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(54) **FLY SCREEN WITH LATERAL WINDING FOR DOORS OR WINDOWS**

(57) Described is a fly screen (1) with lateral winding for doors or windows comprising a lower guide (2) and an upper guide (3), a plurality of lower tracks (8) and a plurality of upper tracks (13) which are designed to be positioned respectively in the lower guide (2) and in the upper guide (3) in a closed configuration of the fly screen (1).

towards a lower surface (12) of the sliding channel (8b) and are configured for locking the lower end (6c) of the mesh (6) if the lower end (6c) tends to escape from the sliding plane (S).

The fly screen (1) comprises a slider (4) which is slidable along the lower guide (2) and the upper guide (3). The slider (4) is hollow, can be inspected and the ends of the tracks (8) and (13) are housed inside it. The slider (4) is kept in a vertical position thanks to the synchronisation between a first portion (24a) of a chain (24) coupled to the track (8) and a second portion (24b) of the chain (24) coupled to the track (13).

The fly screen (1) comprises a lateral box (5) comprising a winding tube (7), and a mesh (6) comprising a lower end (6c) and an upper end (6d) respectively slidable in the lower (2) and upper (3) guides. The mesh (6) is fixed with a first lateral end (6a) to the slider (4) and with a second lateral end (6b) to the winding tube (7) of the lateral box (5). The lower guide (2) and the upper guide (3) define a sliding plane (S) of the mesh (6).

Each lower track (8) defines a sliding channel (8b) of the mesh (6), delimited by a first lateral surface (9a) and a second lateral surface (9b) which are opposite each other. Each lateral surface (9a, 9b) comprises a plurality of brushes (11) protruding towards the inside of the sliding channel (8b). The brushes (11) are arranged inclined

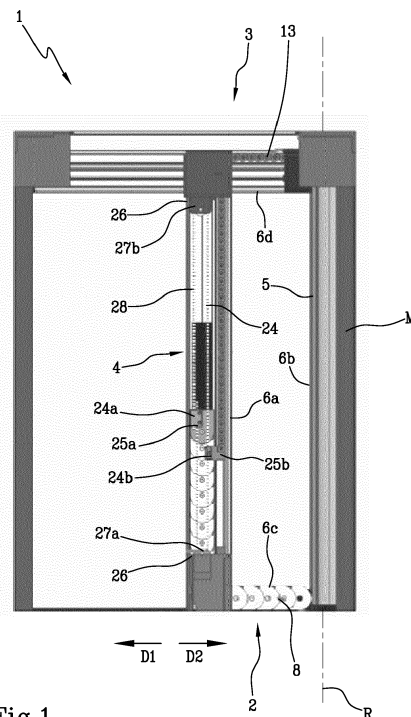


Fig.1

Description

[0001] This invention relates to a fly screen with lateral winding for doors or windows.

[0002] The use of fly screens is known which are installed on doors, windows or French windows preventing the entrance of insects such as mosquitoes or flies inside the home.

[0003] Several models of fly screens with lateral winding of the mesh have been known for some time on both the national and international markets.

[0004] The prior art fly screens have a floor-mounted profile which obstructs the passage of a carriage with wheels. Models with lateral winding have been designed in order to eliminate the problem of the floor-mounted guide. The structure of these models is driven by tracks which slide inside an aluminium profile (the so-called slider) which is used to move the fly screen.

[0005] The mesh of the fly screen slides inside tracks but disadvantageously a space is formed between the tracks, both in height and width, such that some small animals, such as, for example, a lizard, can easily pass from one side to the other.

[0006] Even more disadvantageously one gust of wind, even not very strong, can cause the escape of the mesh from the tracks.

[0007] Moreover, in the case of fly screens with tracks in the upper part as well in the lower part, the Applicant has noted how a strong wind or the fast opening/closing of the fly screen leads the escape of the tracks both from the upper guide and from the mesh.

[0008] The aim of this invention is to provide a fly screen with lateral winding for doors or windows which overcomes the drawbacks of the prior art.

[0009] More specifically, an aim of this invention is to provide a fly screen with lateral winding for doors or windows which prevents the escape of the mesh from the lower guide, and, therefore, from the lower tracks, and which therefore prevents the entrance of animals, such as, for example, lizards.

[0010] Another aim of this invention is to provide a fly screen with lateral winding which avoids the problem also in the upper guide.

[0011] A further aim of this invention is to provide a fly screen with lateral winding which is easily fitted and which does not suffer from the problems of misalignment due to the above-mentioned problems.

[0012] The technical purpose indicated and the aims specified are substantially achieved by a machine comprising the technical features described in one or more of the accompanying claims. The dependent claims correspond to possible embodiments of the invention.

[0013] The invention illustrates a fly screen with lateral winding for doors or windows comprising a lower guide and an upper guide, a plurality of lower tracks and a plurality of upper tracks which are designed to be positioned respectively in the lower guide and in the upper guide in a closed configuration of the fly screen.

[0014] The fly screen comprises a slider slidable along the lower guide and the upper guide, a lateral box comprising a winding tube, and a mesh comprising a lower end and an upper end respectively slidable in the lower and upper guides. The mesh is fixed with a first lateral end to the slider and with a second lateral end to the winding tube of the lateral box. The lower guide and the upper guide define a sliding plane of the mesh.

[0015] Each lower track defines a sliding channel of the mesh, delimited by a first lateral surface and a second lateral surface which are opposite each other. Each lateral surface comprises a plurality of brushes protruding towards the inside of the sliding channel. The brushes are arranged inclined towards a lower surface of the sliding channel and are configured for locking the lower end of the mesh if the lower end tends to escape from the sliding plane.

[0016] Further features and advantages of the invention are more apparent in the nonlimiting description which follows of a preferred non-exclusive embodiment of a fly screen with lateral winding.

[0017] The description is set out below with reference to the accompanying drawings which are provided solely for purposes of illustration without restricting the scope of the invention and in which:

- Figure 1 is a schematic view of a fly screen with lateral winding according to this invention;
- Figures 2a to 2c are schematic representations of lower tracks of the fly screen with lateral winding of Figure 1;
- Figure 3 is a schematic perspective representation of a detail of the upper guide of the fly screen with lateral winding of Figure 1;
- Figures 4a and 4b are schematic representations of the slider of the fly screen with lateral winding side of Figure 1;
- Figures 4c and 4d are schematic representations of details of the slider of the fly screen with lateral winding side of Figure 1;
- Figure 5a is a schematic representation of a cross section of a lateral box and of a wall profile of the fly screen with lateral winding of Figure 1;
- Figure 5b is a schematic representation of a fixing element associated with the lateral box and the wall profile of Figure 5a.

