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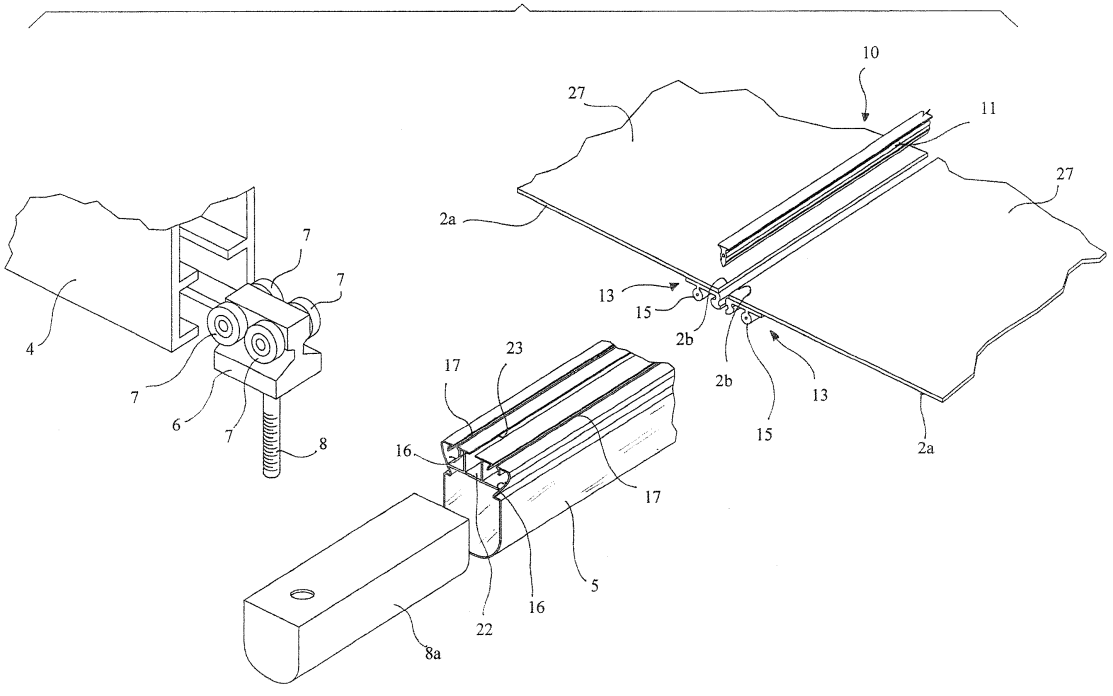
(54) A retractable awning

(57) A retractable awning comprises an awning fabric (2) which can be driven between an extended position and a folded position, at least one pair of lateral guides (4) elongated in the direction (Z) in which the fabric is driven and designed to slidably guide a plurality of sections (5), spaced apart from each other and fixed to the fabric (2), the sections (5) extending transversely to the guides. The fabric (2) comprises a plurality of fabric portions (2a), structurally independent of each other, positioned adjacent to each other in the direction of driving (Z), each fabric portion (2a) extending between each corresponding pair of adjacent sections (5), and sealing means are interposed between adjacent fabric portions (2a), these means extending transversely to the fabric (2) with respect to the direction (Z) in which the fabric is driven, so as to provide a sealing action on the awning across the whole fabric (2) surface formed by these portions (2a).

Fig. 5



EP 1 965 000 A2

Description

[0001] The present invention relates to a retractable awning having the characteristics stated in the preamble of Claim 1 which is the principal claim.

[0002] An awning of the aforesaid type is typically used to cover exterior spaces, and generally comprises a piece of fabric associated with drive means for moving the fabric from the extended position, in which the fabric is extended to form a cover, to the folded position, with the fabric retracted, in which the fabric assumes the typical configuration of pockets adjacent to each other.

[0003] The fabric of the awning is generally guided between two opposing lateral guides, on which a plurality of transverse sections, rigidly fixed to the fabric, are slidably guided by means of carriages or similar slidable guide means, each section carrying a corresponding drive carriage at each of its opposing axial ends.

[0004] A typical configuration uses a pair of lateral guides, between which the fabric of the awning extends, although this width cannot exceed a certain size, typically about three metres, because of the evident problems of the bending of the sections and of the fabric, and of the manoeuvrability of the fabric, due to the weight of the whole structure. If larger spaces are to be covered, it is possible, for example, to place a plurality of awnings adjacent to each other, each having its own lateral guide structure. However, this solution is limited by the fact that air and light, and possibly even water, can filter between the facing longitudinal edges of the adjacent awnings, thus compromising the use of the awning for its intended covering function.

[0005] There are also known solutions in which an awning consisting of a single piece of fabric is used in applications with three or more lateral guides, in other words when wide areas are to be covered; however, the fabric is subject to dimensional limits due to the manufacture of the fabric, in addition to the fact that the handling of wide pieces of fabric is more difficult and complicated, both in their manufacture and in their fitting on the awning structure.

