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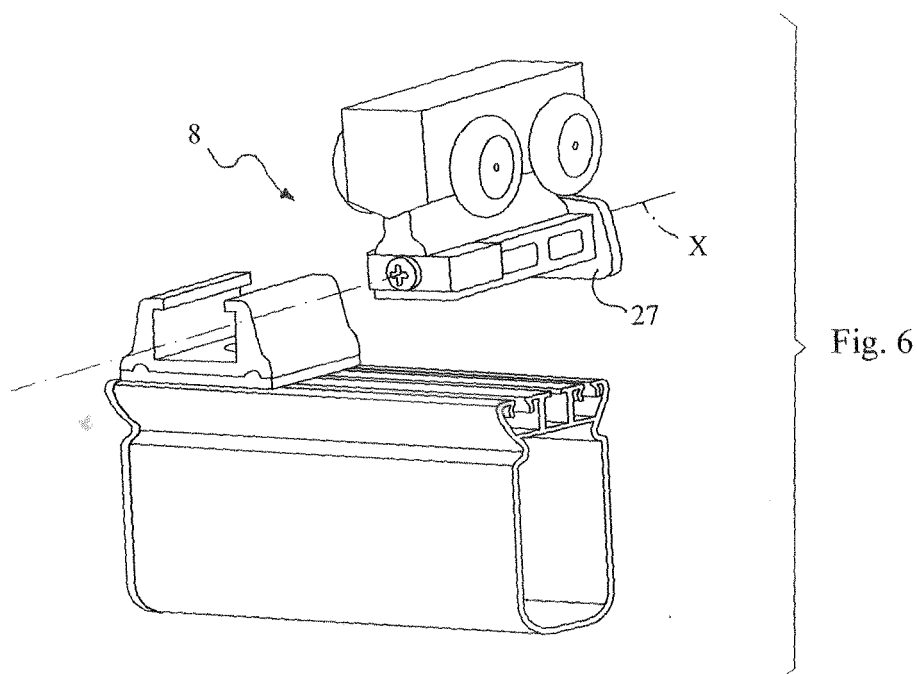
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(54) **Retractable awning**

(57) A retractable awning (1) comprises a piece of fabric (2) fixed to at least one cross-piece (5) which is movable along guide means (4), at least one element (6)

which is guided slidably in the guide means (4) and which can be fixed to the cross-piece (5), and means (8) for the snap-fit connection of the slidable element to the cross-piece.



Description

[0001] The present invention relates to a retractable awning of the type having the characteristics mentioned in the preamble of the principal claim.

[0002] An awning of the aforementioned type is typically used to cover exterior spaces, and generally comprises a piece of fabric fixed to one or more cross-pieces which are movable along two lateral guides.

[0003] There is also a known method of interposing one or more guides between the two lateral guides if a piece of fabric of considerable width with cross-pieces of corresponding length is used, to prevent the overall weight of the structure from causing excessive bending in the centre of the cross-pieces.

[0004] The mobility of the aforesaid cross-pieces and the consequent translation of the fabric from an extended position to a folded position are provided by one or more slidable elements, such as carriages or the like, guided in each of the aforesaid guides.

[0005] Typically, each of these carriages is fixed removably to one of the cross-pieces by a threaded connection. This connection comprises a screw fixed to the carriage, passing through a hole formed in the corresponding cross-piece, and a securing nut screwed on to the free end of this screw, the nut being housed in a corresponding housing formed in the cross-piece. The housing of the securing nut is sealed by a removable cover fitted on the cross-piece.

[0006] The principal drawback of this solution is the relative complexity of the operations for mounting the cross-piece on the guides. This is because, for each carriage to be connected to the cross-piece, the screw has to be passed through the corresponding hole in the cross-piece, the fixing nut has to be screwed on, and the corresponding sealing cover has to be fitted on the nut housing.

[0007] This operation has to be repeated for each cross-piece on each of the guides.

[0008] If there are intermediate guides between the two lateral guides, a further problem is caused by the fact that the screw must also pass through a hole formed in the fabric in a position remote from the edges. It is therefore necessary, during the mounting of the cross-piece, to provide suitable sealing means between the fabric and the screw passing through it, in order to prevent the infiltration of water into the area covered by the awning.

[0009] These and other problems, which are described more fully below, are overcome by the present invention by means of an awning made in accordance with the following claims.

[0010] 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;
- Figures 5 and 6 are two different exploded perspective views of a detail of the awning of Figure 1;
- Figure 7 is a perspective view of the detail of Figures 5 and 6;
- Figure 8 is a perspective view of a variant construction of a retractable awning according to the invention;
- Figure 9 is an exploded perspective view of a detail of Figure 8;
- Figure 10 is a perspective view of the detail of Figure 9.

