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(54) **Hinge connection for a screen structure**

(57) The present invention relates to a screen structure comprising a first structure element, such as a roof structure beam (1) with angle of inclination (β), and a second structure element (2), such as a gutter profiled section (2), which is connected to the first structure element (1) by means of a hinge connection (8, 9) that permits the connected structure elements (1), (2) to rotate with respect to one another, so as to change the angle of inclination (β), while the hinge connection also permits the connected structure elements (1), (2) to be moved in translation with respect to one another in at least two different translational directions (T_1), (T_2). As a result, the position of the structure elements with respect to one another can be changed even after they have been connected, for example in order to correct dimensional tolerances. This makes installation easier and quicker.

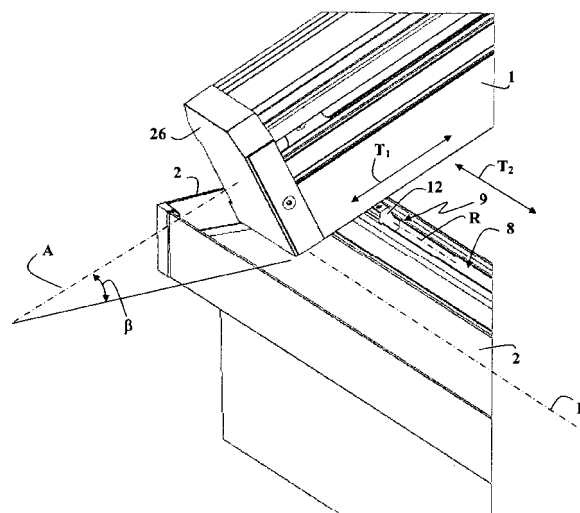


FIG. 1

Description

[0001] The present invention relates to a screen structure comprising a first structure element which, forming part of a roof structure, is positioned at an angle of inclination and a second structure element, which is connected to the first structure element by means of a hinge connection that permits the connected structure elements to rotate with respect to one another, so as to change said angle of inclination.

[0002] More specifically, the present invention relates to a terrace covering, an awning or a pergola, provided with a hinge connection of this type between a sloping roof structure element and another structure element.

[0003] Screen structures of this type are generally set up to protect an outdoor location from adverse weather conditions. For example, screen structures of this type are often set up at domestic dwellings, restaurants, shops and the like to protect an outside terrace or a location at which goods for sale have been set up from sun, precipitation and wind.

[0004] In the existing screen structures having the properties listed in the first paragraph of this description, the angle of inclination of the roof structure element can be adjusted. However, these screen structures are not easy to install. The existing structures (such as walls and the like) to which structure elements of the roof section are attached often have dimensional changes, curves or other inadequacies that have to be dealt with by modifying the screen structure. This means that the hinge connection has to be positioned in situ with respect to the structure elements before they can be connected to the structure elements. The measurements, adjustments and installation work required represent a considerable delay to installation of a screen case of this type.

[0005] The object of the present invention is to alleviate the abovementioned problems by developing a screen structure that can be installed more easily and more quickly.

[0006] These objectives are achieved by providing a screen structure having the features listed in the first paragraph of this description, the hinge connection of which is also intended to permit a translational movement of the connected structure elements with respect to one another in at least two different translational directions, wherein the hinge connection comprises a hinge element that is rotatably connected to one structure element,

- wherein this structure element comprises a channel extending in a first translational direction, while the hinge element comprises a rotational body held in the channel, or
- wherein, alternatively, the hinge element comprises a channel extending in a first translational direction while this structure element comprises a rotational body held in the channel,

wherein this rotational body is rotatable in the channel

about an axis of rotation extending in the longitudinal direction of the channel,

wherein the rotational body is slidable in the longitudinal direction of the channel, so as to allow a translational movement of the hinge element and this structure element with respect to one another in the first translational direction, and

wherein the hinge element is connected to the other structure element in such a way as to allow a translational movement of the hinge element and this other structure element with respect to one another in a second translational direction.

[0007] In this way, the position of the structure elements with respect to one another can still be changed in at least two different directions even after these structure elements have been connected to one another. The structure elements can therefore be connected to one another at the outset by means of the hinge connection, and yet their position with respect to one another can still be changed thereafter in order to compensate for dimensional tolerances. This positioning of connected structure elements is easier and can be carried out much more quickly than the adjustment work that previously had to be carried out. As a result, the installation of a screen structure of this type can be carried out much more quickly and easily. Moreover, any incorrect positioning can be corrected at any time.