[0006] The problem tackled by the present invention is that of providing a retractable awning which is structurally and functionally designed to overcome the limitations described with reference to the aforementioned prior art, and which, in particular, is suitable for covering surfaces having any longitudinal transverse extension, without drawbacks in respect of the infiltration of water, air and light into the area covered by the awning.

[0007] This problem is resolved by the invention by means of an awning made in accordance with the following claims.

[0008] Other features and advantages of the invention will become clear from the following detailed description of a preferred example of embodiment thereof, illustrated, for the purpose of illustration and in a non-limiting way, in the attached drawings, in which:

- Figure 1 is a perspective view of a retractable awning according to the invention shown in the closed position, with the fabric gathered at one of its ends;
- Figure 2 is a view in side elevation of the awning of Figure 1;
- Figure 3 is a perspective view of the awning of the preceding figures, shown in the open position with the fabric extended between the lateral guides;
- Figure 4 is a view in side elevation of the awning of Figure 3;
- Figure 5 is an exploded perspective view on an enlarged scale of a detail of the awning of the preceding figures;
- Figure 6 is a partial perspective view on an enlarged scale of a detail of the awning according to the invention;
- Figure 7 is a view in front elevation of the detail of Figure 6;
- Figures 8, 9 and 10 are views in front elevation of corresponding details of the awning of the preceding figures;
- Figure 11 is a perspective view of a variant of the awning of the preceding figures.

[0009] With reference to the aforesaid figures, the number 1 indicates the whole of a retractable awning, particularly an awning for covering exterior spaces, made according to the invention.

[0010] The awning comprises an awning fabric 2, which can be moved between a closed position with the fabric folded up to form a typical configuration of adjacent pockets 3, shown in Figure 1, and an extended position with the fabric extended over the area covered by the awning, shown in Figure 3.

[0011] The awning also comprises a frame structure including a pair of opposing lateral guides 4, formed from extruded sections for example, between which a plurality of transverse sections 5 (also preferably formed by extrusion of sections) are slidably guided, these sections being spaced apart from each other and fixed to the fabric 2, as will be made clear by the remainder of the description. At the opposite axial ends of each section 5 there are mounted corresponding carriages 6, provided with wheels 7 by means of which the carriages are slidably engaged in the cavities of the guide sections 4. Each carriage 6 is also fixed to the corresponding section 5 by screw fastening means 8, or by other similar conventional fastening means. The carriage is conveniently fixed to a terminal element 8a which can be fixed to the corresponding end of the section 5 (Fig. 5).

[0012] Drive means which are not shown, but which are conventional, are used to impart a translational movement to the front transverse section of the awning, indicated by 5a in the drawing, along the lateral guides 4 (this section pulling the carriages of the other sections with it), thus moving the awning between the operating conditions described above. In particular, the carriages 6 associated with the section 5a can be made to be driven

by corresponding active branches of a pair of powered belts (not shown) housed in the sections of the corresponding lateral guides 4, using belt transmission systems which are known and which therefore do not form part of the present invention.

[0013] The awning fabric 2 also comprises a plurality of fabric portions, all indicated by 2a and structurally independent of each other, positioned adjacent to each other in the direction in which the fabric is driven, indicated by Z in the drawings, in which each fabric portion 2a is extended, in the direction Z, between each corresponding pair of adjacent sections 5. Between each pair of adjacent fabric portions 2a, which can be identified in the fabric 2, there are also interposed sealing means, indicated as a whole by 10, which extend transversely to the fabric 2 with respect to the direction of driving Z, and which are such that they provide a sealing action on the awning 1 across the whole fabric surface formed by the said portions 2a.

[0014] More specifically, each sealing means 10 comprises corresponding sealing elements 11, each of which can be interposed between facing edges 2b of adjacent fabric portions 2a. The sealing elements 11 provided between adjacent pairs of fabric portions are identical to each other, and therefore only one of them will be described in detail below.

[0015] The element 11 is shaped with a predominantly longitudinal extension, and extends substantially along the whole transverse extension (perpendicular to the direction Z) of the fabric portions 2a. It is designed to be retained in the position interposed between the edges 2b of the adjacent fabric portions, and in particular it is retained removably in a housing 12 formed in the corresponding transverse section 5 with which it is associated. The said housing 12 is preferably formed jointly by a pair of corresponding fastening elements 13, each of which is designed to fix each of the corresponding edges 2b of adjacent fabric portions 2a of the awning to the same transverse section 5. The fastening elements 13 are mounted on the section 5 with mirror symmetry about a median longitudinal plane of symmetry of the section, and are structurally identical to each other; consequently, only one of them will be described in detail.

