

Fig. 2

Description

[0001] The present invention relates to a screening arrangement for a wing, such as a window, in particular a roof window, said screening arrangement comprises at least a first screening element, the at least first screening element being arranged between a first movable bar element and a second movable bar element, said screening arrangement further comprises a cord system, the cord system comprises a first set of guiding cords, of which one, in the mounted state of the screening arrangement, is extending from a position at a wing corner along the first bar element to a diametrically opposite wing corner, whereas the other guiding cord of the first set correspondingly runs in mirror-image fashion from another wing corner, and said cord system further comprises a second set of guiding and holding cords, of which one, in the mounted state of the screening arrangement, is extending from a position at the wing corner, along the first bar element, threaded through a first set of apertures of the blind, and along the second bar element to a diametrically opposite wing corner and return to the starting point along the second bar element, a second set of apertures of the blind and along the first bar element, whereas the other guiding and holding cord correspondingly runs in mirror-image fashion from another wing corner, said screening arrangement further comprises cord tensioning means, such as a spring.

[0002] WO-A1-2006/050728 - hereby incorporated by reference - to the applicant discloses such a screening arrangement.

[0003] An object of the invention is to provide a screening arrangement, which provides a high degree of user friendliness regarding the operation as well as an optimal durability of the screening arrangement.

[0004] To achieve this object the screening arrangement as outlined is **characterized in that** said cord tensioning means comprises a first cord tensioner, such as a spring, for tensioning the first guiding cord of the first set of guiding cords, said cord tensioner being attached in/to the second lower bar element, and a second cord tensioner for tensioning the other guiding cord of the first set of guiding cords correspondingly, said cord tensioner being attached in/to the second lower bar element, a third cord tensioner, such as a spring, for tensioning the first guiding cord of the second set of guiding and holding cords, said cord tensioner being attached in/to the first upper bar element, and a fourth cord tensioner for tensioning the other guiding cord of the second set of guiding and holding cords correspondingly, said cord tensioner being attached in/to the first upper bar element.

[0005] Hereby is archived an optimal solution where the screening arrangement is easy to operate, i.e. the bar elements can be moved vertically while being parallel to the horizontal plane, the bar elements will stay in a selected position due to friction and further the abrasions on the cord system will be minimal. All these features will result in a better user experience as well as optimal du-

rability of the screening.

[0006] In the following the invention will be described in more detail by way of example and with reference to the schematic drawing, in which

Fig. 1 is a front view of a screening arrangement according to prior art,

Fig. 2 is a front view of a screening arrangement according to the invention

[0007] For the sake of clarity only half a cord system is illustrated in Fig. 1 and 2, so the reader should visualize a corresponding cord system from the other corner in a mirror-image with regard to the vertical centre axis in Fig. 1 and 2. Hence in Fig. 1 and 2 a cord system identical to the illustrated is extending from the upper right corner of the figure to the lower left corner of the figure.

[0008] A screening arrangement 1 according to prior art is illustrated in Fig. 1. The screening arrangement 1 comprises a screening element 4 arranged between a first upper movable bar element 2 and second lower movable bar element 3. The bar elements may be produced from various materials, but is preferably produced as an extruded aluminium profile. Each bar element is at their respective ends designed with guiding means 13, 14, 15, 16 designed to communicate with not shown side rails. The bar elements are designed as handle bars with at front recess giving the user possibility to enter his fingers when repositioning is wanted. The screening element may comprise different types of material, but is preferably chosen within the group of single or double pleated fabrics or within cellular fabrics. The first upper movable bar element 2 is guided in a vertical orientation by a guiding cord 9. The guiding cord is to ensure a proper parallel guidance of the bar element 2 during the vertical movement. Parallel guidance means that the bar element will keep its horizontal orientation during vertical movement and this will further make it possible to operate the bar element by gripping the bar element anywhere over its horizontal length. The guiding cord 9 comprises a first end 19, which is fixedly positioned to a corner bracket 5 at a first wing corner - here the upper left corner is illustrated. From this position the cord extends vertically towards a first end of the bar element 2, the cord extends further horizontal along the bar element 2 and finally extends vertically towards a second end 18, which is fixedly positioned to a corner bracket 7 at the lower right wing corner. To ensure a proper tensioning of the cord 9 a cord tensioner 12 is positioned in the first upper movable bar element 2. This is only illustrated schematically. The cord is looped 360 degrees by two turning pins (not shown) and one of these turning pins is mounted to a tensioning spring while the other is mounted to a tensioning house. The tensioning spring is at its other end fixedly connected to the tensioning housing, which again is fixedly connected to the bar element.