[0011] 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.

[0012] 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.

[0013] The awning also comprises a plurality of cross-pieces 5, made for example from extruded aluminium sections, spaced apart from each other and fixed to the fabric 2 by fixing means which are described below.

[0014] The cross-pieces 5 are movable along guide means comprising, in the example of embodiment of Figure 1, two lateral guides 4, which are also preferably made by extrusion of aluminium sections. At the opposing axial ends of each section 5 there are fixed corresponding slidable elements 6, each being provided with a body 6a on which are mounted the wheels 7 by means of which the slidable elements 6 are engaged slidably in the cavities of the guide sections 4.

[0015] Each slidable element 6 is also fixed to the corresponding cross-piece 5 by snap-fit connection means indicated as a whole by the numeral 8, and described in detail below.

[0016] Drive means which are not shown, but which are conventional, are used to impart a translational movement to the front cross-piece of the awning, indicated by 5a in the drawing, along the lateral guides 4 (this cross-piece pulling the carriages of the other sections with it), thus moving the awning between the operating conditions described above. In particular, the slidable elements 6 associated with the cross-piece 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.

[0017] The snap-fit connection means 8 for connecting a slidable element 6 to the corresponding cross-piece 5 comprise a first and a second element, which can be engaged with each other, and which are positioned, respectively, on the slidable element 6 and on the cross-piece 5.

[0018] In the example shown in the aforesaid figures, the first element of the snap-fit connection means 8 comprises a projection 9 formed on the slidable element 6, while the second element of the snap-fit connection means 8 comprises a housing 10 associated with the cross-piece 5.

[0019] The projection 9 extends from the corresponding body 6a outside the cavity of the guide section 4, and comprises a free end 9a, from which two lateral appendages 11 and 12 extend in opposite directions.

[0020] The housing 10 comprises a base 13 and two opposing lateral walls 14 and 15, between which a cavity 16 is formed for housing the end 9a of the projection 9. A through hole 13a is formed in the base 13 in a position corresponding to a through hole 2a in the fabric 2 and to a threaded hole 5c on the axial end 5b of the cross-piece 5. The housing 10 can be connected to the cross-piece 5 with the fabric 2 interposed between them, by means of a screw (not shown) passing through the holes 2a and 13a and screwed into the hole of an insert (also not shown) housed in the cross-piece 5.

[0021] The walls 14 and 15 are provided, at their ends farthest from the base 13, with respective protrusions 17 and 18 facing the cavity 16.

[0022] The projection 9 can be fitted into the base 10, to form the connected configuration shown in Figure 7, by sliding these parts relative to each other in a fitting direction X parallel to the guide 4.

[0023] As the protrusions 17 and 18 slide for the purpose of fitting into the aforesaid connected configuration, they encounter the appendages 11 and 12 respectively, which retain the projection 9 in the housing 10 in a direction orthogonal to the direction of insertion X.

[0024] The snap-fit connection means 8 also comprise a third element, comprising, in the example shown in the aforesaid figures, a flat spring 20 which can be deformed between a first compressed position which allows the projection to be fitted into the housing 10 and a second non-deformed position in which the projection 9 and the housing 10 are held together by the spring 20 in the direction opposite the direction of fitting.

[0025] The spring 20 comprises a central 20a, bearing on a planar surface 21 which is orthogonal to the direction of fitting and which is formed at the end of the projection 9 which is initially introduced into the housing 10 on its fitting trajectory. The portion 20a of the spring 20 is fixed to the surface 21 by means of a screw 22, orientated along the direction of fitting X.

[0026] The spring 20 comprises, at the ends of the cen-

tral portion 20a, two wings 23a and 23b, extending over a portion of the appendages 11 and 12 respectively. Each of the wings 23a and 23b is provided has one end 24 adjacent to the portion 20a, and an opposing free end 25.

[0027] The flat spring 20 is movable from the second, non-deformed, position to the first, compressed, position by compression of the wings 23a and 23b in a direction orthogonal to the direction of fitting X.

[0028] The spring assumes a tapered configuration from the free ends 25 of the wings towards the ends 24.

[0029] This configuration enables the wings 23a and 23b to be deformed automatically towards the appendages 11 and 12 respectively, on the fitting trajectory, by interference between the wings 23a and 23b and the walls 14 and 15 respectively of the housing 10.

[0030] When the spring 20 is in its second, non-deformed, position, the free ends 25 of each of the wings 23a and 23b bear on a stop surface 26 of the housing 10, thus holding the projection 9 and the housing 10 together in the direction opposite the direction of insertion.