[0016] Each fastening element 13 has a base 14, on which the terminal edge of the corresponding fabric portion 2a is fixed. A projection 15, running longitudinally and shaped so as to be retained removably in a corresponding cavity 16 of the section 5, extends from the base 14 on the side opposite the area to which the fabric is fixed. In greater detail, a longitudinal slot 17 is made in the section 5, and communicates with the corresponding inner cavity 16 of the section, the projection 15 comprising, starting from the base, a first portion 18 which can slidably engage in the slot, this portion being extended into a second portion 19 which is wider than the first, and which is retained in the cavity 16 when the element 13 is mounted by sliding into the section 5 (Fig. 6).

[0017] A further projection 20, in which a recess 20a is formed, is provided on the side of the element 13 which extends along the terminal edge of the fabric portion 2a,

[0018] After the fastening elements 13 have been mounted on the corresponding section 5, the corresponding recesses 20a of these elements face each other and are spaced apart from each other, thus jointly forming the aforesaid housing 12, in which an enlarged section 21 of the sealing element 11 can be retained by clamping. The said section 21 is thus retained between the recesses 20, consequently providing a seal by contact between the surfaces joined together (Fig. 7).

[0019] It should be noted that the projections 20 of the corresponding fastening elements 13 which face each other continue to be housed, after the mounting of the fastening elements on the section 5, in a central cavity 22 of the section, which opens upwards with a longitudinal slot 23. The projections 20 are housed in the slot and are spaced apart from each other.

[0020] In the sealing element 11, a head 24 and an opposing pair of toothed projections 25 are formed on opposite sides of the enlarged central section 21. These parts extend symmetrically in the sealing element 11 and can bear on corresponding sides of the corresponding fastening elements when the section 21 is housed in the housing 12, thus opposing the extraction of the section and ensuring that the seal 11 is retained in position between the fabric portions.

[0021] The head 24 of the seal is also shaped with a substantially flat or slightly curved (convex) upper surface, this shape allowing the head to remain interposed between the adjacent fabric portions, when the seal 11 is mounted, so that its surface lies substantially flush with the corresponding fabric surfaces to which it is connected. These surfaces are identified by the numeral 27 in the drawings and extend on the opposite side to corresponding surfaces of the fabric 28 facing the transverse sections 5.

[0022] The feature of providing a head of the seal substantially flush with the upper surfaces of the fabric portions advantageously prevents the formation of barriers to water which falls on the awning fabric, thus counteracting the possible formation of standing water on the fabric.

[0023] In a preliminary stage, the fabric portions are fixed at their opposing terminal edges 2b to the corresponding fastening elements 13. During the assembly of the awning, the aforesaid fabric portions 2a are mounted on the corresponding sections 5 by engaging the fastening elements 13 in the sections. The corresponding sealing element 11 is then interposed between each pair of adjacent fabric portions 2a, by inserting the sealing element into the slot 23 until it is clamped in the housing 12, and the teeth 25 consequently provide a supplementary retaining action to oppose disengagement from the housing. On completion of the insertion, the head 24 of the seal is interposed between the edges 2b of the fabric portions so as to lie substantially flush with the corresponding adjacent fabric surfaces 27, as shown in Figure

7.

[0024] It should be noted that the sealed connection between the surfaces of the enlarged section 21 and the recesses 20a which are in contact is formed with at least partial deformation of these parts, thus providing a retaining action due to the elastic return effect of the connected parts.

[0025] In a variant embodiment of the invention, shown in Figure 11, the awning is provided with three lateral guides 4, in order to form a larger cover. By interposing an intermediate guide 4, it is possible, for example, to achieve a width of covering (transversely to the direction Z) which is about twice what has been described in the preceding example. In this application also, the fabric 2 is made in portions 2a of fabric adjacent to each other, in which each fabric portion extends transversely between the outermost pair of lateral guides 4, the sealed fastening system between adjacent fabric portions provided in this variant being the same as in the preceding example, although it is to be understood that this system can be applied regardless of the number of lateral guides provided.

[0026] Using an awning portion according to the invention, therefore, it is possible to prepare fabric portions of specified width (measured in the direction Z) whose length is determined according to the extent of the area to be covered (in the direction transverse to Z), thus making it convenient to use fabrics which are provided, for example, in rolls, and considerably facilitating the operations of handling and storage of the awning fabrics. It is also possible to provide the awning fabric portions with the fastening elements already fixed along the opposing edges, these portions being easy to transport and handle, up to the stage of installing the awning. In this stage, the fabric portions are initially fixed to the corresponding transverse sections and the sealing element is then mounted by inserting it between the facing edges of adjacent fabric portions, as a result of which it is clamped in the corresponding retaining housing.

[0027] It should be noted that the sealing element can be cut to size during the assembly of the awning according to the transverse width to be covered (the width between the outermost lateral guides).

[0028] It should also be noted that the fabric portions pre-assembled with the corresponding fastening elements do not have a predetermined orientation which must be maintained during assembly, and this further simplifies the stages of installation of the awning while also considerably reducing possible errors in assembly and making the assembly faster.

