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(54) **Tensioning device for tensioning cords of a screen, and screen provided with this tensioning device**

Spannvorrichtung zum Spannen von Schnüren einer Abschirmung, und Abschirmung mit dieser Spannvorrichtung

Dispositif tendeur pour tendre des cordes d'un écran, et l'écran fourni avec ce dispositif tendeur

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Description

[0001] The invention relates to a tensioning device for tensioning a first cord of a screen, such as a window covering, wherein the screen comprises at least one rail provided with a profile and wherein the tensioning device comprises at least one tension spring and at least one limiting element for limiting the extension of the at least one tension spring, and wherein the tensioning device comprises two co-acting housing parts, wherein a first outer end and a second outer end of the tension spring are connected to respectively the first housing part and the second housing part, wherein the first housing part comprises first cord engaging means for engaging the cord and the housing parts are slidable apart counter to the action of the spring force of the at least one tension spring, and each limiting element comprises two co-acting limiting element parts, wherein each housing part comprises one of the limiting element parts of each limiting element and the limiting element parts are configured to limit the movement of the housing parts.

[0002] A tensioning device according to the preamble is known in the field. The known tensioning device was published in 2013 in the brochure "Absolute pleated blind" of applicant, page 19, article number PLC20-17, "Tension spring". The known tensioning device has the drawback that the tensioning device is not suitable for tensioning two cords on either side of the tensioning device. The two housing parts co-act by being coupled to each other.

[0003] A tensioning device which is suitable for this purpose is described in the European patent EP 1526245. This other tensioning device has the drawback however that the tension spring comprises the limiting element, whereby the known tensioning device cannot make use of a standard tension spring. In the tensioning device according to EP 1526245 the cords have to be tied directly to the tension spring with integrated limiting element.

[0004] Because the tension spring comprises the limiting element, the limiting element may break off at the connection to the tension spring in the case of repeated use thereof.

[0005] It has additionally been found in practice that mounting of the other known tensioning device is time-consuming.

[0006] The invention has for its object to provide a tensioning device which is suitable for tensioning two cords on either side of the tensioning device and which does not have the above stated drawbacks.

[0007] The invention provides for this purpose a tensioning device according to the preamble characterized in that the second housing part comprises second cord engaging means for engaging a second cord.

[0008] The tensioning device according to the invention need not be fixed but can be mounted in freely movable manner in the screen, whereby cord length difference can be easily corrected. The tensioning device is

hereby very suitable for application in screens intended for the DIY market, since the necessary attachment of the cords of the screen can take place less precisely.

[0009] Both housing parts are preferably configured to be received slidably in the at least one rail of the screen. Because both housing parts are slidably received, the inventive tensioning device can move freely in the rail.

[0010] In order to realize the slidable reception in economic manner the two housing parts are preferably provided on either side with a peripheral edge which is configured for co-action with the profile of the rail.

[0011] In the tensioning device according to the invention a first outer end and a second outer end of the tension spring are preferably connected to respectively the first housing part and the second housing part. Through these measures the pulling force of the tension spring is transmitted directly to the housing parts.

[0012] The first limiting element part and the second limiting element part of the tensioning device according to the invention comprise a first slot and a first cam, wherein the first slot and the first cam are configured for co-action. The first slot runs in a first preferred embodiment in longitudinal direction of the tensioning device. During sliding of the two housing parts relative to each other the first cam slides in the first slot. Through said measures the extension of the tension spring is thus limited by the position of the first slot on the housing parts and the length of the first slot.

[0013] In this preferred embodiment each limiting element is controllable during operation via an open side of the rail, whereby both housing parts can be coupled and uncoupled when the inventive tensioning device is placed in the rail.

[0014] In the preferred embodiment of the tensioning device according to the invention the first housing part preferably comprises a first protrusion in which the first slot is arranged, and the second housing part a first protrusion on which the first cam is arranged. The first protrusions of the two housing parts point toward each other here, wherein parts thereof are adjacent and/or overlapping. The length of the tensioning device can remain limited as a result of these measures.

