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(54) **SCREENING DEVICE AND METHOD OF INSTALLATION OF THE SCREENING DEVICE**

LICHTSCHUTZVORRICHTUNG UND VERFAHREN FÜR DEN EINBAU DER  
LICHTSCHUTZVORRICHTUNG

DISPOSITIF D'ÉCRAN ET MÉTHODE D'INSTALLATION DU DISPOSITIF D'ÉCRAN

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(56) References cited:  
**EP-A2- 0 207 870 EP-A2- 2 071 118**  
**WO-A1-02/06621 WO-A1-2009/143842**  
**WO-A1-2009/143853 DE-A1- 2 906 913**  
**DE-A1- 19 600 952 DE-C1- 4 401 056**  
**DE-U1-202008 013 422 FR-A1- 2 595 403**

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## Description

**[0001]** The present invention relates to a screening device for a pivot window, comprising a top element defining a first longitudinal direction and two side rails extending at right angles to the top element in a second longitudinal direction, each of said side rails being connected to the top element in a hinge connection between the respective side rail and the top element at or near the top element.

**[0002]** Such screening devices are known in many different forms and comprise for instance awning blinds, roller blinds and roller shutters, where the screening body in the non-screening position is rolled-up on a reception means in the top element of the screening device.

**[0003]** In the prior art, such screening devices are known, in particular for placement on the outside of the window or other roof or façade penetrating construction elements. In particular when the screening device is used in connection with an openable sash, it is necessary to tilt or incline at least a part of the screening body in relation to the plane of the frame surface in order to open the window combined with screening of the window. The rotatable connection providing the tilting of the screening body can for instance be provided by a hinge between the top casing and the top frame or sash piece of the window, where the hinge connection can be placed at the lower edge of the top casing as shown in DE patent no. 29 06 913, DE patent no. 44 01 056 and EP patent application no. 0 207 870, whereas e. g. DE publication no. 196 00 952 discloses an arrangement where the hinge connection comprises consoles at the end walls of the top element. Another solution is presented in DE 2 595 403 and DE 20 2008 013 422 U1, in which each side rail is composed by two parts, one of which is firmly connected to the frame of the window, and the other is connected to the one part by a hinge. However, this solution is only applicable in case it is acceptable to let two portions of the screening body form an angle with respect to each other, which is not always the case for aesthetical or practical reasons, most often because this puts severe demands on the screening body and requires particular elaboration of the side rails.

**[0004]** In Applicant's published international application WO 02/06621 a screening device is disclosed, in which the rotatable connection or connections is/are situated within the end walls of the top element. The top element has such a shape that it follows the shape of the window at top pieces of the frame and sash, and the entire top element pivots when the sash is opened, such that the side rails and screening body lie in one plane forming an angle with the plane of the frame. The pivoting motion of the entire top element is not feasible or desirable in all kinds of screening devices.

**[0005]** The invention only relates to screening devices adapted for use in pivot windows, in which the hinge connection is between the side rails and the top element and which is furthermore situated at or near the top element to make it possible for the top element to be mounted

stationary on the frame, and for each side rail to be formed in one piece that remains straight during the opening movement of the sash.

**[0006]** In one commercially available example of this kind of screening device the hinge connection requires the mounting of a separate split element to be inserted into hinge parts connected to the top element and the side rail, respectively. Although this hinge connection functions well when in use, the separate split element renders the installation of the screening device cumbersome and time-consuming. During recent years, an increasing demand to making the installation as easy as possible has arisen. As a consequence, the use of screws and other separate fastening means is sought to be avoided.

**[0007]** With this background it is an object to provide a screening device, in which the installation is made easier.

**[0008]** In a first aspect, this and further objects are achieved by a screening device of the specified kind, which is characterized in that the hinge connection is provided by a set of hinge parts having mutually cooperating engagement surfaces allowing positive engagement between the hinge parts in a predefined angle interval, and in that the engagement between the mutually cooperating engagement surfaces is releasable outside said predefined angle interval.

**[0009]** This means that the screening device may be installed by first positioning the respective hinge parts of the side rails and the top element such that the engagement surfaces may enter into engagement with each other, following which each side rail and hence the associated hinge part is brought to angle within said angle interval, whereby the side rail hinge part is held in place by the engagement with the cooperating engagement surface of the top element hinge part, i.e. by the shape of the respective hinge parts. In turn, this means that no supplemental splits are necessary in order to maintain the engagement. Conversely, the side rails are easily detachable from the top element by simply moving each side rail and its associated hinge part out of the predefined angle interval and thus releasing the positive engagement.

**[0010]** In a preferred embodiment, a first hinge part connected to the top element has a first curved engagement surface portion having a first radius of curvature and a second curved engagement surface portion at a distance from the first curved engagement portion and having a second radius of curvature different from the first radius of curvature, and wherein the second hinge part connected to the side rail has a first curved engagement surface having a radius of curvature corresponding to that of the first radius of curvature of the first curved engagement surface portion of the first hinge part, and a second engagement surface portion having a radius of curvature corresponding to that of the second radius of curvature of the second curved engagement surface portion of the first hinge part.

**[0011]** Preferably, the first engagement surface portion of the first hinge part includes an angle of 60 to 90 degrees, preferably 70 to 80 degrees. This provides for a positive engagement within the entire predefined angle interval and at the same time, a large contact area is ascertained.

**[0012]** In a structurally simple embodiment, the first hinge part is integrated with an end element of the top element.

**[0013]** In a still further development of the preferred embodiment, the second hinge part is substantially wedge-shaped and has its first and second engagement surface portions at opposite sides of the wedge-shape. Advantageously, the wedge-shaped second hinge part is provided with side guide flanges. In addition to making the installation logical and simple, optimum guidance and control of the engagement between the side rails and the top element during operation is ensured.

**[0014]** Although the positive engagement within the predefined angle interval may often be sufficient for most applications, as the geometrical shape of the window frame and sash relative to that of the screening device sets a natural limit to the degree of opening. Additionally, in case of electrically operated windows and screening assemblies, limits as to the opening degree may be built into the system. However, it may be desirable to provide additional security against unintentional release. In such a case, it is preferred to include an opening restricting element limiting the movement of the side rails during opening.

**[0015]** In a structurally simple embodiment, the opening restricting element is a stay element connected to at least one of said side rails and located at a distance from the top element, preferably 50 to 100% of the extent of the side rail in the second longitudinal direction, more preferably about 75% of the extent. This is a mechanical solution providing a reliable and safe retention of the side rails during operation. One stay element only may be utilized but two stay elements provide for a more stable operation.

**[0016]** Preferably, the stay element is pivotally connected to the side rail and to a frame side piece or to a mounting rail mounted on the frame side piece. In order to facilitate the installation and removal, the stay element may be releasably connected to the side rail or to the mounting rail. This effect is increased even further in an embodiment, in which the screening device includes a mounting rail, and wherein the stay element is connected to the side rail or to the mounting rail only in a state of delivery. The stay element may then easily be connected to the other of the mounting rail and the side rail, for instance by snap engagement but possibly by a screw-and-nut connection.

**[0017]** The opening angle range may be adapted to the specific area of use of the window, for instance in accordance with the inclination of the roof in case the window is installed as a roof window. However, it is advantageous if the opening angle range lies in the interval

0 to 90 degrees, preferably 0 to 45 degrees, more preferably 0 to 30 degrees.

**[0018]** In a second aspect of the invention, a method of installing a screening device having a top element defining a first longitudinal direction is provided, the method comprising the steps of providing the top element with a first hinge part at or near each longitudinal end of the top element, each hinge part having a first engagement surface portion and a second engagement surface portion, providing each of two side rails defining a second longitudinal direction with a second hinge part having a first engagement surface portion and a second engagement surface portion, engaging the side rail with the top element by positioning each side rail at a predefined angle engaging the first and second engagement surface portions with each other, and rotating the side rails to an angle lower than said predefined angle.

**[0019]** The installation of the screening device is made very easy, as in principle no supplemental fastening means are necessary.

**[0020]** However, in order to prevent unintentional release of the side rails from the top element, the further steps of providing an opening restricting element to limit the opening of the side rails to the predefined angle, and connecting the opening restricting element to at least one of the side rails, may be foreseen.

**[0021]** Further details are described, and further advantages stated, in the description of particular embodiments of the invention.

**[0022]** In the following the invention will be described in further detail by means of examples of embodiments with reference to the schematic drawings, in which

Fig. 1 is a perspective view of a screening device in an embodiment of the invention;

Fig. 2 is a perspective view on a larger scale of a detail of a screening device in an embodiment of the invention;

Fig. 3 is a view corresponding to Fig. 2, but with some parts removed;

Fig. 4 is a view corresponding to Fig. 2, but with some parts removed and with a side rail forming an angle to a mounting rail of the screening device in an embodiment of the invention;

Fig. 5a is a view corresponding to Fig. 4, but with some parts removed;

Fig. 5b is a perspective view of a detail of the screening device in the embodiment shown in Fig. 5a;

Fig. 5c is a close-up of the hinge part of the detail of the screening device shown in Fig. 5a;

Fig. 6 is a perspective view, on a larger scale, of a detail of the screening device in the embodiment of Figs 4 to 5;

Fig. 7 and 8 are perspective views of the detail of Fig. 6, from other angles;

Fig. 9 is a perspective view of the screening device in an embodiment, some parts being removed;

Figs 10 and 11 are perspective views, on a larger

scale, of the screening device of Fig. 9 from two different angles;

Fig. 11 is a perspective view, on a larger scale, of the screening device of Fig. 9; and

Figs 12 and 13 are perspective views, on a still larger scale, of the screening device in the embodiment of Figs 9 to 11.