[0031] The projection 9 comprises, at its end opposite the end to which the spring 20 is fixed, a shoulder 27, orthogonal to the direction of fitting X, bearing on a surface 28 of the housing 10, parallel to and opposite the surface 26. The shoulder 27 forms the limiting device for the sliding of the projection 9 for fitting in the housing 10.

[0032] Figure 8 shows a variant construction of the invention, indicated by 1a, intended for an awning, particularly for covering exterior spaces.

[0033] This variant is intended for applications in which, because of the greater width of the fabric, an intermediate guide 4a is required in addition to the lateral guides 4, and is placed between the guides 4.

[0034] With reference to Figures 9 and 10, each of the cross-pieces 5 of the awning 1a is associated with a housing 10a which is identical to the housing 10 of the awning 1. The housing 10a, fixed in a position remote from both axial ends of the cross-piece 5, can be connected to a corresponding slidable element (which is not shown, but which is identical to the slidable element 6) which is movable along the guide 4a.

[0035] Fixing means are interposed between the cross-piece 5 and the housing 10a, comprising an insert 29 housed in a channel 30 extending axially in the cross-piece 5. The channel 30 has an opening 30a on the side of the cross-piece 5 facing the awning 2. The insert has three threaded holes 31, 32a and 32b, aligned in the direction of longitudinal extension of the cross-piece.

[0036] The portion of the fabric 2 placed on the cross-piece 5 next to the insert 29 comprises three through holes 33, 34a and 34b, whose size and position match those of the holes 31, 32a and 32b respectively.

[0037] The means of fixing the cross-piece 5 to the housing 10a also comprise a flange 35 which can bear on the fabric 2, and which has three through holes 36, 37a and 37b, whose size and position match those of the holes 31, 32a and 32b respectively. The flange 35 can be fixed to the insert 29 by means of two screws (not

shown) which pass, respectively, through the holes 37a, 37b and 34a, 34b and are screwed into the holes 32a and 32b.

[0038] The housing 10a is removably connected to the flange 35 by means of a screw (not shown) passing through the holes 13a, 36 and 33 and screwed into the hole 31.

[0039] A gasket 38 is interposed between the flange 35 and the fabric 2, to act as a seal to prevent the passage of water through the holes 33, 34a and 34b.

[0040] In an awning made according to the invention, the cross-pieces 5 can be assembled and fixed to the fabric 2, which is interposed between the housings 10 and 10a, before they are connected to the appendages 9 of the corresponding slidable elements 6 of the guides 4 and 4a.

[0041] For the type of connection described above, even when two or more housings 10 are present, the cross-piece 5 can be connected to all the slidable elements 6 which support it along a single fitting trajectory, since the directions of fitting X are parallel to the guides 4 and 4a.

[0042] The fitting is additionally facilitated by the fact that the compression of the spring 20 on the fitting trajectory takes place automatically.

[0043] The stability of the connection is ensured by the fact that, when the projection 9 is fitted into the corresponding housing 10 or 10a, the shoulder 27 and the wings 23a and 23b of the spring 20 interact, by interfering with the surfaces 28 and 26 respectively, to lock the projection 9 with respect to the housing 10 in the fitting direction and in the opposite direction respectively.

[0044] To disengage the snap-fit connection 8, it is simply necessary to compress the wings 23a and 23b of the spring 20, thus enabling the projection 9 and the housing 10 to slide relative to each other in the direction opposite the fitting direction until they are disengaged.

[0045] The presence of intermediate guides 4a, as described in the example of construction of the awning 1a, does not complicate the mounting of the cross-piece 5 on the guides 4 and 4a, and does not adversely affect the waterproofing properties of the fabric 2, since corresponding flanges 35, each provided with a gasket 38, are interposed between the housings 10a and the fabric 2.

[0046] Thus the invention resolves the initial problem and provides the advantages described above over the known art.

Claims

1. A retractable awning (1), comprising:

- a piece of fabric (2) fixed to at least one cross-piece (5) which can be moved along guide means (4);
- at least one element (6) which is guided slidably in the said guide means (4) and which can be

fixed to the said cross-piece (5);

- means (8) of connecting the said slidable element (6) to the said cross-piece;

characterized in that the said connecting means (8) are of the snap-fit type.