[0015] In a sturdy embodiment of the preferred embodiment of the tensioning device according to the invention the first limiting element part and the second limiting element part preferably comprise a second slot and a second cam, wherein the second slot and the second cam are configured for co-action. Just as in the case of the first slot, the second slot also runs here in longitudinal direction of the tensioning device. During sliding of the two housing parts relative to each other the second cam slides in the second slot. In the same way as in the case of the first slot and first cam, the extension of the tension spring is limited as a result of these measures by the position of the second slot on the housing parts and the length of the second slot.

[0016] In the preferred embodiment of the tensioning device according to the invention it is recommended here

that the first housing part also comprises a second protrusion on which the second cam is arranged, and that the second housing part comprises a second protrusion in which the second slot is arranged.

[0017] For application of the inventive tensioning device in a rail of the screen the tensioning device according to the invention can preferably be applied in a screen with at least one rail, and at least one housing part is configured here to be received and to slide in the at least one rail. The at least one housing part is preferably configured here for co-action with the at least one rail such that, after being received in the at least one rail, the at least one housing part can slide only in longitudinal direction of the rail.

[0018] The inventive tensioning device preferably comprises two limiting elements which are the same and arranged mirror-symmetrically in the first and second housing parts. The engaging forces of the two limiting parts are hereby distributed in balanced manner.

[0019] For economic reasons and in order to prevent confusion during assembly of the screen, the first and the second housing part are identical in the tensioning device according to the invention.

[0020] The first and the second housing part are here preferably manufactured from one material, in particular from plastic, using known forming techniques such as injection moulding.

[0021] The height of the inventive tensioning device is preferably such that it is possible during operation of the screen, after placing of the tensioning device in the rail, for other cords which are not connected to the tensioning device to pass over the tensioning device.

[0022] Depending on the type of screen, other resilient properties can be imparted to the tensioning device by applying a different spring, by increasing the stroke length of the spring or by applying a plurality of springs.

[0023] The invention also relates to a screen provided with one or more tensioning devices according to the invention. The invention relates particularly to a screen comprising at least one rail in which one or more tensioning devices according to the invention are slidably received.

[0024] The invention will be further elucidated with reference to the following figures, in which:

Figure 1 shows an isometric view of the known tensioning device;

Figure 2 shows an isometric view of the preferred embodiment of the tensioning device according to the invention;

Figure 3 shows an exploded view of the tensioning device according to Figure 2;

Figure 4 shows an isometric view of the preferred embodiment of the tensioning device according to Figure 2 applied in a rail of a screen, wherein the cords of the screen are slightly tensioned by the tensioning device;

Figure 5 shows an isometric view of the preferred

embodiment of the tensioning device according to Figure 2 applied in a rail of a screen, wherein the cords of the screen are tensioned by the tensioning device; and

Figure 6 shows schematically a cord diagram for a screen with two rails, wherein both rails are provided with the inventive tensioning device.

[0025] The same components are designated in different figures with the same numerals.

[0026] Figure 1 shows an isometric view of the known tensioning device B. Tensioning device B comprises one tension spring B-2. The limiting element for limiting the extension of tension spring B-2 is arranged on the two co-acting housing parts B-3; B-4. Only housing part B-3 comprises the first means B-5 for engaging a cord K-1 (not drawn) of a screen. Housing parts B-3; B-4 are slidable relative to each other counter to the action of the spring force of tension spring B-2. A first outer end and a second outer end of tension spring B-2 are connected to respectively first housing part B-3 and second housing part B-4. Tensioning device B is mountable by means of connecting part B-6 in a hole intended for the purpose in a rail of the screen.

[0027] Figure 2 shows an isometric view of the preferred embodiment of tensioning device 1 according to the invention. Tensioning device 1 comprises one tension spring 2. The limiting element for limiting the extension of tension spring 2 is arranged on the two co-acting housing parts 3; 4. The two housing parts 3; 4 comprise first 5 and second cord engaging means 22 for engaging a cord K-1; K-2 of a screen. In the shown preferred embodiment the cord engaging means 5 and 22 are each configured as re-routing member for the respective cord.

