that of the gravity.

**[0012]** Yet another embodiment provides the feature that the first gripping means are adapted to limit the movement of the rim away from the fixing device by a hook member adapted to engage a nose provided on the first wall panel. This embodiment leads to an extra fixation between the fixing element and said first wall panel, which is inter alia useful for fixation of the fixing element on the wall element during mounting to allow easier mounting.

**[0013]** There are numerous ways of fixing the fixing element to the structure, like nailing or gluing, but to allow an easy mounting the body comprises a through going hole adapted to be traversed by a fixing screw for fixing the fixing device to the structure.

**[0014]** In principle is possible to use the same kind of form locking connection between the fixing device and the

second wall panel, but the construction of the fixing device is simplified if the second gripping means comprise a protrusion adapted to be connected to a sleeve provided in a second border part of the second wall panel.

**[0015]** The fixing device according to the invention can be made out of metal, in particular out of sheet metal by known techniques like die cutting or it can be injection molded from a plastic material. Suitable materials for injection molding the device of the invention are e.g. polyamide, acrylonitril butadiene styrene (ABS) or polyoxymethylene.

**[0016]** The fixation device according to the invention is preferably used in combination with wall elements which have been specially adapted to allow these panels to be gripped by the gripping elements of the invention. Consequently the present invention provides also a wall panel, comprising a protrusion extending substantially parallel to the main plane of the wall panel which is adapted to fit into the sleeve of a fixing device.

**[0017]** To allow extra fixation between the fixing element and the wall panel, which is inter alia useful for fixation of the fixing element on the wall element during mounting to allow easier mounting, a preferred embodiment provides the feature that the wall panel comprises a nose adapted to be engaged by a hook provided on the fixing device.

**[0018]** For connection with the second engaging means of the fixing device the wall panel preferably comprises a sleeve adapted to be fitted to a nose provided on the fixation device.

**[0019]** To improve the appearance of the completed wall cladding another preferred embodiment provides a wall panel wherein a part thereof is adapted to cover at least a part of the fixing device when the wall panel is connected to the fixing device and more preferably also a part of another wall panel connected to the other side of the fixing device when two wall panels are connected with either side of the fixing device.

**[0020]** Finally the invention provides a wall cladding comprising wall panels connected with profiles of the first kind at their first border parts and profiles of the second kind at their second border parts, wherein the profiles are connected to fixing devices as subject of the present invention.

**[0021]** Other features and many attendant advantages of the invention will become more apparent upon a reading of the following detailed description together with the drawings, wherein like reference numerals refer to like parts throughout.

Fig. 1 shows a cross section through a lower and an upper façade panel fixed with devices according to the invention.

Fig. 2 is a perspective view of a fixing device according to the invention.

Fig. 3 is a perspective view of an alternative embodiment of a fixing device according to the invention.

Fig. 4 is cross section through a known upper and

lower façade panel.

**[0022]** With reference now to the drawing, and more particularly to FIG. 1 thereof, there is shown on the left hand side a lower panel 10, in a basic position A1 supported by a device according to the invention 1. The device comprises a guidance sleeve 2 for the lower panel 10 a spring 3 and guidance parts 7 and 8. A clip 6 forms in conjunction with the spring 3 and the guidance parts 7 and 8 a kind of a guidance channel for the upper part of the lower panel in which the panel can be clicked such that, although surrounded by the fixing device can freely move in the longitudinal as well as in the transversal direction. The screw hole comprises a lip 5 (not shown in Fig. 1) to keep a screw 9 in position before the device is screwed in a wall or suitable supports, such, for example, as joists, studs and wooden furring.

**[0023]** The right hand side of Fig. 1 shows the same panel, but now in an expanded position 10'. The expansion is illustrated by the smaller distance d2 with respect to the original distance d1 between the lower panel 10 and the upper panel 20. The upper part of the lower panel is kept in position by the spring 3' in the guidance channel formed by parts 2, 6, 7, and 8. The expansion of the lower panel is absorbed by compression of the spring 3', without changing the position of the higher panel, which position is determined by the support 11 formed by the upper part of the device. The position of the support 11 is determined by the position of the screw 9 only and independent from any expansion or shrinkage of the lower panel, shown by the line A2.