[0018] With reference to the accompanying drawings, the numeral 1 denotes in its entirety a fly screen with lateral winding for doors or windows according to this invention which, for convenience of description, will hereafter be referred to as the fly screen 1. The elements in common in the accompanying drawings are denoted with the same reference numeral.

[0019] The fly screen 1 can preferably be installed in a door, or in a window or in a French window.

[0020] Figure 1 shows the fly screen 1 according to this invention. The fly screen 1 comprises a lower guide

2 and an upper guide 3, a slider 4 slidable between the lower guide 2 and the upper guide 3, a lateral box 5 and a mesh 6.

[0021] The mesh 6 is fixed with a first lateral end 6a to the slider 4 and with a second lateral end 6b to the lateral box 5.

[0022] More specifically, the second lateral end 6b is fixed to a winding tube 7 of the lateral box 5. The winding tube 7 is able to rotate about its own vertical axis of rotation "R" in such a way that to a sliding of the slider 4 corresponds to a rotation of the winding tube 7. This rotation of the winding tube 7 allows the mesh 6 to be freed from or wound on the winding tube 7.

[0023] Preferably, the winding of the mesh 6 around the winding tube 7 is facilitated by the presence of a spring incorporated inside the winding tube 7.

[0024] In this way, a sliding along a first direction 'D1' of the slider 4 allows the mesh 6 to free itself from the winding tube 7 whilst a sliding along a second direction "D2" (opposite to the first direction 'D1') causes a winding of the mesh 5 around the winding tube 7.

[0025] Yet more specifically, the mesh 6 comprises a lower end 6c and an upper end 6d. The ends 6c and 6d are slidable respectively in the lower 2 and upper 3 guides. The lower guide 2 and the upper guide 3 define a sliding plane "S" of the mesh 6. The sliding plane "S" is also the sliding plane of the slider 4.

[0026] The fly screen also comprises a plurality of lower tracks 8 and a plurality of upper tracks 13 which are designed to be positioned respectively in the lower guide 2 and in the upper guide 3 in a closed configuration of the fly screen 1.

[0027] Preferably, the lower end 6c and the upper end 6d of the mesh 6 are configured for sliding, respectively, in the lower tracks 8 and the upper tracks 13.

[0028] More in detail, the lower guide 2 comprises a plurality of lower tracks 8. Figures 2a to 2c schematically show the lower tracks 8.

[0029] As shown in Figure 2a, each lower track 8 may be made of a plurality of components 8a. More specifically, each lower track 8 is made by the coupling of the plurality of components 8a.

[0030] The lower tracks 8 define a sliding channel 8b of the mesh 6. The sliding channel 8b is delimited by a first lateral surface 9a and a second lateral surface 9b opposite to each other. Preferably, each lower track 8 also has a housing 10 on each lateral surface 9a, 9b.

[0031] Each lateral surface 9a, 9b comprises a plurality of brushes 11 preferably inserted in the housing 10. The brushes 11 are inclined relative to a horizontal direction and protrude towards a lower surface 12 of the sliding channel 8b.

[0032] The brushes 11 are configured for locking the lower end 6c of the mesh 6 if the lower end 6c tends to escape from the sliding plane "S".

[0033] Preferably, the brushes 11 are made in such a way as to prevent the brushes 11 from escaping from the housing 10. In other words the brushes 11 comprise a

coupling base 11a configured to be inserted into a first portion 10a of the housing 10 and couple in a second portion 10b of the housing 10.

[0034] The brushes 11 are inclined towards the lower surface 12 of the sliding channel 8b when the bottom end 6c of the mesh 6 lies in the sliding plane "S". Due, for example, to a strong gust of wind or an attempt at intrusion by an animal (such as a lizard), the mesh tends to escape from the sliding plane "S" and the brushes 11 are configured for locking the lower end 6c of the mesh 6, bending slightly upwards. Preferably, the brushes 11 bend with a slight rotation such that the brushes 11 are able to accompany at least partly the mesh 6 in its movement of deviation from the sliding plane "S" and then stop and couple partly with the mesh 6. The slight rotation is made possible also by the housing 10 which allows the coupling base 11a to move slightly inside it. The partial coupling is such that the mesh 6, returning to its position lying in the sliding plane "S" at the end of the event which has led to the escape, is able to disconnect from the brushes 11.

[0035] Figure 3 schematically show the upper guide 3. The upper guide 3 defines a sliding channel 3a. The sliding channel 3a is delimited by a first lateral surface 14a and a second lateral surface 14b opposite to each other. Each lateral surface 14a, 14b comprises a plurality of first brushes 16 preferably inserted in a housing 15 and made in the same way as the brushes 11 of the lower tracks 8. Unlike the brushes 11 of the lower tracks 8, the first brushes 16 are configured for supporting the plurality of upper tracks 13.

[0036] More specifically, the first brushes 16 are inclined towards an upper surface 19 of the sliding channel 3a for supporting the plurality of upper tracks 13.

[0037] Preferably, each lateral surface 14a, 14b comprises a plurality of second brushes 18. The second brushes 18 are inserted in a housing 17 and located below the first brushes 16.

[0038] The second brushes 18 are protruding towards the inside of the sliding channel 3a. More specifically, the second brushes 18 are inclined towards an upper surface 19 of the sliding channel 3a when the upper end 6d of the mesh 6 lies in the sliding plane "S".

[0039] When the mesh 6 protrudes from the sliding plane "S" due, for example, to a strong gust of wind or the attempted entrance of an animal (such as a lizard) the second brushes 18 are configured for locking the upper end 6d of the mesh 6.

[0040] The second brushes 18 operate in the same way as the brushes 11 of the lower tracks 8, coupling with the mesh 6 in such a way that it can disconnect easily when the reason the escape from the sliding plane "S" ceases to act on the mesh 6. Even more permeably, the second brushes 18 are movable with a rotation which allows them to lock the mesh 6 without coupling with it.

[0041] The upper guide 3 is housed inside a guide carrier 19a. The guide carrier 19a is configured for the alignment of the upper guide 3 with the sliding plane "S". More

specifically, if, for example, the upper guide 3 has not been correctly mounted, such that it is not correctly aligned with the lower guide 2, the guide carrier 19a makes it possible to correct this misalignment, correctly aligning the upper guide 3 with the sliding plane 'S'. In other words, the presence of the guide carrier 19a allows the upper guide 3 to maintain and correct a parallelism with the lower parallel with the guide 2 allowing both to remain aligned with the sliding plane "S".

