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(54) **Mounting element for suspending at a distance a façade covering on a wall of a building**

(57) Mounting distance (1) for mounting of suspension mounted façade coverings (20) on a wall of a building, which mounting distance (1) comprises a first (2) and a second (3) essentially planar elongate leg, the first leg (2) having a first length (L1) and a first width (W1), and the second leg having a second length (L2) and a second width (W2) and being arranged to each other to form an elongate thin plate structure having an L-shaped cross-section (4), wherein the first leg (2) has a length (L1) being essentially equal to the length (L2) of the second leg (3), and wherein the first leg (2), and the second leg (3), respectively, in a part (2a, 3b) is bent essentially perpendicular to its plane such that both legs (2, 3) after bending are of essentially the same length, and bent together providing a two-layered supporting mounting plate (4) for mounting the mounting distance (1) to the wall.

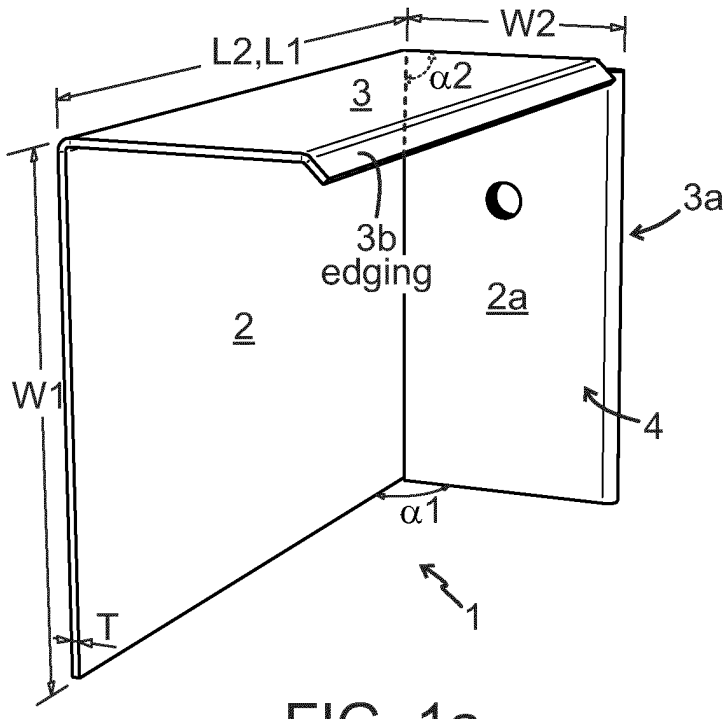

FIG. 1a

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Description

[0001] The invention relates to a mounting distance for suspension mounting of a façade covering, in particular a mounting distance that is part of a façade covering system, wherein the mounting distance is arranged to be attached to a wall of a building for suspension mounting of a façade covering, for instance of façade tiles, or façade stones on the wall, especially stones of the type that includes horizontally elongated façade tiles of a stone material. In particular, the distance is provided for also supporting or being part of a supporting structure for suspension mounting of a façade covering on the wall wherein the façade covering is suspension mounted with a particular distance to the wall. A plurality of mounting distances are provided for carrying the façade covering and the number vary depending on type and in particular the weight of façade covering, wherein a heavier façade covering requires a higher number of mounting distances than a lighter one.

[0002] Such façade coverings and façade covering systems are known from e.g. EP 1 027 507 B1 and EP 0 556 264 B1.

[0003] Typical façade tiles or façade stones that are part of this disclosure have a rectangular shape and usually have a larger width than height. Typically, the stones measures 600*100 mm, but there is also a demand for larger stones, why stones with doubled height, i.e. which measures 600*200 mm have been made available. The tiles or stones are mounted such that the façade is ventilated, in that the tiles or stones are mounted at a distance from the wall, for instance 250 mm by means of the mounting distances. This distance provides a ventilated space to the façade but may also contain insulation material, for instance 200 mm insulation material such as glass wool and a 50 mm free ventilated space in which air may enter for ventilation thereof.

[0004] The weight of the stones requires that once they are mounted they have to be well anchored to the wall and the supporting structure including the mounting distances must have enough strength to suspension mount the façade tiles or stones, which façade may have a weight of 50 kg/m^2, or even more.