[0028] Housing parts 3; 4 are slidable relative to each other counter to the action of the spring force of tension spring 2. A first outer end 2-A and a second outer end 2-B of tension spring 2 are connected to respectively the first housing part 3 and second housing part 4.

[0029] Figure 3 shows an exploded view of tensioning device 1 according to Figure 2. It is noted that housing parts 3; 4 are of identical form. On housing part 3 the limiting elements are formed by a first slot 6 on protrusion 8 and a second cam 11 on protrusion 12. On housing part 4 the limiting elements are formed by a second slot 10 on protrusion 13 and a first cam 7 on protrusion 9. For mounting of spring 2 on tensioning device 1 the first cam 7 and second cam 11 can be arranged in respectively first slot 6 and second slot 10 via openings 19; 20, which are each arranged on an outer end of slots 6; 10. Both cams 7; 11 are provided with a peripheral edge which confines first cam 7 in first slot 6 and confines second cam 11 in second slot 10. It will be apparent to the skilled person that cams 7; 11 and slots 6; 10 limit the movement of housing parts 3; 4 and thereby function as limiting element for spring 2.

[0030] First housing part 3 is provided with a peripheral edge 16; 18. Second housing part 4 is also provided with

a peripheral edge 17 and a peripheral edge on the opposite side. These peripheral edges are intended for co-action with a recess in a rail of a screen. Tensioning device 1 can hereby be slid, preferably in assembled state (Figure 2), via a side of the rail into the rail. Rail R forms a guide for housing parts 3, 4.

[0031] Metal inserts 21 can be pushed into first housing part 3 and second housing part 4 via an underside of first housing part 3 and second housing part 4 for the purpose of strengthening the first 5 and second cord engaging means 22 for engaging a cord K-1; K-2 of a screen.

[0032] Figure 4 shows an isometric view of the preferred embodiment of tensioning device 1 according to Figure 2 applied in a rail R of a screen, wherein cords K-1; K-2 of the screen are slightly tensioned by tensioning device 1. Tensioning device 1 is pushed in assembled state via a side of rail R into the rail, wherein the peripheral edges of tensioning device 1 engage on a recess R-V in rail R. Tensioning device 1 can hereby slide only in the longitudinal direction of rail R. Cords K-1; K-2 are connected to tensioning device 1 by means of first 5 and second cord engaging means 22. Cords K-1; K-2 are not tensioned and spring 2 of tensioning device 1 is consequently not loaded.

[0033] Figure 5 shows an isometric view of the preferred embodiment of tensioning device 1 according to Figure 2 applied in a rail R of a screen, wherein cords K-1; K-2 of the screen are tensioned by tensioning device 1. Cords K-1; K-2 are maximally tensioned by tensioning device 1. The extension of spring 2 is limited in this situation by cams 7; 11 which lie against an outer end of slots 6; 10. By applying tensioning device 1 the spring 2 can be tensioned to only a determined extent. This maximum tension is determined solely by slots 6; 10 and cams 7; 11.

[0034] Figure 6 shows schematically a cord diagram for a screen with two rails R-1; R-2, wherein both rails R-1; R-2 are provided with the inventive tensioning device 1. Cords K-1 and K-2 are connected here to the upper tensioning device 1. Cords K-3 and K-4 are connected here to the lower tensioning device 1. By way of clarification all cords are shown thicker. Both the lower and the upper tensioning device 1 can move freely in rail R-1; R-2.

