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(54) **A screening arrangement for a window**

Abschirmvorrichtung für ein Fenster

Dispositif de criblage pour fenêtre

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Description

[0001] The present invention relates to a screening arrangement for a window, preferably a roof window, comprising a frame with a top piece, a bottom piece and two side pieces the screening arrangement comprising a bottom element and two side rails comprising a longitudinal direction L and a width direction W, the bottom element being movable with respect to the two side rails between a first non-screening position and a second screening position by means of a drive means comprising a first transmission means arranged in said bottom element and a second transmission means arranged in each of the two side rails such as to extend substantially in the longitudinal direction L of the respective side rail.

[0002] A screening arrangement of the above general type is known from JP 11-152974 A, which describes a shutter comprising a bottom element with a shaft and two gear wheels, two side rails with a rack for engagement with the gear wheels and a screening device. An electrical motor for moving the bottom element is arranged in the bottom element of the screening arrangement together with batteries for providing electrical power to the motor.

[0003] When mounting such screening devices on a frame one generally speaking arranges the top element at the top piece of the frame and subsequently the two side rails are connected to the top element by arranging them along the respective side pieces of the frame and connecting them thereto. Finally, one connects the bottom element to the side rails in such a way that the first transmission means is brought into engagement with the second transmission means.

[0004] During the mounting process one may experience that the distance between the side pieces of the frame as measured in a direction perpendicular to both side pieces may vary over the longitudinal extension of the side pieces. Such variations normally arise from imperfections occurring naturally in the frame pieces or being caused during the production of the frame pieces but may in principle also arise from variations in the corresponding distance between the side surfaces of the aperture in which the frame is installed.

[0005] These variations may in turn lead to variations in the distance between the two side rails as measured in a direction perpendicular to both side rails, and thus between the two second transmission means. This, in turn, has the drawback that during use the first transmission means and the second transmission means may be forced out of engagement. For some types of screening arrangements employing electrical drive means the supply of electrical energy to the electrical drive means may furthermore be interrupted. Both of these drawbacks may lead to the screening arrangement malfunctioning, and they may furthermore even lead to the screening arrangement being damaged.

[0006] Therefore, it is the object of the invention to provide a screening device of the type mentioned in the introduction, whereby the transmission means are less

susceptible, or even not susceptible at all, to variations in the distance between the two side pieces of the frame on which the screening arrangement is mounted as measured in a direction perpendicular to both side pieces. Further, it is an object to provide a compact screening device i.e. slim side rails which is also easy to assemble.

[0007] According to the invention, this is obtained by a screening device of the type described in the introduction, in which at least one electrical guide is arranged in at least one of the two side rails such as to extend substantially in the longitudinal direction L of the at least one of the side rails and in which the second transmission means is arranged offset with respect to the at least one electrical guide in a depth direction D extending substantially perpendicular to both the longitudinal direction L and the width direction W.

[0008] Put in other words, the construction of the side rails of a screening arrangement according to the invention may be described such that the surface of at least one electrical guide is offset with respect to the second transmission means in the depth direction D.

[0009] Thereby a screening arrangement is provided in which the first transmission means may follow the path of to the second transmission means, even where the second transmission means does not follow a completely straight line as a result of variations as described above. Thereby the first transmission means is capable of taking up variations in the distance between the two side rails as measured in a direction perpendicular to both side rails. Thus, the transmission means are considerably less susceptible to variations in the distance between the two side pieces of the frame. This in turn leads to a screening arrangement being more robust and less in risk of being damaged.

[0010] According to a preferred embodiment the side rails further comprise an outer profile and an inner profile, the second transmission means and the at least one electrical guide being arranged on the inner profile in such a way that the second transmission means is arranged offset with respect to the at least one electrical guide in a depth direction D extending substantially perpendicular to both the longitudinal direction L and width direction W.

[0011] Thereby a particularly simple construction of the side rails is achieved.

[0012] According to a preferred embodiment at least one of the side rails comprises two electrical guides extending on each side of the second transmission means.

[0013] Thereby an improved supply of electrical energy to the electric motor is achieved.

[0014] According to a preferred embodiment the first transmission means is arranged in the bottom element in such a way that at least a part of the first transmission means is displaceable in a longitudinal direction LB of the bottom element.

[0015] Thereby, a screening arrangement is provided in which the first transmission means is capable of taking up even larger variations in the distance between the two side rails as measured in a direction perpendicular to

both side rails. This in turn leads to a screening arrangement being even more robust and even less in risk of being damaged.

[0016] According to a preferred embodiment the second transmission means is arranged recessed with respect to the at least one electrical guide in a depth direction D extending substantially perpendicularly to both the longitudinal direction L and the width direction W.

[0017] In this way the recessed second transmission means provides for a track in which the first transmission means moves and is guided without being able to inflict damage on the electrical guides. Thereby, a screening arrangement is provided in which the engagement between the first transmission means and the second transmission means is particularly robust.

[0018] According to a preferred embodiment the second transmission means is arranged raised with respect to the at least one electrical guide in a depth direction D extending substantially perpendicular to both the longitudinal direction L and width direction W.

[0019] In this way, a screening arrangement is provided in which the first transmission means is capable of being displaced sideways to a position above the electrical guide(s) without inflicting damage thereto. Thereby the first transmission means may take up particularly large variations in the distance between the two side rails as measured in a direction perpendicular to both side rails. This in turn leads to a screening arrangement being particularly robust.

[0020] The second transmission means may be arranged offset with respect to the at least one electrical guide in a depth direction D extending substantially perpendicular to both the longitudinal direction L and width direction W by at least 0,5 mm, preferably at least 0,8 mm, more preferably at least 1 mm, most preferably at least 1,2 mm.

[0021] According to a preferred embodiment the drive means is an electrical drive means, and that the first transmission means comprises an electrical motor driving the drive means and being arranged in the bottom element.

[0022] According to a preferred embodiment the first transmission means comprises a rotatable shaft and a gear wheel at opposite ends of said shaft and that the second transmission means comprises a rack extending in the longitudinal direction of each of the side rails, which provides for a particularly well functioning and durable transmission system.

[0023] According to a further preferred embodiment the gear wheel is arranged on the shaft in such way that it is displaceable in a longitudinal direction LB of the bottom element.

[0024] Thereby, a screening arrangement is provided in which the gear wheel and/or the rotatable shaft is capable of taking up considerable variations in the distance between the two side rails as measured in a direction perpendicular to both side rails. This in turn leads to a screening arrangement being even more robust.

[0025] According to a preferred embodiment the screening arrangement further comprises at least one suspension element arranged on the bottom element, the suspension element being adapted for allowing the first transmission means to be movable between a first position in which the first transmission means and the second transmission means are in mutual engagement and a second position in which the first transmission means and the second transmission means are disengaged.

[0026] Thereby a screening arrangement is obtained which may be operated manually, e.g. in case the electrical drive means malfunctions.

[0027] According to a preferred embodiment the outer profile and the inner profile are arranged such as to form between them a guide slot for guiding the bottom element.

[0028] Thereby a particularly robust and well functioning guidance of the bottom element is obtained, which in turn also leads to a more stable electrical connection between electrical guide and electric motor.

[0029] According to a preferred embodiment each of the side rails further comprise a bevelled end section adapted for receiving the first transmission means and guiding it into engagement with the second transmission means when connecting the bottom element to the side rails.

[0030] Thereby a screening arrangement being even more simple and straight forward to mount is obtained.

[0031] According to a preferred embodiment each of the side rails further comprise a flange, whereby the side rails may be mounted on a side piece of a frame in a particularly robust and durable manner.

[0032] The invention will be described in more detail below by means of a non-limiting example of an embodiment and with reference to the schematic drawings, in which

Fig. 1 shows a screening arrangement according to the invention mounted on the frame of a window, Fig. 2 shows the screening arrangement according to Fig. 1 in a partially exploded view, Fig. 3 shows a top view of an embodiment of a screening arrangement according to the invention in the assemble state, Fig. 4 shows a perspective view of the top left corner of the screening arrangement according to Fig. 3, Fig. 5 shows a schematic perspective view of a side rail and a bottom element of a screening arrangement according to the invention, Figs. 6a, 6b and 6c show cross sectional views of two different embodiments of a side rail with a second transmission means being raised with respect to two electrical guides, Figs. 7a, 7b and 7c show perspective views of a third different embodiment of a side rail with a second transmission means being raised with respect to two electrical guides,

Fig. 8 shows a cross sectional view of an embodiment of a side rail with a second transmission means being recessed with respect to two electrical guides, Figs. 9 and 10 show perspective views of the embodiment of a side rail according to Fig. 8, Fig. 11 shows a perspective view of the top left corner of a second embodiment of a screening arrangement according to the invention in which the bottom element comprises a suspension element shown in a position in which the screening arrangement may be electrically operated, Fig. 12 shows a perspective view of the top left corner of the screening arrangement according to Fig. 11 in which the suspension element is shown in a position in which the screening arrangement may be manually operated, and Fig. 13 shows an example of a suspension element for a bottom element of a screening arrangement according to the invention. Figs. 14 and 15 show perspective views of the top and bottom left corner, respectively, of a third embodiment of a screening arrangement according to the invention.

[0033] Figs 1 and 2 show an embodiment of a screening arrangement generally designated 1. As shown in Fig. 1, the screening arrangement 1 is adapted to be mounted on a frame constituted by a frame 2 representing a window. The frame 2 is preferably a pivotable frame, but may likewise be a stationary frame, which in a mounted position of the window lines an opening in a building. It is noted that the term "frame" is to be understood as incorporating any substantially rectangular structure positioned in any opening in a building, whether in a wall or the roof, and surrounding an aperture to be screened. The screening arrangement 1 may thus be utilized in connection with e.g. windows having a frame only, windows having a sash and a frame, or in doors.

[0034] The frame 2 has a top piece 21, a bottom piece 22 and two side pieces 23 and 24 surrounding an aperture, which is covered by a suitable panel element such as a glazing in the form of an insulating pane (not shown). The frame 2 furthermore comprises two electrical outlets 25, 26 (cf. Fig. 2), one on each side piece 23, 24. It is noted that in other embodiments only one electrical outlet may be provided, and/or the electrical outlet(s) may be arranged on the top piece 21 or even the bottom piece 22.

