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(54) **Screen device**

(57) The invention relates to a screen device (1) comprising:

- a fixed screen or a roll-up and roll-down screen (2);
- side guides (3) containing screen guides (4) for the securement or guidance of the screen (2);
- and at least one spring (5), comprising a fastening portion (6a, 6b, 6c), for at least partially enclosing the screen guide (4), and at least two fastening elements (6b, 6c), which are arranged on this fastening portion (6a, 6b, 6c) such that they are displaced relative to each other and on opposite sides in the longitudinal direction of the screen guide (4), the said fastening elements having an interspace which is at least as large as the width of the screen guide (4), so that the spring (5) can be fastened with a rotary motion to the screen guide (4), and comprising at least one resilient lip (7), which, with the aid of a fastening element (6b, 6c), is provided on the fastening portion (6a, 6b, 6c), which resilient lip (7) extends between the screen guide (4) and the side guide (3) in order to stretch the screen (2) in a laterally resilient manner.

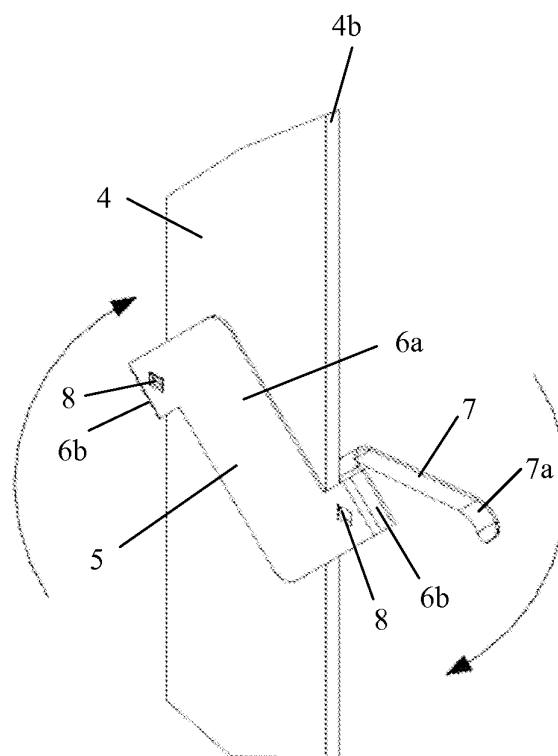


FIG. 4

Description

[0001] The present invention relates to a screen device comprising a fixed or a roll-up and roll-down screen, side guides, in which screen guides are fitted, these screen guides being provided for the securement of the screen or the guidance of the roll-up and roll-down screen during the roll-up and roll-down motion thereof, and at least one spring for the laterally resilient stretching of this screen in the side guides. The present invention also relates to a method for placing a said spring in a screen device of this type.

[0002] In many traditional screen devices, between a screen guide and a side guide in which this screen guide is fitted, resilient material is provided in order, in the event of sudden movements of the screen under the influence of, for example, wind gusts, to at least dampen the shocks resulting from these movements and thus prevent the screen from flapping or tearing.

[0003] This elastic material does not, however, act with sufficient spring to, within a limited space, take up a wide range of tolerance (fabric dimensions, position of side guides, etc.) and nevertheless create a certain tension upon the fabric and thus impart a certain pretension to the screen, with the screen always remaining nicely stretched. Owing to the limited spring force of this resilient material, there is a need for an alternative way of imparting a certain pretension to the screen.

[0004] Screen devices of this type, in which the screen is stretched in a laterally resilient manner with a certain pretension, have already been discussed in a number of patent publications. However, none of these solutions is suitable for actually replacing the known elastic material in case of renovation or repair. Generally, at least the screen guide must also be replaced together with this elastic material, or additional fastening means are required in the event of replacement.

[0005] In JP 2003013680, a helical spring is clipped onto a tailor-made screen guide in order to stretch the screen in a laterally resilient manner in the side guide. This system calls for a specially adapted screen guide for the fastening of this spring and a specially adapted side guide owing to the greater space requirement, and hence cannot be used in the renovation or repair of existing screen devices in which it is wished to replace the elastic material without having also to replace the screen guide.