[0029] Thus the invention resolves the problem which was proposed and provides the aforementioned advantages over the known solutions.

Claims

1. A retractable awning, comprising:

- an awning fabric (2) which can be driven between an extended position and a folded position;
- at least one pair of lateral guides (4), elongated in the direction in which the fabric is driven (Z), and designed to slidably guide a plurality of sections (5) which are spaced apart from each other and are fixed to the fabric (2), the sections extending transversely to the guides; **characterized in that** the said fabric (2) comprises a plurality of fabric portions (2a), structurally independent of each other, positioned adjacent to each other in the direction of driving (Z), each fabric portion (2a) extending between each corresponding pair of adjacent sections (5), and **in that** sealing means (10) are interposed between adjacent fabric portions (2a), these means extending transversely to the fabric (2) with respect to the direction (Z) in which the fabric is driven, so as to provide a sealing action on the awning across the whole fabric (2) surface formed by the said portions (2a).

2. An awning according to Claim 1, comprising a pair of lateral guides (4) and at least one additional intermediate guide, parallel to the lateral guides and interposed between them, each fabric portion (2a) extending transversely between the opposing lateral guides (4), and extending longitudinally over at least one portion of the longitudinal extension of the said guides, the said sealing means (10) being interposed between each pair of fabric portions (2a) which are adjacent to each other, to provide a seal across the whole awning surface formed by the said fabric portions (2a).

3. An awning according to Claim 1 or 2, in which each fabric portion (2a) is formed between a first surface (28) facing the transverse sections (5) and a second opposing surface (27), the sealing means (10) interposed between the adjacent fabric portions (2a) extending so as to lie substantially flush with the corresponding second surfaces (27) of adjacent fabric portions (2a).

4. An awning according to any one of the preceding claims, in which the said sealing means comprise at least one sealing element (11) with a predominantly longitudinal extension interposed between facing edges (2b) of adjacent fabric portions (2a) and extending over at least a predominant part of the transverse extension of the said portions, retaining means being provided between the sealing element (11) and the corresponding transverse section (5) associated with the said adjacent fabric portions (2a).

5. An awning according to Claim 4, in which the said at least one sealing element (11) can be retained

removably in a housing (12) formed in the corresponding transverse section (5) with which it is associated.

6. An awning according to Claim 5, in which the said sealing element (11) is retained in the said housing (12) by clamping.

7. An awning according to Claim 5 or 6, in which the said housing (12) is jointly formed by a pair of corresponding fastening elements (13), each of which is designed to fix each of the corresponding fabric portions (2a), which are adjacent to each other, to the same transverse section (5).

8. An awning according to Claim 7, in which each fastening element (13) is removably retained in the corresponding transverse section (5) and can be fixed rigidly to the edge (2b) of the corresponding fabric portion (2a).

9. An awning according to Claim 8, in which each fastening element (13) comprises a corresponding recess (20a), the said housing (12) being formed by a pair of recesses (20a) of corresponding fastening elements (13) facing each other, the sealing element (11) comprising an enlarged section (21) which can engage with the said recesses (20a) with a mutual sealed retention of the connected surfaces.

10. An awning according to Claim 9, in which the said sealing element (11) comprises, on opposite sides of the said section (21), a head (24) extending between the facing edges (2b) of adjacent fabric portions (2a), and at least one projection (25) which can bear on at least one of the fastening elements (13), when the said section (21) is housed in the said housing (12), so as to oppose the extraction of the section while retaining the sealing element (11) in position between the adjacent fabric portions (2a).

11. An awning according to Claim 10, in which a pair of projections (25) is provided on the said sealing element (11), each projection being designed to bear on the corresponding fastening element (13) of a pair of the said elements provided on a common transverse section (5).