**[0023]** In the Figures of the drawings, embodiments of a screening device according to the invention are shown. In the embodiment shown in Fig. 1, the screening device 10 forms part of a screening assembly generally designated 1 and comprises in addition to the screening device 10 at least one appliance member 100. In the embodiment shown, the screening device 10 takes the form of a roller shutter, and appliance members, of which one appliance member 100 is shown in Fig. 1, are releasably connected to a top element 12 of the screening device 10. In addition to the top element 12, the roller shutter 10 has two side rails 13 and 14 extending at right angles to the top element 12, two mounting rails 15 and 16 extending in parallel with and below a respective side rail 13, 14, and a transverse element 17 extending between the ends of the mounting rails 15 and 16 opposite the ends at the top element 12. A shutter body 18 includes a plurality of slats 18a providing the screening, and the ends of the slats 18a are guided in the side rails 13 and 14. The invention is applicable to screening assemblies comprising other types of screening devices than roller shutters as well, such as for instance an awning blind.

**[0024]** The roller shutter 10 is intended to be mounted on a window 2, for instance a roof window adapted for installation in an inclined roof. The window comprises in a manner known per se a frame 3 and a sash 4 encasing a pane 5. The sash 4 is openable relative to the frame, viz. hinge connected to the frame 3, as in the embodiment shown, for instance by means of a set of pivot hinges (not shown) positioned close to a central axis of the window to allow the sash 3 to pivot relative to the frame 2. The roller shutter may be mounted on the window frame or on sash. In the embodiment shown, the roller shutter 10 is mounted on the frame 3 in that the mounting rails 15 and 16 are fastened to a respective side piece of the frame 3. The side rails 13 and 14 are connected to the mounting rails 15, 16 in a manner to be described in further detail below such that the side rails 13 and 14, and the shutter body 18 and slats 18a, follow the tilting movement of the sash 4, when the sash 4 is opened with the shutter body 18 in a screening position, i.e. is rolled out from the top element 12.

**[0025]** The aperture to be screened is defined by the area limited by the top element 12, the side rails 13, 14, and the bottom of the window, that is the bottom piece of the frame or sash of the window. This aperture thus corresponds in substance to the pane. In order to attain the desired screening, the shutter body 18 is adapted to be moved from a non-screening position to a screening position, in which it covers the pane and other parts of

the window to a larger or lesser degree. The shutter body 18 is adapted to be wound up in and rolled out from the top element 12 by means of a driving device, not shown, in a direction perpendicular to said longitudinal direction to a screening position. Examples of driving devices in roller shutters and examples of tiltable slats are disclosed in Applicant's co-pending international applications published under Nos WO2009/143842 and WO2009/143853, the contents of which are incorporated herein by reference.

**[0026]** The top element 12 is adapted to be positioned at the top of the window in the mounted position, i.e. at the top piece of the frame and the sash of the window, and comprises in the embodiment shown a top cover 21 and two outer end covers, of which the right-hand end cover 22 is visible in Fig. 1. The top element 12 defines a longitudinal direction in parallel with the top piece of the frame and sash of the window. Hence, this longitudinal direction is parallel to the longitudinal direction of the slats and perpendicular to the direction, in which the shutter body moves when rolling up and out the shutter body.

**[0027]** In the following, the connection of the side rails 13, 14 to the top element 12 will be described in further detail with reference to Figs 2 to 13. In the embodiment shown, the hinge connection is provided by a set of hinge parts having mutually cooperating engagement surfaces allowing positive engagement between the hinge parts in a predefined angle interval. The engagement between the mutually cooperating engagement surfaces is releasable outside said predefined angle interval. It is to be understood the the set of hinge parts at the left-hand and the right-hand sides of the screening device correspond to each other and are substantially mirror-inverted.

**[0028]** A first hinge part 30 is connected to the top element 12 and has a first curved engagement surface portion 31 having a first radius of curvature and a second curved engagement surface portion 32 at a distance from the first curved engagement portion and having a second radius of curvature different from the first radius of curvature. The first engagement surface portion 31 of the first hinge part 30 includes an angle of 60 to 90 degrees, for instance 75 degrees as in the shown embodiment. The first hinge part 30 is integrated with the end element 20 of the top element 12, but may also be a separate part connected to the top element. As is apparent, the first engagement surface portion 31 faces downwards and the second engagement surface portion 32 faces upwards.

**[0029]** A second hinge part 50 is connected to the side rail 13 and has a first curved engagement surface 51 having a radius of curvature corresponding to that of the first radius of curvature of the first curved engagement surface portion 31 of the first hinge part 30, and a second engagement surface portion 52 having a radius of curvature corresponding to that of the second radius of curvature of the second curved engagement surface portion 32 of the first hinge part. The second hinge part 50 is

substantially wedge-shaped and has its first and second engagement surface portions 51, 52 at opposite sides of the wedge-shape. The first engagement surface portion 51 of the second hinge part 50 faces upwards and the second engagement surface portion 52 faces substantially downwards, in order to correspond with their respective counterpart engagement surface portions of the first hinge part 30.

**[0030]** Furthermore, the wedge-shaped second hinge part 50 is provided with side guide flanges 53, 54 cooperating with the inner and outer side, respectively, of the end element 20, and bridge portion 61 including protruding portion 62, on the under side of which the second engagement surface portion 52 of the second hinge part 50 is formed. In the embodiment shown, additional stability in the longitudinal direction of the top element 12 is provided by flange portions 63 and 64.

**[0031]** The hinge part 50 may be connected to the side rails 13, 14 in any suitable manner. In the embodiment shown, the hinge part 50 is, as shown in Fig. 6, provided with a number of protruding flanges 55-59 that are in engagement with the side rail 13. Of these flanges, flange 55 has the additional function of acting as a side guide flange cooperating with the outer side of the end element 20. Furthermore, the hinge part 50 is guided by the end cover 22.

**[0032]** In principle, the engagement between the first and second engagement surface portions 31, 32 of the first hinge part 30 on the one hand, and the first and second engagement surface portions 51, 52 of the second hinge part 50 on the other, would be sufficient to keep the hinge parts 30, 50 in mutual positive engagement with each other within the predefined angle interval. However, supplemental surface portions are provided on the first and second hinge parts, respectively. These supplemental surface portions include an under side 54a of side guide flange 54 to cooperate with surface portion 34a; an upwards facing surface 55a to cooperate with a correspondingly shaped surface portion (not shown) on the outer side of end element 20; downwards facing surface portion 66a to cooperate with upwards facing surface portion 66a of the second hinge part 50.

**[0033]** Referring now in particular to Figs 9 to 13, an opening restricting element 80 limiting the movement of the side rails 13, 14 during opening is provided. In embodiment shown, the opening restricting element is a stay element 80 connected to at least one of said side rails 13, 14 and located at a distance from the top element, preferably 50 to 100% of the extent of the side rail in the second longitudinal direction, more preferably about 75% of the extent, as in the shown embodiment. In the embodiment shown, a stay element 80 is connected to each side rail 13, 14, and the connection between one stay element 80 and the one side rail 13 will be described in further detail below.

**[0034]** The stay element 80 is pivotally connected to one side rail 13 and to the mounting rail 15 mounted on the frame side piece. In order to facilitate the installation

and removal, the stay element 80 is releasably connected to the side rail or to the mounting rail. For instance, the stay element may be connected to the side rail or to the mounting rail only in a state of delivery. The stay element may then easily be connected to the other of the mounting rail and the side rail, for instance by snap engagement but possibly by a screw-and-nut connection. In the embodiment shown, the connection comprises a pin 85 at the mounting rail 15, and a separate element 90 fastened to the side rail 16 (not shown in Fig. 12 in order to ascertain the readability). An engagement part 89 of the stay element 80 cooperates with the separate element 90.

**[0035]** The opening angle range preferably lies in the interval 0 to 90 degrees, preferably 0 to 45 degrees, more preferably 0 to 30 degrees.

**[0036]** The manner of installing the screening device 10 of any of the above embodiment thus includes the following steps: Engaging the side rail with the top element by positioning the side rail at a predefined angle engaging the first and second engagement surface portions with each other, and rotating the side rail to an angle lower than said predefined angle.

**[0037]** The installation of the screening device is made very easy, as in principle no supplemental fastening means are necessary.

**[0038]** However, in order to prevent unintentional release of the side rails from the top element, the further steps of providing an opening restricting element to limit the opening of the side rails to the predefined angle, and connecting the opening restricting element to at least the each side rail, may be foreseen.

**[0039]** The invention should not be regarded as being limited to the embodiments shown in the drawings and described in the above. Various modifications and combinations may be carried out within the scope of the appended claims.

## Claims

1. A screening device (10) for a pivot window comprising an openable sash, comprising a top element (12) defining a first longitudinal direction and two side rails (13, 14) extending at right angles to the top element (12) in a second longitudinal direction, each of said side rails being connected to the top element (12) in a hinge connection between the respective side rail and the top element (12) at the top element, each side rail being formed in one piece that remains straight during the opening movement of the sash, whereby the hinge connection is provided by a set of hinge parts (30, 50) having mutually cooperating engagement surfaces allowing positive engagement between the hinge parts (30, 50) in a predefined angle interval, and in that the engagement between the mutually cooperating engagement surfaces is releasable outside said predefined angle interval.