[0042] Figures 4a and 4b schematically show the slider 4. The slider 4 preferably has a first inner guide 22 and a second inner guide 23.

[0043] The first 22 and the second inner guide 23 are configured to house and allow the sliding, respectively, of the lower tracks 8 and of the upper tracks 13. Preferably, the slider 4 houses entirely the lower tracks 8 and the upper tracks 13, in an open configuration of the fly screen 1.

[0044] Preferably, the first inner guide 22 has an opening 22a configured for allowing the entry or exit of the lower tracks 8 in the first inner guide 22 when the slider 4 is placed in motion for the opening or closing of the fly screen 1.

[0045] Preferably, the second inner guide 23 has an opening 23a configured for allowing the entry or exit of the upper tracks 13 in the second inner guide 23 when the slider 4 is placed in motion for the opening or closing of the fly screen 1.

[0046] Even more preferably, as shown in Figures 4c and 4d, the first inner guide 22 and the second inner guide 23 comprise respective seats 22b and 23b close to the openings 22a and 23a. The seats 22b and 23b are configured to allow the sliding of the lower tracks 8 and the upper tracks 13 in such a way that the slider 4 can stop in any position, even if the spring, incorporated in the winding tube 7, is particularly loaded. Preferably, the seats 22b and 23b have an inclination of 45° relative to the lower guide 2 and to the upper guide 3 which house, respectively, the lower tracks 8 and the upper tracks 13.

[0047] Preferably, the first inner guide 22 comprises a counterweight made of metal which pushes on the lower tracks 8 in such a way as to block the movement of the lower tracks 8 in the seat 22b having the inclination of 45°.

[0048] Preferably, the slider 4 comprises a first profile 20 and a second profile 21. The first profile 20 and the second profile 21 define the first 22 and the second 23 inner guide. More specifically, the first 20 and the second 21 profile are configured for closing and opening the first 22 and the second 23 inner guide.

[0049] The first profile 20 also comprises a coupling channel 20a designed to fix the first lateral end 6a of the mesh 6 to the slider 4.

[0050] Preferably, the slider 4 comprises a chain 24 which allows a constant sliding of the plurality of lower tracks 8 and of upper tracks 13 inside the first 22 and the second 23 inner guide when the slider 4 is set in motion (for the closing or opening of the fly screen 1).

[0051] The chain 24 is inside the first profile 20 and

passes through the first inner guide 22 and the second guide 23 following a closed path. More specifically, the chain 24 is anchored with a first portion 24a to at least one lower track 8 by a first fastening means 25a, and is anchored with a second portion 24b to at least one upper track 13 by a second fastening means 25b. In other words, the chain 24 is anchored to an accessory consisting of the first and second fastening means which in turn is anchored to both the lower 8 and upper 13 tracks. More specifically, the first fastening means 25a are configured for anchoring the first portion 24a to an end of the plurality of lower tracks 8 (preferably to the first lower track 8) associated with the slider 4 (and not to the end associated with the lateral box 5) thereby anchoring to a single lower track 8 or to more than one. Similarly, the second fastening means 25b are configured for anchoring the second portion 24b to an end of the plurality of upper tracks 13 (preferably to the first upper track 13) associated with the slider 4 (and not to the end associated with the lateral box 5) thereby anchoring to a single upper track 13 or to more than one. In this way, the chain 24 balances the operation of the slider 4 during use allowing the correct sliding of the lower tracks 8 and of the upper tracks 13 and therefore of the slider 4. In other words, the chain 24 keeps the slider 4 in a vertical position thanks to the synchronism of the lower the tracks 8 and the upper tracks 13.

[0052] Two gear wheels 26 are housed inside the first profile 20. The gear wheels 26 are positioned in a lower section 27a and a upper section 27b of the slider 4. The gear wheels 26 are configured to allow the sliding of the chain 24 inside the first profile 20. Preferably, one of the gear wheels 26 is adjustable and is locked by a screw. In this way, the chain 24 allow the sliding of the lower tracks 8 and upper 13 inside the first profile 20 when the slider 4 is moved along the first direction "D1" (allowing a sliding downwards of the lower tracks 8 and a sliding upwards of the upper tracks 13) or along the second direction "D2" (allowing a sliding upwards of the lower tracks 8 and a sliding downwards of the upper tracks 13). Preferably, the chain 24 comprises a plurality of balls 28.

[0053] In other words, a sliding along "D1" or along "D2" of the slider 4 causes a rotation of the gear wheels 26 which cause a consequent rotation of the chain 24 which leads to a sliding of the lower tracks 8 and of the upper tracks 13.

[0054] The second profile 21 of the slider 4 is designed to facilitate the opening and closing of the slider 4 in the case of need, such as, for example, in the case of maintenance.

[0055] Preferably, the second profile 21 facilitates the fitting and/or replacing of the internal components of the slider 4 since it allows an operator to have a clear vision of the inside of the slider 4 as all the components are on view.

[0056] The fly screen 1 preferably comprises a wall profile 30, shown in Figure 5a. The wall profile 30 is configured for housing the lateral box 5. More specifically,

the wall profile 30 comprises a channel 31 configured for fixing the lateral box 5 with the wall profile 30.

[0057] Figure 5b shows a fixing element 32 comprising an inserting base 32a and at least two coupling elements 32b preferably made in the form of two tabs made at the sides of the fixing element 32. The fixing element 32 can be inserted in the channel 31 of the wall profile 30 as shown in Figure 5a.

[0058] More specifically, the fixing element 32 is movable between a rest configuration and a fixing configuration of the lateral box 5 to the wall profile 30.

[0059] Yet more specifically the fixing element 32 is configured for fixing the lateral box 5 with the wall profile 30 with a rotation of the fixing element 32, thus forming a bayonet or snap-on coupling of the lateral box 5 to the wall profile 30.

[0060] The inserting base 32a of the fixing element 32 is inserted along a direction of insertion "D3" in the channel 31. Similarly, the two coupling elements 32b are inserted in an engagement channel 33 of the lateral box 5. At this point, the fixing element 32 is made to rotate in such a way as to couple the coupling elements 32b with at least two tabs 33a of the engagement channel 33 of the lateral box 5.