[0035] In the embodiment shown, the screening arrangement 1 comprises a top element 4 positioned at the top piece 21, a screening body 6 (shown in Fig. 1 only) and a bottom element 7. At its upper end edge, the screening body 6 is accommodated in the top element 4 and its opposed, lower end edge is fastened to the bottom element 7. In the embodiments shown on the figures, the bottom element 7 is adapted to be electrically operated during operation of the screening arrangement 1, i.e. when moving the bottom element 7 and hence the screening body 6 between the non-screening position

shown in Figs 1 and 3 and a screening position, in which the screening body 6 covers the frame aperture partly or fully. To this end the bottom element comprises an electric motor 710, cf. Fig. 3.

[0036] It is noted that the electric motor of a screening arrangement according to the invention may in principle also be arranged in the top element 4. Furthermore, the screening arrangement according to the invention may in principle also be a manually operated screening arrangement.

[0037] Furthermore, and as is also shown on Fig. 3, the screening arrangement 1 comprises two side rails 8 and 9 adapted to be connected to a respective side piece 23 and 24 of the frame 2 by means of fastening elements, such as screws, and to the top element 4, e.g. by means of a snap or click connection or a plug and socket connection. In the mounted position of the screening arrangement 1, opposite ends of the bottom element 7 and opposite side edges of the screening body 6 are guided in these side rails 8 and 9. In the embodiment shown, the screening arrangement comprises a roller blind having as its screening body 6 a cloth or fabric, and of which the top element 4 includes a spring-biased roller bar. However, other screening arrangements having other kinds of screening bodies and other configurations of the top element are conceivable as well. Hence, it is noted that as used herein the term "screening body" is intended to encompass all feasible types of screening bodies, examples being blinds, curtains, awnings, roller shutters and shades.

[0038] Turning now to Fig. 3 depicting the screening arrangement 1 according to the invention, it may be seen that the top element 4 has a left-hand side surface 414 and a right-hand side surface 415, each comprising a connection element 412 and 413, respectively, adapted for connection to the frame in a manner known per se.

[0039] Furthermore, with reference also to Fig. 4, the bottom element 7 and the two side rails 8, 9 are shown. As may be seen, the screening arrangement 1 comprises an electrical drive means. Arranged in the bottom element 7, the electrical drive means comprises an electric motor 710, a first transmission means 711, 712, 713 and at least one electrical connection device 714, 715 for providing electrical power to the motor 710.

[0040] In the embodiment shown, the first transmission means 711, 712, 713 comprises a shaft 711 arranged such as to be rotatable by means of the electric motor 710 and gear wheels 712, 713 arranged at opposite ends of said shaft 711.

[0041] Arranged in the side rail 8 the electrical drive means comprises a second transmission means 810 and two electrical guides 811, 812 extending substantially in a longitudinal direction L of the side rail 8. Similarly, arranged in the side rail 9 the electrical drive means comprises a second transmission means 910 and two electrical guides 911, 912 extending substantially in a longitudinal direction of the side rail 9.

[0042] In the embodiment shown the second transmis-

sion means comprises a rack 810, 910 extending in the longitudinal direction L of each of the side rails 8, 9.

[0043] It is noted that other configurations of the first transmission means 711, 712, 713 and the second transmission means 810 are feasible. For instance, the second transmission means may be a rail or a track, while the first transmission means comprise wheel(s) adapted for being guided in or on the rail or track.

[0044] The first transmission means 711, 712, 713 and the second transmission means 810 are mounted in such a way with respect to each other that variations in the width of the frame, on which the screening arrangement 1 is mounted, may be absorbed or taken up.

[0045] For instance, one or both of the gear wheels 712 and 713 may be mounted in such a way as to be movable with respect to the shaft 711, and thereby in a direction perpendicular to the longitudinal extension of the racks 810 and 910, respectively. Alternatively the entire first transmission means 711, 712, 713 may be mounted in such a way as to be movable with respect to the remaining bottom element 7 in a direction parallel with the shaft 711, and thereby in a direction perpendicular to the longitudinal extension of the rack 810. In another alternative, the gear wheel 712 is arranged such as to be displaceable with respect to the shaft 711 as the shaft 711 comprises a shaft segment 728 on which the gear wheel 712 is mounted and which is arranged such as to be telescopically displaceable within the shaft 711. Also, combinations of these alternatives are naturally feasible. Examples will be described with respect to Figs. 6a to 10 further below.

[0046] It is noted that in principle only one of the side rails 8, 9 need to be equipped with the electrical guides described above, and that another number than two electrical guides, particularly one electrical guide although in principle also more than two, may be provided in one of or each of the side rails.

[0047] In the following the screening arrangement 1 will be described with reference to the side rail 8 and the adjacent end of the bottom element 7 comprising the gear wheel 712. It is noted, however, that in the embodiment shown, the opposite side rail 9 and the adjacent opposite end of the bottom element 7 comprising the gear wheel 713 are intended to be constructed in the same way.

[0048] The two electrical connection devices 714, 715 of the bottom element 7 are adapted for, in the mounted position of the screening arrangement 1, being in electrical connection with the at least one electrical guide 811, 812 such that electrical power is provided to the motor 710. In the embodiment shown the electrical connection devices 714, 715 are brushes arranged on a conductor, which in turn is connected electrically to the motor 710, either directly or by means of electrical wiring arranged in the bottom element 7. In other embodiments other suitable types of electrical connection devices suitable for providing a continuous electrical connection during movement of the bottom element along the side rail, and thus of the electrical connection devices along the

electrical guides, may be provided. Non-limiting examples are a slide contact and a contact pin adapted for being guided in a track provided in the electrical guide on the side rail.

[0049] Electrical power may be provided from the electrical outlet 25, 26 on the frame 2 to the electrical guides 811, 812, and thereby further to the electrical connection devices 714, 715 and the electric motor 710, via electrical contact means (not shown) provided on at least one of the side rails 8, 9 or via electrical connection elements (not shown) provided on the top element 4 as described in the applicant's two co-pending applications filed on the same date as the current application.

[0050] The casing of the top element 4, the profiles 817, 818, 821 of the side rail 8 and the casing of the bottom element 7, are all preferably made of aluminium or a like lightweight and durable material. For safety reasons the parts of the screening arrangement conducting electric power, particularly the electrical guides 811, 812 and the electrical connection devices 714, 715, are therefore preferably arranged such as to be electrically insulated from the profiles 817, 818, 821 of the side rail 8 and the casing of the bottom element 7 and the top element 4, respectively.

[0051] Furthermore, the bottom element 7 comprises a biasing means (not shown) adapted for urging the electrical connection device 714, 715 against the electrical guide 811, 812. The biasing means is preferably a suitable spring element which may be provided as a part of or in connection with the electrical connection devices 714, 715. The biasing means may for example be a spring loaded hinge. The biasing means may be a coil spring in a cylinder. Or the biasing means may comprise a support with a flexible portion e.g. a spring portion.

[0052] In the embodiment shown, a similar electrical connection system is provided in the side rail 9 and the adjacent end of the bottom element 7 comprising the gear wheel 713. In another embodiment it is, however, feasible that the electrical connection system described above is provided in only one of the side rails and the adjacent end of the bottom element.

[0053] Furthermore, referring also to Figs. 11 and 12, the bottom element 7 comprises, at the end comprising the gear wheel 712, a slide shoe 716 in which the electrical connection devices 714, 715 are arranged. The slide shoe 716 is arranged on the bottom element 7 in such a way that, in a mounted position of the screening arrangement 1 on the frame 2 of the window, it is aligned or even fixed in relation to the side rail 8 and movable in relation to the bottom element 7. The electrical connection devices 714, 715 may be mounted in or on the slide shoe 716 in any suitable way, examples being moulding, soldering, riveting, snap connection or frictional connection.

[0054] The slide shoe 716 is arranged on the bottom element 7 in such a way that it is movable, e.g. about a pivot axis, between a first position in which the electrical connection devices 714, 715 are in electrical contact with

the electrical guides 811, 812 (cf. e.g. Figs. 4, 11 and 12) and a second position in which the electrical connection devices 714, 715 are out of electrical contact with the electrical guides 811, 812 (not shown).

[0055] The biasing means adapted for urging the electrical connection device 714, 715 against the electrical guide 811, 812 may likewise be arranged in or on the slide shoe 716, e.g. as a suitable spring element affecting the pivot axis around which the slide shoe 716 is movable.

[0056] The slide shoe 716 may be manually operable by means of a handle element 721. The slide shoe 716 may furthermore comprise a housing 720 (cf. Figs. 11 and 12) for protective purposes. The handle element 721 preferably extends through an opening in the housing 720 as shown on Figs. 11 and 12. The sliding shoe may be automatically operable. For example a ramp on the side rail 8,9 may automatically lift and lower the shoe 716, so the electrical connection devices 714, 715 are connected to the electrical guides 811, 812 when the side rail 8,9 is inserted through the bottom element 7. For example a ramp may compress the biasing means (not shown) and level the slide shoe 716 with the electrical guides 811, 812 when assembled with the side rail 8,9.

[0057] The slide shoe is mounted adjacent to the gear wheel as shown in the figures. Alternatively the slide shoe may be mounted in such a way that the shaft extends into the slide shoe, the gear wheel being arranged in the slide shoe, preferably in the housing of the slide shoe, or that the shaft extends through the slide shoe.

[0058] It is noted that the slide shoe 716 is an optional yet preferred feature of the screening arrangement, and that a similar slide shoe may be provided at the end of the bottom element 7 comprising the gear wheel 713.