[0006] JP 10212878 and DE 102006023813 illustrate how a screen can be stretched in a laterally resilient manner in a side guide by fastening a spring to that side of the screen guide which is facing away from the screen, between this screen guide and the side guide. Such a spring cannot, however, be easily fastened to this screen guide and this side guide without additional fastening means. Moreover, in existing screen devices where elastic material has been provided on the opposite side of the screen guide, there is insufficient space available to fit a spring between the screen guide and the side guide

in this way, so that this spring can no more easily be used in the renovation and repair of existing screen devices.

[0007] JP 4073393 illustrates how resilient lips are provided on the side edges of the screen guide in order herewith to absorb shocks upon sudden movements of the screen. However, it is not easy herewith to impart a certain pretension to the screen. Moreover, were they to be used in the renovation and repair of existing screen devices where the strips of elastic material need to be replaced, then these lips would require the replacement of the complete screen guide.

[0008] The object of the present invention is to provide a screen device comprising a spring for the laterally resilient stretching of a screen in a side guide of this screen device, which spring can be easily fastened to the screen guide of this screen device without extra fastening means and is also suitable for use in the renovation or repair of this screen device to laterally stretch the screen, without the need to replace the complete screen guide.

[0009] This object of the invention is achieved with the aid of a screen device, comprising a fixed or a roll-up and roll-down screen, side guides, in which screen guides are fitted, these screen guides being provided for the securement of the screen or the guidance of the roll-up and roll-down screen during the roll-up and roll-down motion thereof, and at least one spring for the laterally resilient stretching of this screen in the side guides, said spring comprising

■ a fastening portion, which comprises at least two fastening elements, arranged to at least partially enclose the screen guide in order to fasten the spring to this screen guide, which fastening elements are arranged on this fastening portion such that they are displaced relative to each other and on opposite sides in the longitudinal direction of the screen guide, between these fastening elements in the said longitudinal direction an interspace being present which is at least as large as the width of the screen guide, which extends in a direction transversely to the screen when the latter is stretched;

■ and comprises at least one resilient lip, which, with the aid of a fastening element, is provided on the fastening portion, which resilient lip is arranged to extend between the screen guide and the side guide in order to stretch the screen in a laterally resilient manner.

[0010] Through the provision of such an interspace between the fastening elements of this spring, this spring, according to the hereinafter discussed method according to the present invention, can be fastened to a screen guide of such a screen device in a particularly simple manner via a rotary motion, without the need for any additional fastening means.

[0011] Preferably, the said spring of such a screen device comprises at least two resilient lips, which, with the aid of a fastening element, are each provided on the fas-

tening portion, so that they are arranged on this fastening portion such that they are displaced relative to each other and on opposite sides in the longitudinal direction of the screen guide, between these resilient lips in the said longitudinal direction an interspace being present which is at least as large as the width of the screen guide, which extends in a direction transversely to the screen when the latter is stretched, which resilient lips are arranged to extend between the screen guide and the side guide in order to stretch the screen in a laterally resilient manner.

[0012] In this way, the screen, already with the aid of one such spring, is more evenly stretched, without being obliquely pulled in the direction of location of a single resilient lip.

[0013] The fastening portion of a specific embodiment of a spring for such a screen device comprises:

- a supporting surface, which is arranged to rest against that side of the screen guide which is facing away from the screen;
- at least two raised connecting parts as part of the connecting elements, which are located transversely to the supporting surface and are arranged to extend alongside those sides of the screen guide which connect to the side remote from the screen and extend in a direction transversely to this side;
- at least two supporting portions as part of the connecting elements, with whose aid the resilient lips are provided on the raised connecting parts, each of these supporting portions being arranged to rest against a side of the screen guide which is facing towards the screen.

[0014] In this way, this spring can be realized such that it can be fitted into all existing screen devices.

[0015] Where the screen guide comprises a guide part, arranged to guidingly secure the screen, and a flanged portion, arranged to herewith fit the screen guide in the side guide, the fastening portion of the spring of a screen device according to the present invention is preferably arranged to at least partially enclose the flanged portion of the screen guide in order to fasten the spring to this screen guide.

[0016] In a further preferred embodiment of a spring for such a screen device, the resilient lips extend, in the assembled state, away from each other in the longitudinal direction of the screen guide. In this way, the spring can be realized with the interspace between the resilient lips which is required according to the present invention, with a minimum use of material.

[0017] Preferably, the resilient lips comprise at their free end also a bent-over part, which is arranged to rest against the side guide when the spring extends between the screen guide and the side guide.

[0018] This bent-over part is here preferably provided with such a rounding that, when the resilient lips are bent under the various possible spring tensions, the resilient

lips constantly remain resting against the side guide with this bent-over part.