Claims

1. Tensioning device (1) for tensioning a first cord (K-1; K-3) of a screen, such as a window covering, wherein the screen comprises at least one rail (R) provided with a profile and wherein the tensioning device comprises at least one tension spring (2) and at least one limiting element for limiting the extension of the at least one tension spring (2), and wherein the tensioning device (1) comprises two co-acting housing parts (3; 4), wherein a first outer end (2-A) and a second outer end (2-B) of the tension spring

(2) are connected to respectively the first housing part (3) and the second housing part (4), wherein the first housing part (3) comprises first cord engaging means (5) for re-routing the cord (K-1; K-3) and the housing parts (3; 4) are slidable apart counter to the action of the spring force of the at least one tension spring (2), and each limiting element comprises two co-acting limiting element parts, wherein each housing part (3; 4) comprises one of the limiting element parts of each limiting element and the limiting element parts are configured to limit the movement of the housing parts (3; 4), **characterized in that** the second housing part comprises second cord engaging means (22) for re-routing a second cord (K-2; K-4), wherein the first limiting element part comprises a first slot (6) and the second limiting element part comprises a first cam (7), wherein the first cam (7) is confined in the first slot (6) and the first cam (7) is slidable in the first slot (6) thereby limiting the movement of the housing part (3;4) and the tension spring (2).

2. Tensioning device (1) as claimed in claim 1, wherein both housing parts (3; 4) are configured to be received slidably in the at least one rail (R) of the screen.

3. Tensioning device (1) as claimed in claim 2, wherein both housing parts (3; 4) are provided on either side with a peripheral edge (16, 17, 18) which is configured for co-action with the profile of the rail (R).

4. Tensioning device (1) as claimed in claim 1, 2 or 3, wherein the first housing part (3) comprises a first protrusion (8) in which the first slot (6) is arranged, and the second housing part (4) comprises a second protrusion (9) on which the first cam (7) is arranged.

5. Tensioning device (1) as claimed in claim 1, 2, 3 or 4, wherein the first limiting element part and the second limiting element part comprise a second slot (10) and a second cam (11), wherein the second cam (11) is slidable in the second slot (10).

6. Tensioning device (1) as claimed in claim 1, 2, 3, 4 or 5, wherein the first housing part (3) comprises a second protrusion (12) on which the second cam (11) is arranged, and the second housing part (4) comprises a second protrusion (13) in which the second slot (10) is arranged.

7. Tensioning device (1) as claimed in any of the foregoing claims, wherein the tensioning device (1) comprises two limiting elements which are the same and arranged mirror-symmetrically in the first (3) and second housing part (4).

8. Tensioning device (1) as claimed in any of the claims

3 to 7, wherein the first (3) and the second housing part (4) are identical.

9. Tensioning device (1) as claimed in any of the foregoing claims, wherein both the first (3) and the second housing part (4) are manufactured from one material.
10. Tensioning device (1) as claimed in claim 9, wherein the first (3) and the second housing part (4) are manufactured using injection moulding.
11. Screen provided with one or more tensioning devices as claimed in any of the foregoing claims.
12. Screen comprising at least one rail (R) in which one or more tensioning devices as claimed in any of the foregoing claims 1-10 are slidably received.

Patentansprüche

1. Spannvorrichtung (1) zum Spannen einer ersten Schnur (K-1; K-3) einer Abdeckung, wie einer Fensterabdeckung, wobei die Abdeckung mindestens eine Schiene (R) umfasst, die mit einem Profil versehen ist und wobei die Spannvorrichtung mindestens eine Zugfeder (2) und mindestens ein Begrenzungselement zum Begrenzen der Ausdehnung der mindestens einen Zugfeder (2) umfasst, und wobei die Spannvorrichtung (1) zwei zusammenwirkende Gehäuseteile (3; 4) umfasst, wobei ein erstes äußeres Ende (2-A) und ein zweites äußeres Ende (2-B) der Zugfeder (2) jeweils mit dem ersten Gehäuseteil (3) und dem zweiten Gehäuseteil (4) verbunden sind, wobei der erste Gehäuseteil (3) erste Schnureingriffsmittel (5) zum Umleiten der Schnur (K-1; K-3) umfasst und die Gehäuseteile (3; 4) gegen die Wirkung der Federkraft der mindestens einen Zugfeder (2) auseinanderschiebbar sind und jedes Begrenzungselement zwei zusammenwirkende Begrenzungselemente umfasst, wobei jedes Gehäuseteil (3; 4) eines der Begrenzungselemente jedes Begrenzungselements umfasst und die Begrenzungselemente zur Begrenzung der Bewegung der Gehäuseteile (3; 4) ausgebildet sind, **dadurch gekennzeichnet, dass** der zweite Gehäuseteil zweite Schnureingriffsmittel (22) zum Umleiten einer zweiten Schnur (K-2; K-4) umfasst, wobei der erste Begrenzungselementteil einen ersten Schlitz (6) und der zweite Begrenzungselementteil einen ersten Nocken (7) umfasst, wobei der erste Nocken (7) in dem ersten Schlitz (6) angeordnet ist und der erste Nocken (7) in dem ersten Schlitz (6) verschiebbar ist, wodurch die Bewegung der Gehäuseteile (3; 4) und der Zugfeder (2) begrenzt wird.
2. Spannvorrichtung (1) nach Anspruch 1, wobei beide