[0061] In this way, it is possible to fit the lateral box 5 extremely easily to the wall profile 30 by means of a simple pressure on the lateral box 5.

[0062] Advantageously, the fixing element 32 is fixed without the addition of screws, or the like, to the wall profile 30.

[0063] Advantageously, the fixing element 32 makes it possible to mount the lateral box 5 extremely easily in a wall "M".

[0064] The fly screen 1 with lateral winding as described above makes it possible to overcome the drawbacks of the prior art.

[0065] Advantageously, the brushes 11 prevent the escape, due to strong gusts of wind, of the mesh 6 from the lower guide 2 (and thus from the lower tracks). The brushes 11 also prevent, by the partial coupling of the mesh 6, the entrance of animals, such as, for example, lizards. Similarly, the fly screen 1 advantageously makes it possible to overcome the problem also in the upper guide 3, as well as avoid misalignments due to the presence of the guide carrier 19a.

Claims

1. A fly screen (1) with lateral winding for doors or windows comprising:

- a lower guide (2) and an upper guide (3)
- a plurality of lower tracks (8) and a plurality of upper tracks (13) which are designed to be positioned respectively in the lower guide (2) and in the upper guide (3) in a closed configuration of the fly screen,

- a slider (4) which is slidable along the lower guide (2) and the upper guide (3),
- a lateral box (5) comprising a winding tube (7), and

- a mesh (6) comprising a lower end (6c) and an upper end (6d) respectively slidable in the lower (2) and upper (3) guides, wherein the mesh (6) is fixed with a first lateral end (6a) to the slider (4) and with a second lateral end (6b) to the winding tube (7) of the lateral box (5),

wherein the lower guide (2) and the upper guide (3) define a plane (S) for sliding of the mesh (6), and wherein

each lower track (8) defines a sliding channel (8b) of the mesh delimited by a first lateral surface (9a) and a second lateral surface (9b) opposite to each other, each lateral surface (9a, 9b) comprising a plurality of brushes (11) protruding towards the inside of the sliding channel, the brushes (11) being arranged inclined towards a lower surface (12) of the sliding channel (8b) and configured for locking the lower end (6c) of the mesh (6) in the case in which the lower end (6c) tends to escape from the sliding plane (S).

2. The fly screen (1) according to claim 1, wherein the upper guide (3) defines a sliding channel (3a) delimited by a first lateral surface (14a) and a second lateral surface (14b) opposite one another, each lateral surface (14a, 14b) comprising a plurality of first brushes (16), inclined towards an upper surface (19) of the sliding channel (3a), the first brushes (16) being configured to support the plurality of upper tracks (13).

3. The fly screen (1) according to claim 2, wherein each lateral surface (14a, 14bb) comprises a plurality of second brushes (18) located below the first brushes (16) and protruding towards the inside of the sliding channel (3a), the second brushes (18) being arranged inclined towards an upper surface (19) of the sliding channel (3a) and configured for locking the upper end (6d) of the mesh (6) in the case in which the upper end (6d) tends to escape from the sliding plane (S).

4. The fly screen (1) according to any one of the preceding claims, comprising a guide carrier (19a) housing the upper guide (3) and configured for aligning the upper guide (3) with the sliding plane (S).

5. The fly screen (1) according to any one of the preceding claims, wherein the slider (4) has a first inner guide (22) and a second inner guide (23) configured to house and allow the sliding, respectively, of the lower tracks (8) and of the upper tracks (13).

6. The fly screen (1) according to claim 5, wherein the first inner guide (22) and the second inner guide (23) comprise respective openings (22a, 23a) and respective seats (22b, 23b) close to the openings (22a, 23a) configured to allow the sliding, respectively, of the lower tracks (8) and of the upper tracks (13), the seats (22b, 23b) having an inclination preferably of 45° relative to the lower guide (2) and the upper guide (3). 5
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7. The fly screen (1) according to claim 5 or 6, wherein the slider (4) comprises a first profile (20) and a second profile (21) defining the first (22) and second (23) inner guide, the first and second (21) profile being configured for closing and opening the first (22) and second (23) inner guide. 15
8. The fly screen (1) according to claim 7, wherein the slider (4) comprises a chain (24), anchored with a first portion (24a) to at least one lower track (8) and with a second portion (24b) to at least one upper track (13), and two gear wheels (26) positioned in a lower section (27a) and an upper section (27b) of the slider (4), configured for allowing the sliding of the chain (24), the chain (24) being configured to allow a constant sliding of the lower tracks (8) and of the upper tracks (13) in the first (22) and second (23) inner guide. 20
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9. The fly screen (1) according to claim 8, wherein the chain (24) comprises a first fastening means (25a) configured for anchoring the first portion (24a) to at least one lower track (8) and a second fastening means (25b) configured for anchoring the second portion (24b) to at least one upper track (13), the first (25a) and second (25b) fastening means being configured to allow the correct sliding of the slider (4) keeping a vertical position of the slider (4). 30
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10. The fly screen (1) according to claim 8 or 9, wherein the chain (24) comprises a plurality of balls (28). 40
11. The fly screen (1) according to any one of the preceding claims, comprising a wall profile (30) configured to house the lateral box (5), the wall profile (30) comprising a channel (31) configured for fixing the lateral box (5) to the wall profile (30). 45
12. The fly screen (1) according to claim 11, comprising a fixing element (32) which can be inserted in the channel (31) of the wall profile (30) and movable between a rest configuration and a configuration for fixing the lateral box (5) to the wall profile (30). 50
13. The fly screen (1) according to claim 12, wherein the fixing element (32) is configured for a bayonet or snap-on coupling of the lateral box (5) to the wall profile (30). 55