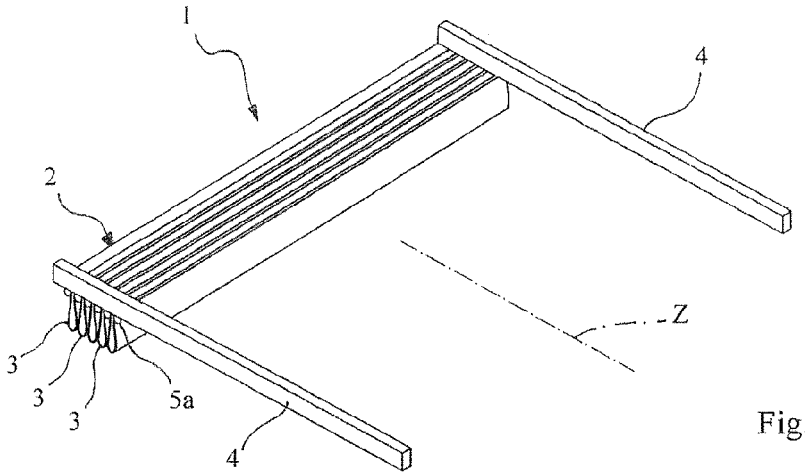


Fig. 1

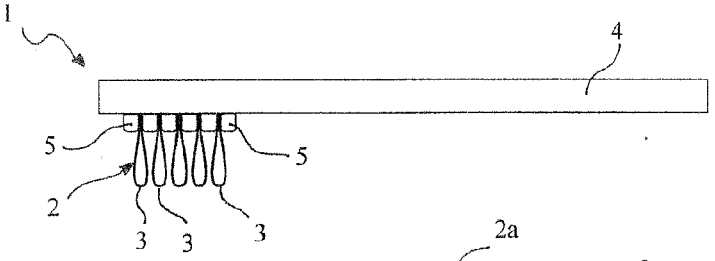


Fig. 2