Gehäuseteile (3; 4) ausgebildet sind, um in der mindestens einen Schiene (R) der Abdeckung verschiebbar aufgenommen zu werden.

3. Spannvorrichtung (1) nach Anspruch 2, wobei beide Gehäuseteile (3; 4) auf jeder Seite mit einer Umfangskante (16, 17, 18) versehen sind, die zum Zusammenwirken mit dem Profil der Schiene (R) ausgebildet ist.
4. Spannvorrichtung (1) nach Anspruch 1, 2 oder 3, wobei der erste Gehäuseteil (3) einen ersten Vorsprung (8) umfasst, in dem der erste Schlitz (6) angeordnet ist, und der zweite Gehäuseteil (4) einen zweiten Vorsprung (9) umfasst, an dem der erste Nocken (7) angeordnet ist.
5. Spannvorrichtung (1) nach Anspruch 1, 2, 3 oder 4, wobei der erste Begrenzungselementteil und der zweite Begrenzungselementteil einen zweiten Schlitz (10) und einen zweiten Nocken (11) umfassen, wobei der zweite Nocken (11) in dem zweiten Schlitz (10) verschiebbar ist.
6. Spannvorrichtung (1) nach Anspruch 1, 2, 3, 4 oder 5, wobei der erste Gehäuseteil (3) einen zweiten Vorsprung (12) umfasst, an dem der zweite Nocken (11) angeordnet ist, und der zweite Gehäuseteil (4) einen zweiten Schlitz (10) umfasst, in dem der zweite Schlitz (10) angeordnet ist.
7. Spannvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei die Spannvorrichtung (1) zwei gleiche und im ersten (3) und zweiten Gehäuseteil (4) spiegelsymmetrisch angeordnete Begrenzungselemente umfasst.
8. Spannvorrichtung (1) nach einem der Ansprüche 3 bis 7, wobei der erste (3) und der zweite Gehäuseteil (4) identisch sind.
9. Spannvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei sowohl der erste (3) als auch der zweite Gehäuseteil (4) aus einem Material hergestellt sind.
10. Spannvorrichtung (1) nach Anspruch 9, wobei der erste (3) und der zweite Gehäuseteil (4) im Spritzgussverfahren hergestellt sind.
11. Abdeckung, die mit einer oder mehreren Spannvorrichtungen nach einem der vorhergehenden Ansprüche versehen ist.
12. Abdeckung mit mindestens einer Schiene (R), in der eine oder mehrere Spannvorrichtungen nach einem der vorhergehenden Ansprüche 1 bis 10 verschiebbar aufgenommen sind.