2. A screening device according to claim 1, wherein a first hinge part (30) connected to the top element (12) has a first curved engagement surface portion (31) having a first radius of curvature and a second curved engagement surface portion (32) at a distance from the first curved engagement portion and having a second radius of curvature different from the first radius of curvature, and wherein the second hinge part (50) connected to the side rail has a first curved engagement surface (51) having a radius of curvature corresponding to that of the first radius of curvature of the first curved engagement surface portion (31) of the first hinge part, and a second engagement surface portion (52) having a radius of curvature corresponding to that of the second radius of curvature of the second curved engagement surface portion (32) of the first hinge part. 5
3. A screening device according to claim 2, wherein the first engagement surface portion (31) of the first hinge part (30) includes an angle of 60 to 90 degrees, preferably 70 to 80 degrees. 10
4. A screening device according to claim 2 or 3, wherein the first hinge part (30) is integrated with an end element (20) of the top element (12). 15
5. A screening device according to any one of claims 2 to 4, wherein the second hinge part (50) is substantially wedge-shaped and has its first and second engagement surface portions (51, 52) at opposite sides of the wedge-shape. 20
6. A screening device according to claim 5, wherein the wedge-shaped second hinge part (50) is provided with side guide flanges (53, 54). 25
7. A screening device according to any one of the preceding claims, wherein an opening restricting element (80) limiting the movement of the side rails (13, 14) during opening is provided. 30
8. A screening device according to claim 7, wherein the opening restricting element is a stay element (80) connected to at least one of said side rails (13, 14) and located at a distance from the top element, preferably 50 to 100% of the extent of the side rail in the second longitudinal direction, more preferably about 75% of the extent. 35
9. A screening device according to claim 7 or 8, wherein the stay element is pivotally connected to the side rail (13, 14) and to a frame side piece or to a mounting rail (15, 16) mounted on a frame side piece. 40
10. A screening device according to claim 9, wherein the stay element (80) is releasably connected to the side rail or to the mounting rail. 45
11. A screening device according to claim 10, wherein the screening device includes a mounting rail, and wherein the stay element is connected to the side rail or to the mounting rail only in a state of delivery. 50
12. A screening device according to any one of the preceding claims, wherein the predefined angle interval lies in the range 0 to 90 degrees, preferably 0 to 45 degrees, more preferably 0 to 30 degrees. 55
13. A method of installing a screening device for a pivot window comprising an operable sash, said screening device having a top element (12) defining a first longitudinal direction, the method comprising the steps of providing the top element (12) with a first hinge part (30) at each longitudinal end of the top element (12), each hinge part (30) having a first engagement surface portion (31) and a second engagement surface portion (32), providing each of two side rails (13, 14) in one piece that remains straight during the opening movement of the sash and defining a second longitudinal direction with a second hinge part (50) having a first engagement surface portion (51) and a second engagement surface portion (52), engaging each side rail (13, 14) with the top element (12) by positioning the side rail (13, 14) at a predefined angle and engaging the first and second engagement surface portions (31, 51; 32, 52) with each other, and rotating each side rail to an angle lower than said predefined angle.
14. The method of claim 13, comprising the further steps of providing an opening restricting element (80) to limit the opening of the side rails to the predefined angle, and connecting the opening restricting element (80) to at least the each side rail (13, 14).

#### Patentansprüche

1. Abschirmvorrichtung (10) für ein Schwenkfenster, das einen zu öffnenden Flügel aufweist, das ein oberes Element (12), das eine erste Längsrichtung definiert, und zwei Seitenschienen (13, 14) aufweist, die sich in rechten Winkeln zu dem oberen Element (12) in einer zweiten Längsrichtung erstrecken, wobei jede der Seitenschienen mit dem oberen Element (12) in einer Scharnierverbindung zwischen der jeweiligen Seitenschiene und dem oberen Element (12) am oberen Element verbunden ist, wobei jede Seitenschiene als ein Teil ausgebildet ist, das während der Öffnungsbewegung des Flügels gerade bleibt, wobei die Scharnierverbindung durch einem

Satz von Scharnierteilen (30, 50) vorgesehen ist, die gegenseitig zusammenwirkende Eingriffsflächen haben, die einen formschlüssigen Eingriff zwischen den Scharniersteilen (30, 50) in einem vordefinierten Winkelintervall erlauben, und dass der Eingriff zwischen den gegenseitig zusammenwirkenden Eingriffsflächen außerhalb des vordefinierten Winkelintervalls lösbar ist.

2. Abschirmvorrichtung nach Anspruch 1, wobei ein erstes Scharnierenteil (30), das mit dem oberen Element (12) verbunden ist, einen ersten gekrümmten Eingriffsflächenabschnitt (31), der einen ersten Krümmungsradius hat, und einen zweiten gekrümmten Eingriffsflächenabschnitt (32) in einem Abstand von dem ersten gekrümmten Eingriffsabschnitt hat, der einen zweiten Krümmungsradius hat, der unterschiedlich zu dem ersten Krümmungsradius ist, und wobei das zweite Scharnierenteil (50), das mit der Seitenschiene verbunden ist, eine erste gekrümmte Eingriffsfläche (51), die einen Krümmungsradius hat, der dem des ersten Krümmungsradius des ersten gekrümmten Eingriffsflächenabschnitts (31) des ersten Scharnierteils entspricht, und einen zweiten Eingriffsflächenabschnitt (52) hat, der einen Krümmungsradius hat, der dem des zweiten Krümmungsradius des zweiten gekrümmten Eingriffsflächenabschnitts (32) des ersten Scharnierteils entspricht.
3. Abschirmvorrichtung nach Anspruch 2, wobei der erste Eingriffsflächenabschnitt (31) des ersten Scharnierteils (30) einen Winkel von 60 bis 90°, bevorzugt 70 bis 80°, einschließt.
4. Abschirmvorrichtung nach Anspruch 2 oder 3, wobei das erste Scharnierenteil (30) in einem Endelement (20) des oberen Elements (12) integriert ist.
5. Abschirmvorrichtung nach einem der Ansprüche 2 bis 4, wobei das zweite Scharnierenteil (50) im Wesentlichen keilförmig ist und seinen ersten und zweiten Eingriffsflächenabschnitt (51, 52) auf gegenüberliegenden Seiten der Keilform hat.
6. Abschirmvorrichtung nach Anspruch 5, wobei das keilförmige zweite Scharnierenteil (50) mit seitlichen Führungsflanschen (53, 54) versehen ist.
7. Abschirmvorrichtung nach einem der vorherigen Ansprüche, wobei ein öffnungsbeschränkendes Element (80), das die Bewegung der Seitenschienen (13, 14) während eines Öffnens begrenzt, vorgesehen ist.
8. Abschirmvorrichtung nach Anspruch 7, wobei das öffnungsbeschränkende Element ein Strebenelement (80) ist, das mit wenigstens einer der Seitenschienen (13, 14) verbunden ist und das in einem

Abstand zu dem oberen Element angeordnet ist, bevorzugt 50 bis 100 % der Abmessung der Seitenschiene in der zweiten Längsrichtung, weiter bevorzugt ungefähr 75 % der Abmessung.

9. Abschirmvorrichtung nach Anspruch 7 oder 8, wobei das Strebenelement schwenkbar mit der Seitenschiene (13, 14) und mit einem Rahmenseitenteil oder einer Befestigungsschiene (15, 16) verbunden ist, die an einem Rahmenseitenteil befestigt ist.
10. Abschirmvorrichtung nach Anspruch 9, wobei das Strebenelement (80) lösbar mit der Seitenschiene oder der Befestigungsschiene verbunden ist.
11. Abschirmvorrichtung nach Anspruch 10, wobei die Abschirmvorrichtung eine Befestigungsschiene umfasst und wobei das Strebenelement mit der Seitenschiene oder mit der Befestigungsschiene nur in einem Auslieferungszustand verbunden ist.
12. Abschirmvorrichtung nach einem der vorherigen Ansprüche, wobei das vordefinierte Winkelintervall in dem Bereich von 0 bis 90 Grad, bevorzugt 0 bis 45 Grad, weiter bevorzugt 0 bis 30 Grad, liegt.
13. Verfahren zur Montage einer Abschirmvorrichtung für ein Schwenkfenster, das einen zu öffnenden Flügel aufweist, wobei die Abschirmvorrichtung ein oberes Element (12) hat, das eine erste Längsrichtung definiert, wobei das Verfahren die folgenden Schritte aufweist:
 

Bereitstellen des oberen Elements (12) mit einem ersten Scharnierenteil (30) an jedem Längsende des oberen Elements (12), wobei jedes Scharnierenteil (30) einen ersten Eingriffsflächenabschnitt (31) und einen zweiten Eingriffsflächenabschnitt (32) hat,

Bereitstellen von jeder der zwei Seitenschienen (13, 14) in einem Stück, das während der Öffnungsbewegung des Flügels gerade bleibt und eine zweite Längsrichtung definiert, und mit einem zweiten Scharnierenteil (50), das einen ersten Eingriffsflächenabschnitt (51) und einen zweiten Eingriffsflächenabschnitt (52) hat,

in Eingriff bringen jeder Seitenschiene (13, 14) mit dem oberen Element (12) durch Anordnen der Seitenschiene (13, 14) in einem vordefinierten Winkel und in Eingriff bringen des ersten und des zweiten Eingriffsflächenabschnitts (31, 51; 32, 52) miteinander und

Drehen jeder Seitenschiene in einen Winkel kleiner als der vordefinierte Winkel.
14. Verfahren nach Anspruch 13, das die weiteren Schritte aufweist:

Bereitstellen eines öffnungsbeschränkenden Elements (80) zur Begrenzung des Öffnens der Seitenschienen auf den vordefinierten Winkel und

Verbinden des öffnungsbeschränkenden Elements (80) mit wenigstens einer der Seitenschienen (13, 14).