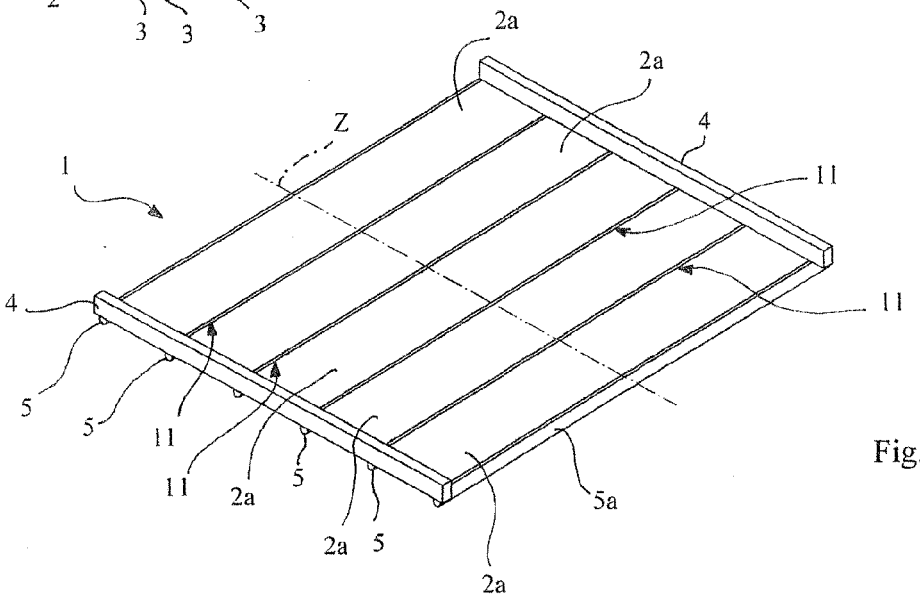


Fig. 3

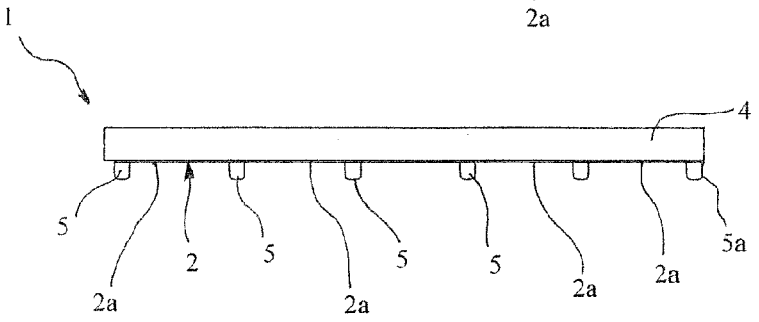
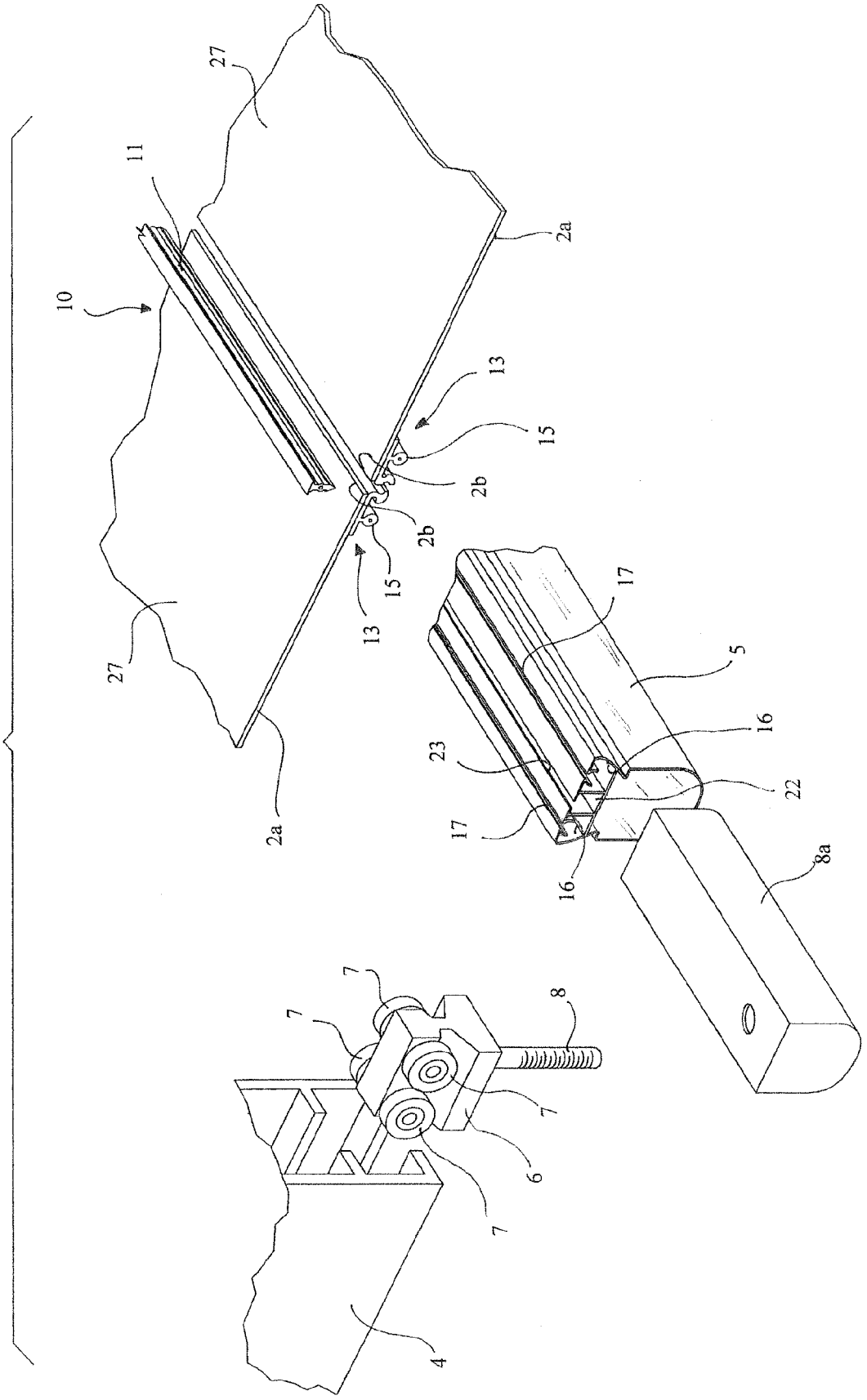