[0005] Because of the weight of the façade tiles or façade stones, the supporting structure, in particular the mounting distance which may face a quite large bending torque must have considerable strength, in particular section modulus, to carry the weight of the façade covering and the part of the supporting structure attached to the mounting distance, the latter being attached to the wall of the building, also during a long period of time, typically decades of years without causing problems due to tiles or stones moving, typically hanging down because of the heavy weight, which may cause problems such as water leakage, stones, or tiles coming loose etc. Also other types of façade coverings such as sheet steel façades require good anchoring even though they usually are lighter than stone façades for instance to handle movements due to cold, heat, water and wind.

[0006] Also easy and quick handling of the supporting structure including the mounting distance during mounting of the façade are desirable features, i. e. it is often a requirement that the mounting distance is easy to mount to the wall, for professionals as well as for non-professionals, and is not to heavy, but nevertheless has considerable strength.

[0007] The invention provides a mounting distance that includes improvements with respect to the prior art considering the life time, handling and price.

Short description

[0008] The invention relates to a mounting distance for mounting of suspension mounted façade covering tiles on a wall of a building. The mounting distance comprises a first and a second essentially planar elongate leg, wherein the first leg has a first length and a first width, and the second leg has a second length and a second width and being arranged to each other to form an elongate thin plate structure having an L-shaped cross-section. The first leg has a length that is essentially equal to the length of the second leg, and wherein the first leg, and the second leg, respectively, in a part is bent essentially perpendicular to its plane such that both legs after bending are of essentially of the same length, and folded together providing a two-layered supporting mounting plate for mounting the mounting distance to the wall.

[0009] The mounting distance is typically made of thin plate, such as thin sheet steel of 0.5 - 1.5 mm thickness. Herein, the term "thin plate" means a thickness between 0.5 - 3 mm, preferably 0.5 - 1.5 mm.

[0010] By means of the mounting distance according to the invention the object is achieved that the suspension mounted façade covering, and façade system components comprised therein, is prevented from moving, at least to the extent that the façade covering is damaged. The mounting distance according to the invention is strong due to the two-layered mounting plate attaching the mounting distance to the wall and the strong L-shaped cross-section in the part of the mounting distance extending from the wall. The mounting distance is also cheap to manufacture and simple to handle compared to presently known prior art mounting distances because of the thin plate, which is cheap and simple and easy to handle (for instance due to low weight) and machine (easy to drill holes and cut using hand-held tool) compared to known mounting distances which normally have to be thicker to provide the same strength. Because of that, they will be more expensive (more material is required), heavier (more difficult to handle) and thicker (more difficult to machine using hand-held tools such as drilling machine, plate shears etc.).

[0011] Since the mounting distance is made of thin plate, it can be machined, for instance cut with hand-held cutting tools, such as plate shears. It is also easy to attach other supporting means such as crossbars, mounting

profiles etc. since it is easy to use conventional fastening means such as screws, rivets, or the like suitable for thin sheet metal.

[0012] Other advantages of the invention will appear from the detailed description and from the dependent claims.

Short description of the figures

[0013] Below the invention is described in terms of specific embodiments with reference to the accompanying drawings, of which:

Figure 1a shows a perspective view of a mounting distance according to one embodiment of the invention;

Figure 1b shows a simplified perspective view of a mounting distance according to an alternative embodiment of the invention, wherein the legs have the same length but different width;

Figure 1c shows a simplified perspective view of a mounting distance according to yet an alternative embodiment of the invention, wherein both legs have the same length and width;

Figure 2a shows a side view of a front side of the mounting distance shown in figure 1 with the mounting plate intended to be mounted to the wall at the right;

Figure 2b shows a rear view of the mounting plate of the mounting distance shown in figure 1 a and 1 c;

Figure 2c shows a side view of s rear side of the mounting distance shown in figure 1a and 1c;

Figure 3 shows a sheet metal precursor before bending to form the distance mounting of figure 1a;

Figure 4 shows a vertical side section of the mounting distance shown in figure 1a, 1b or 1c mounted to a wall of a building; and

Figure 5 shows a perspective view of the mounting distance shown in figure 1a, mounted to a cross-bar and mounting profile with façade stones arranged upon it.

Detailed description of the shown embodiments

[0014] In the following detailed description an embodiment of a mounting distance according to the invention is described, arranged to be part of a mounting system of or supporting structure arranged to carry façade tiles or stones, as well as a façade covering of sheet metal or other suitable material such wooden material. For a façade covering, a suitable number of mounting distances are used, for instance depending on the size and weight of the façade being mounted according to instructions.