[0008] After the structure elements have been correctly positioned with respect to one another, the structure elements can be fixed in the correct position with respect to one another by preventing the abovementioned translational movements with the aid of simple blocking means. Said translational directions are preferably directions that are perpendicular to one another.

[0009] A hinge connection of this type comprises a minimal number of simple components which are easy to assemble. For example, it is sufficient for the rotational body of the hinge element to be slid within said channel in order to realize the rotational connection of the hinge element to one of the structure elements.

[0010] In a preferred embodiment, the hinge element comprises an elongate passage or slot which extends in the second translational direction, while the other structure element comprises a sliding body which is held in this passage or slot, or the other structure element comprises an elongate passage or slot which extends in the second translational direction, while the hinge element comprises a sliding body that is held in this passage or slot.

[0011] In a highly preferred embodiment, the first structure element is a sloping beam of a roof structure, while the hinge connection is intended to move the connected structure elements with respect to one another in a first direction that is transverse to the longitudinal axis of the beam and in a second direction that coincides with or is parallel to said longitudinal axis.

[0012] This greatly facilitates the connection of the sloping beams to other structure elements, such as a

horizontally running supporting structure component.

[0013] In a particular embodiment, the structure elements are rotatable with respect to one another about an axis of rotation extending in one of said translational directions. The second structure element is preferably a gutter profiled section, while the second translational direction coincides with or is parallel to the longitudinal axis of the gutter profiled section.

[0014] The passage and the rotational body should ideally have a substantially cylindrical, complementary shape, so as to allow easy and continuously variable rotation of the hinge element with respect to the structure element.

[0015] Furthermore, it is also possible to provide blocking means in order to hold the rotational body in a specific translational position in the channel. This blocking means comprises, for example, a locking screw or locking bolt which fixes the hinge element in the channel, or a blocking means which fits into the channel and can be fixed in the channel in a position adjoining the rotational body, in order to prevent displacement of the structure element in the longitudinal direction of the channel.

[0016] The invention will now be explained in more detail on the basis of the following more detailed description of a preferred embodiment of a screen structure provided with a hinge connection according to the present invention. This accurate description of these illustrative examples is intended only to provide an illustration of the basic features of the invention and of further advantages and details of this screen structure. Therefore, this description cannot be considered to restrict the scope of protection or the application area of the invention.

[0017] This more detailed description refers to the accompanying drawings by means of reference symbols. In the drawings:

■ **Figure 1** shows a perspective illustration of the connection of one of the beams to the gutter profiled section of a screen structure according to the present invention,

■ **Figure 2** shows a vertical cross section through the connection shown in Figure 1, in the direction of the longitudinal axis A of the beam,

■ **Figure 3** shows a perspective illustration of the arrangement shown in Figures 1 and 2 with the beam removed, so as to show the various elements of the hinge connection,

■ **Figure 4** shows a front view of the beam from which the covering plate has been removed, as seen in the direction of arrow P in Figure 2,

■ **Figures 5a, 5b and 5c** show a perspective illustration of a number of components of the hinge connection according to the present invention, namely a hinge piece, a connecting piece and a blocking pin,

■ **Figure 6** shows a perspective illustration of another embodiment of a hinge piece for this hinge connection.

[0018] In one particular embodiment, the screen structure according to the invention comprises a roof structure consisting of a covering material, such as a screen and/or one or more panel-like elements (for example made from glass). The screen may comprise one or more strips of flexible material which can be rolled up and unrolled on a respective screen roller.

[0019] The roof section comprises a sloping support structure for supporting the roof-forming section and comprises a number of sloping beams (1), which at one end are attached via a wall profile section (not shown in the figures) or via supports to a wall or other such structure and, sloping downwards from this wall or structure, at the other end are connected to a gutter profiled section (2) that is attached to a front bar (3). Figures 1 and 2 show the connection of one of these sloping beams (1) to the gutter profiled section (2). The beam (1) and the gutter profiled section (2) are only shown in part here.

[0020] The beams (1) may be provided with guide means for guiding, for example, the lateral sides of a screen made from flexible material while it is being rolled up and unrolled. Beams of this type are also known as side guides.