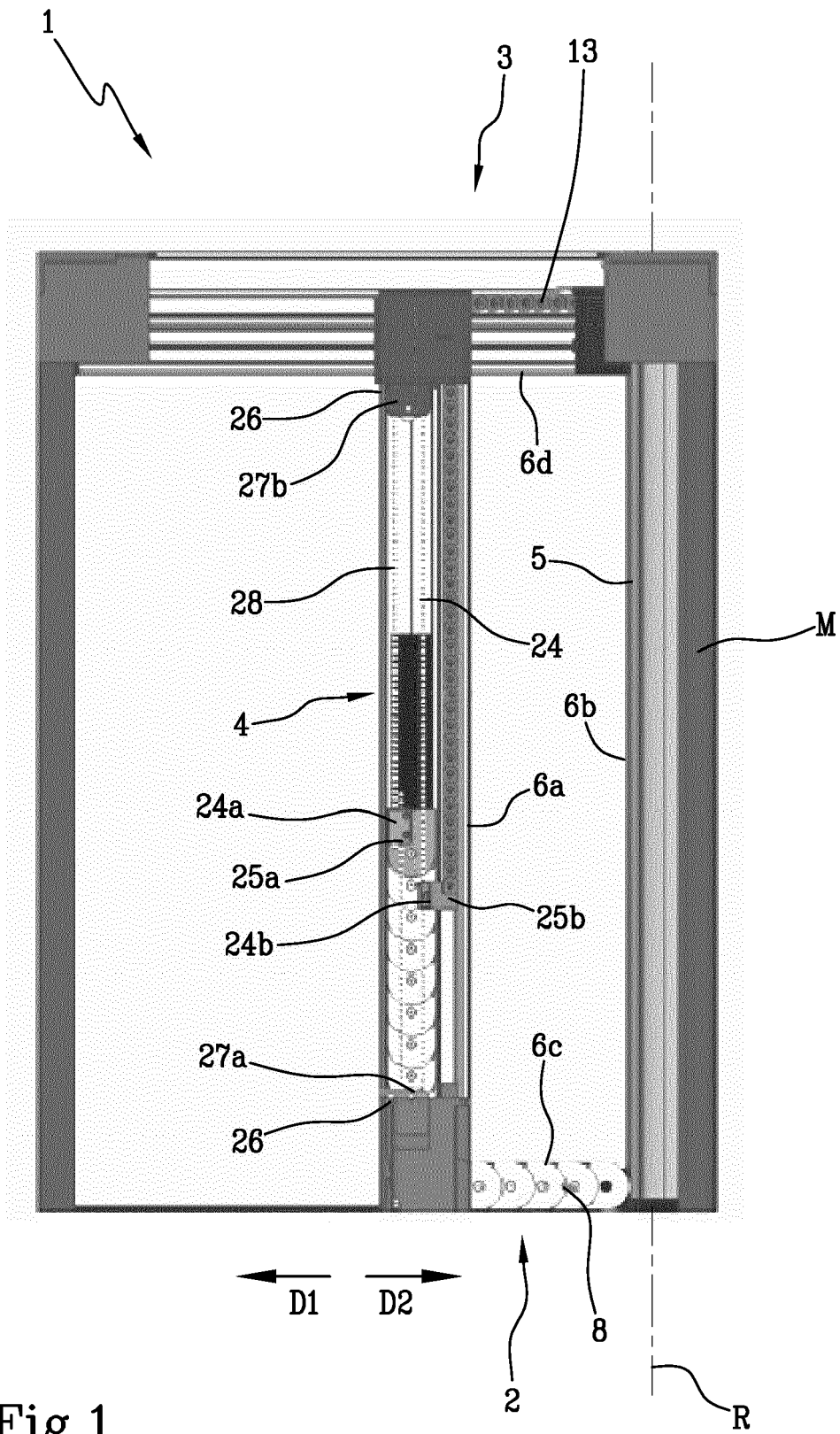


Fig.1

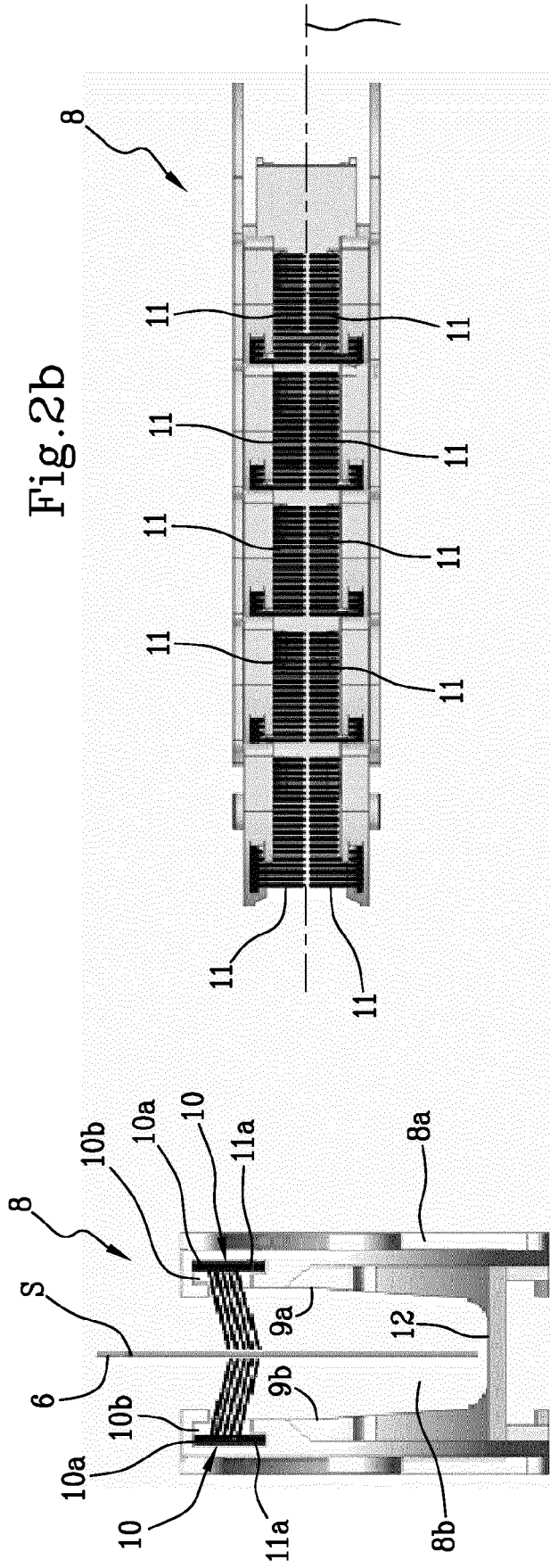