[0019] The fastening portion of the said spring is further preferably provided with at least one clamping hook in order to clamp this spring, in the fastened state, fixedly relative to the screen guide. By virtue of such clamping hooks, the spring can then be produced with sufficient play relative to the dimensions of the screen guide to enable it to be comfortably fastened to this screen guide, whilst the clamping hooks provide a secure fastening which ensures the fixed fastening of the spring relative to the screen guide.

[0020] Still more preferably, the said spring is produced from a single piece of sheet metal. Such a spring can be easily produced from sheet metal by punching of a basic shape and the respective parts are bent over into a discussed spring. The said clamping hook can here be produced, for example, by being jointly punched in the sheet metal and bent over.

[0021] This spring could also be produced, for example, from an elastic plastics material.

[0022] The object of the present invention is further also achieved with the aid of a method for placing a said spring of this type in a screen device according to the present invention, this method comprising the following steps:

- Step 1: fitting of the spring against that side of the screen guide which is arranged to be facing in the screen device away from the screen, the fastening elements extending alongside the screen guide and extending on that side which is arranged to be facing in the screen device towards the screen;
- Step 2: the rotation of the spring against the screen guide until the resilient lip extends in the longitudinal direction of the screen guide along that side of the screen guide which, in the assembled state, is facing in the screen device towards the screen;
- Step 3: the fitting of the screen guide, with the spring attached thereto, in the side guide, so that the resilient lip extends between the screen guide and the side guide.

[0023] If the said spring of the screen device comprises at least two resilient lips, this method preferably comprises the following steps:

- Step 1: fitting of the spring against that side of the screen guide which is arranged to be facing in the screen device away from the screen, the resilient lips extending alongside the screen guide and extending on that side which is arranged to be facing in the screen device towards the screen;
- Step 2: the rotation of the spring against the screen guide until the resilient lips extend in the longitudinal direction of the screen guide along that side of the screen guide which, in the assembled state, is facing in the screen device towards the screen;

- Step 3: the fitting of the screen guide, with the spring attached thereto, in the side guide, so that the resilient lips extend between the screen guide and the side guide.

[0024] By virtue of this method, a spring of this type can be fastened with a simple rotary motion to a screen guide and in a screen device according to the present invention.

[0025] The present invention is now explained in greater detail below with reference to the following detailed description of a preferred embodiment of a screen device according to the present invention. The aim of this description is solely to provide illustrative examples and to indicate further advantages and particularities of this embodiment and thus can in no way be interpreted as limiting the field of application of the invention or the patent rights claimed in the claims.

[0026] In this detailed description, reference is made by means of reference numerals to the appended drawings, wherein

- **Figure 1** shows a screen device according to the present invention in perspective view, the side guides having been partially cut away to illustrate the screen guides fitted herein and bearing the springs;

- **Figure 2** shows the screen guide, in which a screen has been guidingly provided and to which a spring has been fitted, so that detail A from Figure 1 is represented in more detail;

- **Figure 3** shows the screen guide, in which a screen has been guidingly provided and to which a spring has been fitted, so that detail B from Figure 1 is represented in more detail;

- **Figure 4** shows schematically in perspective the method for fastening a spring to a screen guide according to the present invention;

- **Figure 5** shows in cross section the screen device from Figure 1 at the level of one of the side guides, the resilient lips of the spring being fully tensioned;

- **Figure 6** shows in side view the released screen guide from Figure 5 with the spring attached thereto, with the resilient lips in the fully tensioned state;

- **Figure 7** shows in cross section the screen device from Figure 1 at the level of one of the side guides, the screen being maximally stretched by the resilient lips;

- **Figure 8** shows in side view the released screen guide from Figure 7 with the spring attached thereto, with the resilient lips in the fully relaxed state.

[0027] The embodiment of a screen device (1) according to the present invention, as illustrated in Figure 1, comprises a screen (2) which can be rolled up and down in a known manner, and side guides (3) in which screen guides (4) are fitted.

[0028] As is illustrated in Figures 1, 5 and 7, the screen

(2) is here fitted such that it is displaceable with its sides in the screen guides (4), so that the roll-up and roll-down motion of the screen (2) is guided by the screen guides (4). In order to prevent the screen (2) from detaching from the screen guides (4), it can be provided, for example, as illustrated, with a half zip fastening. Other ways are known of providing such a screen (2) in a screen guide (4) without it detaching from the latter.