Revendications

1. Dispositif tendeur (1) pour tendre un premier cordon (K-1 ; K-3) d'un écran, tel qu'un couvre-fenêtre, dans lequel l'écran comprend au moins un rail (R) muni d'un profil, et dans lequel le dispositif tendeur comprend au moins un ressort de tension (2) et au moins un élément limitateur pour limiter l'extension du au moins un ressort de tension (2), et dans lequel le dispositif tendeur (1) comprend deux parties de boîtier (3 ; 4) agissant conjointement, une première extrémité externe (2-A) et une seconde extrémité externe (2-B) du ressort de tension (2) étant reliées respectivement à la première partie de boîtier (3) et à la seconde partie de boîtier (4), la première partie de boîtier (3) comprenant des premiers moyens d'engagement de cordon (5) pour renvoyer le cordon (K-1, K-3), et les parties de boîtier (3 ; 4) pouvant coulisser en s'écartant à l'encontre de l'action de la force de ressort du au moins un ressort de tension (2), et chaque élément limitateur comprenant deux parties d'élément limitateur agissant conjointement, chaque partie de boîtier (3 ; 4) comprenant l'une des parties d'élément limitateur de chaque élément limitateur, et les parties d'élément limiteur étant configurées pour limiter le mouvement des parties de boîtier (3 ; 4), **caractérisé en ce que** la seconde partie de boîtier comprend des seconds moyens d'engagement de cordon (22) pour renvoyer un second cordon (K-2 ; K-4), la première partie d'élément limitateur comprenant une première fente (6) et la seconde partie d'élément limitateur comprenant une première came (7), la première came (7) étant confinée dans la première fente (6), et la première came (7) pouvant coulisser dans la première fente (6), limitant ainsi le mouvement de la partie de boîtier (3 ; 4) et du ressort de tension (2).
2. Dispositif tendeur (1) selon la revendication 1, dans lequel les deux parties de boîtier (3 ; 4) sont configurées pour être reçues de manière coulissante dans le au moins un rail (R) de l'écran.
3. Dispositif tendeur (1) selon la revendication 2, dans lequel les deux parties de boîtier (3 ; 4) sont munies de chaque côté d'un bord périphérique (16, 17, 18) configuré pour agir conjointement avec le profil du rail (R).
4. Dispositif tendeur (1) selon la revendication 1, 2 ou 3, dans lequel la première partie de boîtier (3) comprend une première saillie (8) dans laquelle est disposée la première fente (6), et la deuxième partie de boîtier (4) comprend une seconde saillie (9) sur laquelle est disposée la première came (7).
5. Dispositif tendeur (1) selon la revendication 1, 2, 3 ou 4, dans lequel la première partie d'élément limitateur et la seconde partie d'élément limitateur comprennent une deuxième fente (10) et une seconde came (11), la seconde came (11) pouvant coulisser dans la deuxième fente (10).
6. Dispositif tendeur (1) selon la revendication 1, 2, 3 4 ou 5, dans lequel la première partie de boîtier (3) comprend une seconde saillie (12) sur laquelle est disposée la seconde came (11), et la seconde partie de boîtier (4) comprend une seconde saillie (13) dans laquelle est disposée la seconde fente (10).
7. Dispositif tendeur (1) selon l'une quelconque des revendications précédentes, dans lequel le dispositif tendeur (1) comprend deux éléments limiteurs qui sont identiques et sont disposés selon une symétrie de miroir dans la première (3) et deuxième partie de boîtier (4).
8. Dispositif tendeur (1) selon l'une quelconque des revendications 3 à 7, dans lequel la première (3) et la deuxième partie de boîtier (4) sont identiques.
9. Dispositif tendeur (1) selon l'une quelconque des revendications précédentes, dans lequel à la fois la première (3) et la seconde partie du boîtier (4) sont fabriquées à partir d'un même matériau.
10. Dispositif tendeur (1) selon la revendication 9, dans lequel la première (3) et la seconde partie de boîtier (4) sont fabriquées par un procédé de moulage par injection.
11. Écran muni d'un ou plusieurs dispositifs tendeurs selon l'une quelconque des revendications précédentes.
12. Écran comprenant au moins un rail (R) dans lequel sont reçus de façon coulissante un ou plusieurs dispositifs tendeurs selon l'une quelconque des revendications 1 à 10.