[0059] It is furthermore noted that the slide shoe 716 and/or the electrical connection devices 714, 715 may also, alternatively or in addition to the first transmission means 711, 712, 713 and the second transmission means 810 as described above, be mounted in such a way with respect to the bottom element 7 that smaller variations in the width of the frame on which the screening arrangement 1 is mounted may be absorbed or taken up. For instance, the slide shoe 716 and/or the electrical connection devices 714, 715 may be mounted in such a way as to be movable in a direction substantially in parallel with the shaft 711, and thereby in a direction perpendicular to the longitudinal extension of the electrical guide 811, 812.

[0060] With reference to Fig. 5, the construction of the side rail 8 will now be described. The side rail 8 comprises a longitudinal direction L, a width direction W and a depth direction D being mutually perpendicular.

[0061] It is noted that the longitudinal direction LB of the bottom element 7 extends substantially in parallel with the width direction W of the side rail 8, 9 when the screening arrangement 1 is mounted on the frame 2.

[0062] The side rail 8 comprises, as mentioned above, a track 810 and two electrical guides 811, 812 extending parallel with each other in the longitudinal direction L. In

one example the track 810 is sandwiched between two electrical guides 811, 812.

[0063] Generally speaking the track 810 is according to the invention arranged offset with respect to the electrical guides 811, 812 in the depth direction D. The track 810 may be raised with respect to the at least one electrical guide 811, 812 or recessed with respect to the at least one electrical guide 811,812.

[0064] Generally the track 810 is on the same surface/face as the electrical guides 811, 812. The track 810 and the the electrical guides 811, 812 may be provided on the inner profile 818, as explained later. Preferably the the electrical guides 811, 812 are integral parts of the track 810 or the electrical guides 811,812 are embedded in the track 810. This has several advantages: The track 810 may be made from polymer, which is suitable for silent and maintenance free gear transmission while also insulating the electrical guides 811, 812. Thereby a compact design is provided, because the track 810 also provides insulated electrical guides 811,812. The side rail 8 further comprises a profile element, which is made, preferably extruded, moulded or cast, of a metal such as aluminium or of plastic. The profile element comprises an outer profile 817, an inner profile 818 and a side profile 821. The first transmission means, being a rack 810, and the two electrical guides 811, 812 are mounted on the inner profile 818. The outer profile 817 and the inner profile 818 form between them a guide slot 819 adapted to guide a protrusion, such as a flange 727, formed on the bottom element 7 such as to stabilize and guide the movement of the bottom element 7 on the side rail 8.

[0065] The side rail 8 may furthermore optionally comprise a bevelled or ramp-shaped end section 820 with the purpose of making it easier for the user to bring the bottom element 7 and the side rail 8 into engagement with each other.

[0066] It is noted that with regard to the profiles and the track the other side rail 9 is identical, albeit mirror inverted about a mirror axis extending in the longitudinal direction L, to the side rail 8.

[0067] It is furthermore noted that, expressed in general terms, the second transmission means 810, 910 may be seen as being in a neutral or non-offset position with respect to the electrical guide(s) 811, 812; 911, 912 when a bottom surface of the second transmission means 810, 910, e.g. in case of a rack a surface opposite the row of teeth, is level with the electrical guide(s) 811,812;911,912.

[0068] Referring now to Figs. 6a to 6c and 7a to 7c three embodiments are described in which the rack 810 is arranged raised with respect to the two electrical guides 811, 812 in the depth direction D.

[0069] In the embodiment depicted on Figs. 6a and 6b the rack 810 and the two electrical guides 811, 812 are mounted on the inner profile 818 and the gear wheel 712 is arranged such as to be displaceable with respect to the shaft (not shown on Figs. 6a and 6b) in the direction indicated by the arrow A. As may be seen, the gear wheel

712 is situated in a vertical distance from the electrical guide 811 or 812 when it is displaced to a position above the electrical guide 811 or 812.

[0070] In the embodiment depicted on Fig. 6c the rack 810 is mounted on the inner profile 818, whereas the two electrical guides 811, 812 are arranged in the guide slot 819 on a surface of the inner profile 818 opposite the rack 810 and on a surface of the outer profile 817, respectively. Likewise the electrical connection devices 714, 715 are mounted on opposite surfaces of the flange 727, which extends into the guide slot 819 in the mounted position of the screening arrangement, such as to provide electrical power to the electric motor 710. Furthermore, the flange 727 is arranged such as to be movable with respect to the guide slot in the direction indicated by the arrow B. To this end the flange 727 may e.g. be arranged such as to be movable with respect to the remaining parts of the bottom element 7. The gear wheel 712 is arranged such as to be displaceable with respect to the shaft (not shown on Fig. 6c) in the direction indicated by the arrow A. It is noted that in embodiments where the bottom element 7 comprises a suspension element 718, the flange 727 may form part of the suspension element 718, e.g. of the protrusion member 722 described in connection with Fig. 13 below.

[0071] In the embodiment depicted on Figs. 7a to 7c the rack 810 and the two electrical guides 811, 812 are mounted on the inner profile 818. The gear wheel 712 and the shaft 711 are arranged such as to be displaceable together and with respect to the remaining parts of the bottom element 7 (not shown on Figs. 7a to 7c) in the directions indicated by the arrow A in Figs. 7b and 7c.

[0072] It is noted that the direction indicated by the arrow A in Figs. 6b, 6c, 7b and 7c extends in parallel with the longitudinal direction LB of the bottom element, and thus with the width direction W of the side rail. The same applies to the direction indicated by the arrow B shown on Fig. 6c.

[0073] Thereby, irrespective of the embodiment, the gear wheel 712, which is displaceable in the width direction W of the side rail, may be displaced beyond a side edge of the rack 810 while still remaining in engagement with the rack 810.

[0074] In other words, irrespective of the embodiment, the raised rack 810 may be seen as guiding the gear wheel 712, which is displaceable in the width direction W of the side rail 8, in such a way as to allow the gear wheel 712 to be displaced beyond a side edge of the rack 810.

[0075] Referring now to Figs. 8 to 10 two embodiments are described in which the rack 810 is arranged recessed with respect to the two electrical guides 811, 812 in the depth direction D.

[0076] In the embodiment depicted on Fig. 8 the rack 810 and the two electrical guides 811, 812 are mounted on the inner profile 818 and the gear wheel 712 is arranged such as to be displaceable with respect to the shaft

[0077] (not shown on Figs. 6a and 6b) in the direction indicated by the arrow C. To this end the shaft 711 in this embodiment comprises a shaft segment 728 on which the gear wheel 712 is mounted and which is arranged such as to be telescopically displaceable within the shaft 711.

[0078] A shaft segment on which the gear wheel 712 is mounted and in which an end section of the shaft 711 is arranged such as to be telescopically displaceable within the shaft segment is of course also feasible.

[0079] Furthermore, it is also feasible to provide embodiments of a screening arrangement in which the rack is raised with respect to the electrical guides and in which the shaft comprises a telescopically displaceable segment on which the gear wheel is mounted.

[0080] In the embodiment depicted on Figs. 9 and 10 the rack 810 and the two electrical guides 811, 812 are likewise mounted on the inner profile 818. The gear wheel 712 is arranged in a slide shoe 716 such as to be displaceable together with the slide shoe 716 and with respect to the shaft 711 in the direction indicated by the arrow A in Fig. 10. This may be obtained by mounting the gear wheel 712 and the slide shoe 716 in a linked or integral manner and by mounting the gear wheel 712 and slide shoe 716 on the shaft in a displaceable manner or by means of a telescopic shaft as described in relation to Fig. 8 above.

[0081] It is noted that the direction indicated by the arrow C in Fig. 8 extends in parallel with the longitudinal direction LB of the bottom element, and thus with the width direction W of the side rail.

[0082] Hence, irrespective of the embodiment, the recessed rack 810 may be seen as guiding the respective gear wheel 712, 713, which is displaceable in the width direction W of the side rail, while the shaft 711 takes up variations in the distance between the two side rails 8, 9 as measured perpendicular to both side rails 8, 9.

[0083] In this way the first transmission means 711, 712, 713 and the second transmission means 810, 910 are arranged in such a way with respect to each other that variations in the width of the frame 2 on which the screening arrangement 1 is mounted may be absorbed.

[0084] It is noted that the rack 910 and the electrical guides 911, 912 of the opposite side rail 9 as well as the gear wheel 713 arranged at the end of the shaft 711 opposite the gear wheel 712 (cf. Fig. 3) are intended to be provided as identical to any one of the embodiments of the rack 810, the electrical guides 811, 812 and the gear wheel 712 as described above with respect to Figs. 6a to 10. Combinations of the different embodiments are, however, also feasible. For example the displaceable gear wheel from figure 8-10 may be combined with a separate sliding shoe 716 freely suspended and not linked to the gear wheel 712.

[0085] Furthermore, in any one of the embodiments described above with respect to Figs. 6a to 8, when the bottom element furthermore comprises a slide shoe 716 as described above, the slide shoe 716 may also be

mounted on the bottom element 7 such as to be displaceable together with the gear wheel 712 as described above in relation to Fig. 10.

[0086] Referring now to Figs. 11 and 12, the bottom element 7 furthermore comprises at each opposite end surface a suspension element 718 and 719, respectively (cf. also Fig. 3). Such a suspension element is known per se and has been described in the applicant's WO 02/068786 A1. The suspension elements 718, 719 serve the purpose of allowing the first transmission means 711, 712, 713 to be movable between a first position in which the first transmission means 711, 712, 713 and the second transmission means 810, 910 are in mutual engagement, and in which the screening arrangement 1 is thus electrically operable, and a second position in which the first transmission means 711, 712, 713 and the second transmission means 810, 910 are disengaged, whereby the screening arrangement 1 may be operated manually.

[0087] The suspension elements 718, 719 are therefore mounted on the bottom element 7 in such a way as to be movable between the said first and second positions, while the shaft 711 and the gear wheel 712, 713 are fixed in relation to the suspension elements 718, 719.

[0088] Preferably, the suspension elements 718, 719 are biased towards the first position in which the first transmission means 711, 712, 713 and the second transmission means 810, 910 are in mutual engagement by means of a biasing element, e.g. the spring 723 shown in Fig. 13, arranged in the bottom element 7.