## Revendications

1. Dispositif d'écran (10) destiné à une fenêtre à pivot comportant un châssis ouvrable, comprenant un élément supérieur (12) définissant une première direction longitudinale et deux rails latéraux (13, 14) s'étendant à angles droits par rapport à l'élément supérieur (12) dans une seconde direction longitudinale, chacun desdits rails latéraux étant raccordé à l'élément supérieur (12) au moyen d'un raccordement par articulation entre le rail latéral respectif et l'élément supérieur (12) au niveau de l'élément supérieur, chaque rail latéral étant formé en une pièce qui reste rectiligne pendant le mouvement d'ouverture du châssis, de sorte que le raccordement par articulation est fourni par un ensemble de pièces d'articulation (30, 50) présentant des surfaces d'engagement coopérant les unes avec les autres permettant un engagement positif entre les pièces d'articulation (30, 50) dans un intervalle angulaire prédéfini, et en ce que l'engagement entre les surfaces d'engagement coopérant les unes avec les autres est libérable en dehors dudit intervalles angulaire prédéfini.
2. Dispositif d'écran selon la revendication 1, dans lequel une première pièce d'articulation (30) raccordée à l'élément supérieur (12) présente une première partie de surface d'engagement incurvée (31) présentant un premier rayon de courbure et une seconde partie de surface d'engagement incurvée (32) à distance de la première partie de surface d'engagement incurvée et présentant un second rayon de courbure différent du premier rayon de courbure, et dans lequel la seconde pièce d'articulation (50) raccordée au rail latéral possède une première surface d'engagement incurvée (51) présentant un rayon de courbure correspondant à celui du premier rayon de courbure de la première partie de surface d'engagement incurvée (31) de la première pièce d'articulation, et une seconde partie de surface d'engagement (52) présentant un rayon de courbure correspondant à celui du second rayon de courbure de la seconde partie de surface d'engagement incurvée (32) de la première pièce d'articulation.
3. Dispositif d'écran selon la revendication 2, dans lequel la première partie de surface d'engagement (31) de la première pièce d'articulation (30) inclut un

angle de 60 à 90 degrés, de préférence de 70 à 80 degrés.

4. Dispositif d'écran selon la revendication 2 ou 3, dans lequel la première pièce d'articulation (30) est intégrée avec un élément d'extrémité (20) de l'élément supérieur (12).
5. Dispositif d'écran selon l'une quelconque des revendications 2 à 4, dans lequel la seconde pièce d'articulation (50) est essentiellement configurée en forme de coin et présente ses première et seconde parties de surface d'engagement (51, 52) au niveau des côtés opposés de la configuration en forme de coin.
6. Dispositif d'écran selon la revendication 5, dans lequel la seconde pièce d'articulation configurée en forme de coin (50) est dotée de rebords de guidage latéraux (53, 54).
7. Dispositif d'écran selon l'une quelconque des revendications précédentes, dans lequel un élément de réduction d'ouverture (80) limitant le déplacement des rails latéraux (13, 14) pendant l'ouverture est fourni.
8. Dispositif d'écran selon la revendication 7, dans lequel l'élément de réduction d'ouverture est un élément d'entretoise (80) raccordé à au moins l'un desdits rails de guidage latéraux (13, 14) et situé à une certaine distance de l'élément supérieur, de préférence à une distance de 50 à 100% de l'extension du rail latéral dans la seconde direction longitudinale, avec plus de préférence, à 75% environ de l'extension.
9. Dispositif d'écran selon la revendication 7 ou 8, dans lequel l'élément d'entretoise est raccordé à pivotement au rail latéral (13, 14) et à une pièce latérale de cadre ou à un rail de montage (15, 16) monté sur une pièce latérale de cadre.
10. Dispositif d'écran selon la revendication 9, dans lequel l'élément d'entretoise est raccordé de façon libérable au rail latéral ou au rail de montage.
11. Dispositif d'écran selon la revendication 10, dans lequel le dispositif de guidage inclut un rail de montage, et dans lequel l'élément d'entretoise est raccordé au rail latéral ou au rail de montage seulement à un état de livraison.
12. Dispositif d'écran selon l'une quelconque des revendications précédentes, dans lequel l'intervalle angulaire prédéfini se trouve dans la plage de 0 à 90 degrés, de préférence de 0 à 45 degrés, avec plus de préférence de 0 à 30 degrés.



13. Procédé d'installation d'un dispositif d'écran destiné à une fenêtre à pivot comportant un châssis pouvant être actionné, ledit dispositif d'écran présentant un élément supérieur (12) définissant une première direction longitudinale, le procédé comportant les étapes comprenant de :

doter l'élément supérieur (12) d'une première pièce d'articulation (30) au niveau de chaque extrémité longitudinale de l'élément supérieur (12), chaque pièce d'articulation (30) présentant une première partie de surface d'engagement (31) et une seconde partie de surface d'engagement (32),  
fournir chacun des deux rails latéraux (13, 14) en une pièce qui reste rectiligne pendant le mouvement d'ouverture du châssis et définir une seconde direction longitudinale avec une seconde pièce d'articulation (50) présentant une première partie de surface d'engagement (51) et une seconde partie de surface d'engagement (52), engager chaque rail latéral (13, 14) avec l'élément supérieur (12) en positionnant le rail latéral (13, 14) selon un angle prédéfini et engager les première et seconde parties de surface d'engagement (31, 51; 32, 52) l'une avec l'autre, et faire tourner chaque rail latéral suivant un angle plus petit que ledit angle prédéfini.

14. Procédé selon la revendication 13, comprenant en outre, les étapes comprenant le fait de :

fournir un élément de réduction d'ouverture (80) pour limiter l'ouverture des rails latéraux jusqu'à l'angle prédéfini, et raccorder l'élément de réduction d'ouverture (80) à au moins l'un de chaque rail latéral (13, 14).

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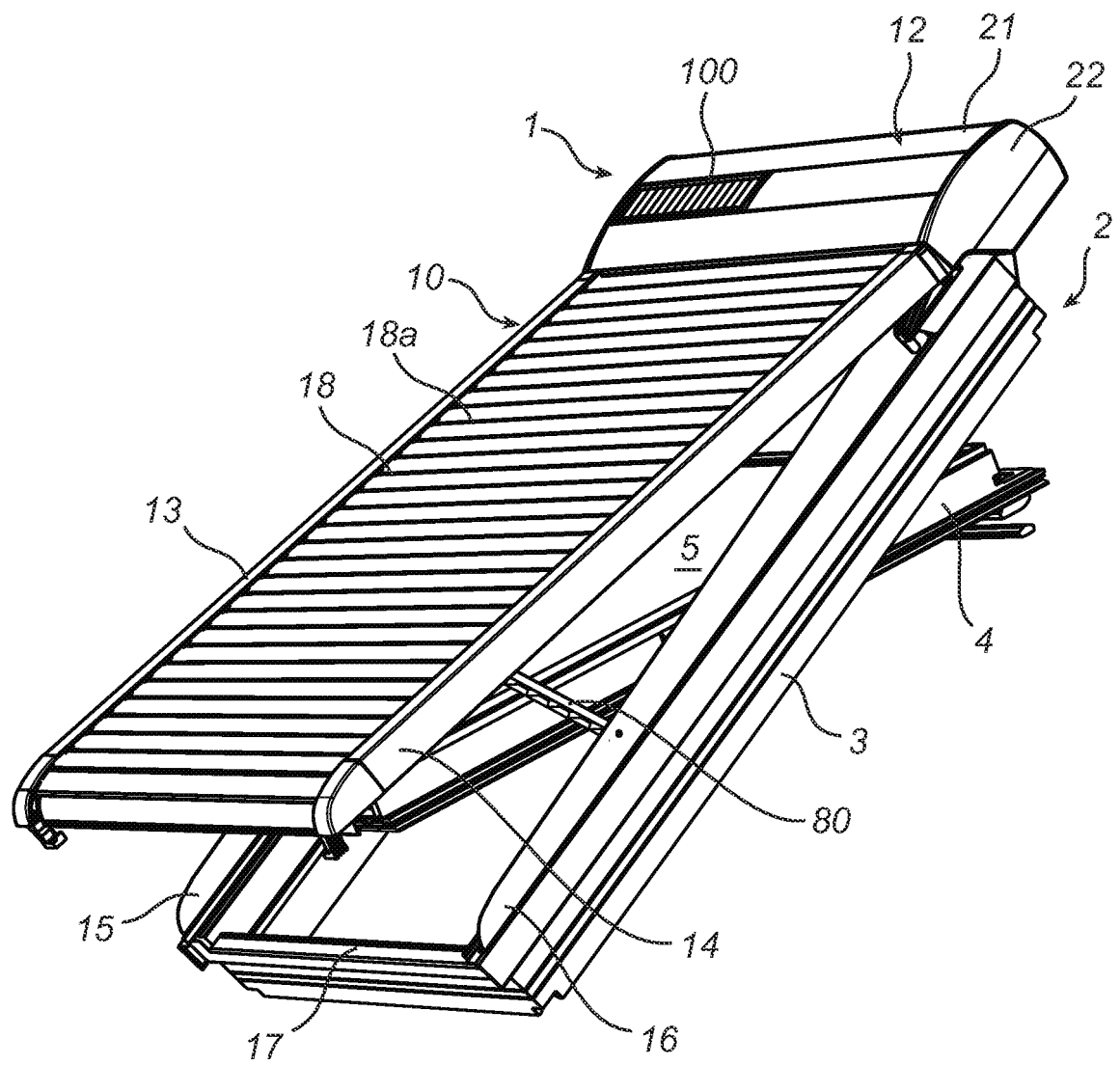
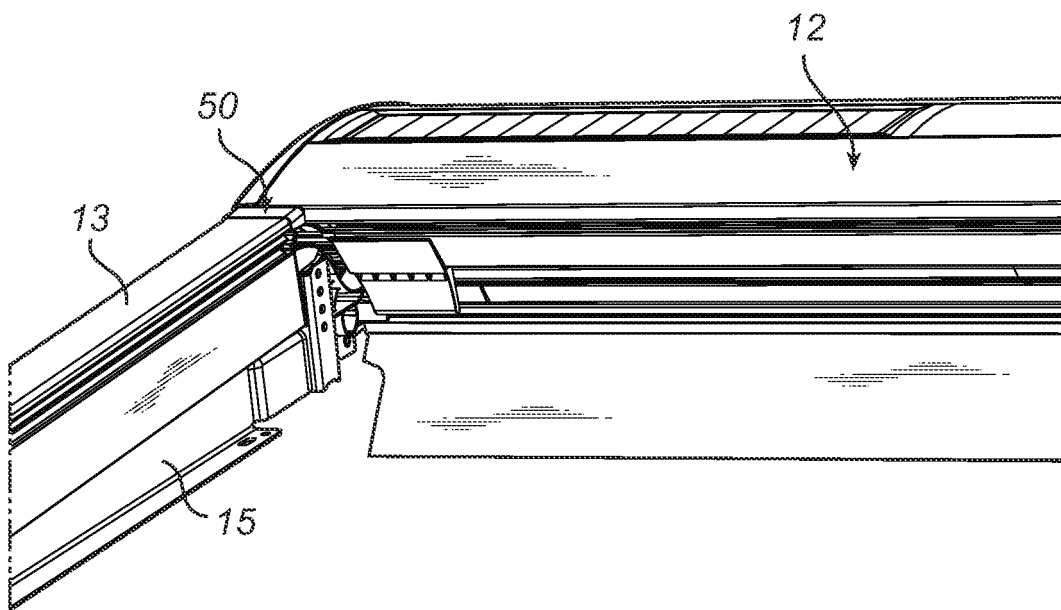
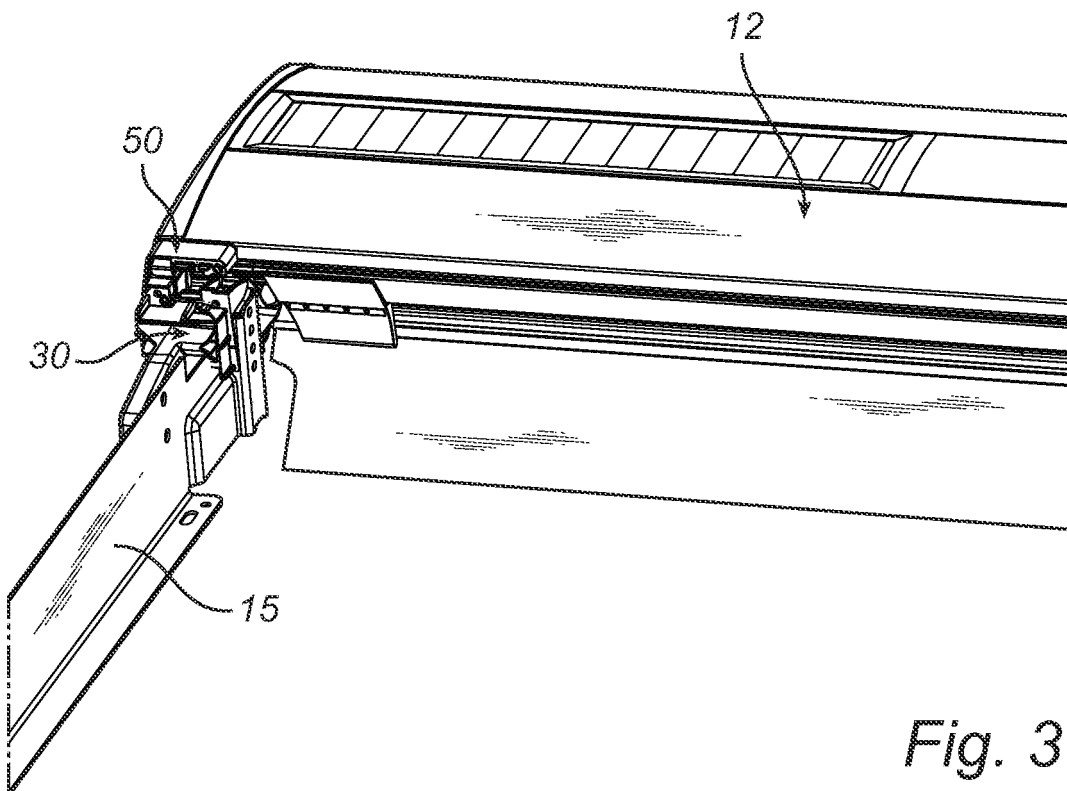