[0009] The second lower movable bar element 3 is guided in a vertical orientation by a guiding cord 10. The

guiding cord 10 has an additional function compared to the guiding cord 9 of the first upper moveable bar element. As the screening element 4 normally is made from a thin fabric there is no or very little resistance against movement perpendicular to the screening opening. Therefore the guiding cord 10 is extended through the screening element 4 to hold it in the plane of the screening opening. Especially when used in roof windows this hold is essential. The cord 10 is at a first end 20 fixedly positioned to a corner bracket 5 - here the upper left corner is illustrated. From this position the cord 10 extends vertically towards a first end of the bar element 2, the cord extends further horizontal along a part of the bar element 2. From this position the cord extends vertically and being threaded through a first set of apertures in the screening material until it reaches the second lower movable bar element 3, along which the cord extends horizontally. At the right end of the bar element 3 the cord extends vertically to a corner bracket 7 - here the lower right corner is illustrated. At this end the cord is returned around a turning point 17, which can be designed differently as long as the friction between the cord and the turning point is low. Preferably the turning point is a turning pin or a pulley. From the turning point 17 the cord returns to the corner bracket 5 - at the upper left corner in a similar way as the opposite way - with the only difference that the cord extends between the lower movable bar element 3 and the upper moveable bar element 2 through a second set apertures in the screening material. With this configuration the first set of apertures are the most distant from the vertical side edges of the screening material. At the corner bracket 5 the second end of the cord 10 is fixedly positioned.

[0010] To ensure a proper tensioning of the cord 10 a cord tensioner 11 is positioned in the second lower movable bar element 3. The tensioner is placed in the bar element 3 and being in connection with the cord at a position between the vertical threaded part and horizontal part along the bar element 3. The cord tensioner 11 can be designed in various ways and is only illustrated schematically. Preferably the cord is turned 90 degrees around a turning pin or pulley, which is in connection with at tensioning means - such a spring. The other end of the tensioning means is mounted to the bar element 3 or to a tensioner housing, which again is mounted to the bar element 3.

[0011] The friction between the cords and the bars 2, 3 are mainly achieved by the contact between the cords and by plastic bushings with rounded edges at each position where the cords are changing direction. It is important to have enough friction that the bars can stay in a wanted position, but at the same time as little friction as possible to minimize abrasions.

[0012] Now turning to Fig. 2 and the invention. The overall numerals in Fig. 2 is the same as in Fig. 1 as most of the elements are the same. Therefore the description of Fig. 1 will also serve as description for Fig. 2 and only the differences in Fig. 2 will be described below.

[0013] When working with cord guided screenings the main issue is to ensure that the bar elements can be moved vertically while being parallel to the horizontal plane and that the bar elements will stay in a selected position due to friction between the cord and bar elements. Further the abrasions on the cord system should be minimal, in order to ensure a long durability.

[0014] It has been proven that the positioning of the cord tensioners have an important role to ensure an optimal operation during vertical movement of the bar elements.

[0015] Therefore the cord tensioner 120 (equivalent to cord tensioner 12 in Fig. 1) of the guiding cord 9 ensuring the parallel guidance of the first upper movable bar element 2 is positioned in the second lower movable bar element 3. As illustrated in Fig. 2 the cord 9 is extending shortly into the right side of the lower movable bar element 3, is turned 180 degrees around a turning point, such as turning pin, a pulley or similar, and is extending back along the bar element again. A tensioner, such as a spring, is attached to the turning point and the other end of the spring is attached to the bar element or to a tensioner housing.

[0016] Further the cord tensioner 110 (equivalent to cord tensioner 11 in Fig. 1) of the guiding and holding cord 10 ensuring the parallel guidance of the second lower movable bar element 3 and ensuring the holding of the screening material 4 between the bar elements 2, 3, is positioned in the first upper movable bar element 2. As illustrated in Fig. 2 the cord tensioner 110 is in connection with the cord at a position just before the cord extends downwardly vertically threaded through the screening material between the bar elements 2, 3.

[0017] So in other words the cord tensioner of the first upper bar element 2 is positioned and attached in/to the second lower bar element 3 and the cord tensioner of the second lower bar element 3 is positioned and attached in/to the first upper bar element 2.

[0018] The cord arrangement of the screening arrangement is intended for providing parallel guidance of the bar elements of the screening arrangement, i.e. that each bar element is guided to perform a translatory motion without any angular movement. This is achieved by the fact that any cord is arranged to extend from a position at one (upper) corner to a diametrically opposite (lower) corner. Hereby it is possible to operate the screening arrangement by pushing or pulling the bar element at any position along the length thereof without risking to set the bar element askew.