Fig. 4

Fig. 5



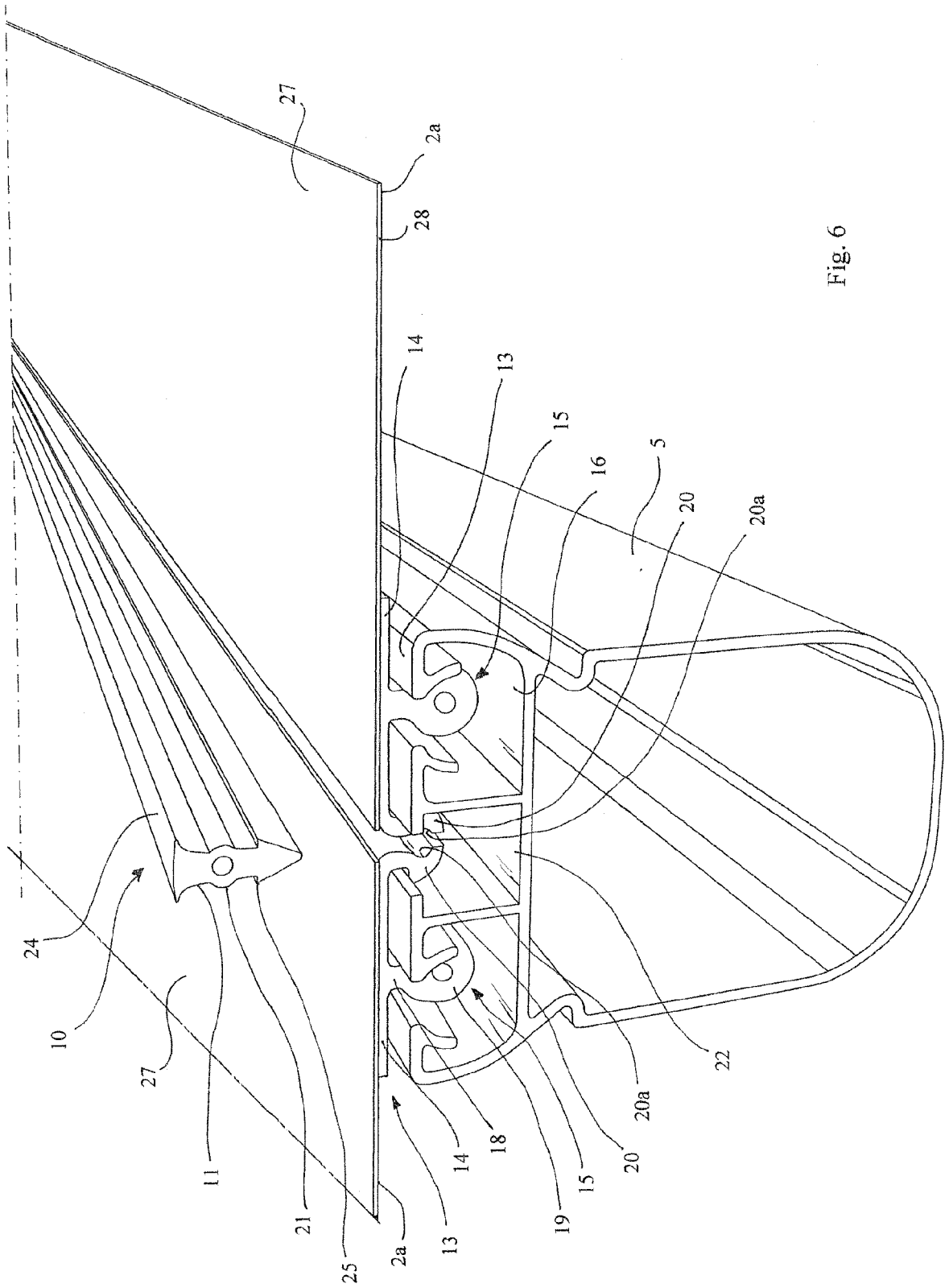

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Fig. 6

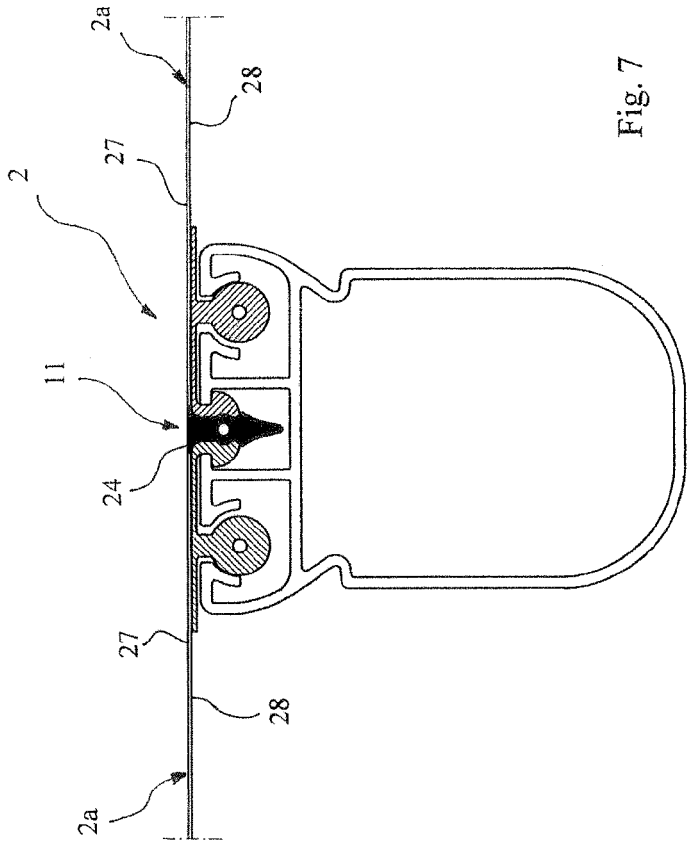

Fig. 7