[0015] The invention relates to a mounting distance that in the drawing figures is exemplified by a mounting distance 1 for mounting of suspension mounted façade covering stones on a wall of a building. The mounting distance 1 comprises a first 2 and a second 3 essentially planar elongate leg, or flange, typically made a corrosion protected sheet metal having a thickness t of 0.5 - 1.5 mm. The first leg 2, herein this figure shown extending in a horizontal direction has a first length L1 and a first width W1, herein shown extending in a vertical direction, and the second leg has a second length L2, herein shown extending in a horizontal direction and a second width W2, herein also extending in a horizontal direction. The legs 2 and 3 are arranged to each other, in particular bent of one and the same sheet metal to form an elongate thin plate structure having an L-shaped cross-section T. The first length L1 is essentially equal to the second length L2, and the first leg 2, and the second leg 3, respectively, in a part 2a, 3a is bent essentially perpendicular to its plane such that both legs 2, 3 after bending are of essentially the same length, and bent together forming a two-layered supporting mounting plate 4 for mounting the mounting distance 1 to the wall. The first leg 2 is bent inwards approximately at a first angle α_1 90° to its plane and the second leg 3 is bent approximately downwards 90° at a second angle α_2 to its plane (See figure 2a). In this way, a two-layered mounting plate 4, for mounting the mounting distance to a wall (not shown in this figure) of a building (not shown in this figure) having a doubled thickness $t_2 = 2*t_1$ which has improved strength compared to a single layer mounting plate by acting as a reinforcing and supporting washer is provided. To further increase the strength, the mounting plate 4 may be riveted, or even welded at one or more locations (not shown). In the embodiment shown in this figure, the mounting plate 4 is prepared with mounting means 5, herein a hole typically having a diameter of 8 - 10 mm, for receiving mounting means such as a screw (not shown) that can be screwed into the wall of the building. Also the hole 5 and the mounting means provide further strength to the mounting distance 1 when mounted. The hole 5 may be provided at any suitable location, typically displaced to the other leg for improved strength. Typically, the hole can be located about 25-45 mm from an inner corner 3b of the legs (See figure 2b).

[0016] To further increase strength, one or both of the legs 2, 3 may be provided with further reinforcements such as grooves, indentations or the like.

[0017] Figures 1b and 1c, respectively shows alterna-

tive widths W1, W2 of the legs 2, 3, for instance the first width W1 about 100 mm, the second width W2 about 70 mm; or the first width W1 about 80 mm, the second width W2 about 70 mm. Both legs 2, 3 may also have the same width, for instance 80 mm, i. e. W1 = W2, as shown in figure 1c.

[0018] Now is referred to figure 3 showing a sheet metal precursor 1' before bending to form the distance mounting 1. Bending lines are marked with dashed lines and labelled "bending lines". An indentation is also shown and marked "cut". A typical length L1, L2 of the sheet metal precursor 1' is about 100 + 150 mm = 250 mm and a typical width W1 + W2 is about 100 + 50 mm = 150 mm. The sheet metal is made of 0.5 - 3.0 mm, preferably 1.5 mm, sheet metal Aluzink according to AZ 185 DIN (Deutsche Industrie Norm) 10142, 10147 or any other suitable corrosion protected sheet metal or a composite material.

[0019] Figure 4 shows the mounting distance 1 of figure 1a mounted to a wall 20 of a building 22. The fastening means 21, herein a screw, is screwed into the wall 20 securing the mounting distance by means of the screw going through the hole 5 and thus the mounting plate 4, made up of both legs 1 and 3.

[0020] Now is referred to figure 5, showing the mounting distance 1 of figure 4 mounted to a wall 22 of a building 22 and mounted to a cross-bar 24 by means of fastening means such as screws 24a fastening the cross-bar 24 onto an upper side of the mounting distance 1, herein the second leg 3 of the mounting distance 1. To the cross-bar 24, façade covering stones 23 are mounted. Each façade covering stone 23 has a rectangular front side 25 that is adapted to be face out from a building and constitute the visible part of the façade of the building. The rear side 26 of the stone 23 has a downwardly directed supporting means (not shown) for suspension mounting of the stone and on the front side of the stone there is an allowance (not shown) and a downwardly directed tongue (not shown). The façade covering stones 23 are adapted to be placed the one over the other on a wall of a building 22 with vertical adjacent stones overlapping each other with their upper and lower edges in such a way that the tongue of each stone extends into the allowance of the downwardly adjacent stones. Such stones are known per se and are therefore not described in detail here. The invention is by no means limited to façade stones, but also comprises other types of façade covering material such as façade tiles, or other board materials such as façade board in large size, as well as also sheet metal (plates), also for indoor use. Also the supporting structure, but (not) the mounting distance 1 according to the invention is known and will therefore not be described in more detail.