[0019] This invention is, of course, not limited to the above-described embodiments which may be modified without departing from the scope of the invention or sacrificing all of its advantages. In this regard, the terms in the foregoing description and the following claims, such as "upper", "lower", "vertical", "horizontal", "perpendicular", "right", "left" have been used only as relative terms to describe the relationships of the various elements of the screening arrangement for a cord guided window cov-

ering of the invention as shown in the figures.

[0020] The expression "wing corner" as used above is intended to cover any position at or near a frame corner of e.g. a window or door.

[0021] For example the cord tensioners have been described as comprising a spring, for instance a helically-wound metal tension spring. Of course other tensioners can be used as long as they have the wanted overall tensioning characteristic and durability.

[0022] The bars 2, 3 of the screening arrangement 1 and any additional rails are not necessarily hollow, but can be longitudinally extending profiles that are open to front and/or back, such as a U-shaped profile or an L-shaped profile. The guide cords 9, 10 would then be routed along the open back of the bar or rail profiles, and the cord tensioner(s) 11, 12, 110, 120 could be attached to the back of the profiles. In this regard, although it is preferred that the cord tensioners are attached in/to an interior surface of the bars 2, 3 of the screening arrangement 1, the cord tensioners can be attached instead to an exterior surface of such bars or could even be closely adjacent to an exterior surface of such bars.

[0023] The guiding cords 9, 10 can enter the bar elements 2, 3 from the side of cross-sectional side of the elements in configurations, where the mounting of the corner brackets 5, 6, 7, 8 are outside the horizontal length of the bar elements 2, 3. In other configurations the mounting of the corner brackets 5, 6, 7, 8 are within the horizontal length of the bar elements 2, 3. In this configuration the bar element 2 respectively 3 could overlap the mounting brackets 5, 6 respectively 7, 8. Therefore the cords 9, 10 can enter the bar elements 2, 3 perpendicular to the horizontal length.

[0024] The screening arrangement can be used alone to screen a window or door opening or might be combined with other screening, such as a traditionally roller blind. The roller blind can be mounted with its top casing to the upper side of the window opening. Normally a roller blind has a lower bar element, which can be used to as a handle bar during operation. The lower bar element might be integral with the first upper movable bar element 2 or might be connectable to the first upper movable bar element 2. Alternatively the roller blind might be completely separate from the screening arrangement of the invention and might be operated separately in the window opening space above the screening arrangement of the invention.

Claims

1. A screening arrangement for a wing, such as a window, in particular a roof window, said screening arrangement comprises at least:

- a least a first screening element, the at least first screening element being arranged between a first upper movable bar element and a second

lower movable bar element, said screening arrangement further comprises a cord system, the cord system comprises:

- a first set of guiding cords, of which one, in the mounted state of the screening arrangement, is extending from a position at a wing corner along the first upper bar element to a diametrically opposite wing corner, whereas the other guiding cord of the first set correspondingly runs in mirror-image fashion from another wing corner, and said cord system further comprises:

- a second set of guiding and holding cords, of which one, in the mounted state of the screening arrangement, is extending from a position at a wing corner, along the first upper bar element, threaded through a first set of apertures of the blind, and along the second lower bar element to a diametrically opposite wing corner and return to the starting point along the second lower bar element, threaded through a second set of apertures of the blind and along the first upper bar element, whereas the other guiding and holding cord correspondingly runs in mirror-image fashion from another wing corner, said screening arrangement further comprises:
- cord tensioning means,

characterised in, that said cord tensioning means comprises:

- a first cord tensioner, such as a spring, for tensioning the first guiding cord of the first set of guiding cords, said cord tensioner being attached in/to the second lower bar element, and
- a second cord tensioner for tensioning the other guiding cord of the first set of guiding cords correspondingly, said cord tensioner being attached in/to the second lower bar element
- a third cord tensioner, such as a spring, for tensioning the first guiding cord of the second set of guiding and holding cords, said cord tensioner being attached in/to the first upper bar element, and
- a fourth cord tensioner for tensioning the other guiding cord of the second set of guiding and holding cords correspondingly, said cord tensioner being attached in/to the first upper bar element.

2. A screening arrangement according to claim 1, wherein the first and second cord tensioner is positioned in opposite sides of the second lower bar element at a predetermined distance from the end of the bar element, and that the first respectively the second guiding cord of the first set of guiding cords is extending along the second lower bar element towards the respectively cord tensioner, turning 180 degrees and returning along the bar element.