Fig. 1



*Fig. 2*



*Fig. 3*

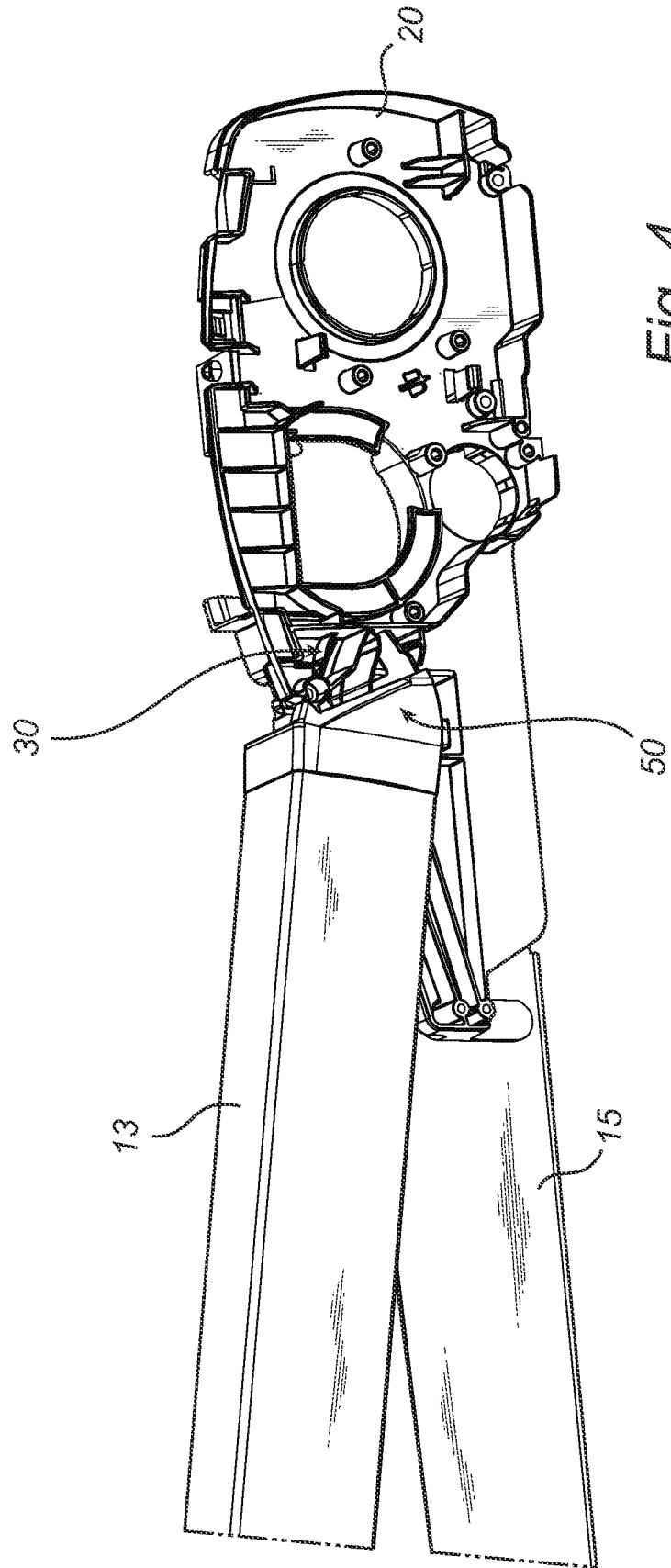
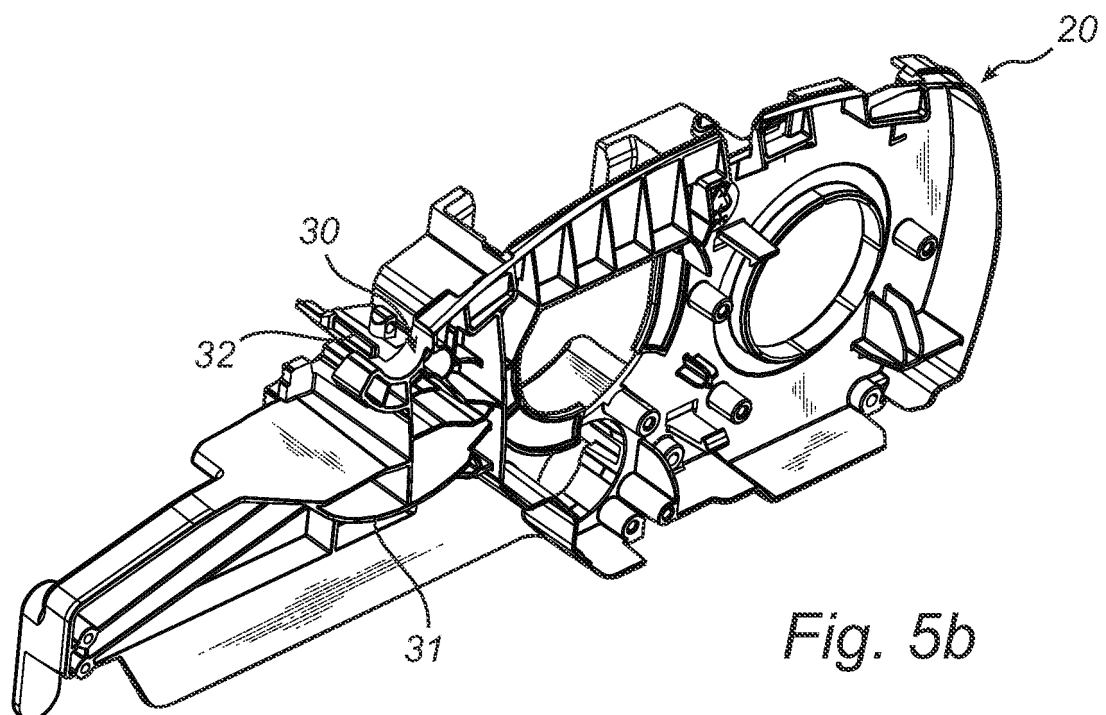
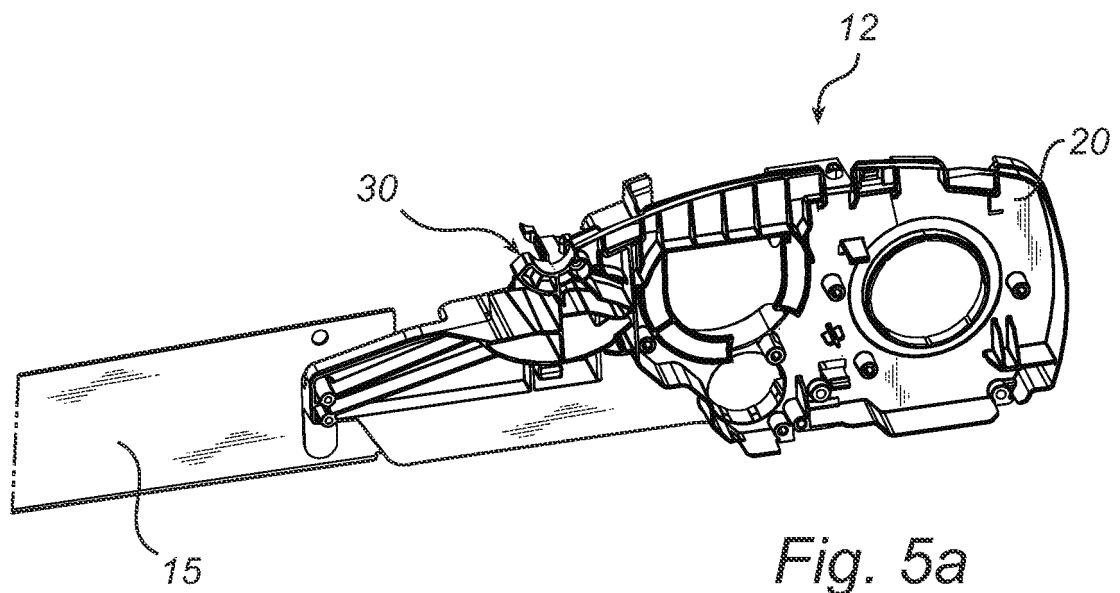