2. A retractable awning (1) according to Claim 1, in which the said snap-fit connection means (8) comprise a first element, placed on one of the said slidable element (6) and the said cross-piece (5), a second element, placed on the other of the said slidable element (6) and the said cross-piece (5), the said first and second elements being capable of being fitted together, and a third element which is resiliently deformable between a first position in which the first and second elements can be fitted together and a second position in which the said first and second elements are held together by the said third element in at least one direction along the direction of fitting.
3. A retractable awning (1) according to Claim 2, in which the direction of fitting is parallel to the said guide means (4).
4. A retractable awning (1) according to Claim 2 or 3, in which the said first element is a projection (9) and the said second element comprises a housing (10), the said projection (9) being capable of being fitted into the said housing (10).
5. A retractable awning (1) according to Claim 4, in which the said projection (9) is formed on the said slidable element (6) and the said housing (10) is associated with the said cross-piece (5).
6. A retractable awning (1) according to Claim 5, in which the said housing (10) is removably connectable to the said cross-piece (5) at an axial end (5b) of the said cross-piece (5).
7. A retractable awning (1) according to Claim 5, in which the said housing (10a) is removably connected to the said cross-piece (5), in a position remote from both axial ends of the said cross-piece (5), by fixing means placed at least partially inside a seat extending axially in the said cross-piece (5).
8. A retractable awning (1) according to Claim 7, in which the said seat comprises a channel (30) having an opening (30a) facing towards the said fabric (2) and the said fixing means comprise an insert (29) housed in the said channel (30), including at least one threaded hole (31).
9. A retractable awning (1) according to Claim 8, in which the said fixing means comprise a flange (35) which can be fixed to the said insert (29) by means

of at least one screw, which can be connected to the said threaded hole (31) and which passes through the said opening (30a) and through a hole (33) in the said fabric (2), the said fabric (2) being interposed between the said flange (35) and the said cross-piece (5). 5

10. A retractable awning (1) according to Claim 9, the said housing (10a) being removably connected to the said flange (35). 10
11. A retractable awning (1) according to any one of Claims 2 to 10, in which the said third element comprises a flat spring (20), fixed to the said first element. 15
12. A retractable awning (1) according to Claim 11, in which the said flat spring (20) is provided with at least one flexible wing which can bear, in the said second position, on a stop surface (26) of the said housing (10, 10a). 20
13. A retractable awning (1) according to Claim 12, in which the said flat spring (20) is movable from the said second position to the said first position by the compression of the said at least one wing (23a) in a direction orthogonal to the said direction of fitting. 25
14. A retractable awning (1) according to Claim 13, in which the said at least one wing (23a) can be compressed automatically as a result of the interference between the said housing (10, 10a) and the said projection (9), on the trajectory of the fitting of the said projection (9) into the said housing (10, 10a). 30
15. A retractable awning (1) according to any one of Claims 4 to 14, in which limiting means are provided on at least one of the said housing (10, 10a) and the said projection (9) to stop the relative sliding by which the said projection (9) is fitted into the said housing (10, 10a). 35 40
16. A retractable awning according to Claim 15, in which the said limiting means comprise a shoulder (27) orthogonal to the said direction of fitting. 45
17. A retractable awning (1) according to Claim 16, in which the said shoulder (27) is formed on the said projection (9), at an end opposite the said flat spring (20). 50

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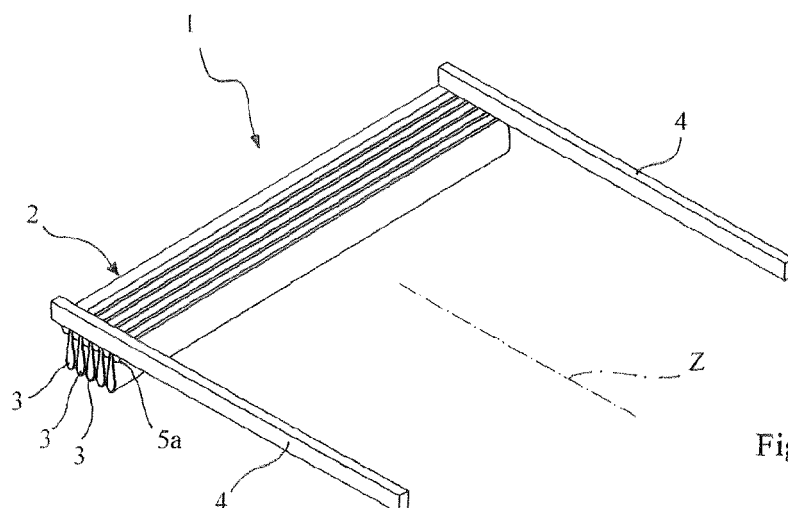