3. A screening arrangement according to claim 1 or 2, wherein the third and forth cord tensioner is positioned in the first upper bar element.
4. A screening arrangement according to claim 3, wherein the third respectively the forth cord tensioner is arranged in a horizontal position in the first upper bar element corresponding to where the first respectively the second guiding and holding cords are threaded through openings of the blind most distant from the side edges thereof.
5. A screening arrangement according to the claims 1-4, wherein each of the cords of the second set of guiding and holding cords are hold fixedly positioned at the end nearest the first upper bar element, and wherein the cords at the wing corner nearest the second lower bar element are positioned movable around a turning means, such as a turning pin or a pulley.
6. A screening arrangement according to any of the claims above, wherein the at least first screening element is a pleated blind.
7. A screening arrangement according to any of the claims above, wherein the at least first upper and second lower bar elements being adapted for engagement with a set of side rails.
8. A screening arrangement according to any of the claims above, wherein the first upper bar element is either integral with or connectable to the bottom bar of a roller blind.

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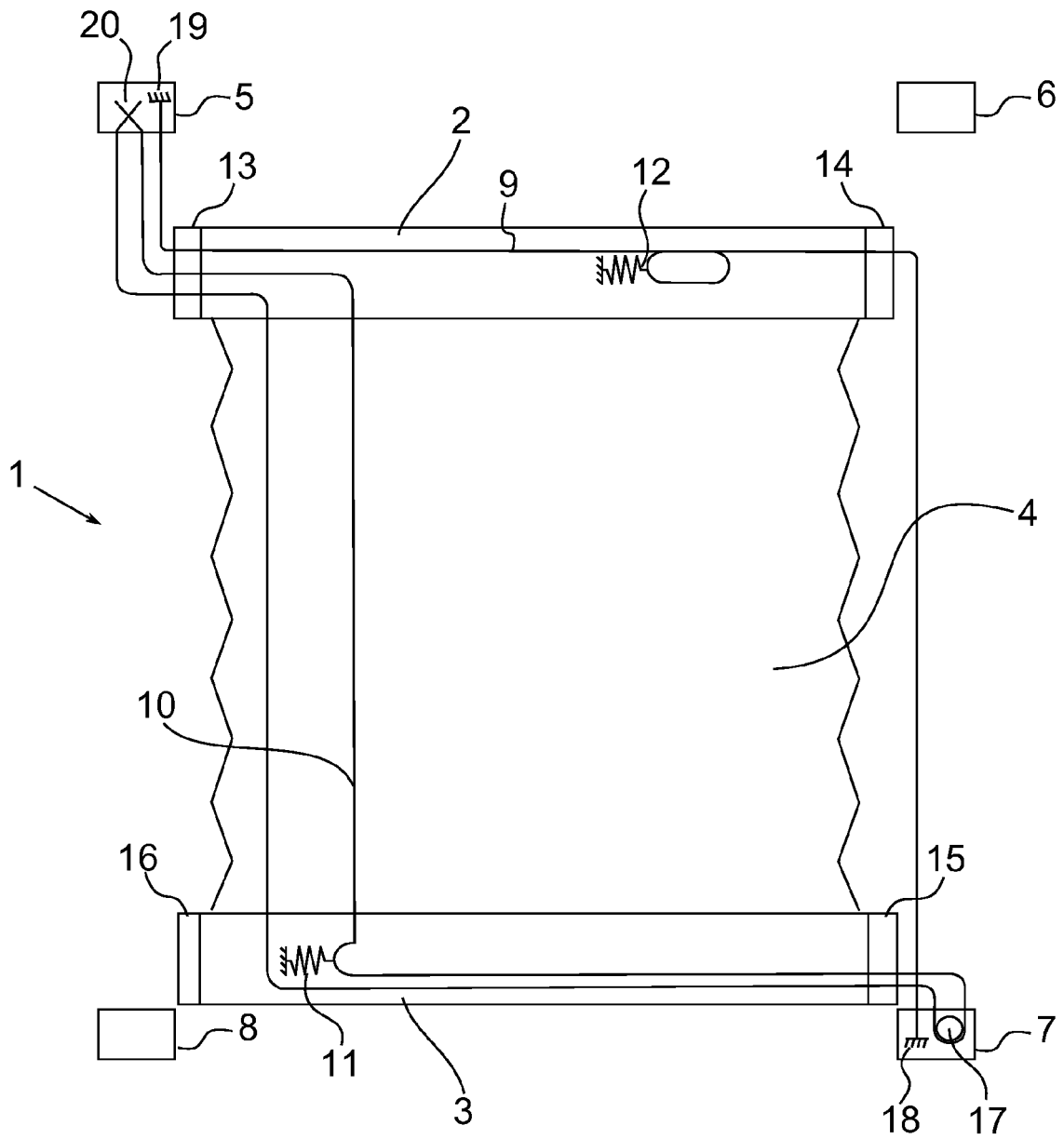