[0021] Above, the invention has been described with reference to shown and not shown embodiments. These embodiments are however not limiting for the invention, which instead is only limited by the appended claims.

Claims

1. Mounting distance (1) for mounting of suspension mounted façade coverings of a building, which mounting distance (1) comprises a first (2) and a second (3) essentially planar elongate leg, the first leg (2) having a first length (L1) and a first width (W1), and the second leg having a second length (L2) and a second width (W2) and being arranged to each other to form an elongate thin plate structure having an L-shaped cross-section (4)
characterised in that the first leg (2) has a length (L1) being essentially equal to the length (L2) of the second leg (3), and wherein the first leg (2), and the second leg (3), respectively, in a part (2a, 3a) is bent essentially perpendicular to its plane such that both legs (2, 3) after bending are of essentially the same length, and bent together providing a two-layered supporting mounting plate (4) for mounting the mounting distance (1) to the wall.

2. Mounting distance according to claim 1, **characterised in that** the second leg (3) is also bent in its length (L1) in an outer part (3b).

3. Mounting distance according to claim 2, **characterised in that** the second leg (3) is bent 30-45 degrees to its plane (2') in the outer part (2b).

4. Mounting distance according to any of the previous claims, **characterised in that** the first width (W1) is wider than the second width (W2).

5. Mounting distance according to any of the previous claims, **characterised in that** the first width (W1) is essentially equal to the second width (W2).

6. Mounting distance according to any of the previous claims, **characterised in that** the mounting plate (4) is provided with mounting means (5).

7. Mounting distance according to claim 6, **characterised in that** the mounting means (5) is a hole for receiving fastening means.

8. Mounting distance according to claim 7, **characterised in that** the mounting means (5) is positioned in an outer upper part (4a) of the mounting plate (4).

9. Mounting distance according to any of the previous claims, **characterised in that** the mounting distance (1) is made in one piece.

10. Mounting distance according to claim 9, **characterised in that** the mounting distance (1) is made of sheet metal up to 1, 5 mm in thickness.

11. Mounting distance support according to claim 9,

characterised in that the mounting distance (1) is made of a laminate material.

12. Mounting distance according to claim 10, **characterised in that** the mounting distance (1) is made of corrosion protected sheet metal up to 1, 5 mm.

13. Mounting distance according to claim 12, **characterised in that** the mounting distance (1) is made of aluminium galvanized sheet metal.