Fig. 1

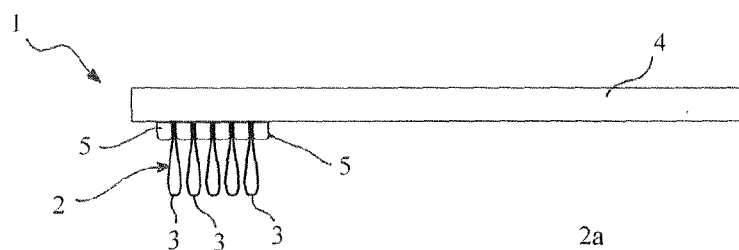


Fig. 2

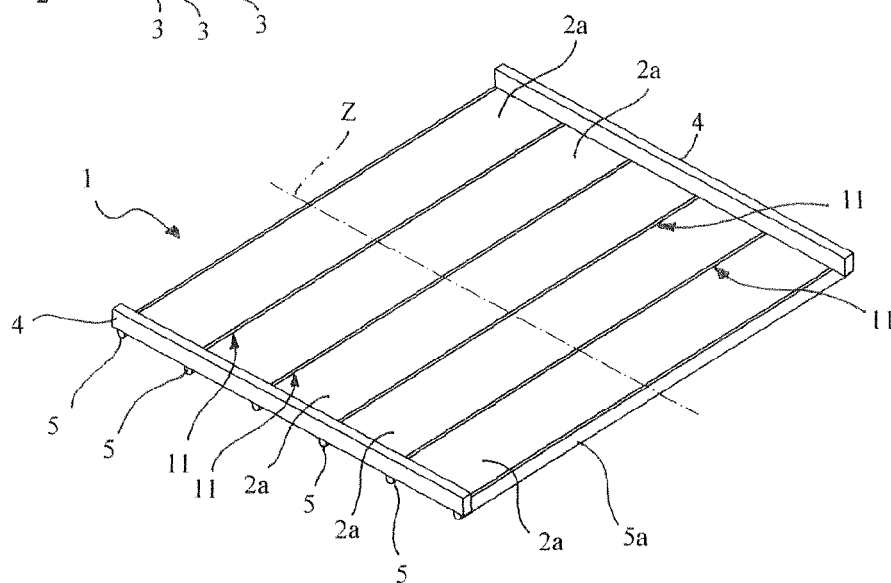


Fig. 3