[0021] The front bar (3) is supported in a horizontal position by a supporting structure (not shown in the figures), such as a number of columns or poles. This front bar (see Figure 2) comprises panel-like wall elements (4), which form a bar-like element and enclose an internal space (5) in which a screen roller (not shown) can be provided. This front bar (3) then also functions as a screen case. The screen provided on this screen roller, in the unrolled state, forms a vertical wall of the screen structure. In the bottom wall (4) of the front bar (3) there is an elongate opening for this screen to pass through. This opening can be closed off by means of a closure plate (6) for screen structures in which there is no need to provide a screen roller in the front bar (3).

[0022] The gutter profiled section (2) is attached to the top side of the front bar (3). This gutter profiled section (2) extends over the entire length of the front bar (3) and is provided for the purpose of draining off precipitation water.

[0023] The sloping beam (1) of the roof structure is connected to the gutter profiled section (2) by means of a hinge connection (8, 9). For this purpose, a channel (8), which extends along the longitudinal axis (B) of the gutter profiled section (2) and has a substantially cylindrically curved wall and an open top side, is provided in an edge section of the gutter profiled section (2).

[0024] Furthermore, this screen structure also comprises a hinge piece (9) which in a first embodiment (see Figure 5a) comprises a connecting body (10) that is substantially bar-shaped, with a low height and an approximately flat top side and bottom side. The connecting body (10) comprises a passage (11) which extends along the longitudinal axis of the connecting body (10), parallel to the longitudinal axis (B) of the gutter profiled section (2). The passage (11) has a substantially rectangular profile

with rounded side walls, so as to obtain a flattened tube shape. At one of the longitudinal sides of the connecting body (10) extending parallel to the passage (11) there is a rotational body (12) which is formed integrally with the connecting body (10) and likewise extends along the direction of the passage (11). The rotational body (12) is in the form of an elongate rib with a bottom section that has a substantially cylindrically curved surface. The rotational body (12) has a greater height than the connecting body (10) and extends over the same length.

[0025] In an alternative embodiment (see Figure 6), the rotational body (12) is of a greater length than the connecting body (10) and the rotational body (12) extends beyond the connecting body (10) on one side. In this case too, the rotational body (12) has a substantially cylindrically shaped bottom section, and the connecting body (10) has a flattened tube shape with a passage (11) as described above.

[0026] The rotational body (12) of the hinge piece (9) is accommodated in the channel (8) of the gutter profiled section (2), as can be seen most clearly from the vertical cross section shown in Figure 2 and from Figure 3.

[0027] As can be seen from Figure 4, the beam (1) comprises a core section (13) having a bottom wall (13a) in which two holes are provided. A connecting piece (14) (shown in Figure 5b) is attached to the underside of the beam (1) by means of bolts (19a), (20a) and associated nuts (19b), (20b). A covering plate (26) is attached to the front side of the beam (1) (see Figure 1).

[0028] The connecting piece (14) has a flat rectangular base (15) in which two openings (16) are provided and two parallel upright flanks (17) which, forming a right angle, adjoin the base (15). Respective openings (18) are provided in these parallel flanks (17). The two bolts (19a), (20a) fit through the openings (16) of the connecting piece (14) and through the holes in the bottom wall of the beam core section (13). The base (15) of the connecting piece (14) is placed against the bottom wall (13a) of the beam core section (13), with the flanks (17) directed downwards.

[0029] The connecting piece (14) may also form part of a roof structure element (1), in which case it is either formed integrally with the structure element (1) or is attached to the structure element (1) by means of non-releasable securing means, for example by welding.

[0030] The openings (18) in the flanks (17) of the connecting piece (14), are provided opposite one another, so that they are in line with one another on an axis extending parallel to the base (15).

[0031] A bolt shank (22), which extends through the flank openings (18) of the securing piece (14) and belongs to a bolt (21), extends between the two flanks (17). This bolt is introduced from one flank (17) (the right-hand flank in Figure 4) into the openings (18) and its threaded bolt shank is screwed into the opening (18) in the other flank (17) (the left-hand flank in Figure 4), which has of course previously been provided with a mating screw thread.

[0032] The beam (1) is connected to the hinge piece (9) by virtue of the bolt shank (22) connected to the beam (1) via the connecting piece (14) extending through the passage (11) in the securing body (10) of the hinge piece (9) in the zone between the two flanks (17) of the connecting piece (14). The passage (11) extends in the direction of the longitudinal axis (B) of the gutter profiled section, which is also perpendicular to the longitudinal axis (A) of the beam (1).