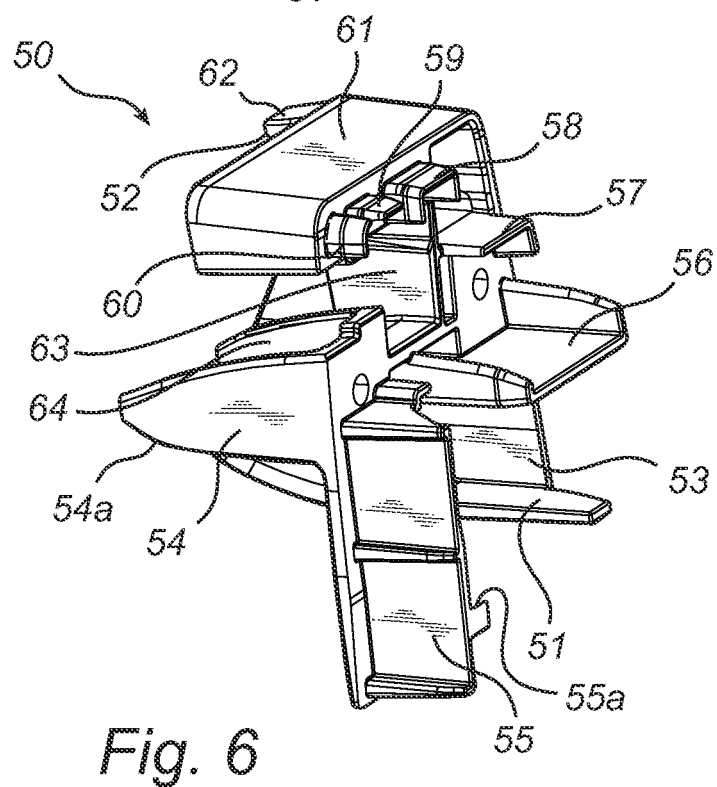
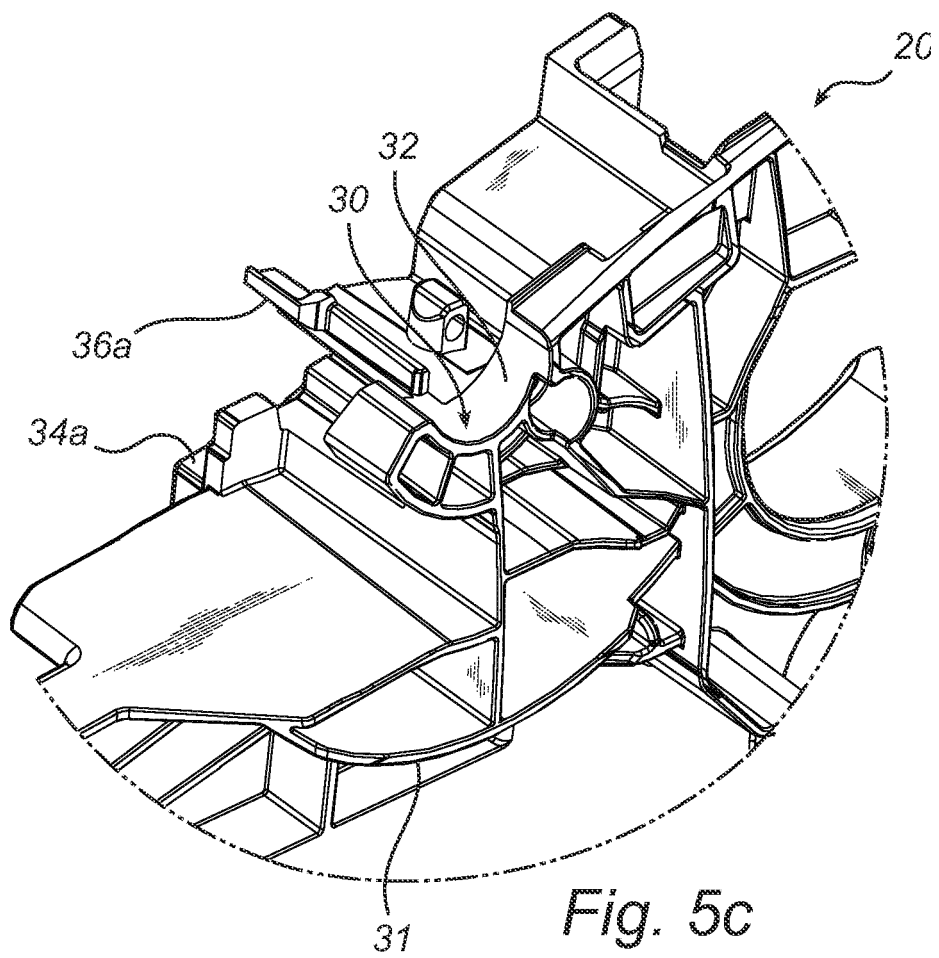
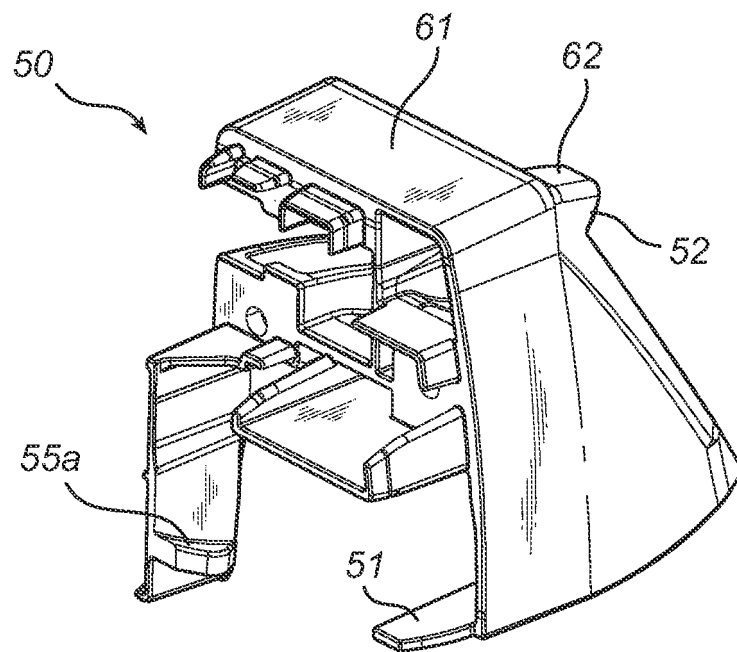