**[0024]** Fig. 2 is a perspective view of a fixing device 1 according to the invention, which illustrates the guidance channel for the upper part of the lower panel, formed by parts 6, 2, 7 and 8 and wherein the upper part of the lower panel can be clicked in by means of the spring 3. Fig. 2 further shows the screw hole 4 with the lip 5 to keep a screw in a pre-mounting position.

**[0025]** An alternative embodiment in steel is shown in Fig. 3 with a screw 9 that could be pre-mounted.

**[0026]** Fig. 4 is a cross section through a mounting method of a panel known in the art. The lower panel is mounted with screw 9 in the wall. The lower panel supports the higher panel via a foamed tape 12. The foamed tape permits a certain amount of expansion of the higher mounted panel. However if the lower panel is distorted in a banana-shaped manner, e.g. concave at the upper side, an efficient support of a straight higher mounted panel requires a compression of the foamed tape at the extreme ends of the lower mounted panel, such that additional compression due to transverse expansion of the higher mounted is very limited or not possible at all, reason for which a distortion of the façade formed by the panels with the known fixing system may occur.

The fixing device of the present invention on the contrary allows a straight horizontal positioning even when a lower panel is distorted in a banana shaped manner.

Although the Figures show an example of a fixing device

used in horizontally mounted wall panels, the fixing device of the invention is not limited for use in horizontally mounted wall panels, but can be applied with vertically mounted panels as well as used with panels for ceiling applications, both of which are comprised in the definition of wall panels in this description.

## Claims

1. Fixing device for fixing wall panels on a structure, the device comprising:

- a body adapted to be connected to the structure;
- first engaging means connected to the body for engaging a first border part of a first wall panel; and
- second engaging means connected to the body for engaging a second border part of a second wall panel,

**characterized in that** the first engaging means comprise a sleeve defined by two guidance parts and that spring means are present for urging the first border part of the first wall panel away from the fixing device in the direction perpendicular to the rim of the first border part.

2. Fixing device as claimed in claim 1, **characterized in that** the spring means comprise resilient toe elements connected to the body and located opposite the open side of the sleeve

3. Fixing device as claimed in claim 1 or 2, **characterized in that** the first engaging means are adapted to engage the upper border part of which the rim extends substantially horizontal.

4. Fixing device as claimed in claim 1, 2 or 3, **characterized in that** the first engaging means are adapted to limit the movement of the rim away from the fixing device by a hook member adapted to engage a nose provided on the first border part of the first wall panel.

5. Fixing device as claimed in any of the preceding claims, **characterized in that** the body comprises a through going hole adapted to be traversed by a fixing screw for fixing the fixing device to the structure.

6. Fixing device as claimed in any of the preceding claims, **characterized in that** the second gripping means comprise a protrusion adapted to be connected to a sleeve provided in a second border part of the second wall panel.

7. Fixing device as claimed in any of the preceding

claims, **characterized in that** the fixing device has been made from plastic.

8. Fixing device as claimed in any of the claims 1-6, **characterized in that** the fixing device has been made from sheet metal.

9. Wall panel, **characterized by** a protrusion at its first border part extending substantially parallel to the main plane of the wall panel which is adapted to fit into the sleeve of a fixing device.

10. Wall panel as claimed in claim 9, **characterized by** a nose at its first border part adapted to be engaged by a hook provided on the fixing element.

11. Wall panel as claimed in claim 9 or 10, **characterized by:** a sleeve at its second border part, adapted to be engaged by a nose provided on the fixing element.

12. Wall panel as claimed in claim 11, **characterized in that** a cover part at its second border part of the wall panel is adapted to cover at least a part of the fixing device when the wall panel is connected to the fixing device.

13. Wall panel as claimed in claim 12, **characterized in that** the cover part of the wall panel is adapted to cover at least a part of another wall panel connected to the first engaging means of same fixing device.

14. Wall cladding comprising wall panels as claimed in any of the claims 9-13, being connected with fixing devices as claimed in any of the claims 1-8.