[0033] By virtue of the passage (11) being wider than the width of the bolt shank (22), this bolt shank (22) can be displaced in the width direction of the passage (11) of the hinge piece (9). This is in the direction (T_1) of the longitudinal axis (A) of the beam (1), and also perpendicular to the direction of the longitudinal axis (B) of the gutter profiled section (2), as can be seen in Figures 1 and 2. The beam (1) can therefore be moved in this direction (T_1) with respect to the gutter profiled section (2).

[0034] By virtue of the hinge piece (9) being slidable in the channel (8), the beam (1) can also be moved with respect to the gutter profiled section (2) in the longitudinal direction (T_2) of the gutter profiled section (2) and the channel (8).

[0035] To fix the position of the hinge piece (9) in the channel (8) a cylindrical blocking pin (23) is provided (see Figures 3 and 5c) which can be placed in the channel (8) and can be fixed in the channel (8) by means of a locking screw (24), in a position in which it adjoins the rotational body (12).

[0036] In the hinge piece (9) shown in Figure 6, a hole (25) is provided in that part of the rotational body (12) which extends beyond the connecting body (10), to receive a locking screw or locking bolt by which the hinge piece (9) can be fixed in the channel (8).

Claims

1. Screen structure comprising a first structure element (1) which, forming part of a roof structure, is positioned at an angle of inclination (β) and a second structure element (2), which is connected to the first structure element (1) by means of a hinge connection (8, 9) that permits the connected structure elements (1), (2) to rotate with respect to one another, so as to change said angle of inclination (β), **characterized in that** the hinge connection is also provided so as to permit a translational movement of the connected structure elements (1), (2) with respect to one another in at least two different translational directions (T_1), (T_2), **in that** the hinge connection comprises a hinge element (9) that is rotatably connected to one structure element (1), (2)

- wherein this structure element comprises a channel (8) extending in a first translational direction (T_2), while the hinge element (9) com-

prises a rotational body (12) held in the channel (8), or
 - wherein, alternatively, the hinge element (9) comprises a channel extending in a first translational direction (T_2) while this structure element comprises a rotational body held in the channel,

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while this rotational body (12) is rotatable in the channel (8) about an axis of rotation (R) extending in the longitudinal direction of the channel (8),

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in that the rotational body (12) is slidable in the longitudinal direction of the channel (8), so as to allow a translational movement of the hinge element (9) and this structure element (1), (2) with respect to one another in the first translational direction (T_2), and **in that** the hinge element (9) is connected to the other structure element (1), (2) in such a way as to allow a translational movement of the hinge element (9) and this other structure element (1, 2) with respect to one another in a second translational direction (T_1).

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2. Screen structure according to Claim 1, **characterized in that** the hinge element (9) comprises an elongate passage (11) or slot which extends in the second translational direction (T_1), while the other structure element (1) comprises a sliding body (22) which is held in this passage (11) or slot, or wherein, alternatively, the other structure element comprises an elongate passage (11) or slot which extends in the second translational direction (T_1), while the hinge element (9) comprises a sliding body (22) that is held in this passage (11) or slot.

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3. Screen structure according to Claim 1 or 2, **characterized in that** the first structure element is a sloping beam (1) of a roof structure, and **in that** the hinge connection is intended to move the connected structure elements (1), (2) with respect to one another in a first direction (T_2) that is transverse to the longitudinal axis (A) of the beam and in a second direction (T_1) that coincides with or is parallel to said longitudinal axis (A).

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4. Screen structure according to one of the preceding claims, **characterized in that** the second structure element is a gutter profiled section (2), and **in that** the first translational direction (T_2) coincides with or is parallel to the longitudinal axis (B) of the gutter profiled section (2).

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5. Screen structure according to one of the preceding claims, **characterized in that** the channel (8) and the rotational body (12) have a substantially cylindrical, complementary shape.

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6. Screen structure according to one of the preceding

claims, **characterized in that** blocking means (23, 24) are provided in order to hold the rotational body (12) in a specific translational position in the channel (8).