Fig. 2b

Fig. 2a

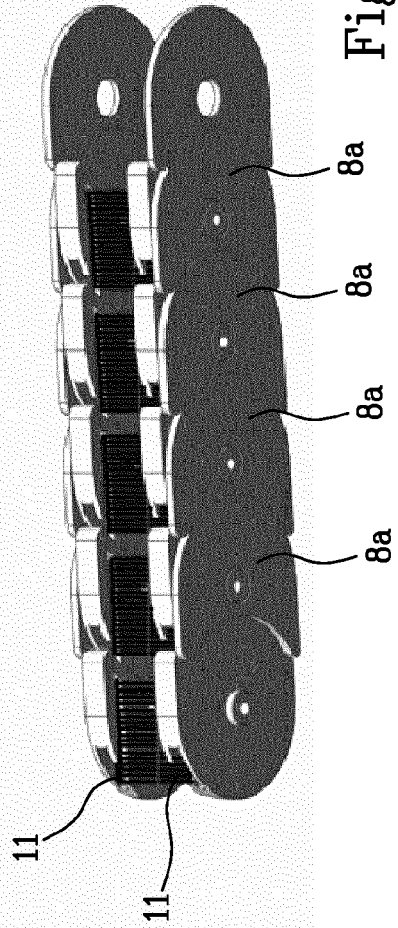
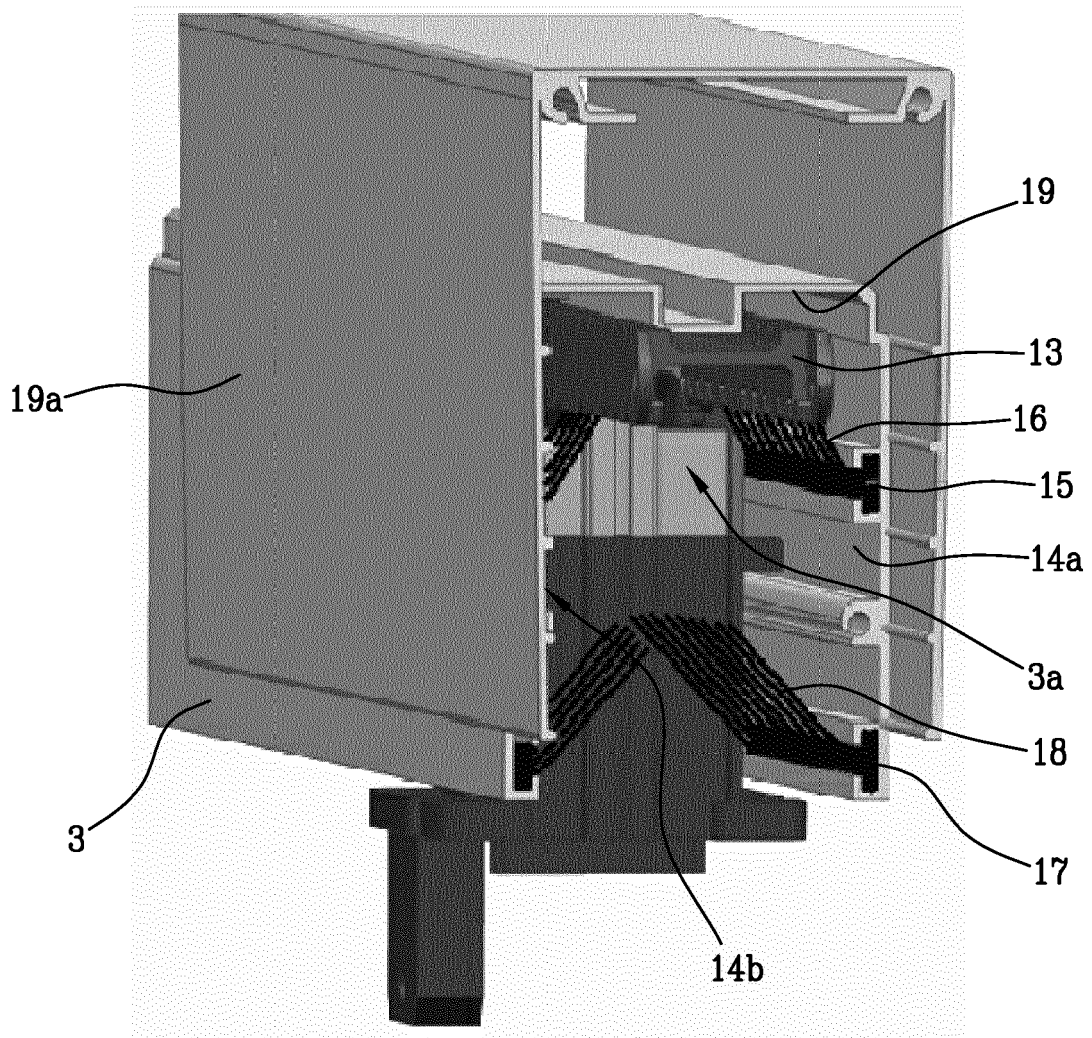