[0029] In order for the screen (2) to be stretched in a laterally resilient manner, this illustrated screen device (1) shall be provided with springs (5), at least one such spring (5) being fitted to each screen guide (4). Preferably, a plurality of such springs (5) are likewise fitted at regular mutual spacings on each screen guide (4). The appropriate number of springs (5) for each screen guide (4) can be determined in dependence on the type of screen (2) and the known loads which may act thereupon.

[0030] The screen guide (4) of this illustrated embodiment of a screen device (1) comprises a guide part (4a) in which the screen (2) is guidingly or fixedly fastened, and a flanged portion (4b) with which the screen guide (4) is fitted in the side guide (3).

[0031] As can be clearly seen in Figures 2 to 8, each spring (5) comprises a fastening portion (6a, 6b, 6c) for at least partially enclosing the flanged portion (4b) of the screen guide (4) in order to fasten the spring (5) to this screen guide (4). This fastening portion (6a, 6b, 6c) comprises for this purpose a supporting surface (6a), which is arranged to rest against that side of the flanged portion (4b) which in the assembled state of the screen device is facing away from the screen (2). The fastening portion (6a, 6b, 6c) further comprises two raised connecting parts (6b), which are located transversely to the supporting surface (6a) such that they are displaced relative to each other and on opposite sides in the longitudinal direction of the screen guide (4). In the assembled state, these raised connecting parts (6b) extend alongside the flanged portion (4b) of the screen guide (4), on the sides which connect to the side remote from the screen (2) and extend in a direction transversely to this side. In addition, this fastening portion (6a, 6b, 6c) comprises two more supporting portions (6c), which are each arranged to rest against a side of the flanged portion (4b) which is facing towards the screen (2). Finally, this fastening portion (6a, 6b, 6c) comprises two clamping hooks (8), which are fitted in the supporting surface (6a), with which the spring (5), in the fastened state, is clamped fixedly relative to the screen guide (4).

[0032] Each spring (5) additionally comprises two resilient lips (7), which are each provided on a said supporting portion (6c). In the assembled state of the screen device (1), these resilient lips (7) extend between the screen guide (4) and the side guide (3) in order to stretch the screen (2) in a laterally resilient manner. The interspace between the resilient lips (7) in the assembled state, viewed in the longitudinal direction of the screen guide (4), is at least as large as the width of the screen guide (4) transversely to the screen (2) when the latter

is stretched. These resilient lips (7) extend, in the assembled state, away from each other in the longitudinal direction of the screen guide (4). The resilient lips (7) also comprise at their free end a bent-over part (7a), which is arranged to rest against the side guide (3) when the spring (5) extends between the screen guide (4) and the side guide (3).

[0033] The said interspace between the resilient lips (7) permits the spring (5) to be fastened with a simple rotary motion to the screen guide (4), as is illustrated in Figure 4. For this purpose, the spring (5) is fitted with its supporting surface (6a) against that side of the flanged portion (4b) of the screen guide (4) which is facing away from the screen (2), in such a way that the resilient lips (7) extend alongside the screen guide (4) and on the side arranged to be facing in the screen device (1) towards the screen (2). After this, the spring (5) is rotated against this flanged portion (4b) until the resilient lips extend in the longitudinal direction of the screen guide (4) along that side of the flanged portion (4b) which, in the assembled state, is facing in the screen device (1) towards the screen (2).

[0034] After the spring (5) has been fastened to the screen guide (4) in this manner, the screen guide (4) is then fitted in the side guide (3) in such a way that the resilient lips (7) extend between the screen guide (4) and the side guide (3).

[0035] In this way, the resilient lips (7), when fully relaxed, will stretch the screen (2) to a maximum, as illustrated in Figures 7 and 8, whilst shocks can be absorbed by tensioning of the resilient lips (7) as illustrated in Figures 5 and 6, after which the resilient lips (7), by automatically relaxing back again, ensure a maximal stretching of the screen (2).