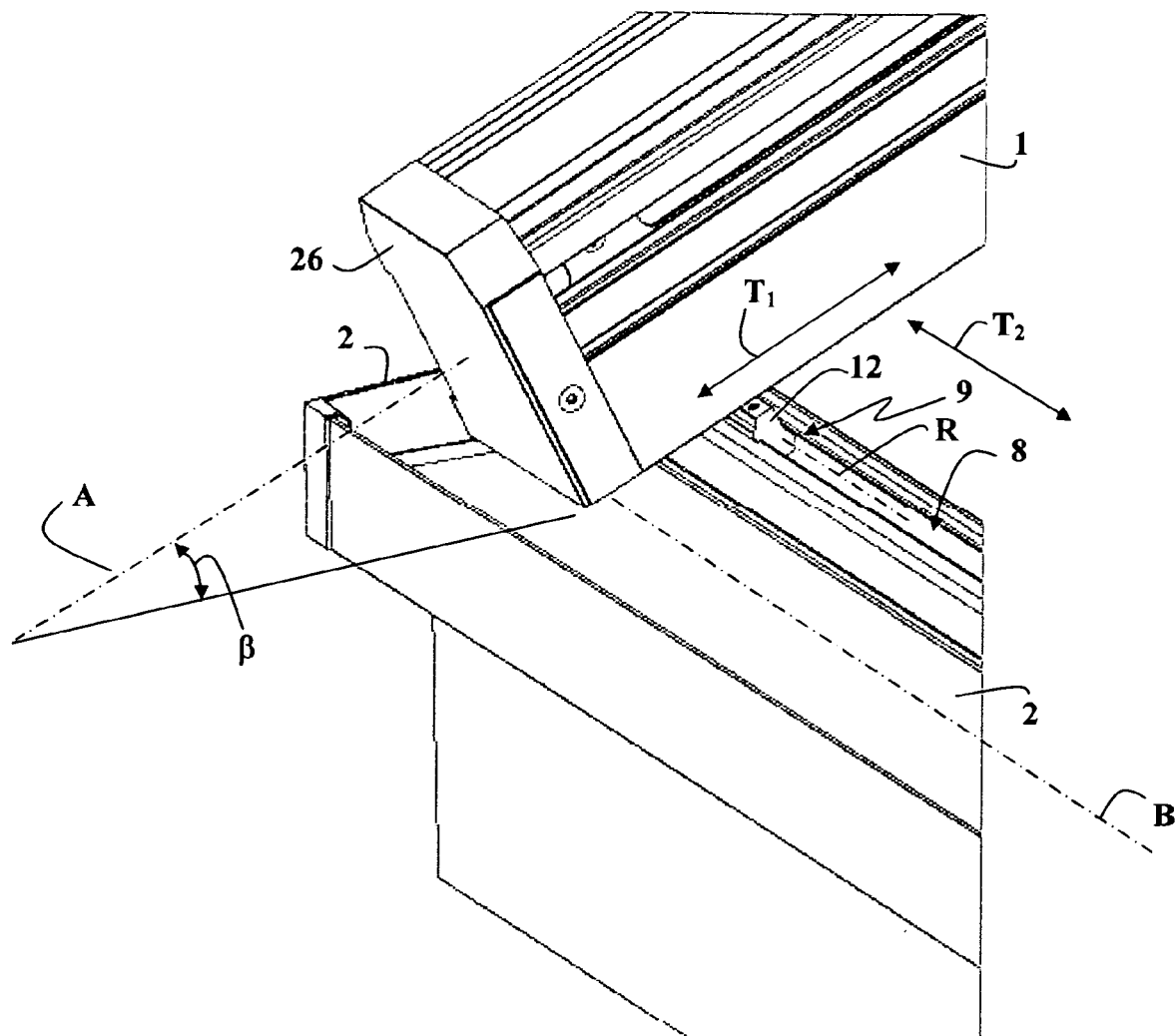


FIG. 1

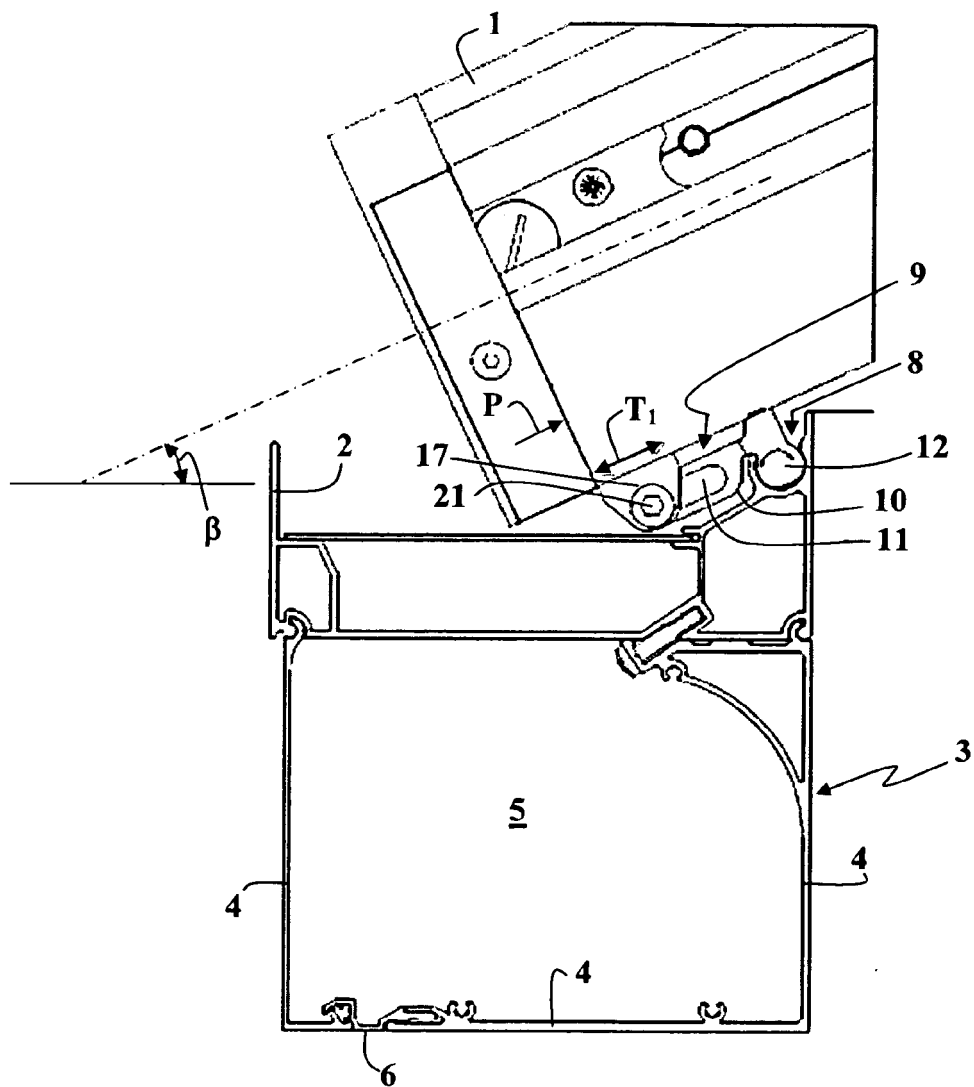


FIG. 2

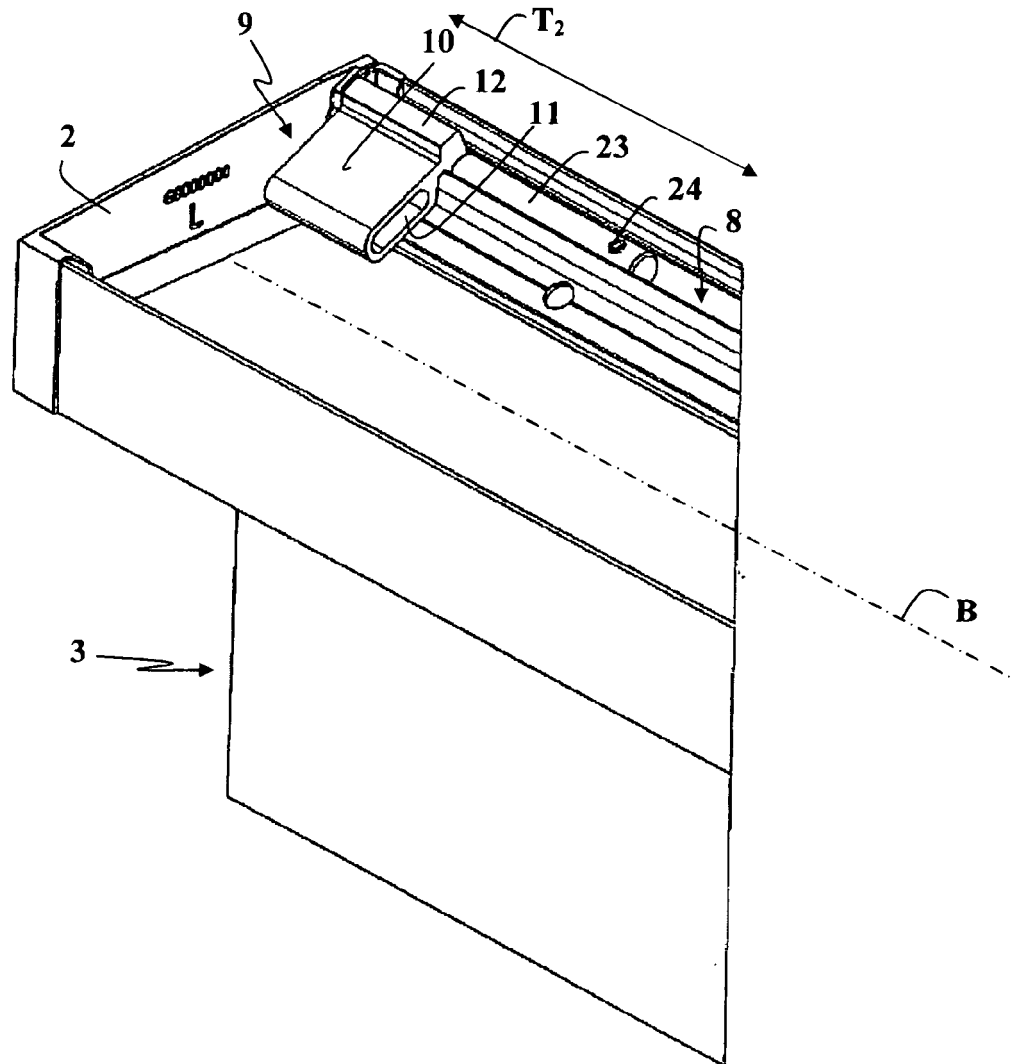


FIG. 3

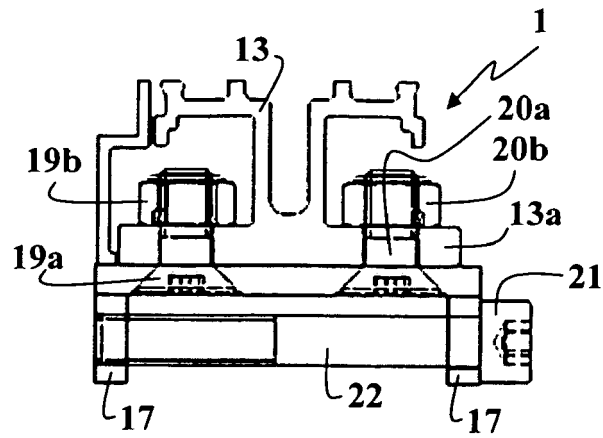


FIG. 4

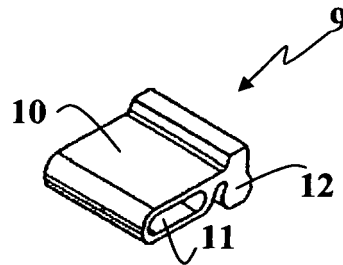


FIG. 5a

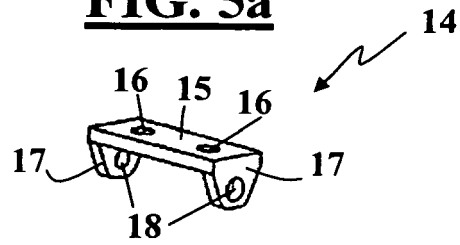


FIG. 5b

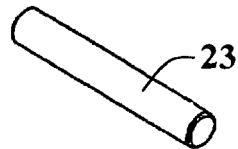


FIG. 5c

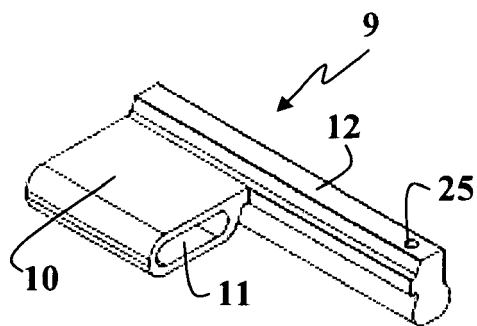


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
EP 10 19 4147

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 14 March 2011	Examiner Demeester, Jan
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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EPO FORM 1503 (03.02) (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 10 19 4147

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