[0089] Furthermore, the suspension elements 718, 719 may alternatively or in addition to the above serve the purpose of moving the electrical connection device 714, 715 between a first position in which the electrical connection device 714, 715 is in electrical connection with the electrical guide 811, 812 and a second position in which the electrical connection device 714, 715 is not in electrical connection with the electrical guide 811, 812; 911, 912. In this case the slide shoe 716 may be omitted or alternatively be made immobile in relation to suspension means 718 and/or the bottom element 7.

[0090] In addition to the above functions, the suspension element 718 also absorbs physical variations in the height and/or width of the side rail(s).

[0091] With reference to Fig. 13, an embodiment of the suspension element 718 is shown. The suspension element 718 comprises a protrusion member 722 connecting the suspension element 718 to the bottom element 7 in a hinged manner allowing for the movability described above. The protrusion member 722 is connected with a biasing element, shown as a spring 723, through a linking element 725 to apply a force to the suspension means biasing it towards the first position as described above. The protrusion member 722 may in itself provide a recoiling action towards the first position as described above. Various other embodiments of the suspension element and biasing element are also feasible.

[0092] It is noted that the suspension elements 718, 719 is an optional yet preferred feature of the screening

arrangement according to the invention.

[0093] The spring 724 shown on Fig. 13 is connected to the slide shoe 716 via the connecting piece 726 and serves to limit the movement of the slide shoe 716, and thereby of the electrical connection device 714, 715, relative to the electrical guide 810 in the width direction W of the side rail 8. Thereby correct placement of the electrical connection device 714, 715 with respect to the electrical guide 810 is ensured. It is noted, however, that the spring 724 is an optional feature of the screening arrangement according to the invention.

[0094] Referring now to Figs. 14 and 15, a third embodiment of a screening arrangement according to the invention is shown, according to which the bottom element 7 comprises a biasing means 717 adapted for urging the electrical connection device 714, 715 against the electrical guide 811, 812.

[0095] The biasing means is in the embodiment shown a helical spring 717 arranged centrally in the housing 720 and in contact with the slide shoe 716 such as to provide an even biasing of the electrical connection device 714, 715 against the electrical guide 811, 812. However, the biasing means may in principle be any suitable biasing means which may be provided as a part of or in connection with the housing 720, the slide shoe 716 and/or the electrical connection devices 714, 715.

[0096] The helical spring 717 is connected to an attachment means 729 forming a connection between the helical spring 717 and the housing 720. In the embodiment shown the attachment means 729 comprises two abutment elements, here circumferential abutment surfaces 731, 732, for abutment on each side of an opening or slot 730 in the housing such as to form a sliding and/or frictional engagement or alternatively a snap-locking engagement between the attachment means 729 and the opening or slot 730 by sliding the attachment means into the opening or slot 730. This embodiment provides for simple and straight-forward mounting of the biasing element and at the same time a robust and durable connection between the biasing element and the housing 720.

[0097] However, the helical spring 717 or biasing means may in principle be attached to the housing 720 or even the slide shoe 716 by any suitable type of attachment including but not limited to an adhesive, welding and integral formation, e.g. moulding, of the attachment means 729 and the housing 720 or slide shoe 716.

[0098] In other alternative embodiments the attachment means 729 may be omitted and the biasing means 717 may be connected directly to the housing 720 or the slide shoe 716.

[0099] Furthermore, with reference particularly to Fig. 15, the side rail 8 comprises at one or both ends a bevelled or ramp-shaped end section 820 with the purpose of making it easier for the user to bring the bottom element 7 and the side rail 8 into engagement with each other. Fig. 15 shows the bevelled or ramp-shaped end section 820 at the bottom end of the side rail 8.

[0100] With reference particularly to Fig. 14, the slide

shoe 716 may in such an embodiment be provided with bevelled or ramp-shaped sections 733, 734 and 735, 736, respectively, arranged on mutually opposite sides of the electrical connection devices 714, 715, respectively. The bevelled or ramp-shaped sections 733, 734, 735, 736 are provided for sliding abutment with the bevelled or ramp-shaped end section 820, which may optionally be provided with guide sections 822, 823 for receiving and guiding the bevelled or ramp-shaped sections 733, 734, 735, 736, when bringing the the bottom element 7 and the side rail 8 into engagement with each other. Thereby it is made particularly easy for the user to bring the bottom element 7 and the side rail 8, and particularly the respective electrical connection devices 714, 715 and electrical guides 811, 812, into engagement with each other.

[0101] The invention should not be regarded as being limited to the described embodiments. Several modifications and combinations of the different embodiments will be apparent to the person skilled in the art.

Claims

1. A screening arrangement (1) for a window, preferably a roof window, comprising a frame (2) with a top piece (21), a bottom piece (22) and two side pieces (23, 24), the screening arrangement (1) comprising:
 - a bottom element (7), and
 - two side rails (8, 9) comprising a longitudinal direction (L) and a width direction (W),
 - the bottom element (7) being movable with respect to the two side rails (8, 9) between a first non-screening position and a second screening position by means of a drive means comprising a first transmission means (711, 712, 713) arranged in said bottom element (7), and
 - a second transmission means (810, 910) arranged in each of the two side rails (8, 9) such as to extend substantially in the longitudinal direction (L) of at least one of the side rails (8, 9) **characterized in that** at least one electrical guide (811, 812; 911, 912) is arranged in at least one of the two side rails (8, 9) such as to extend substantially in the longitudinal direction (L) of at least one of the side rails (8, 9), and **in that** the second transmission means (810, 910) is arranged offset with respect to the at least one electrical guide (811, 812; 911, 912) in a depth direction (D) extending substantially perpendicular to both the longitudinal direction (L) and the width direction (W).
2. A screening arrangement according to claim 1, **characterized in that** the side rails (8, 9) further comprise an outer profile (817, 917) and an inner profile (818, 918), the second transmission means (810, 910) and the at least one electrical guide (811, 812; 911, 912) being arranged on the inner profile (818, 918) in such a way that the second transmission means (810, 910) is arranged offset with respect to the at least one electrical guide (811, 812; 911, 912) in a depth direction (D) extending substantially perpendicular to both the longitudinal direction (L) and width direction (W).
3. A screening arrangement according to claim 1 or 2, **characterized in that** at least one of the side rails comprises two electrical guides (811, 812; 911, 912) extending on each side of the second transmission means (810, 910).
4. A screening arrangement according to any one of claims 1 to 3, **characterized in that** the first transmission means (711, 712, 713) is arranged in the bottom element (7) in such a way that at least a part of the first transmission means (711, 712, 713) is displaceable in a longitudinal direction (LB) of the bottom element (7).
5. A screening arrangement according to any one of claims 1 to 4, **characterized in that** the second transmission means (810, 910) is arranged recessed with respect to the at least one electrical guide (811, 812; 911, 912) in a depth direction (D) extending substantially perpendicularly to both the longitudinal direction (L) and the width direction (W).
6. A screening arrangement according to any one of claims 1 to 4, **characterized in that** the second transmission means (810, 910) is arranged raised with respect to the at least one electrical guide (811, 812; 911, 912) in a depth direction (D) extending substantially perpendicular to both the longitudinal direction (L) and width direction (W).
7. A screening arrangement according to any one of claims 1 to 6, **characterized in that** the second transmission means (810, 910) is arranged offset with respect to the at least one electrical guide (811, 812; 911, 912) in a depth direction (D) extending substantially perpendicular to both the longitudinal direction (L) and width direction (W) by at least 0,5 mm, preferably at least 0,8 mm, more preferably at least 1 mm, most preferably at least 1,2 mm.
8. A screening arrangement according to any one of claims 1 to 7, **characterized in that** a bottom surface (822) of the second transmission means (810, 910) is arranged offset with respect to the at least one electrical guide (811, 812; 911, 912) in a depth direction (D) extending substantially perpendicular to both the longitudinal direction (L) and width direction (W).

9. A screening arrangement according to any one of claims 1 to 8, **characterized in that** the drive means is an electrical drive means, and that the first transmission means comprises an electrical motor (710) driving the drive means and being arranged in the bottom element (7). 5
10. A screening arrangement according to any one of claims 1 to 9, **characterized in that** the first transmission means comprises a rotatable shaft (711) and a gear wheel (712, 713) at opposite ends of said shaft (711), and that the second transmission means comprises a rack (810, 910) extending in the longitudinal direction of each of the side rails (8, 9). 10
11. A screening arrangement according to claim 10, **characterized in that** the gear wheel (712, 713) is arranged on the shaft (711) in such way that it is displaceable in a longitudinal direction (LB) of the bottom element (7). 15
12. A screening arrangement according to any one of claims 1 to 11, **characterized in that** it further comprises at least one suspension element (718, 719) arranged on the bottom element (7), the suspension element (718, 719) being adapted for allowing the first transmission means (711, 712, 713) to be movable between a first position in which the first transmission means (711, 712, 713) and the second transmission means (810, 910) are in mutual engagement and a second position in which the first transmission means (711, 712, 713) and the second transmission means (810, 910) are disengaged. 20
13. A screening arrangement according to any one of claims 2 to 12, **characterized in that** the outer profile (817, 917) and the inner profile (818, 918) are arranged such as to form between them a guide slot (819, 919) for guiding the bottom element (7). 25
14. A screening arrangement according to any one of claims 1 to 13, **characterized in that** each of the side rails (8, 9) further comprise a bevelled end section (820, 920) adapted for receiving the first transmission means (711, 712, 713) and guiding it into engagement with the second transmission means (811, 812, 813) when connecting the bottom element (7) to the side rails (8, 9). 30
15. A screening arrangement according to any one of claims 1 to 14, **characterized in that** each of the side rails (8, 9) further comprise a flange (821, 921). 35

Patentansprüche

1. Abschirmanordnung (1) für ein Fenster, vorzugsweise ein Dachfenster, das einen Rahmen (2) mit einem

oberen Teil (21), einem unteren Teil (22) und zwei Seitenteilen (23, 24) aufweist, wobei die Abschirmanordnung (1) umfasst:

ein unteres Element (7) und
zwei seitliche Schienen (8, 9), die eine Längsrichtung (L) und eine Breitenrichtung (W) aufweisen,
wobei das untere Element (7) beweglich in Bezug auf die zwei seitlichen Schienen (8, 9) zwischen einer ersten Nicht-Abschirmstellung und einer zweiten Abschirmstellung mittels eines Antriebsmittels ist, das
ein erstes Übertragungsmittel (711, 712, 713), das in dem unteren Element (7) angeordnet ist, und
ein zweites Antriebsmittel (810, 910) aufweist, das in jedem der zwei seitlichen Schienen (8, 9) angeordnet ist, um sich im Wesentlichen in der Längsrichtung (L) von wenigstens einer der seitlichen Schienen (8, 9) zu erstrecken, **dadurch gekennzeichnet, dass**
wenigstens eine elektrische Führung (811, 812; 911, 912) in wenigstens einer der zwei seitlichen Schienen (8, 9) angeordnet ist, um sich im Wesentlichen in der Längsrichtung (L) von wenigstens einer der seitlichen Schienen (8, 9) zu erstrecken, und dass
das zweite Übertragungsmittel (810, 910) versetzt in Bezug auf die wenigstens eine elektrische Führung (811, 812; 911, 912) in einer Tiefenrichtung (D), die sich im Wesentlichen senkrecht sowohl zu der Längsrichtung (L) als auch der Breitenrichtung (W) erstreckt, angeordnet ist.

2. Abschirmanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die seitlichen Schienen (8, 9) ferner ein äußeres Profil (817, 917) und ein inneres Profil (818, 918) aufweisen, wobei das zweite Übertragungsmittel (810, 910) und die wenigstens eine elektrische Führung (811, 812; 911, 912) an dem inneren Profil (818, 918) in einer solchen Weise angeordnet sind, dass das zweite Übertragungsmittel (810, 910) versetzt in Bezug auf die wenigstens eine elektrische Führung (811, 812; 911, 912) in einer Tiefenrichtung (D) angeordnet ist, die sich im Wesentlichen senkrecht sowohl zu der Längsrichtung (L) als auch der Breitenrichtung (W) erstreckt.
3. Abschirmanordnung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** wenigstens eine der seitlichen Schienen zwei elektrische Führungen (811, 812; 911, 912) aufweist, die sich an jeder Seite des zweiten Übertragungsmittels (810, 910) erstrecken.
4. Abschirmanordnung nach einem der Ansprüche 1

- bis 3, **dadurch gekennzeichnet, dass** das erste Übertragungsmittel (711, 712, 713) in dem unteren Element (7) in einer solchen Weise angeordnet ist, dass wenigstens ein Teil des ersten Übertragungsmittels (711, 712, 713) in einer Längsrichtung (LB) des unteren Elements (7) verlagerbar ist.
5. Abschirmanordnung nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** das zweite Übertragungsmittel (810, 910) zurückgezogen in Bezug auf die wenigstens eine elektrische Führung (811, 812; 911, 912) in einer Tiefenrichtung (D) angeordnet ist, die sich im Wesentlichen senkrecht sowohl zu der Längsrichtung (L) als auch der Breitenrichtung (W) erstreckt.
6. Abschirmanordnung nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** das zweite Übertragungsmittel (810, 910) hervorgehoben in Bezug auf die wenigstens eine elektrische Führung (811, 812; 911, 912) in einer Tiefenrichtung (D) angeordnet ist, die sich im Wesentlichen senkrecht sowohl zu der Längsrichtung (L) als auch der Breitenrichtung (W) erstreckt.
7. Abschirmanordnung nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** das zweite Übertragungsmittel (810, 910) versetzt in Bezug auf die wenigstens eine elektrische Führung (811, 812; 911, 912) in einer Tiefenrichtung (D), die sich im Wesentlichen senkrecht sowohl zu der Längsrichtung (L) als auch der Breitenrichtung (W) erstreckt, um wenigstens 0,5 mm, bevorzugt um wenigstens 0,8 mm, weiter bevorzugt um wenigstens 1 mm, am meisten bevorzugt um wenigstens 1,2 mm, angeordnet ist.
8. Abschirmanordnung nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** eine untere Fläche (822) des zweiten Übertragungsmittels (810, 910) versetzt in Bezug auf die wenigstens eine elektrische Führung (811, 812; 911, 912) in einer Tiefenrichtung (D) angeordnet ist, die sich im Wesentlichen senkrecht sowohl zu der Längsrichtung (L) als auch der Breitenrichtung (W) erstreckt.
9. Abschirmanordnung nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** das Antriebsmittel ein elektrisches Antriebsmittel ist und dass das erste Übertragungsmittel einen Elektromotor (710) aufweist, der das Antriebsmittel antreibt und in dem unteren Element (7) angeordnet ist.
10. Abschirmanordnung nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** das erste Übertragungsmittel eine drehbare Welle (711) und ein Zahnrad (712, 713) an gegenüberliegenden Enden der Welle (711) aufweist und dass das zweite Übertragungsmittel eine Zahnstange (810, 910) aufweist, die sich in der Längsrichtung von jeder der seitlichen Schienen (8, 9) erstreckt.
11. Abschirmanordnung nach Anspruch 10, **dadurch gekennzeichnet, dass** das Zahnrad (712, 713) an der Welle (711) in einer solchen Weise angeordnet ist, dass es in einer Längsrichtung (LB) des unteren Elements (7) verlagerbar ist.
12. Abschirmanordnung nach einem der Ansprüche 1 bis 11, **dadurch gekennzeichnet, dass** sie ferner wenigstens ein Halteelement (718, 719) aufweist, das an dem unteren Element (7) angeordnet ist, wobei das Halteelement (718, 719) angepasst ist, um dem ersten Übertragungsmittel (711, 712, 713) zu ermöglichen, zwischen einer ersten Position, in der das erste Übertragungsmittel (711, 712, 713) und das zweite Übertragungsmittel (810, 910) in gegenseitigem Eingriff sind, und einer zweiten Position beweglich zu sein, in der das erste Übertragungsmittel (711, 712, 713) und das zweite Übertragungsmittel (810, 910) voneinander gelöst sind.
13. Abschirmanordnung nach einem der Ansprüche 2 bis 12, **dadurch gekennzeichnet, dass** das äußere Profil (817, 917) und das innere Profil (818, 918) so angeordnet sind, dass sie einen Führungsschlitz (819, 919) zwischen sich zum Führen des unteren Elements (7) bilden.
14. Abschirmanordnung nach einem der Ansprüche 1 bis 13, **dadurch gekennzeichnet, dass** jede der seitlichen Schienen (8, 9) ferner einen geneigten Endabschnitt (820, 920) aufweist, der angepasst ist, das erste Übertragungsmittel (711, 712, 713) aufzunehmen und es in Eingriff mit dem zweiten Übertragungsmittel (811, 812, 813) zu führen, wenn das untere Element (7) mit den seitlichen Schienen (8, 9) verbunden wird.
15. Abschirmanordnung nach einem der Ansprüche 1 bis 14, **dadurch gekennzeichnet, dass** jede der seitlichen Schienen (8, 9) ferner einen Flansch (821, 921) aufweist.

Revendications

1. Agencement formant écran (1) pour une fenêtre, de préférence une fenêtre de toit, comprenant un cadre (2) avec une pièce de dessus (21), une pièce de dessous (22) et deux pièces de côté (23, 24), l'agencement formant écran (1) comprenant :
- un élément de dessous (7), et
deux rails de côté (8, 9) comprenant une direction longitudinale (L) et une direction de la lar-

geur (W),
l'élément de dessous (7) étant mobile par rapport aux deux rails de côté (8, 9) entre une première position non-écran et une deuxième position écran au moyen d'un moyen d'entraînement comprenant :

un premier moyen de transmission (711, 712, 713) agencé dans ledit élément de dessous (7), et
un deuxième moyen de transmission (810, 910) agencé dans chacun des deux rails de côté (8, 9) de manière à s'étendre sensiblement dans la direction longitudinale (L) d'au moins l'un des rails de côté (8, 9) **caractérisé en ce que**
au moins un guide électrique (811, 812 ; 911, 912) est agencé dans au moins l'un des deux rails de côté (8, 9) de manière à s'étendre sensiblement dans la direction longitudinale (L) d'au moins l'un des rails de côté (8, 9), et **en ce que**
le deuxième moyen de transmission (810, 910) est agencé décalé par rapport à l'au moins un guide électrique (811, 812 ; 911, 912) dans une direction de la profondeur (D) s'étendant sensiblement perpendiculairement à la fois à la direction longitudinale (L) et à la direction de la largeur (W).