Claims

1. Screen device (1), comprising a fixed or a roll-up and roll-down screen (2), side guides (3), in which screen guides (4) are fitted, these screen guides being provided for the securement of the screen or the guidance of the roll-up and roll-down screen (2) during the roll-up and roll-down motion thereof, and at least one spring (5) for the laterally resilient stretching of this screen (2) in the side guides (3), **characterized in that** the said spring (5)

■ comprises a fastening portion (6a, 6b, 6c), which comprises at least two fastening elements (6b, 6c), arranged to at least partially enclose the screen guide (4) in order to fasten the spring (5) to this screen guide (4), which fastening elements (6b, 6c) are arranged on this fastening portion (6a, 6b, 6c) such that they are displaced relative to each other and on opposite sides in the longitudinal direction of the screen guide (4), between these fastening elements (7) in the said

longitudinal direction an interspace being present which is at least as large as the width of the screen guide (4), which extends in a direction transversely to the screen (2) when the latter is stretched;

■ and comprises at least one resilient lip (7), which, with the aid of a fastening element (6b, 6c), is provided on the fastening portion (6a, 6b, 6c), which resilient lip (7) is arranged to extend between the screen guide (4) and the side guide (3) in order to stretch the screen (2) in a laterally resilient manner.

2. Screen device (1) according to Claim 1, **characterized in that** the said spring comprises at least two resilient lips (7), which, with the aid of a fastening element (6b, 6c), are each provided on the fastening portion (6a, 6b, 6c), so that they are arranged on this fastening portion (6a, 6b, 6c) such that they are displaced relative to each other and on opposite sides in the longitudinal direction of the screen guide (4), between these resilient lips (7) in the said longitudinal direction an interspace being present which is at least as large as the width of the screen guide (4), which extends in a direction transversely to the screen (2) when the latter is stretched, which resilient lips (7) are arranged to extend between the screen guide (4) and the side guide (3) in order to stretch the screen (2) in a laterally resilient manner.
3. Screen device (1) according to Claim 1, **characterized in that** the fastening portion (6a, 6b, 6c) of the spring (5) comprises:

■ a supporting surface (6a), which is arranged to rest against that side of the screen guide (4) which is facing away from the screen (2);

■ at least two raised connecting parts (6b) as part of the connecting elements (6b, 6c), which are located transversely to the supporting surface (6a) and are arranged to extend alongside those sides of the screen guide (4) which connect to the side remote from the screen (2) and extend in a direction transversely to this side;

■ at least two supporting portions (6c) as part of the connecting elements (6b, 6c), with whose aid the resilient lips (7) are provided on the raised connecting parts (6b), each of these supporting portions (6c) being arranged to rest against a side of the screen guide (4) which is facing towards the screen (2).

4. Screen device (1) according to one of the preceding claims, **characterized in that** the screen guide (4) comprises a guide part (4a), arranged to guidingly secure the screen (2), and a flanged portion (4b), arranged to herewith fit the screen guide (4) in the side guide (3), the fastening portion (6a, 6b, 6c) of

the spring (5) being arranged to at least partially enclose the flanged portion (4b) of the screen guide (4) in order to fasten the spring (5) to this screen guide (4).

5. Screen device (1) according to one of the preceding claims, **characterized in that** the resilient lips (7) extend, in the assembled state, away from each other in the longitudinal direction of the screen guide (4). 5
6. Screen device (1) according to one of the preceding claims, **characterized in that** the resilient lips (7) comprise at their free end a bent-over part (7a), which is arranged to rest against the side guide (3) when the spring (5) extends between the screen guide (4) and the side guide (3). 10
7. Screen device (1) according to one of the preceding claims, **characterized in that** the fastening portion (6a, 6b, 6c) of the said spring (5) is provided with at least one clamping hook (8), provided in order to clamp this spring (5), in the fastened state, fixedly relative to the screen guide (4). 15
8. Screen device (1) according to one of the preceding claims, **characterized in that** the said spring (5) is produced from a single piece of sheet metal. 20
9. Method for placing a said spring (5) in a screen device (1) according to one of Claims 1 to 8, **characterized in that** this method comprises the following steps: 25
 - Step 1: fitting of the spring (5) against that side of the screen guide (4) which is arranged to be facing in the screen device (1) away from the screen (2), the fastening elements (6b, 6c) extending alongside the screen guide (4) and extending on that side which is arranged to be facing in the screen device (1) towards the screen (2); 30
 - Step 2: the rotation of the spring (5) against the screen guide (4) until the resilient lip (7) extends in the longitudinal direction of the screen guide (4) along that side of the screen guide (4) which, in the assembled state, is facing in the screen device (1) towards the screen (2); 35
 - Step 3: the fitting of the screen guide (4), with the spring (5) attached thereto, in the side guide (3), so that the resilient lip (7) extends between the screen guide (4) and the side guide (3). 40
10. Method according to Claim 9 for placing a said spring (5) in a screen device (1) according to one of Claims 2 to 8, **characterized in that** this method comprises the following steps: 45
 - Step 1: fitting of the spring (5) against that side 50

of the screen guide (4) which is arranged to be facing in the screen device (1) away from the screen (2), the resilient lips (7) extending alongside the screen guide (4) and extending on that side which is arranged to be facing in the screen device (1) towards the screen (2);