Fig. 2c

Fig.3



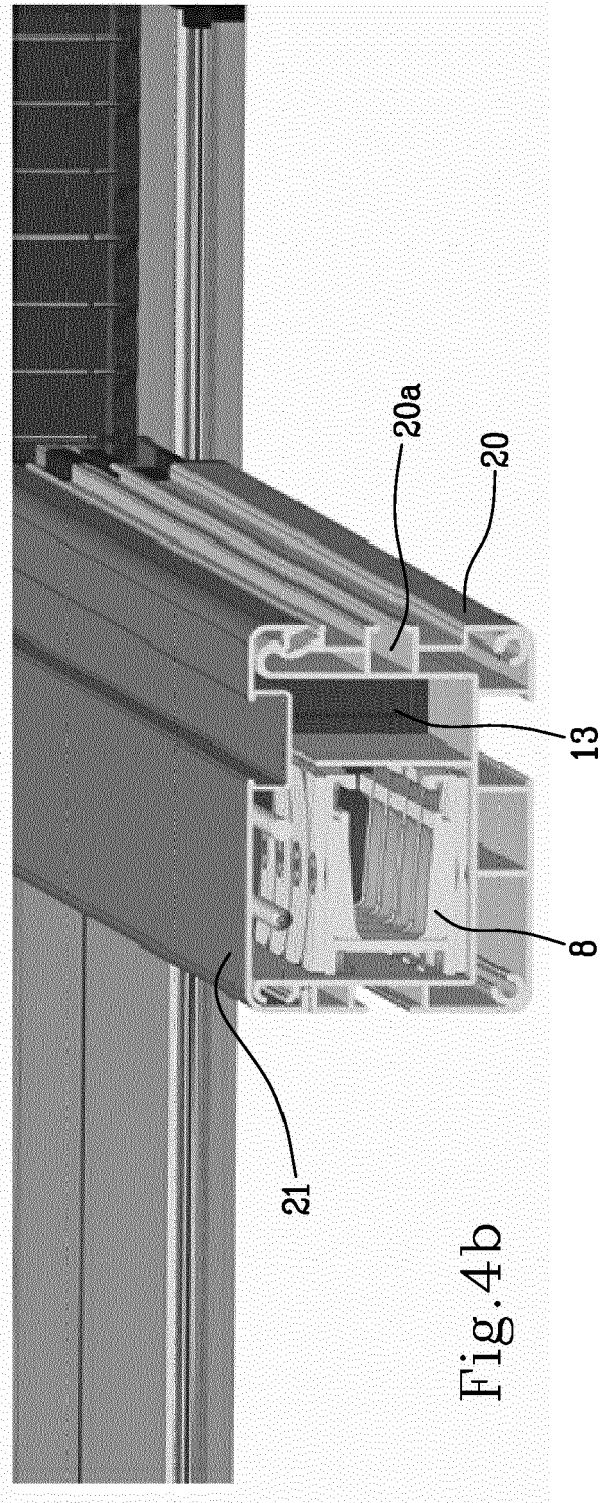
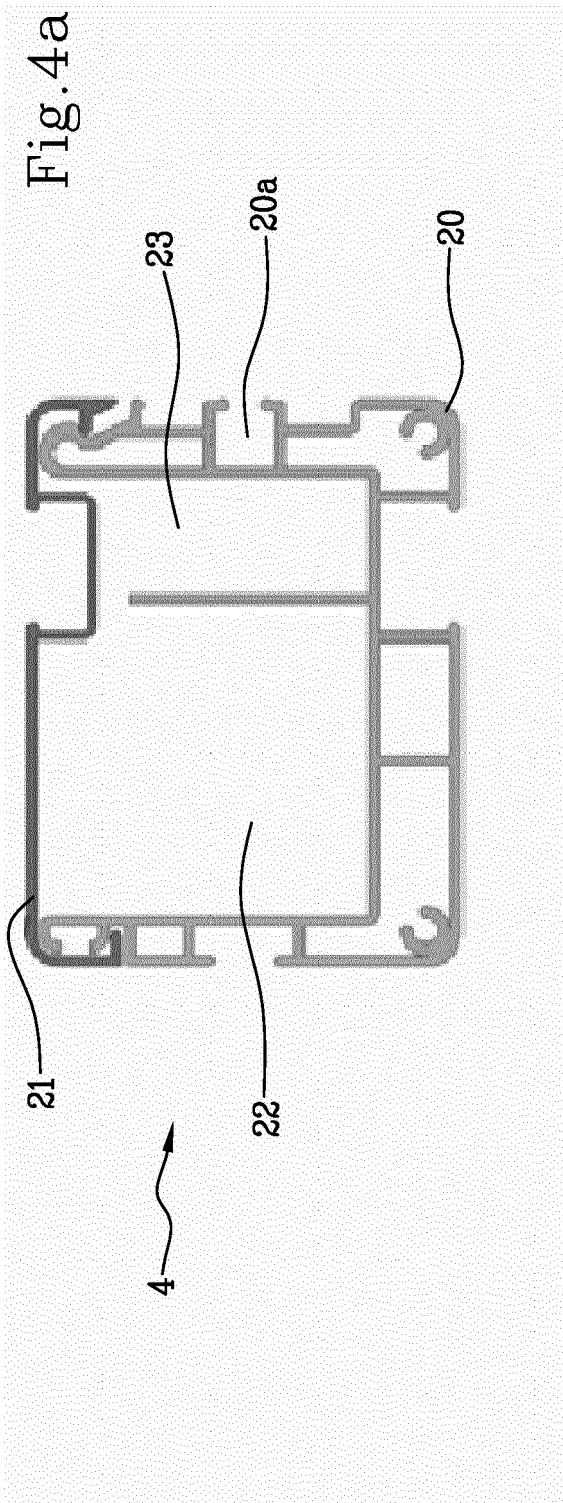