2. Agencement formant écran selon la revendication 1, **caractérisé en ce que** les rails de côté (8, 9) comprennent en outre un profil externe (817, 917) et un profil interne (818, 918), le deuxième moyen de transmission (810, 910) et l'au moins un guide électrique (811, 812 ; 911, 912) étant agencé sur le profil interne (818, 918) de telle manière que le deuxième moyen de transmission (810, 910) soit agencé décalé par rapport à l'au moins un guide électrique (811, 812 ; 911, 912) dans une direction de la profondeur (D) s'étendant sensiblement perpendiculairement à la fois à la direction longitudinale (L) et à la direction de la largeur (W).
3. Agencement formant écran selon la revendication 1 ou 2, **caractérisé en ce qu'**au moins l'un des rails de côté comprend deux guides électriques (811, 812 ; 911, 912) s'étendant de chaque côté du deuxième moyen de transmission (810, 910).
4. Agencement formant écran selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** le premier moyen de transmission (711, 712, 713) est agencé dans l'élément de dessous (7) de telle manière qu'au moins une partie du premier moyen de transmission (711, 712, 713) est déplaçable dans une direction longitudinale (LB) de l'élément de dessous (7).
5. Agencement formant écran selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** le deuxième moyen de transmission (810, 910) est agencé en retrait par rapport à l'au moins un guide électrique (811, 812 ; 911, 912) dans une direction de la profondeur (D) s'étendant sensiblement perpendiculairement à la fois à la direction longitudinale (L) et à la direction de la largeur (W).
6. Agencement formant écran selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** le deuxième moyen de transmission (810, 910) est agencé surélevé par rapport à l'au moins un guide électrique (811, 812 ; 911, 912) dans une direction de la profondeur (D) s'étendant sensiblement perpendiculairement à la fois à la direction longitudinale (L) et à la direction de la largeur (W).
7. Agencement formant écran selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** le deuxième moyen de transmission (810, 910) est agencé décalé par rapport à l'au moins un guide électrique (811, 812 ; 911, 912) dans une direction de la profondeur (D) s'étendant sensiblement perpendiculairement à la fois à la direction longitudinale (L) et à la direction de la largeur (W) d'au moins 0,5 mm, de préférence au moins 0,8 mm, de manière davantage préférée au moins 1 mm, de manière préférée entre toutes au moins 1,2 mm.
8. Agencement formant écran selon l'une quelconque des revendications 1 à 7, **caractérisé en ce qu'**une surface de dessous (822) du deuxième moyen de transmission (810, 910) est agencée décalée par rapport à l'au moins un guide électrique (811, 812 ; 911, 912) dans une direction de la profondeur (D) s'étendant sensiblement perpendiculairement à la fois à la direction longitudinale (L) et à la direction de la largeur (W).
9. Agencement formant écran selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** le moyen d'entraînement est un moyen d'entraînement électrique, et **en ce que** le premier moyen de transmission comprend un moteur électrique (710) entraînant le moyen d'entraînement et étant agencé dans l'élément de dessous (7).
10. Agencement formant écran selon l'une quelconque des revendications 1 à 9, **caractérisé en ce que** le premier moyen de transmission comprend un arbre rotatif (711) et un engrenage (712, 713) à des extrémités opposées dudit arbre (711), et **en ce que** le deuxième moyen de transmission comprend une crémaillère (810, 910) s'étendant dans la direction longitudinale de chacun des rails de côté (8, 9).
11. Agencement formant écran selon la revendication

10, **caractérisé en ce que** l'engrenage (712, 713) est agencé sur l'arbre (711) de manière à ce qu'il soit déplaçable dans une direction longitudinale (LB) de l'élément de dessous (7).

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12. Agencement formant écran selon l'une quelconque des revendications 1 à 11, **caractérisé en ce qu'il** comprend en outre au moins un élément de suspension (718, 719) agencé sur l'élément de dessous (7), l'élément de suspension (718, 719) étant adapté pour permettre au premier moyen de transmission (711, 712, 713) d'être déplaçable entre une première position dans laquelle le premier moyen de transmission (810, 910) sont en enclenchement mutuel et une deuxième position dans laquelle le premier moyen de transmission (711, 712, 713) et le deuxième moyen de transmission (810, 910) sont désenclenchés.

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13. Agencement formant écran selon l'une quelconque des revendications 2 à 12, **caractérisé en ce que** le profil externe (817, 917) et le profil interne (818, 918) sont agencés de manière à former entre eux une fente de guidage (819, 919) permettant de guider l'élément de dessous (7).

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14. Agencement formant écran selon l'une quelconque des revendications 1 à 13, **caractérisé en ce que** chacun des rails de côté (8, 9) comprend en outre une section d'extrémité biseautée (820, 920) adaptée pour recevoir le premier moyen de transmission (711, 712, 713) et le guider en enclenchement avec le deuxième moyen de transmission (811, 812, 813) lors du raccordement de l'élément de dessous (7) aux rails de côté (8, 9).

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15. Agencement formant écran selon l'une quelconque des revendications 1 à 14, **caractérisé en ce que** chacun des rails de côté (8, 9) comprend en outre une bride (821, 921).

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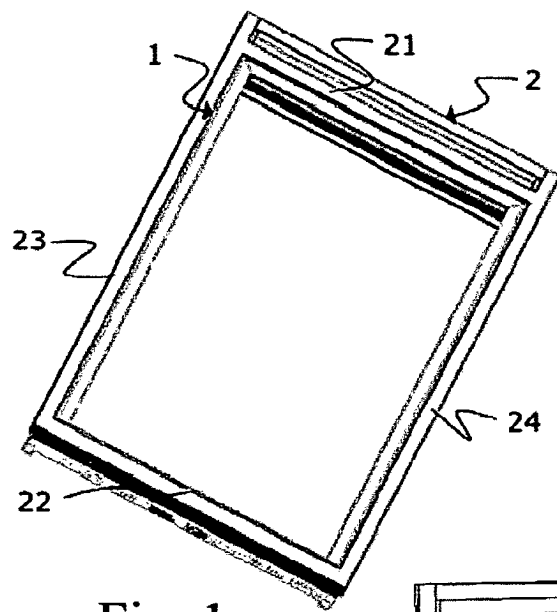


Fig. 1

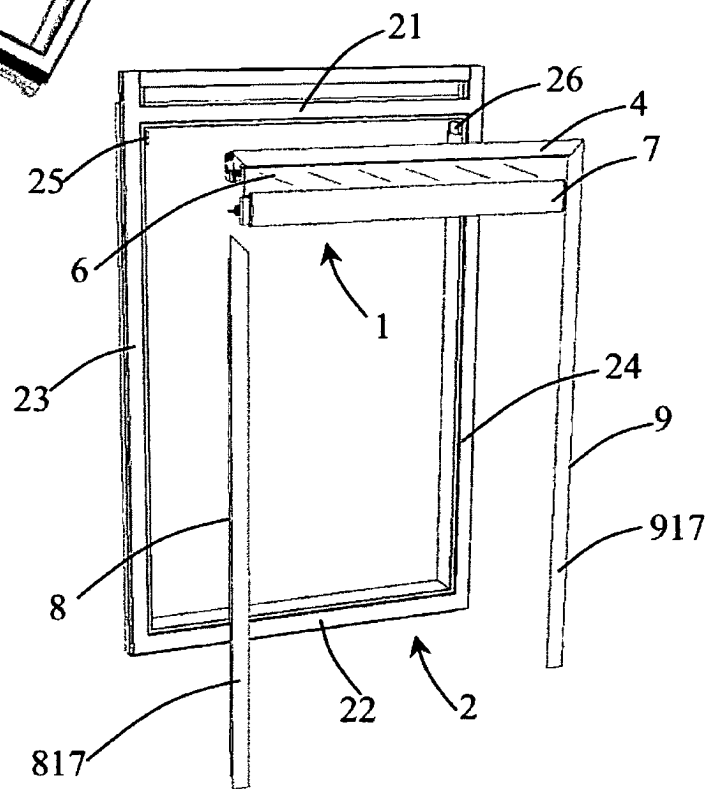


Fig. 2

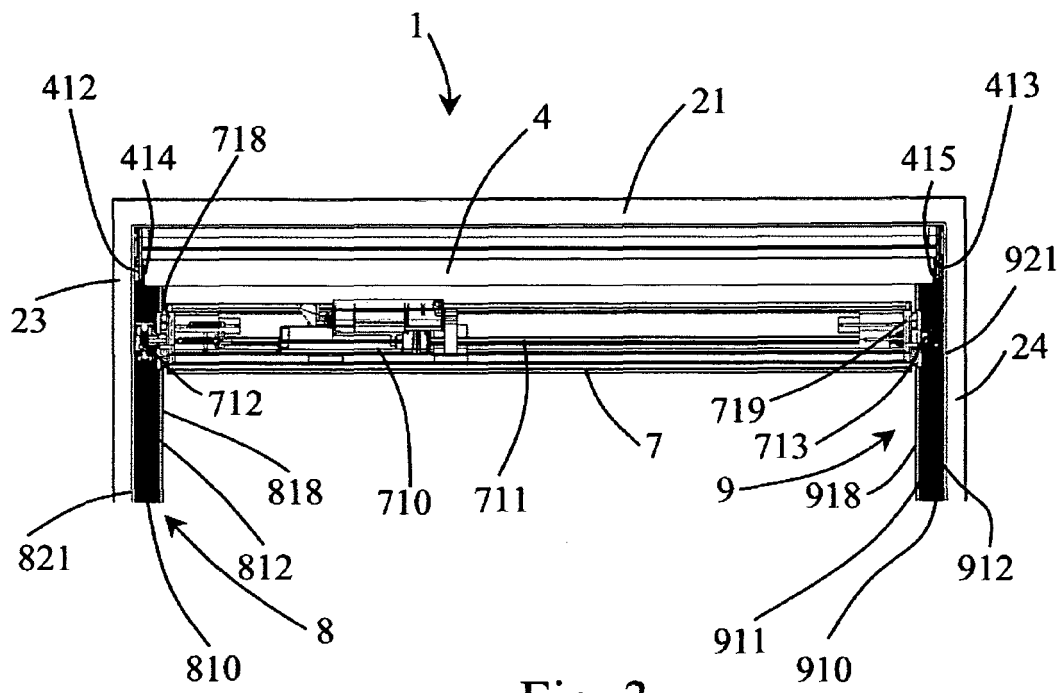
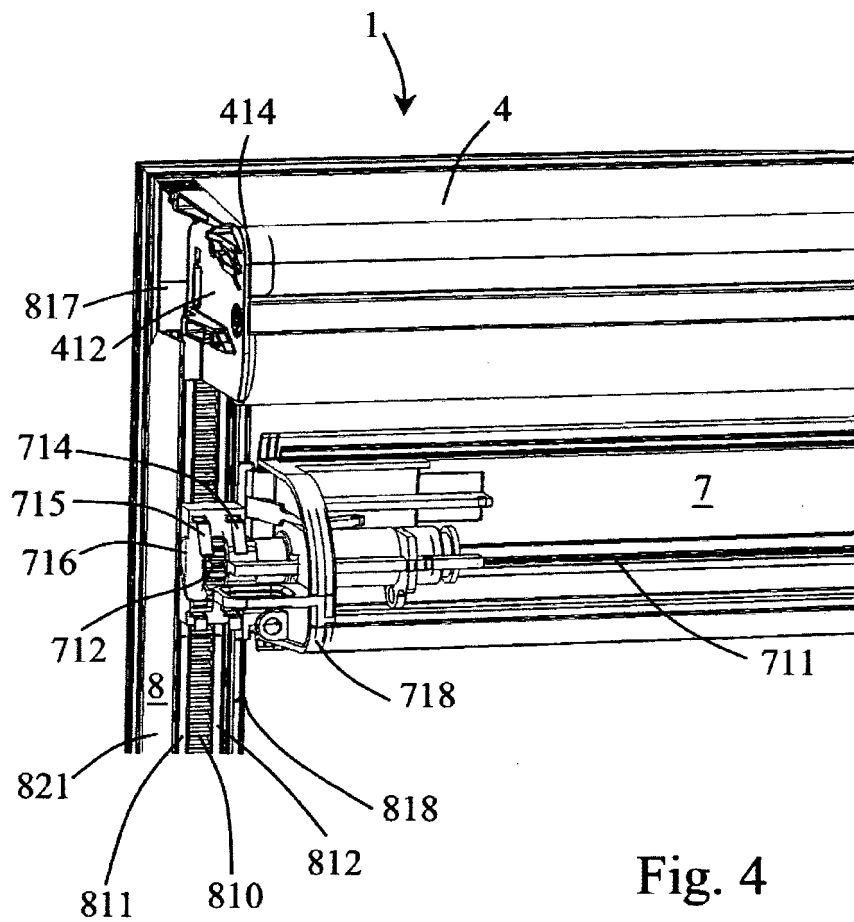