- Step 2: the rotation of the spring (5) against the screen guide (4) until the resilient lips (7) extend in the longitudinal direction of the screen guide (4) along that side of the screen guide (4) which, in the assembled state, is facing in the screen device (1) towards the screen (2);

- Step 3: the fitting of the screen guide (4), with the spring (5) attached thereto, in the side guide (3), so that the resilient lips (7) extend between the screen guide (4) and the side guide (3).

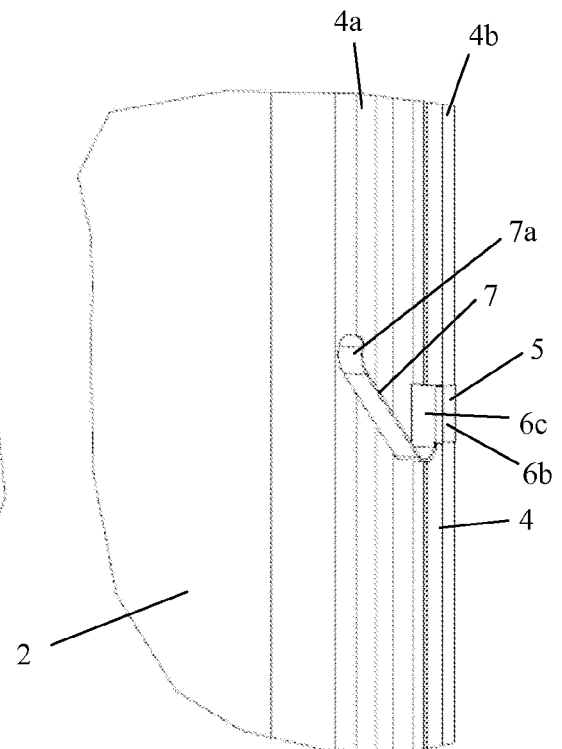
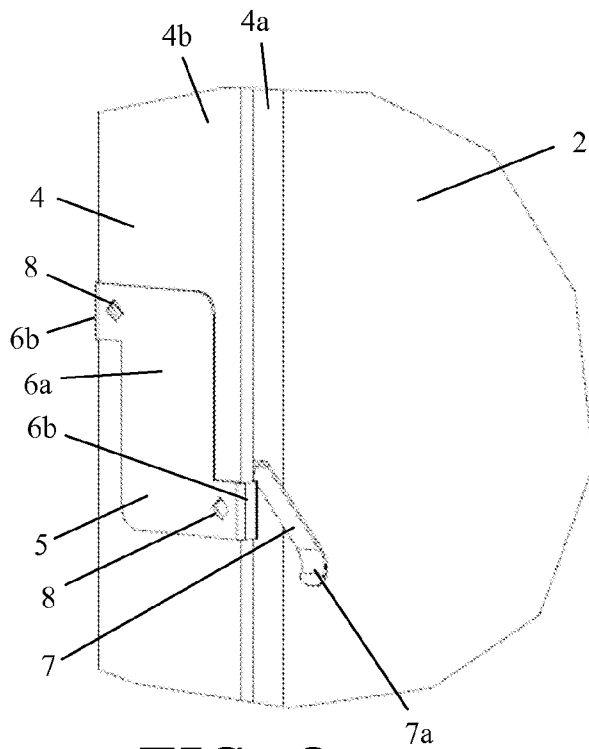
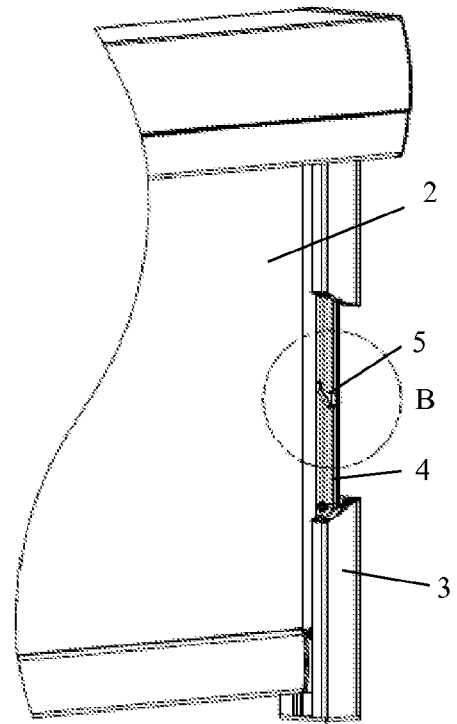
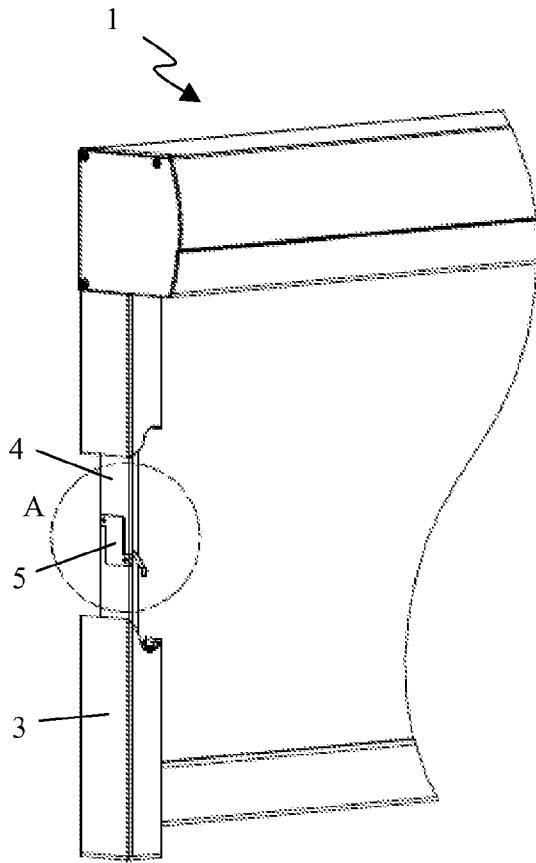