Fig. 1

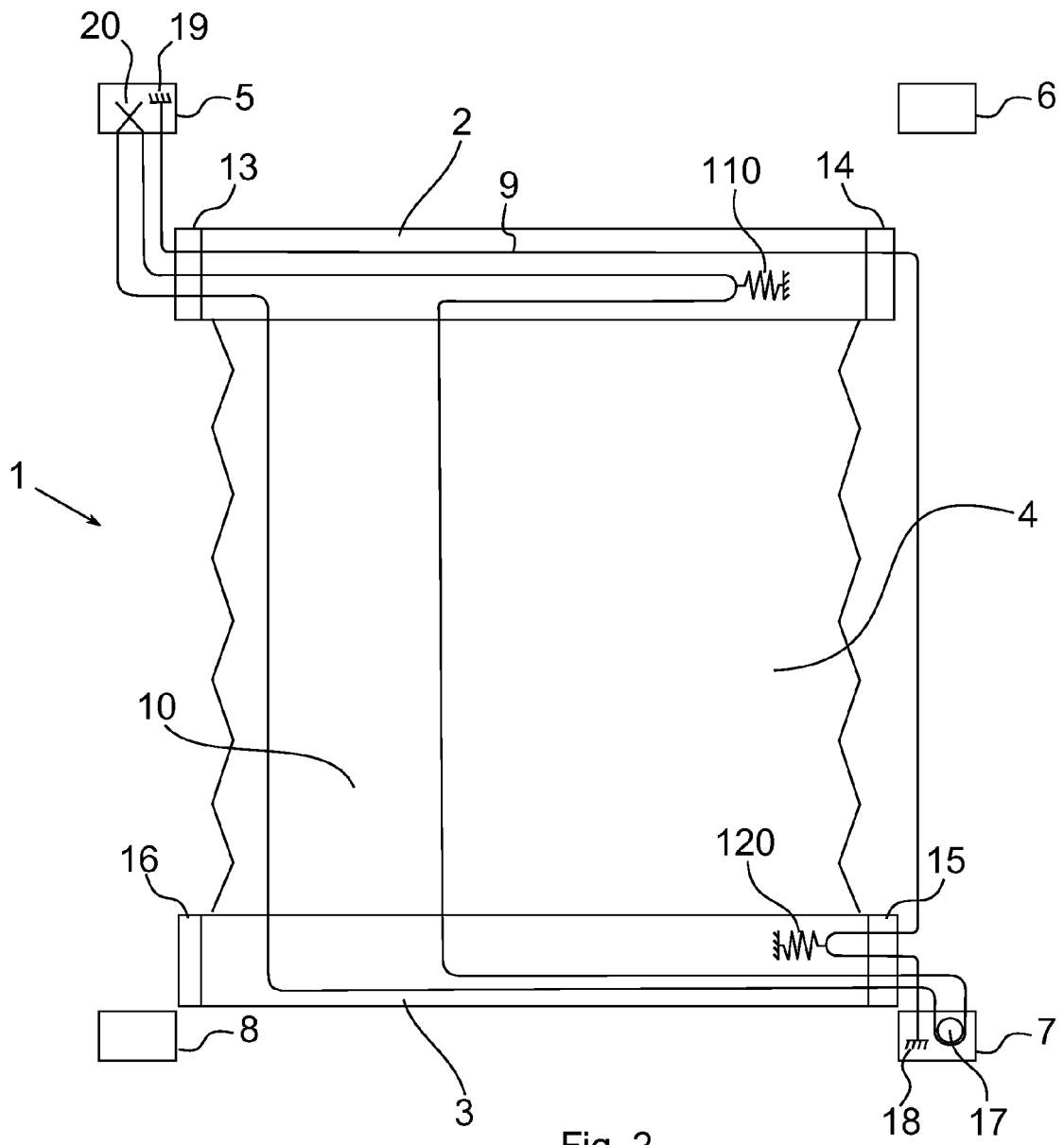


Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2006050728 A1 [0002]