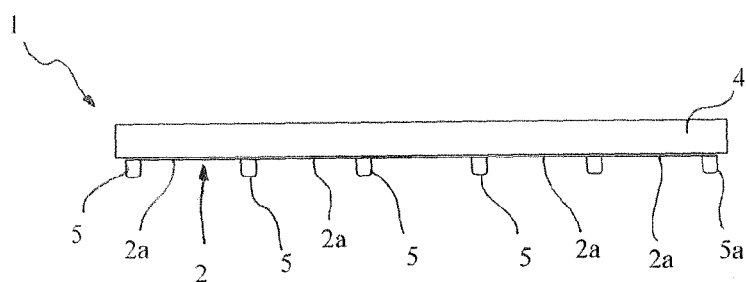
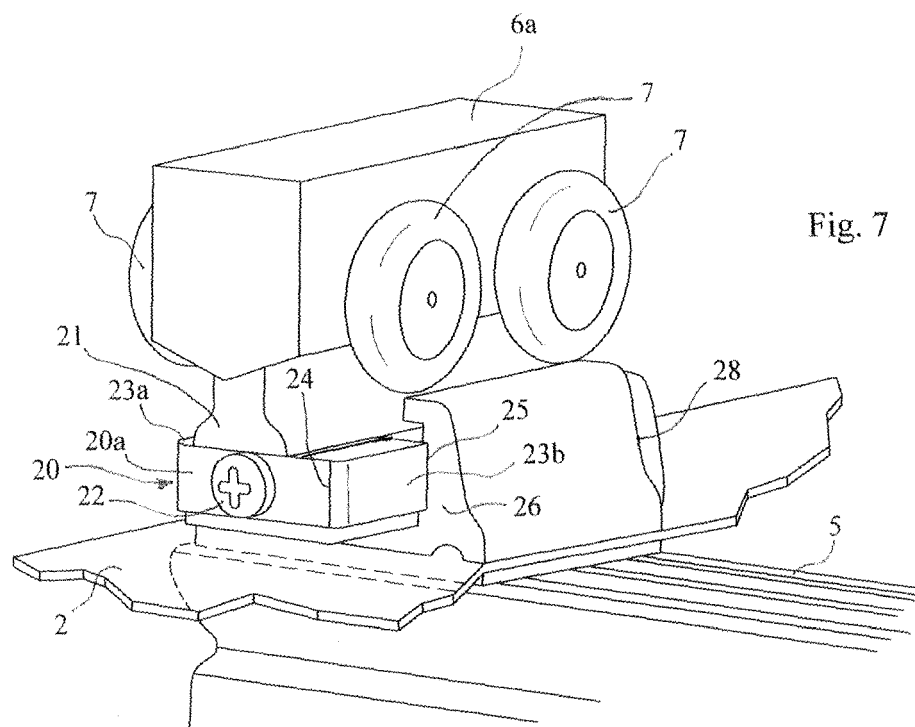
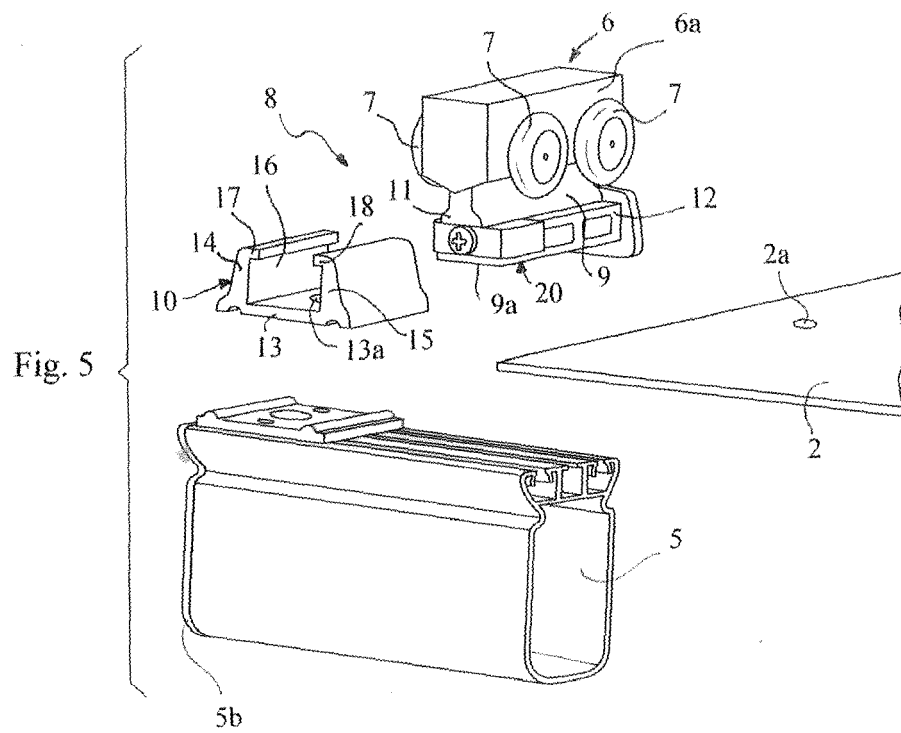