Fig. 3



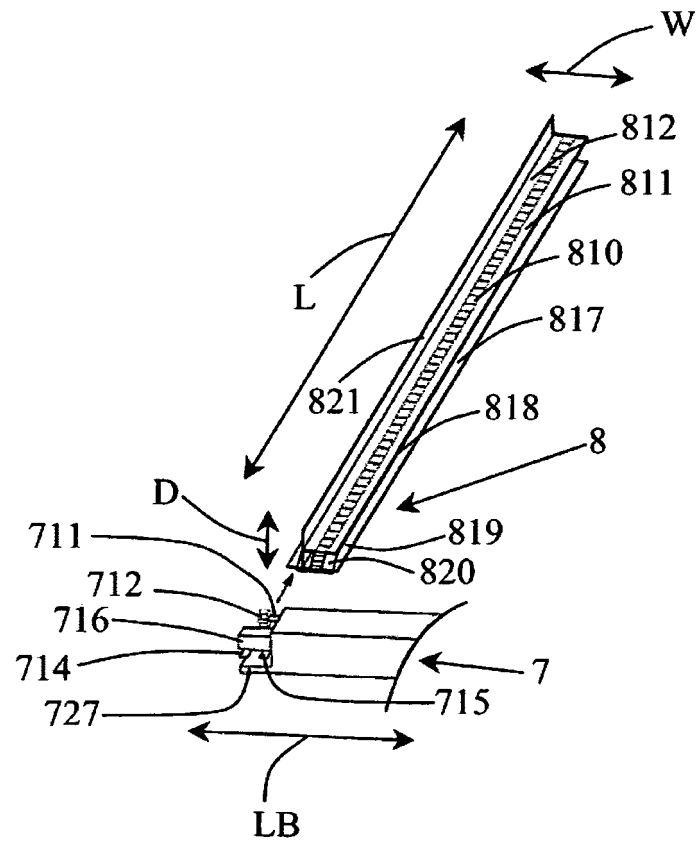
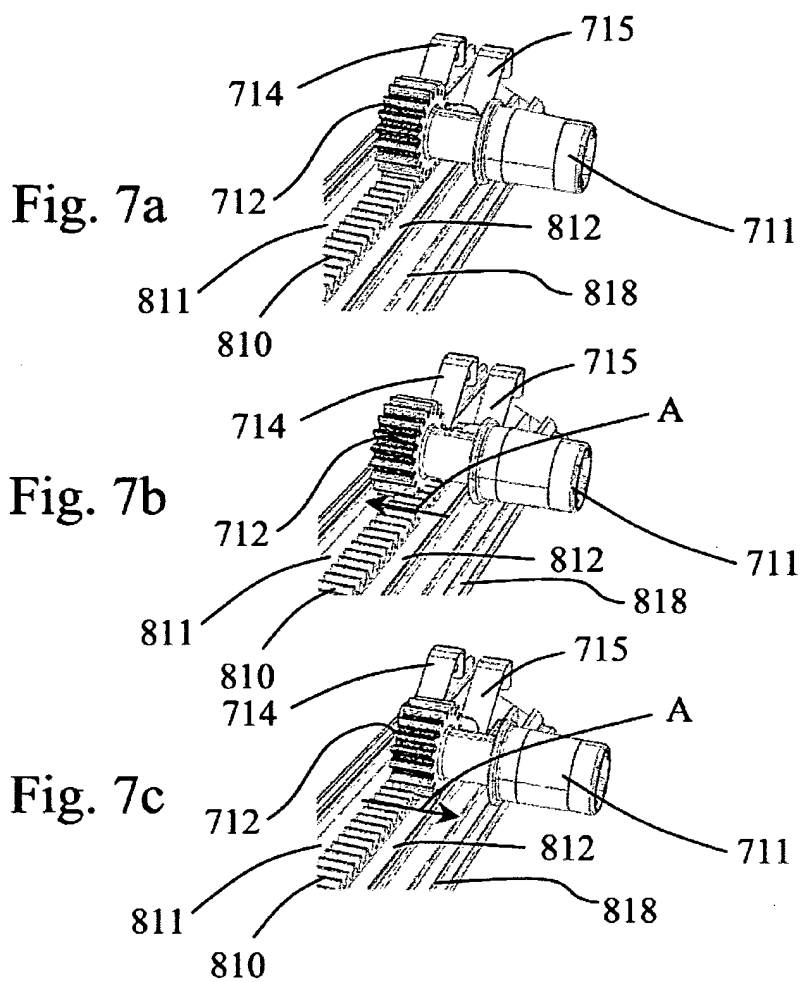
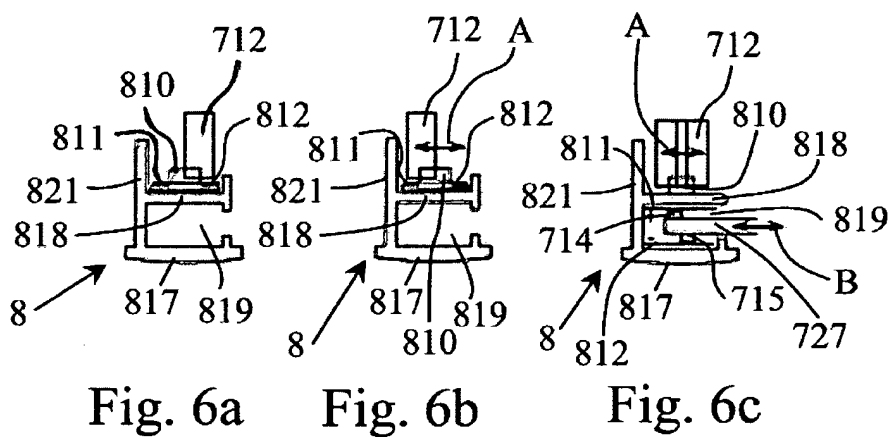