FIG. 2

FIG. 3

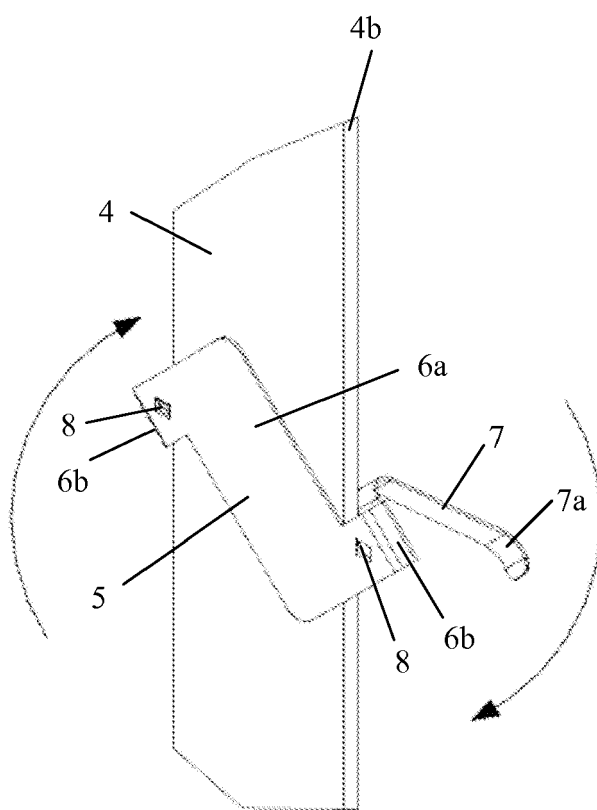


FIG. 4

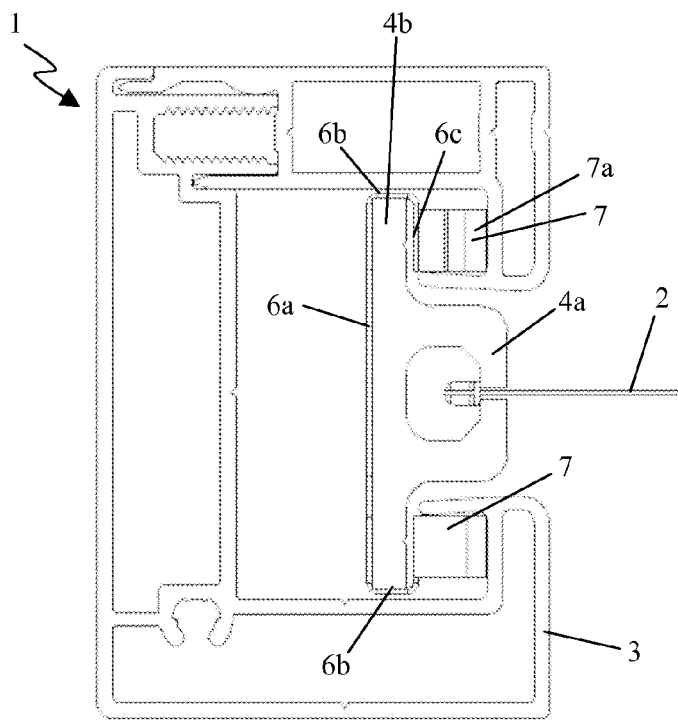


FIG. 5

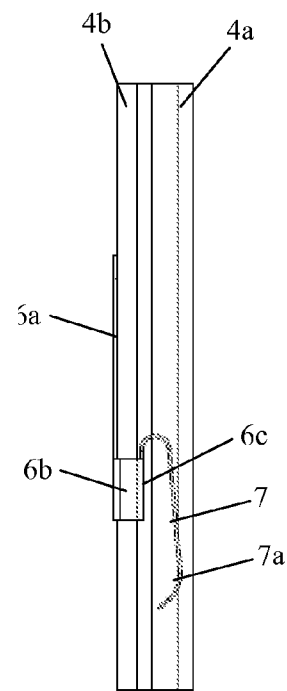


FIG. 6