Fig. 4



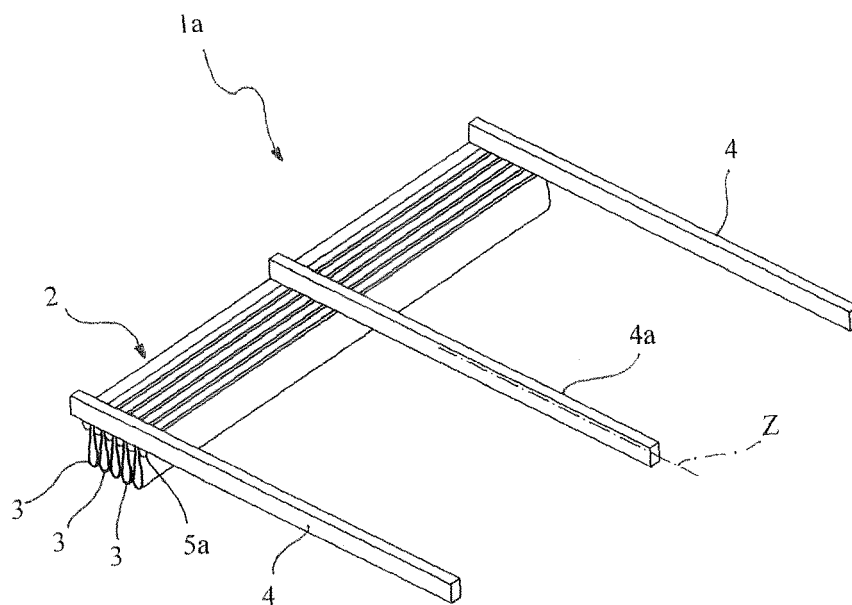
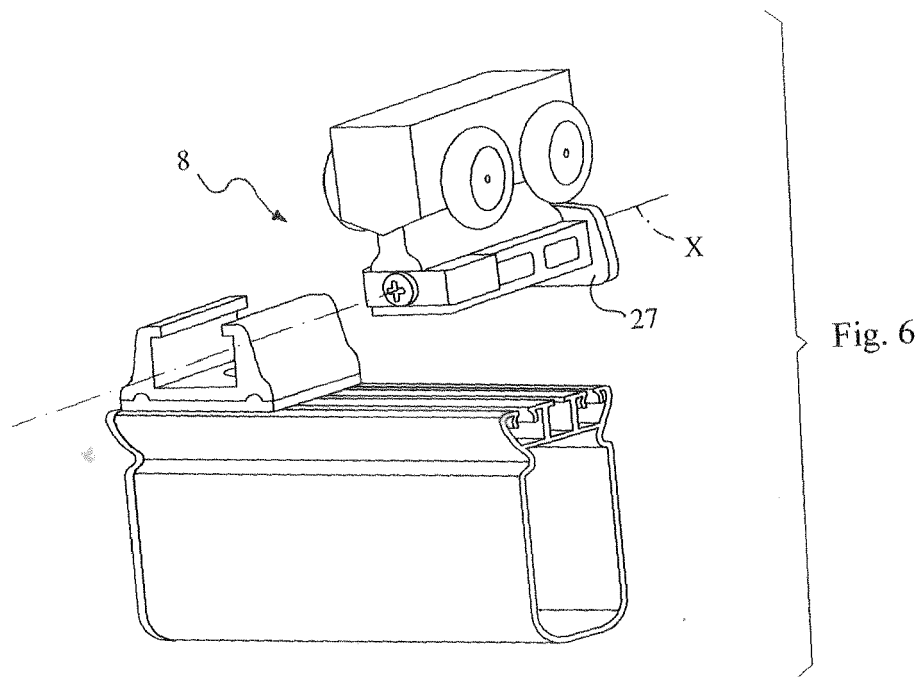