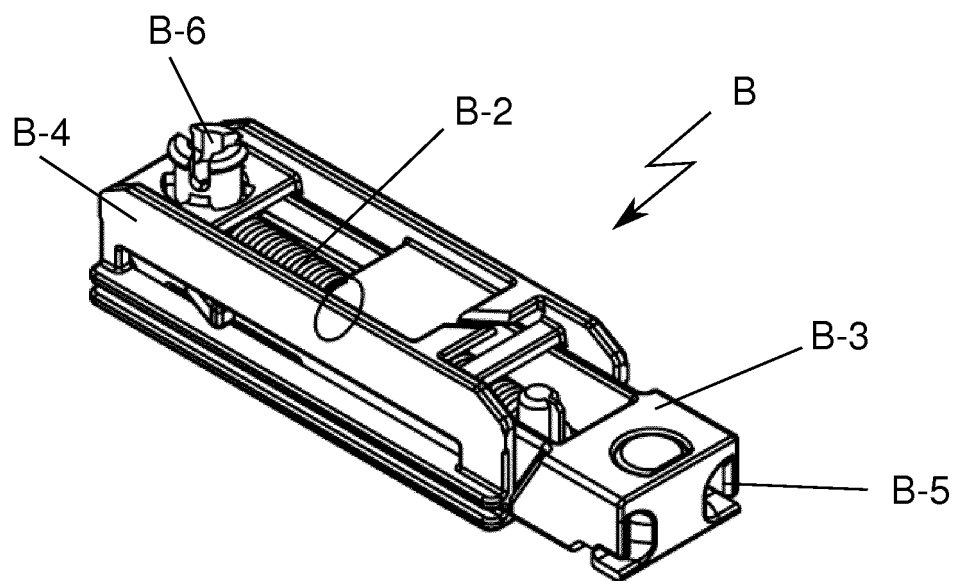
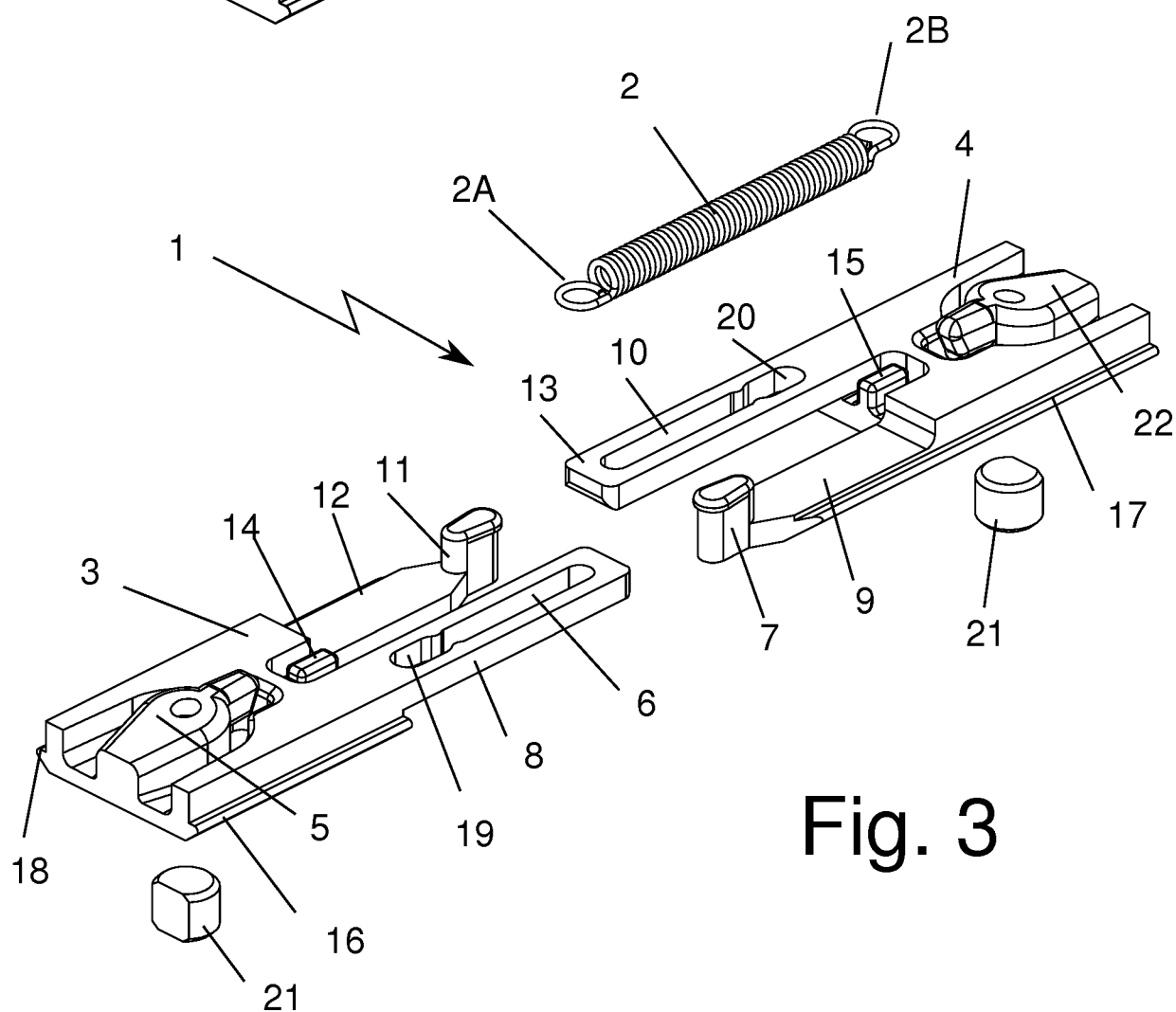