Fig.4c

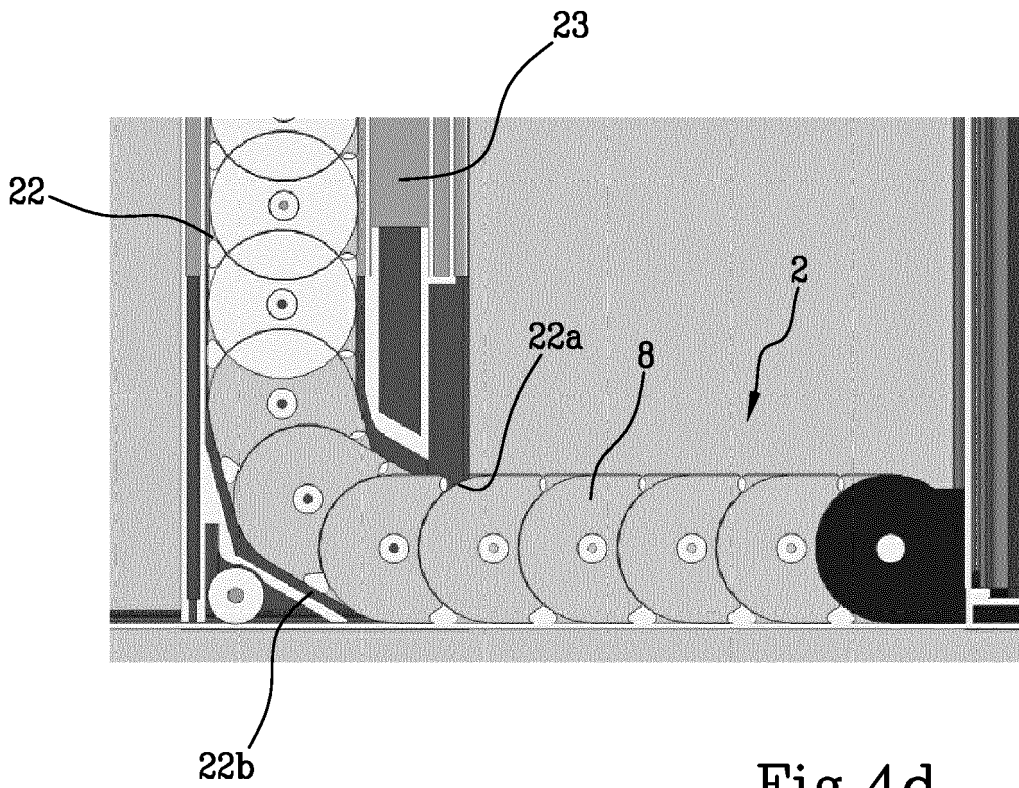
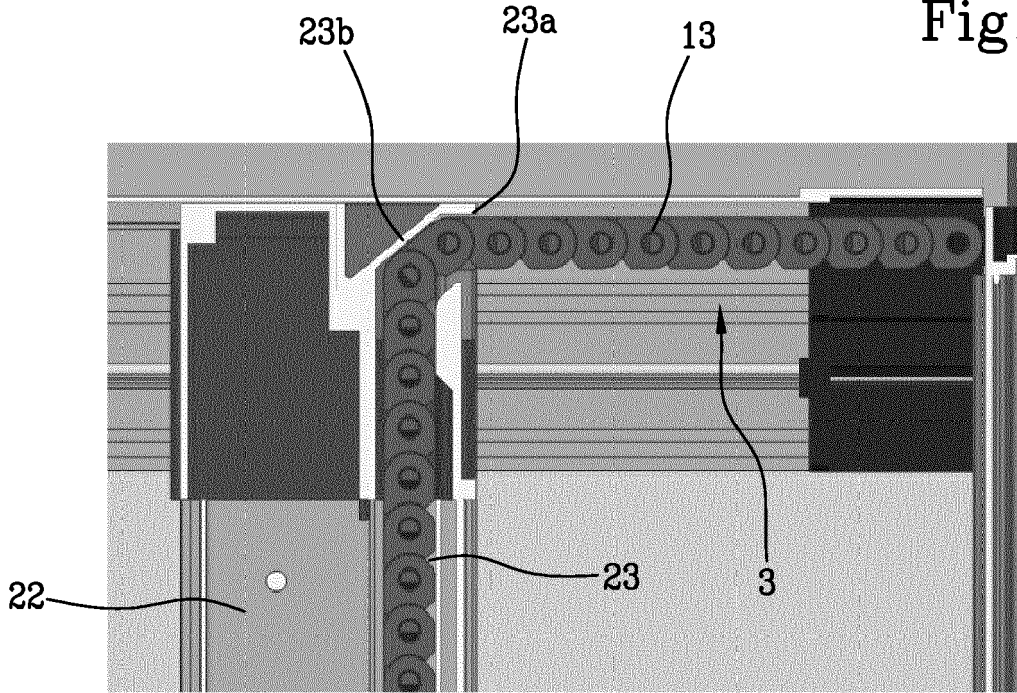


Fig.4d

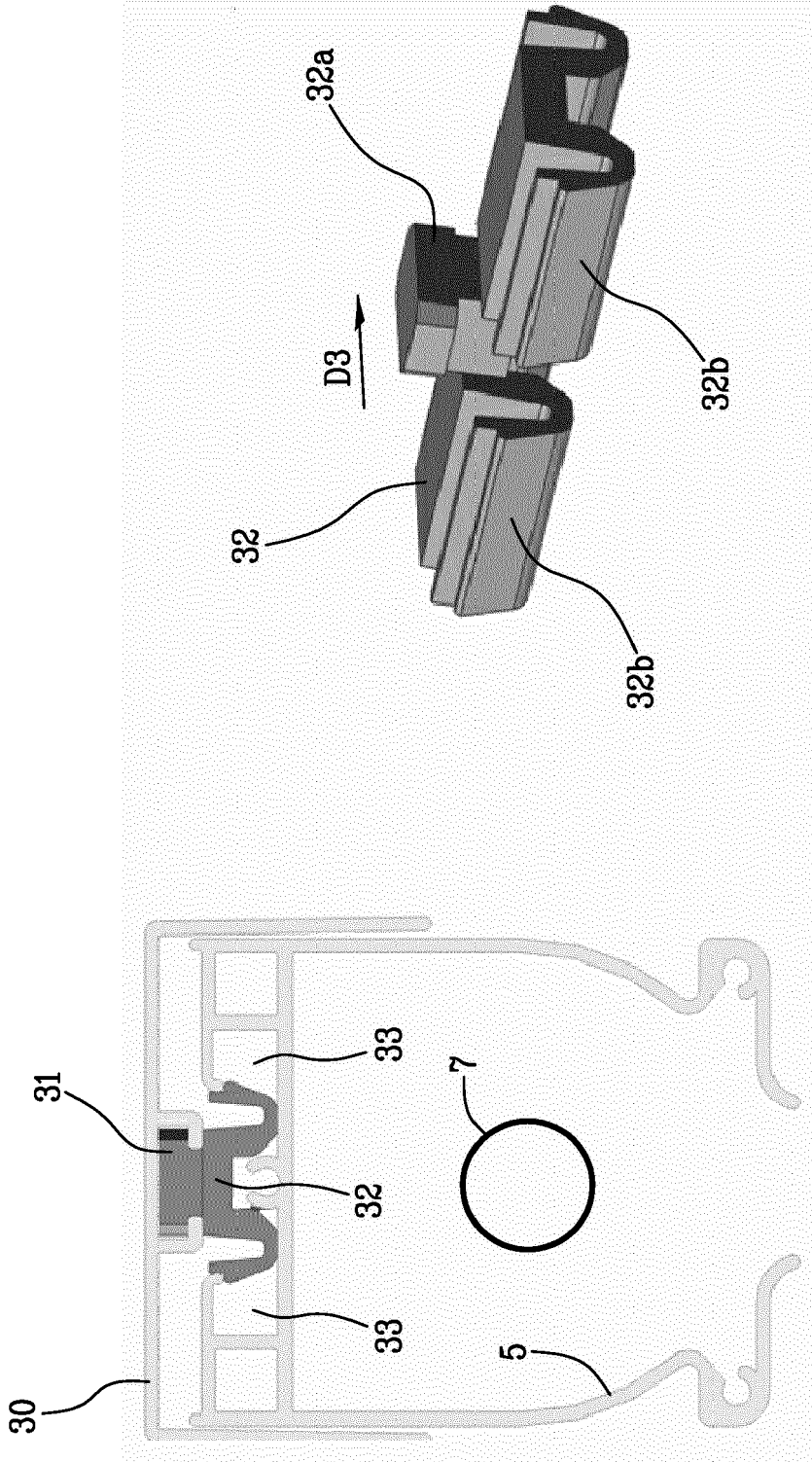


Fig. 5b

Fig. 5a

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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