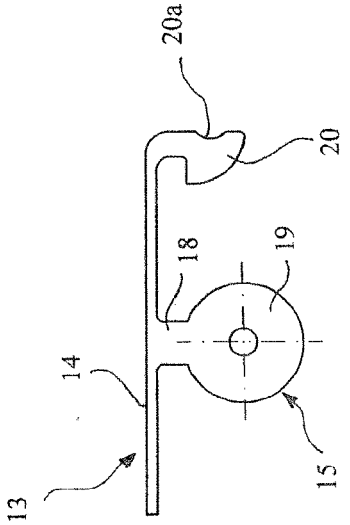

Fig. 10

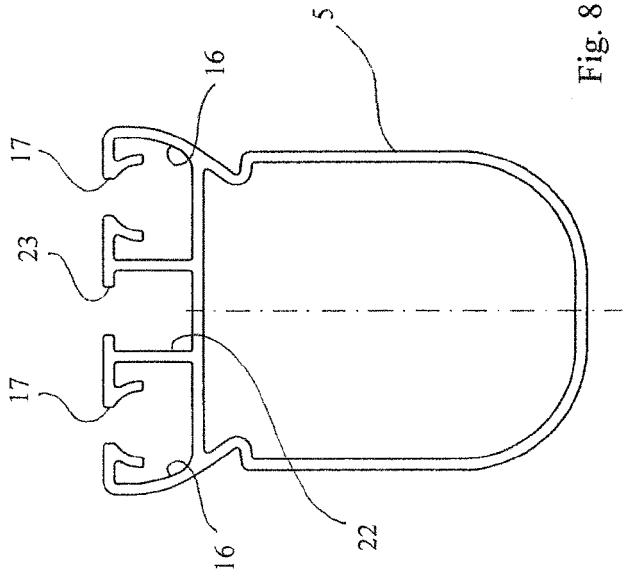

Fig. 8

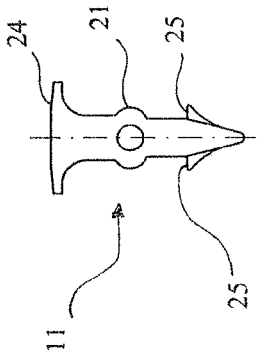

Fig. 9

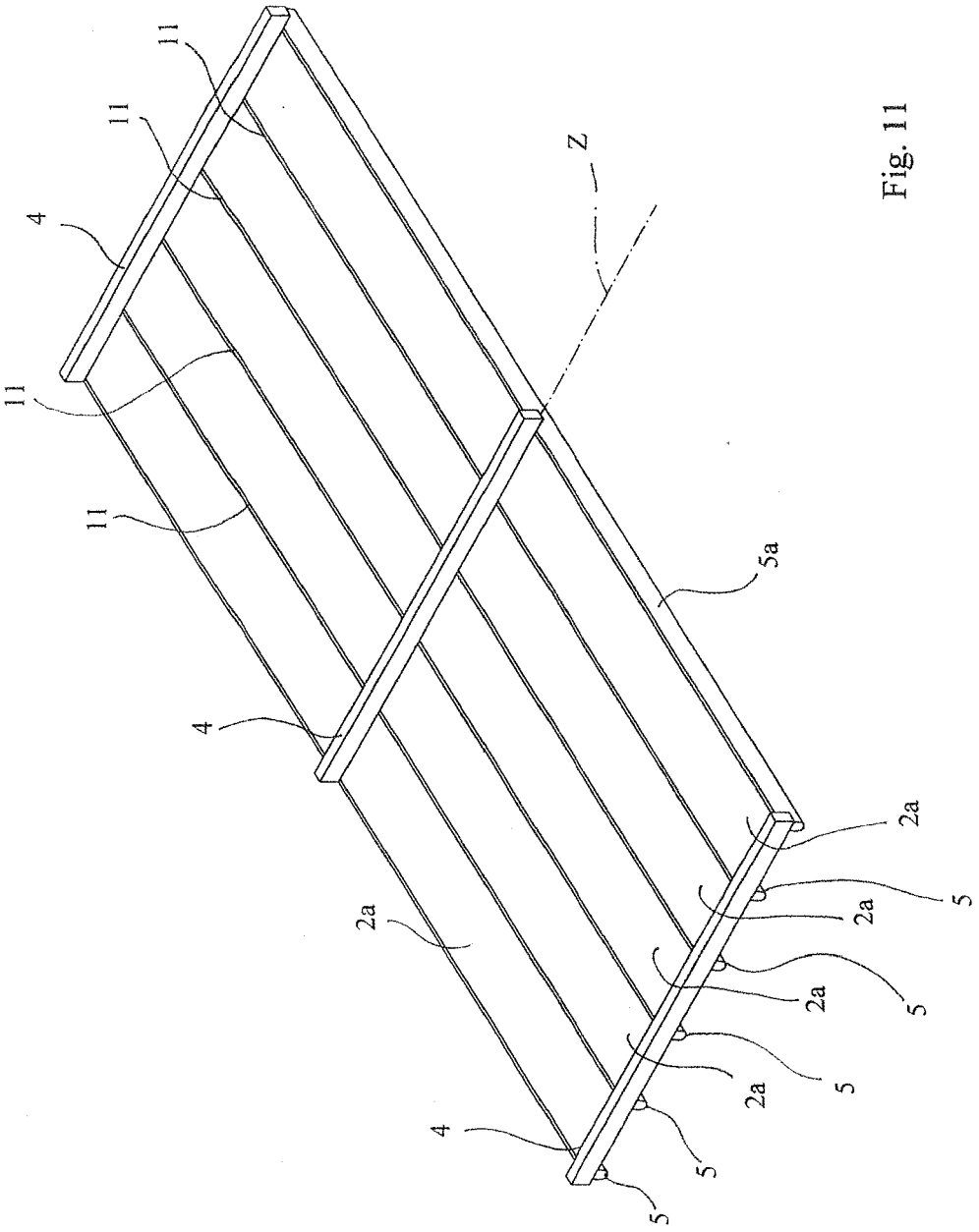

Fig. 11