Fig. 8

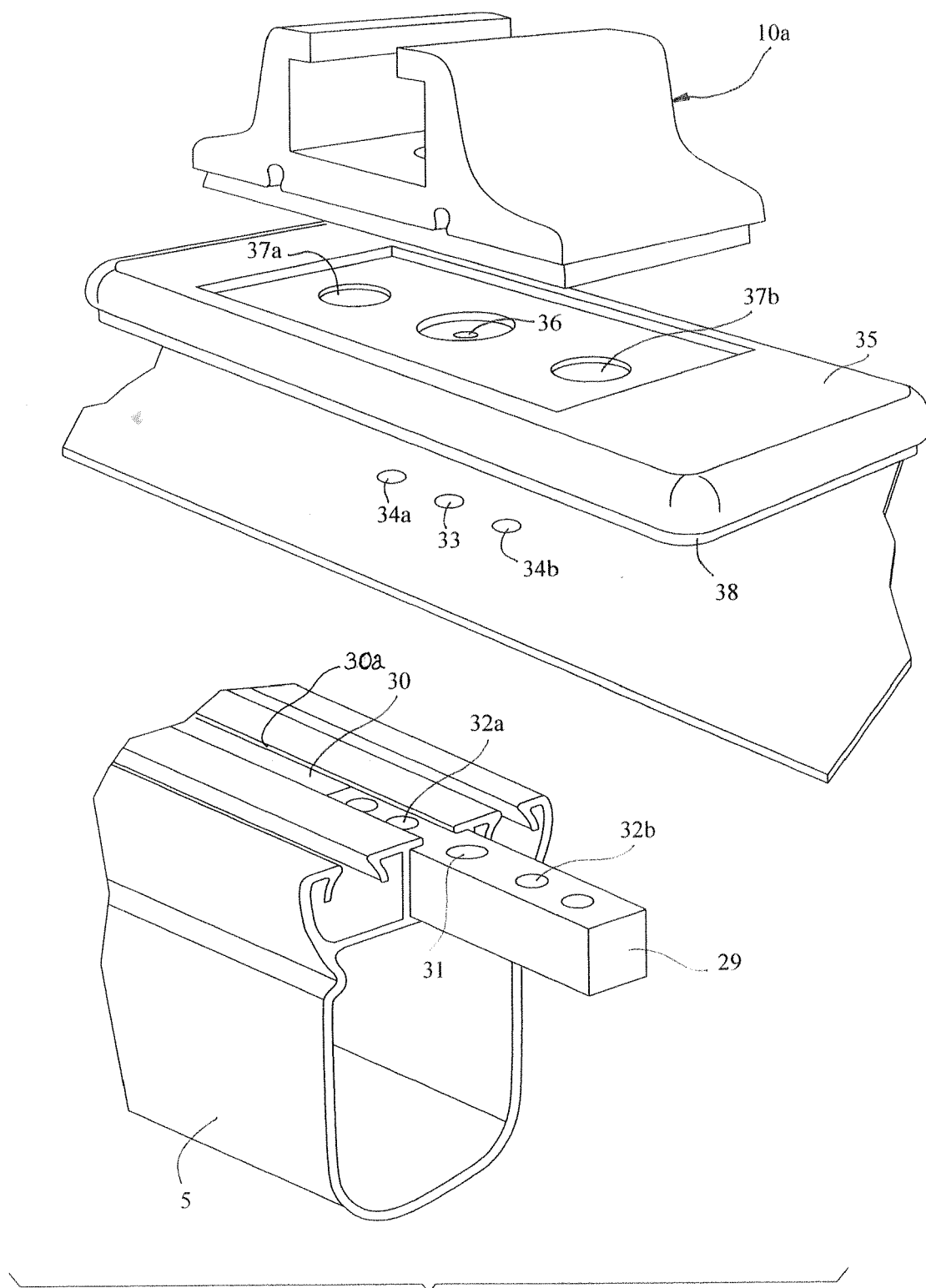


Fig. 9

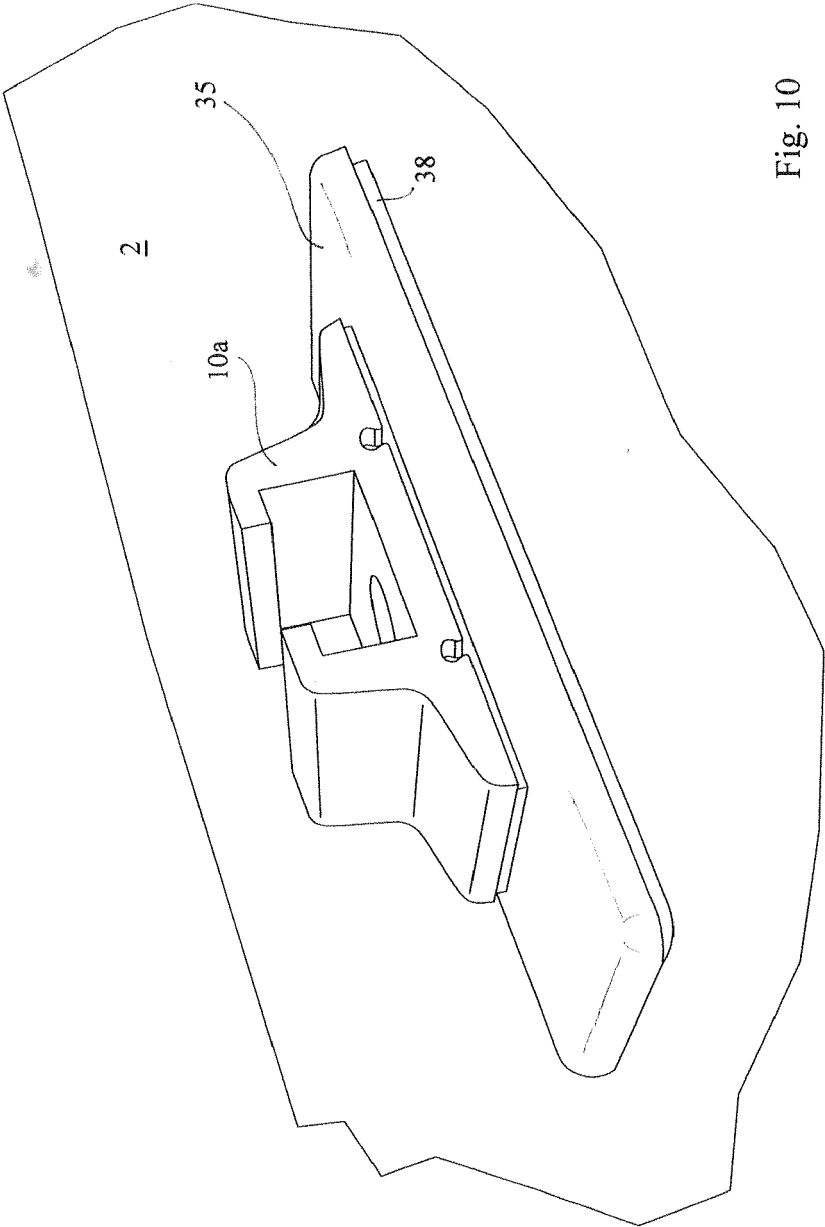


Fig. 10