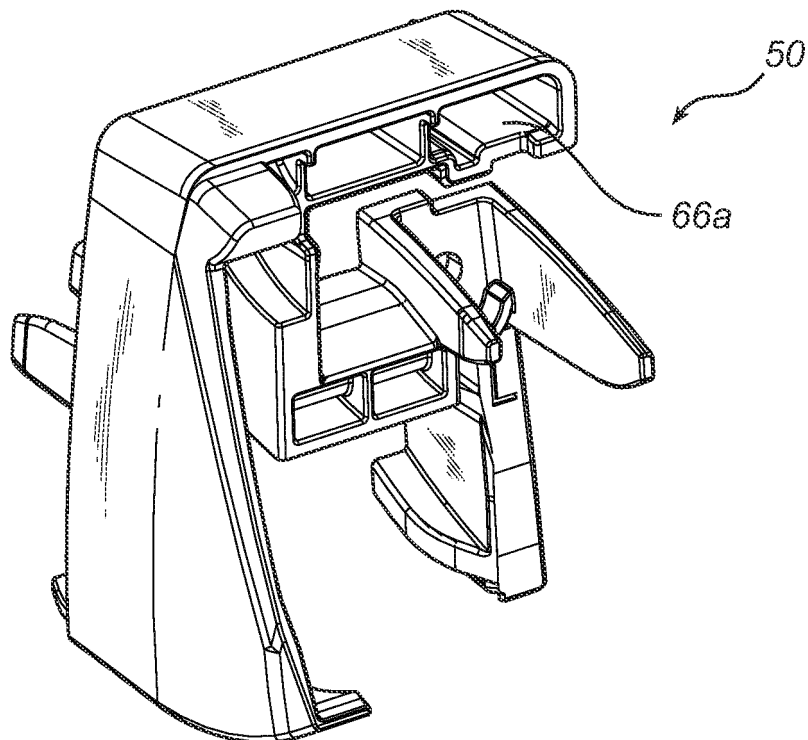
Fig. 4







*Fig. 7*



*Fig. 8*

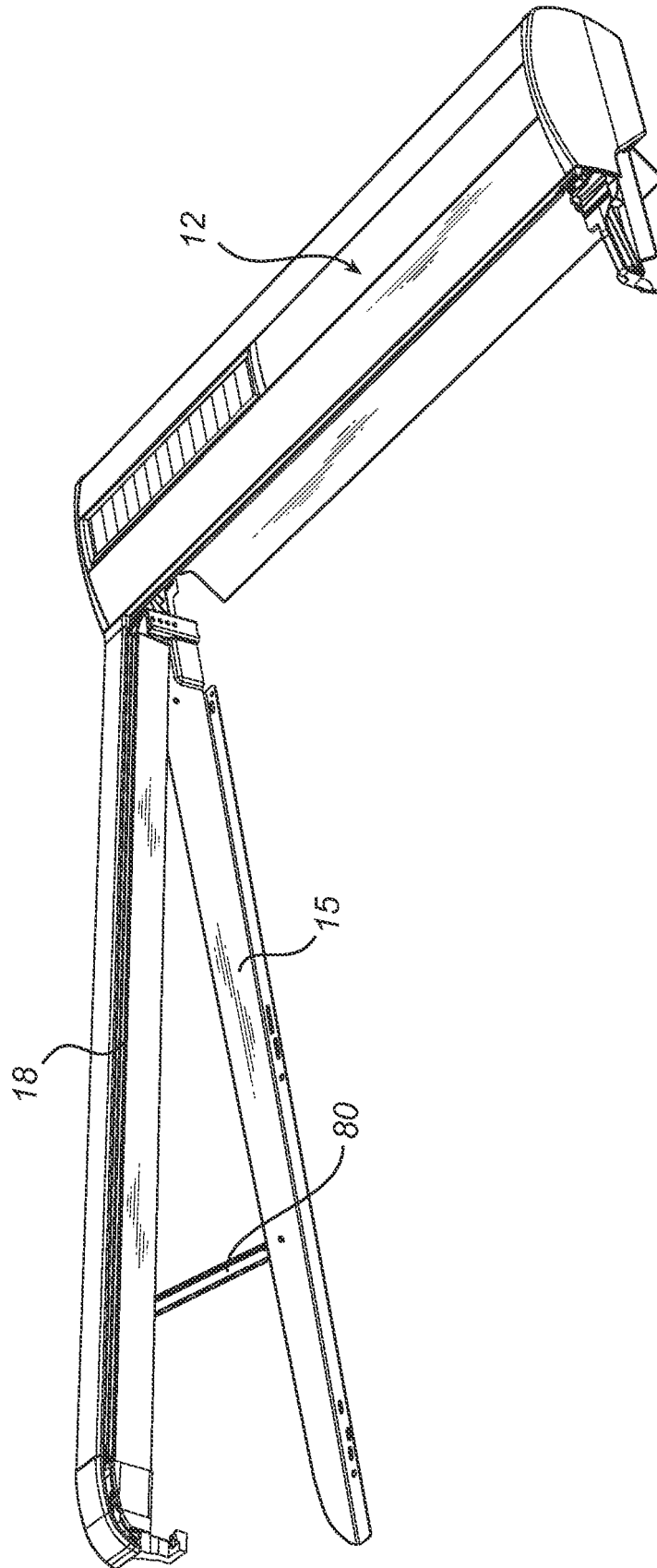
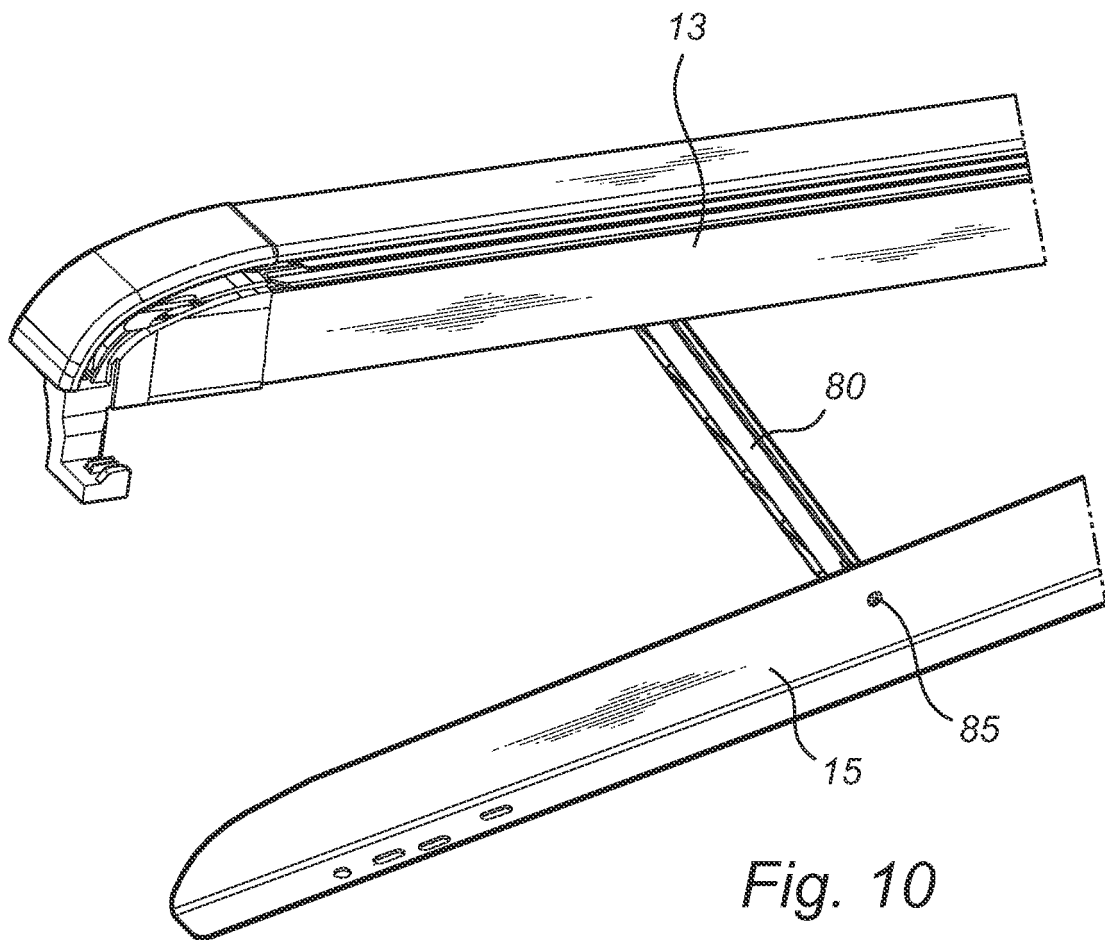
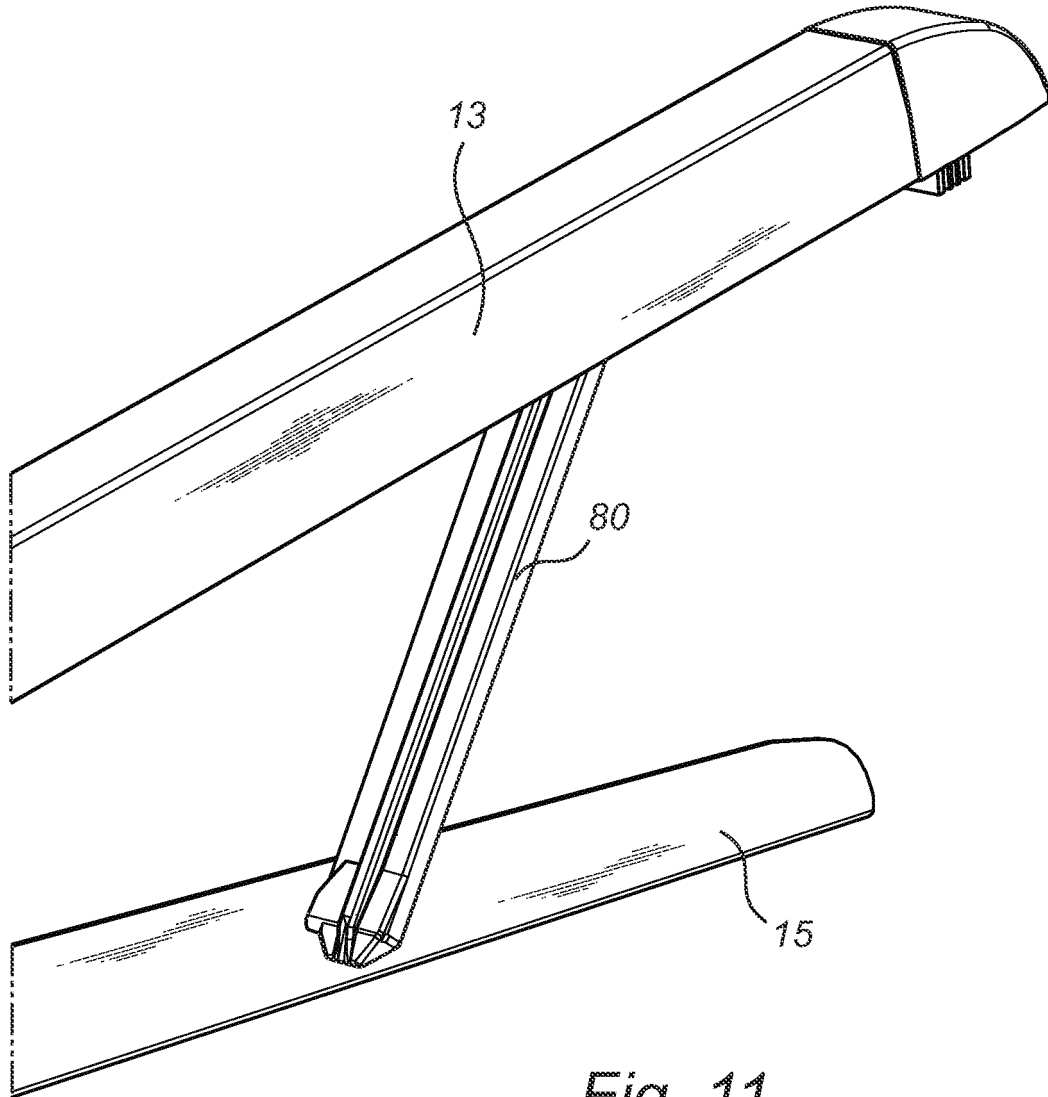