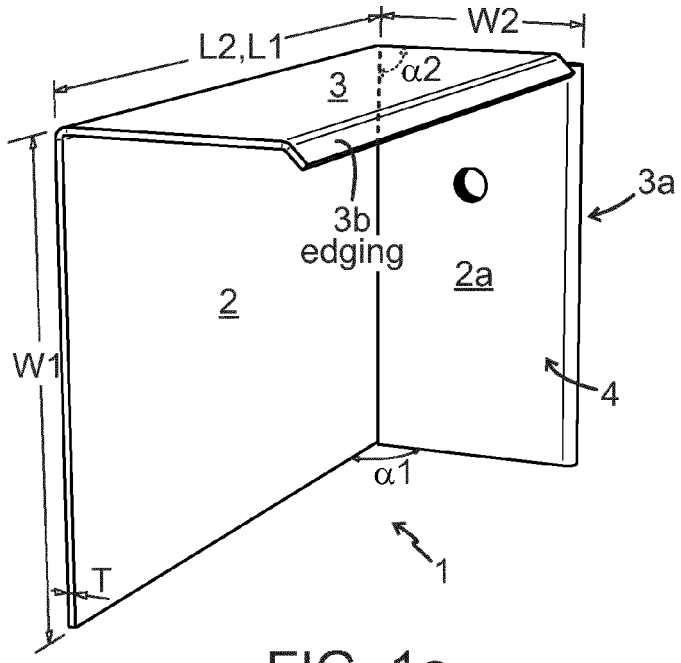

FIG. 1a

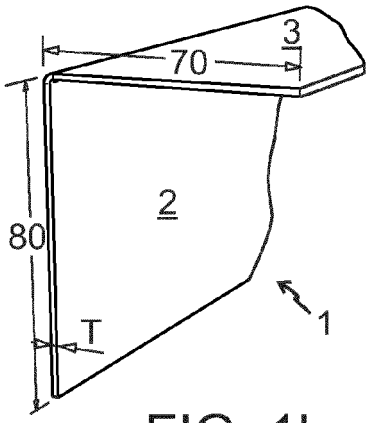

FIG. 1b

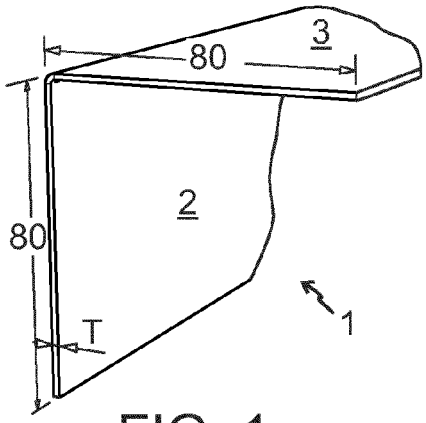

FIG. 1c

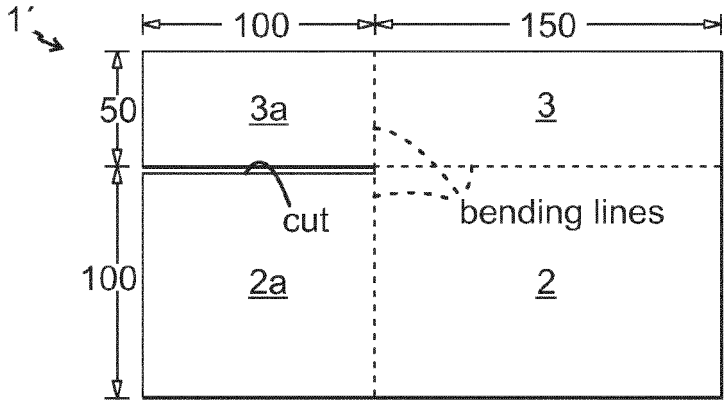

FIG. 3

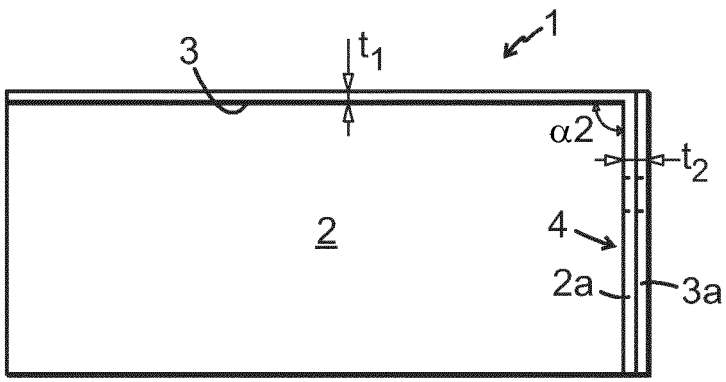

FIG. 2a

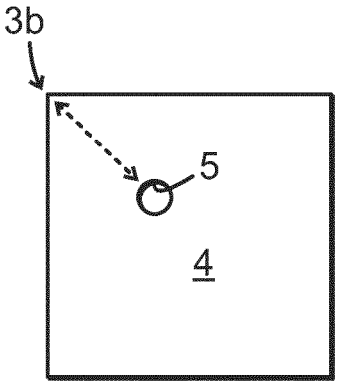

FIG. 2b

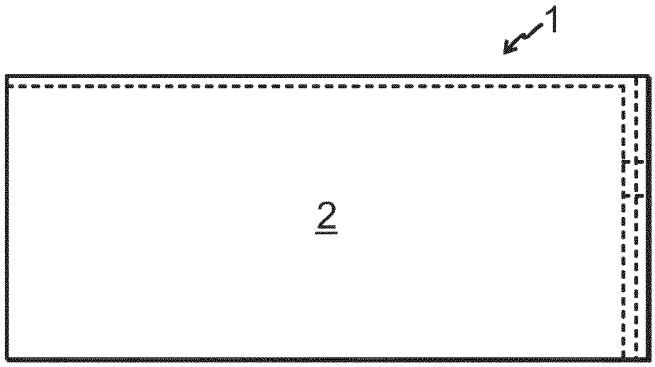

FIG. 2c

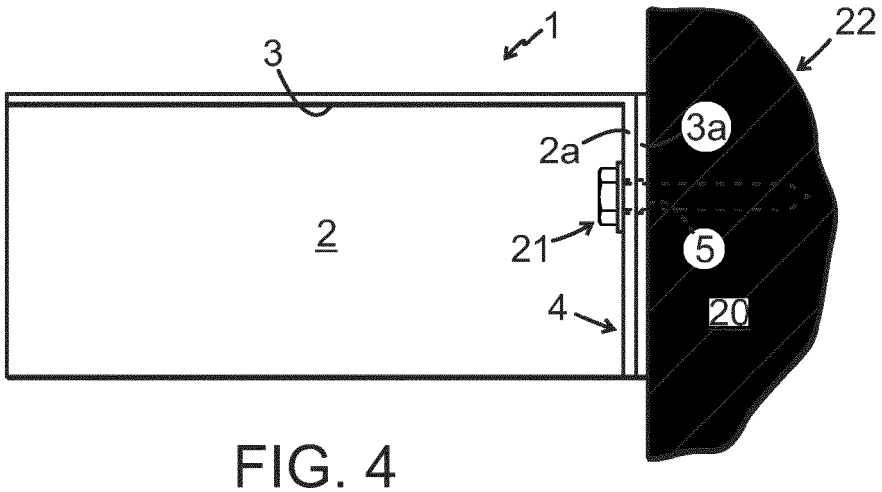

FIG. 4

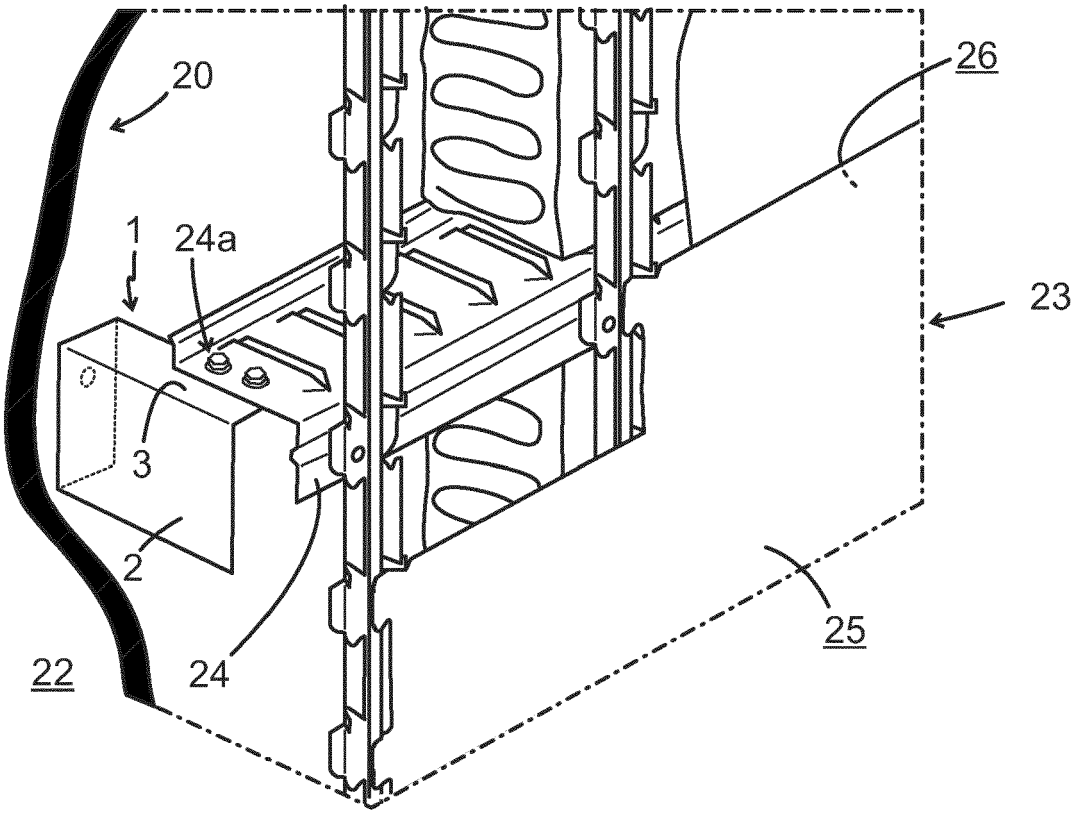

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 5997

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y A	FR 2 924 138 A1 (SAINT GOBAIN ISOVER SA [FR]) 29 May 2009 (2009-05-29) * page 10, line 27 - line 32 * * page 11, line 1 - line 3 * -----	1,4-8, 10,12 9 2,3,11, 13	INV. E04F13/08
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TECHNICAL FIELDS SEARCHED (IPC)

E04F
E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 July 2015	Estorgues, Marlène

CATEGORY OF CITED DOCUMENTS

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08-07-2015

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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