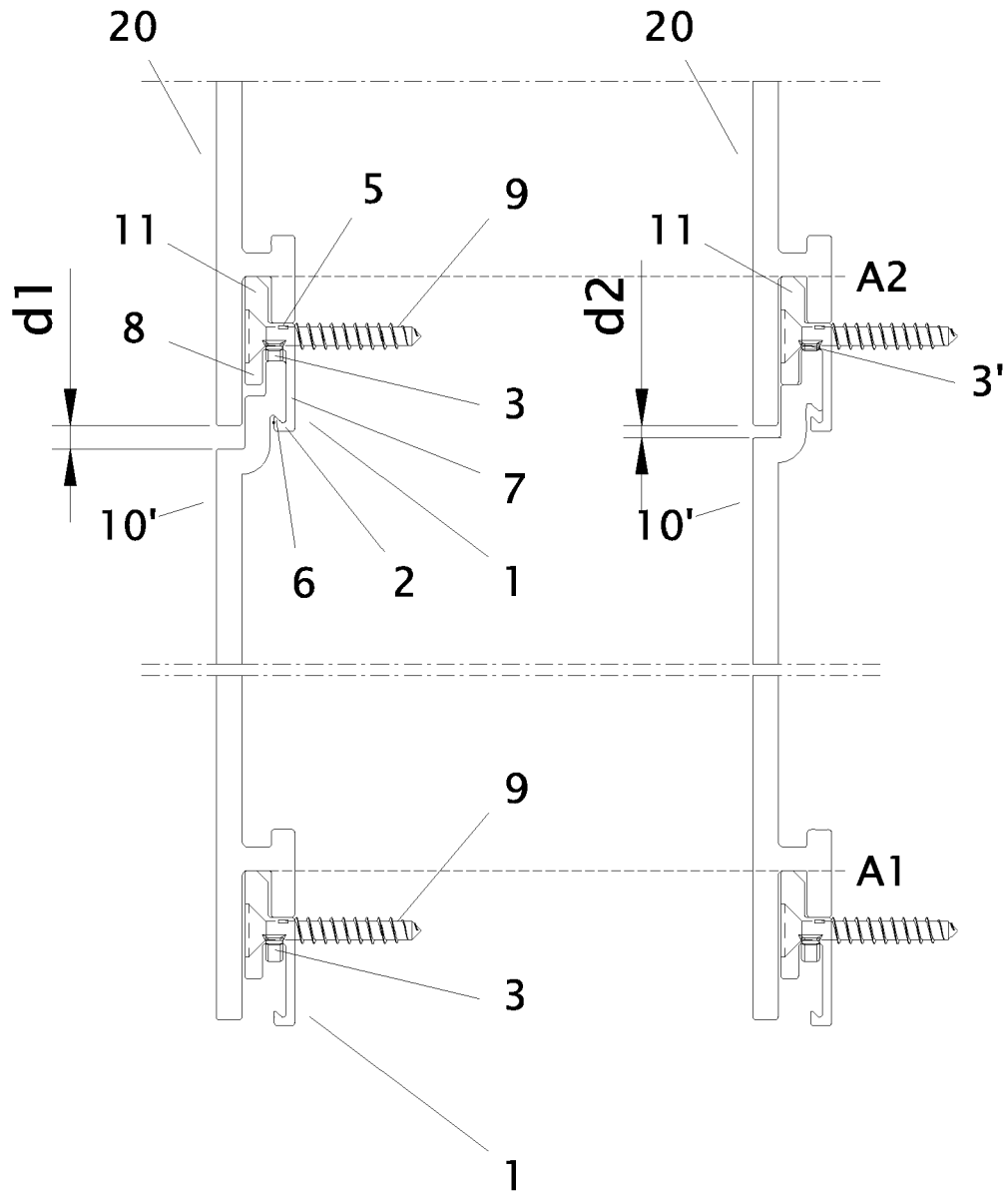


FIG. 1

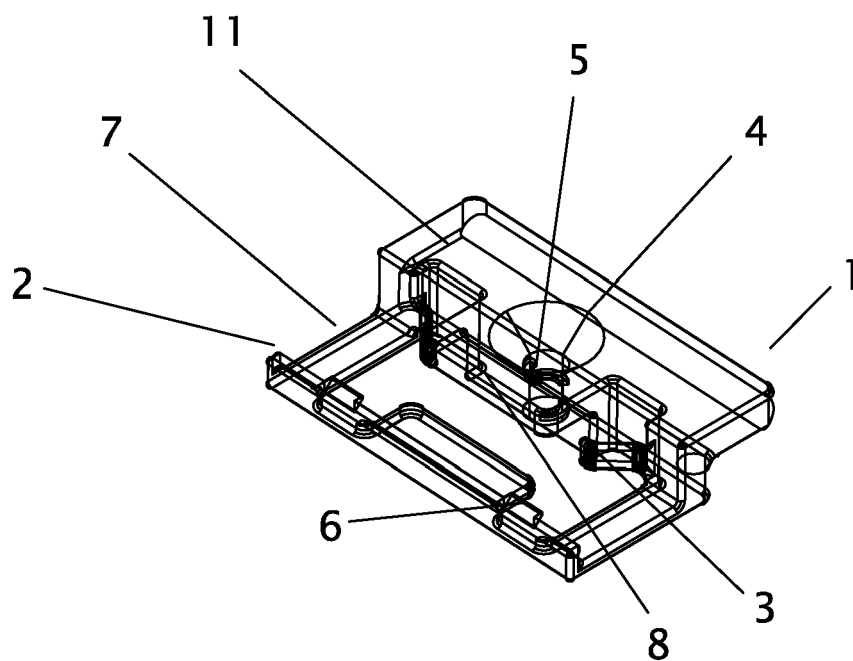


FIG. 2

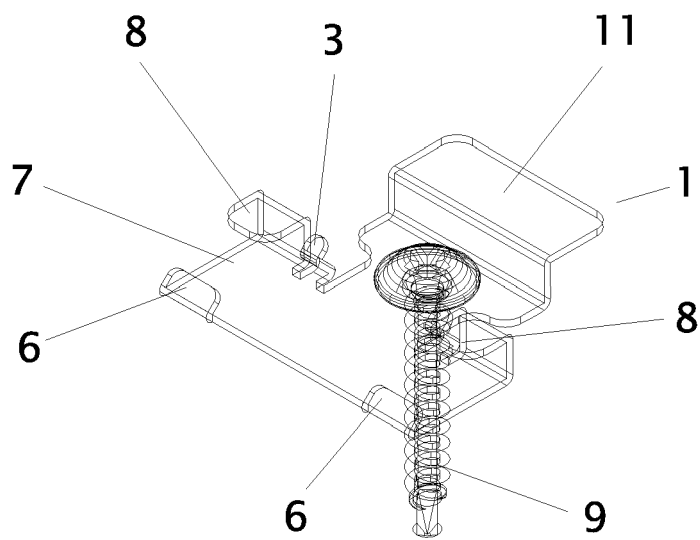


FIG. 3

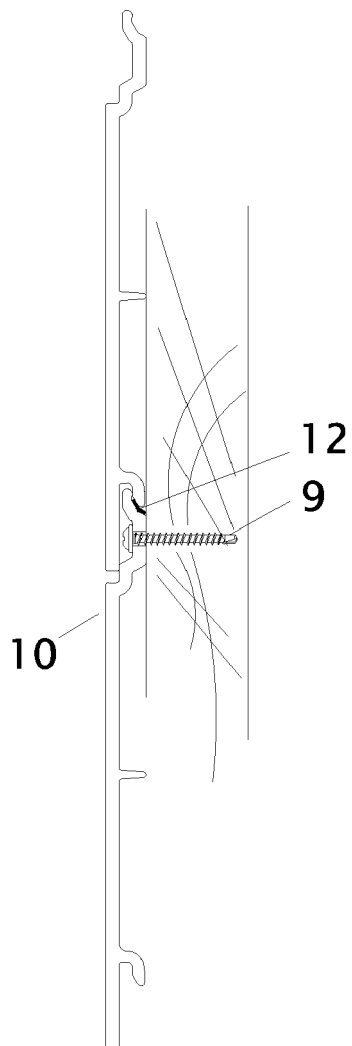


FIG. 4





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Application Number  
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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