Fig. 9

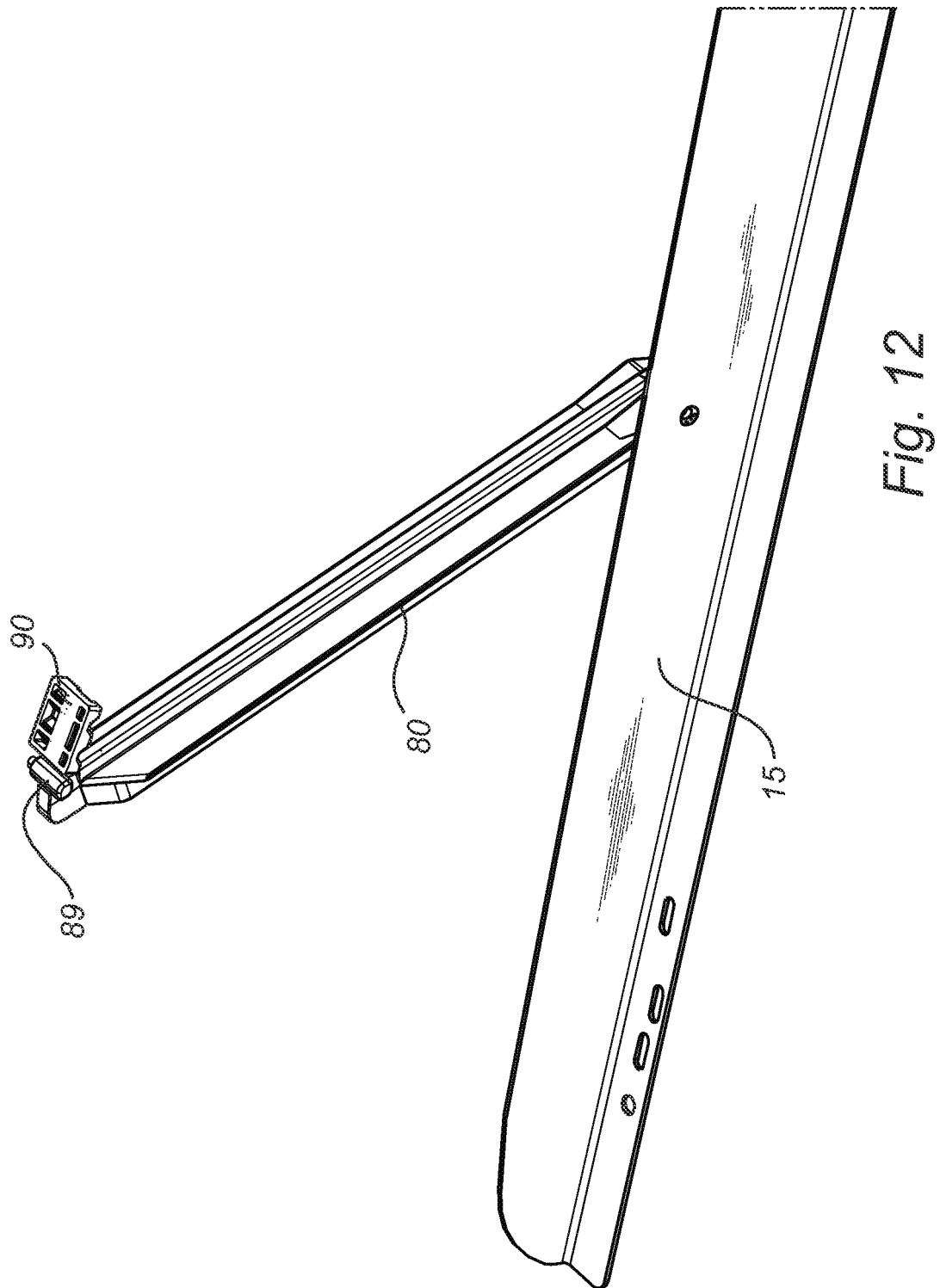




*Fig. 10*



*Fig. 11*



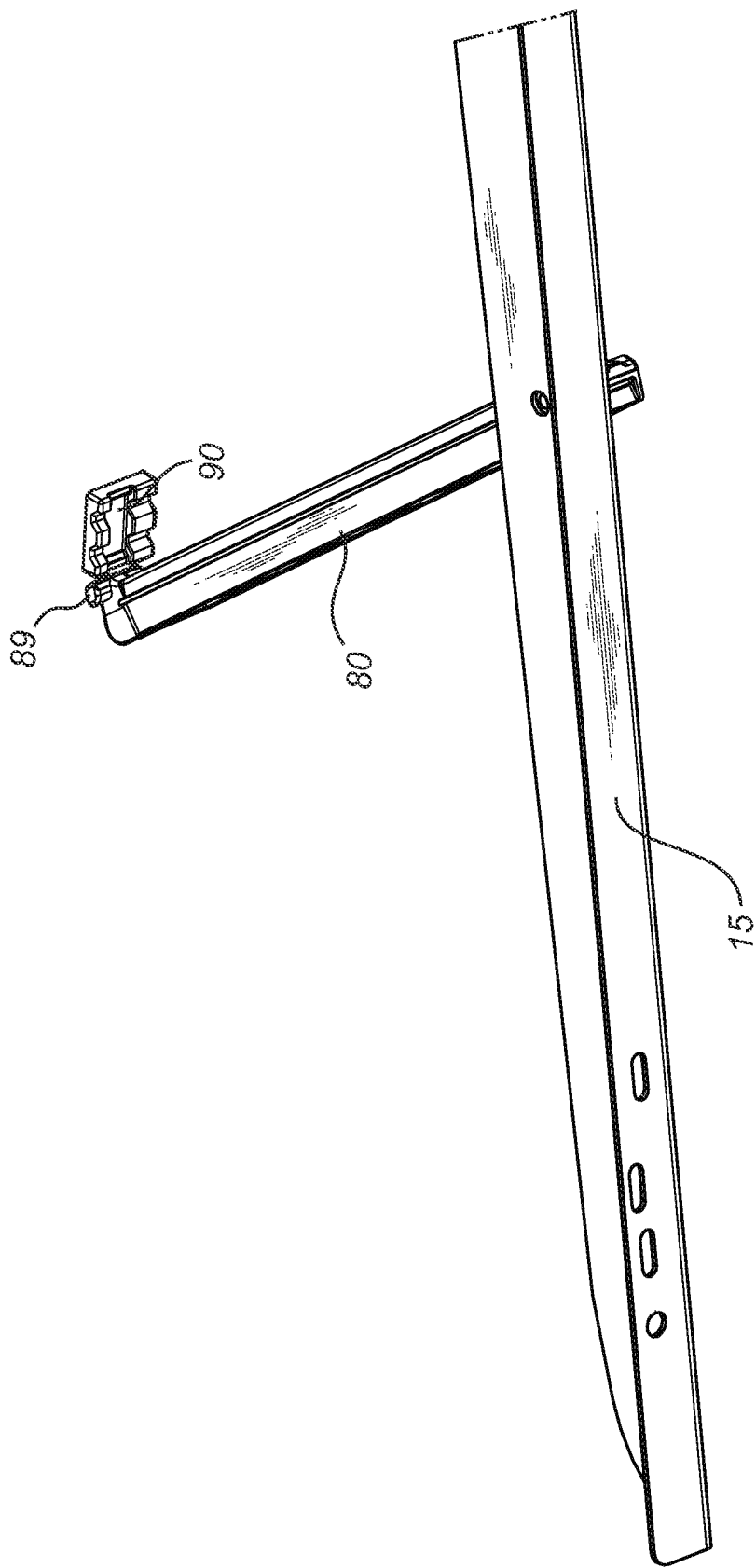


Fig. 13

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- DE 2906913 [0003]
- DE 4401056 [0003]
- EP 0207870 A [0003]
- DE 19600952 [0003]
- DE 2595403 [0003]
- DE 202008013422 U1 [0003]
- WO 0206621 A [0004]
- WO 2009143842 A [0025]
- WO 2009143853 A [0025]