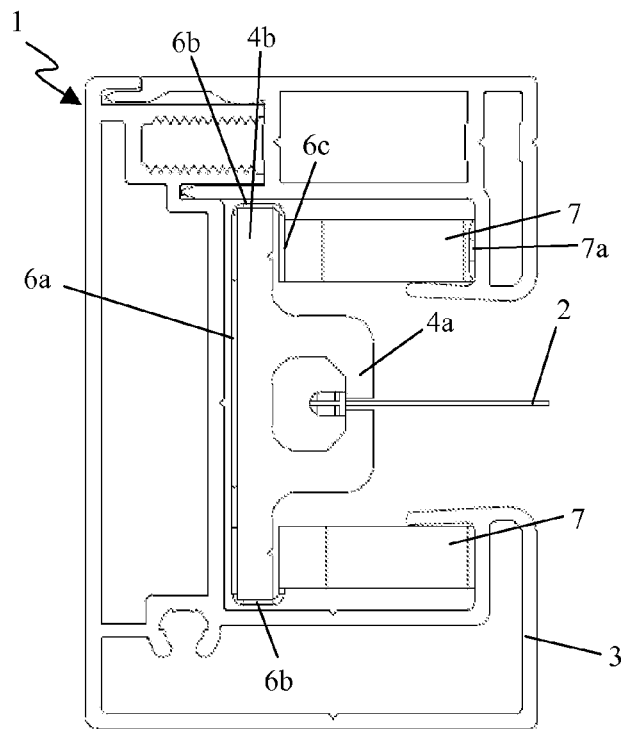


FIG. 7

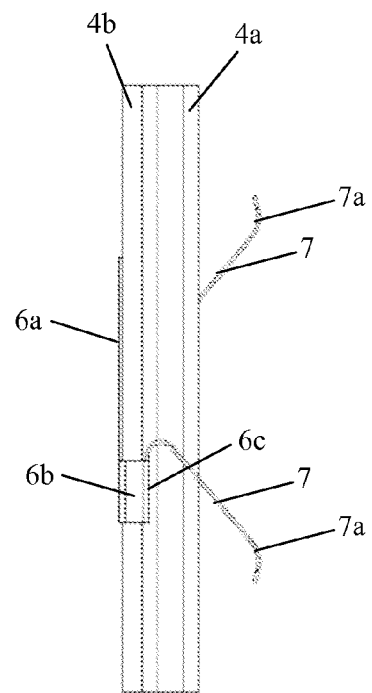


FIG. 8

REFERENCES CITED IN THE DESCRIPTION

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