Fig. 5



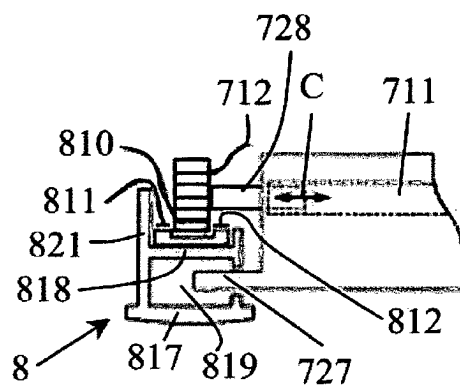


Fig. 8

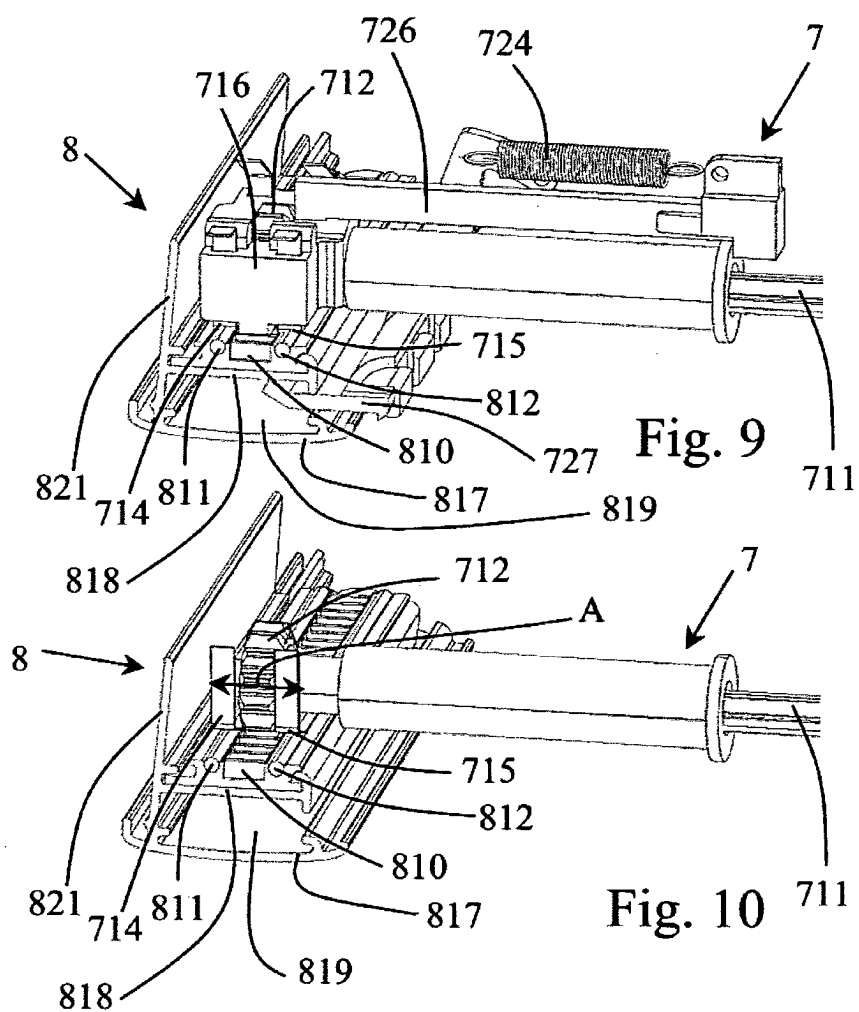
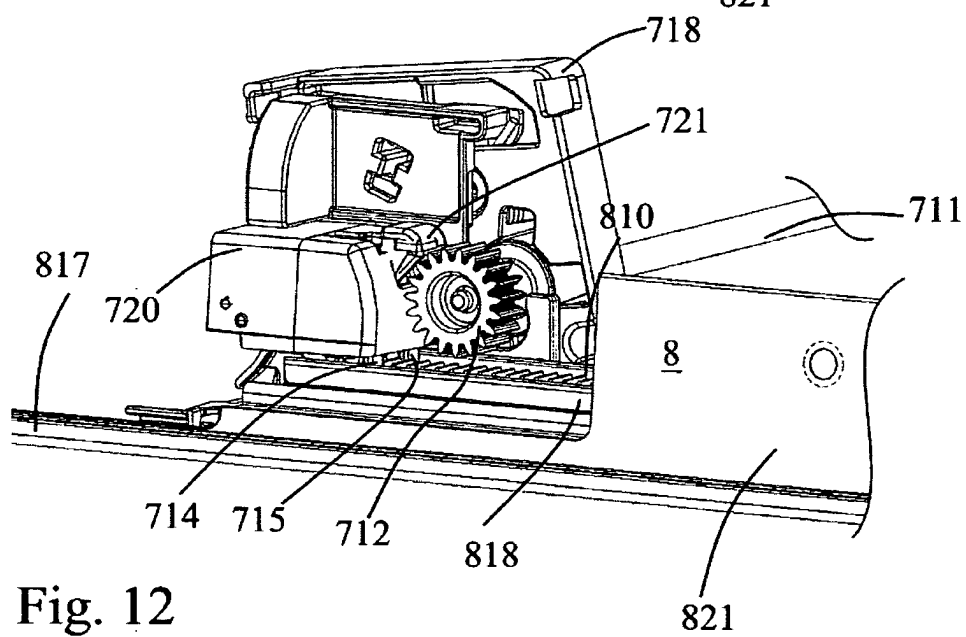
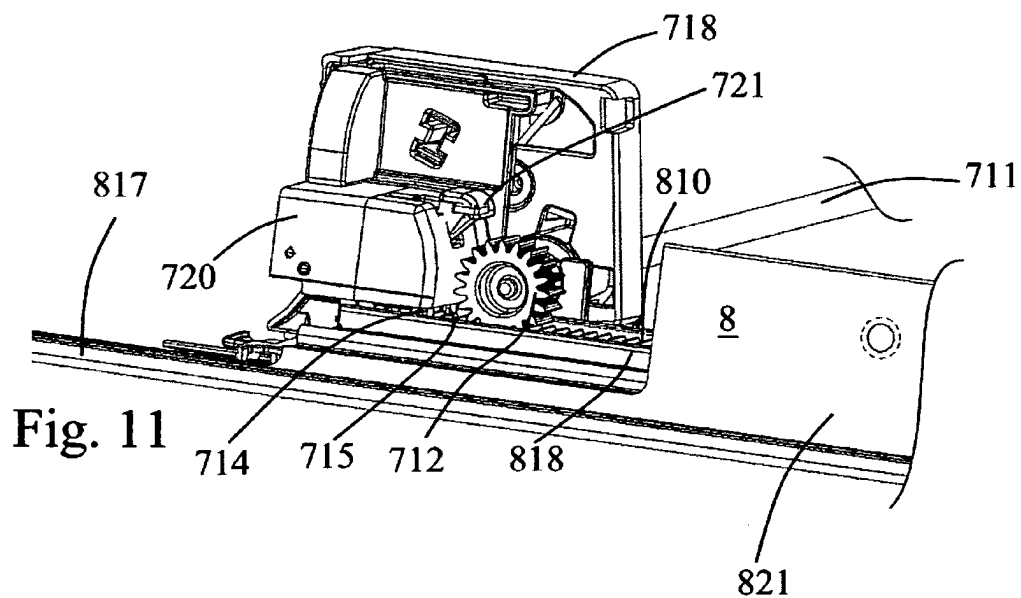


Fig. 9

Fig. 10



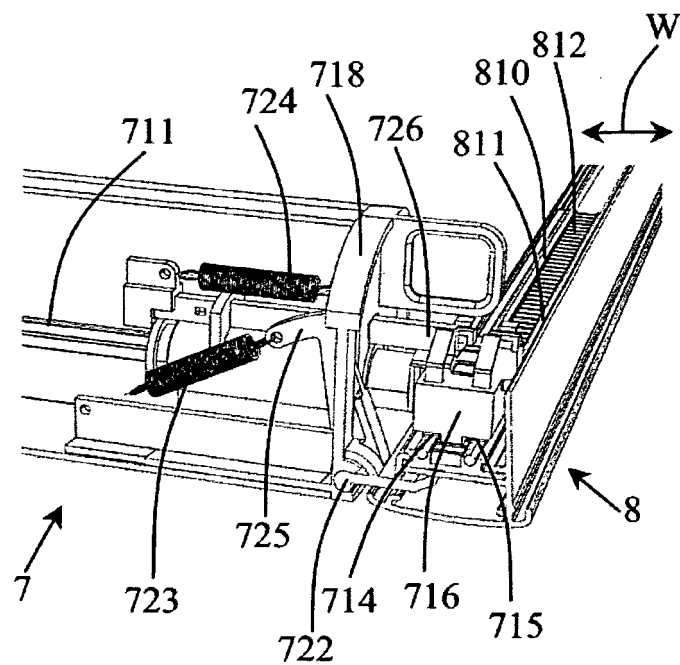
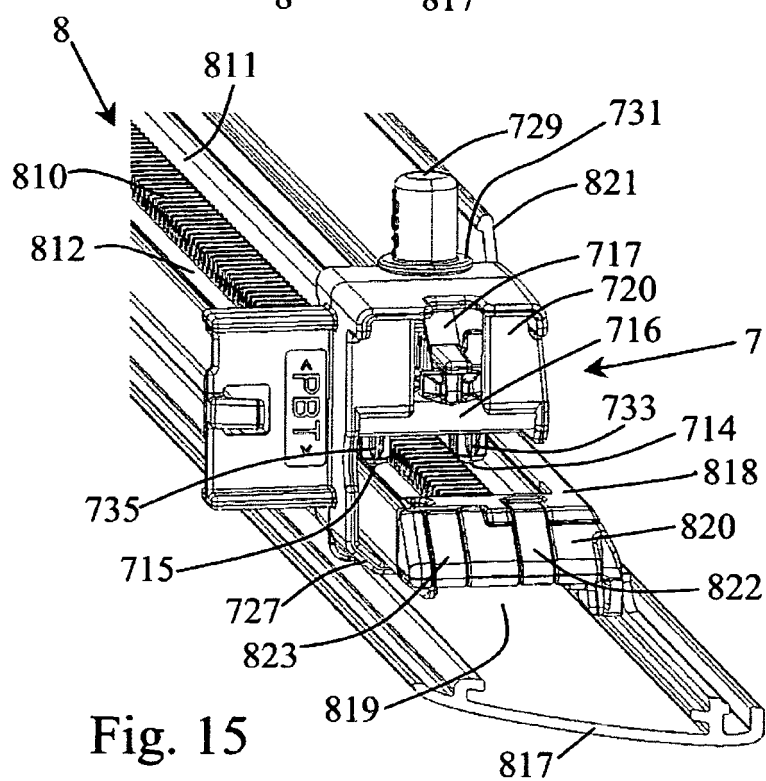
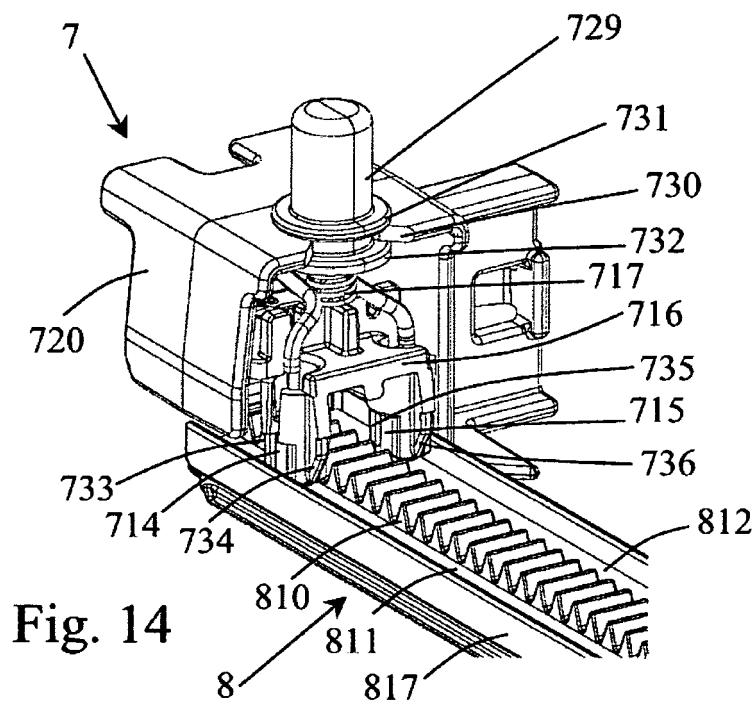


Fig. 13



REFERENCES CITED IN THE DESCRIPTION

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