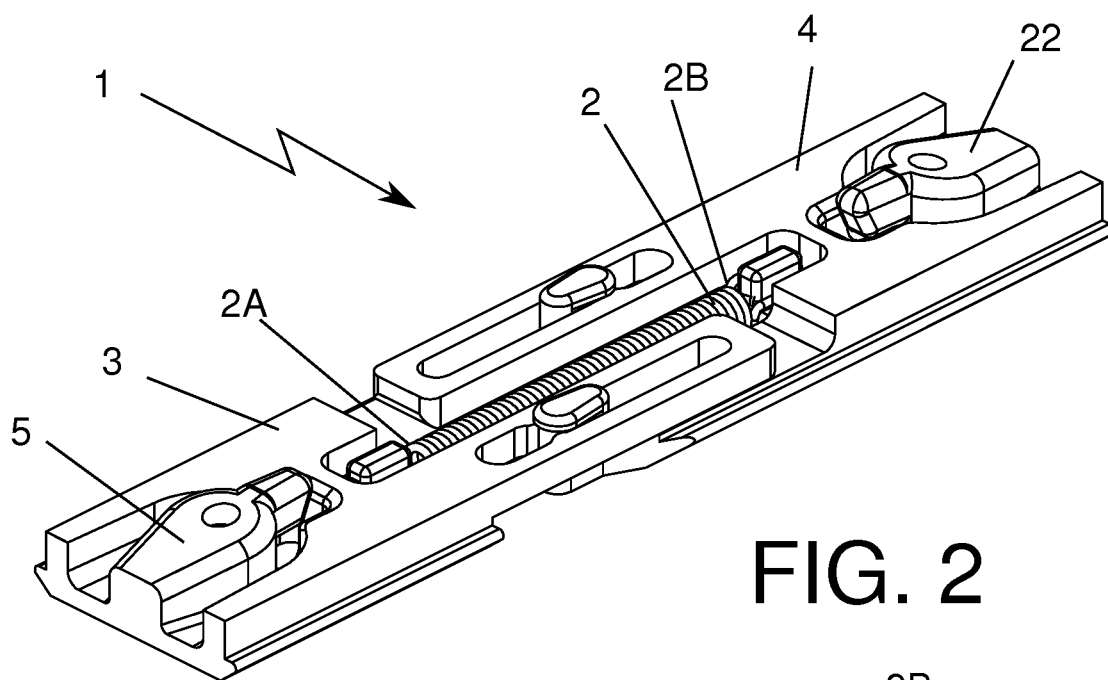


FIG. 1



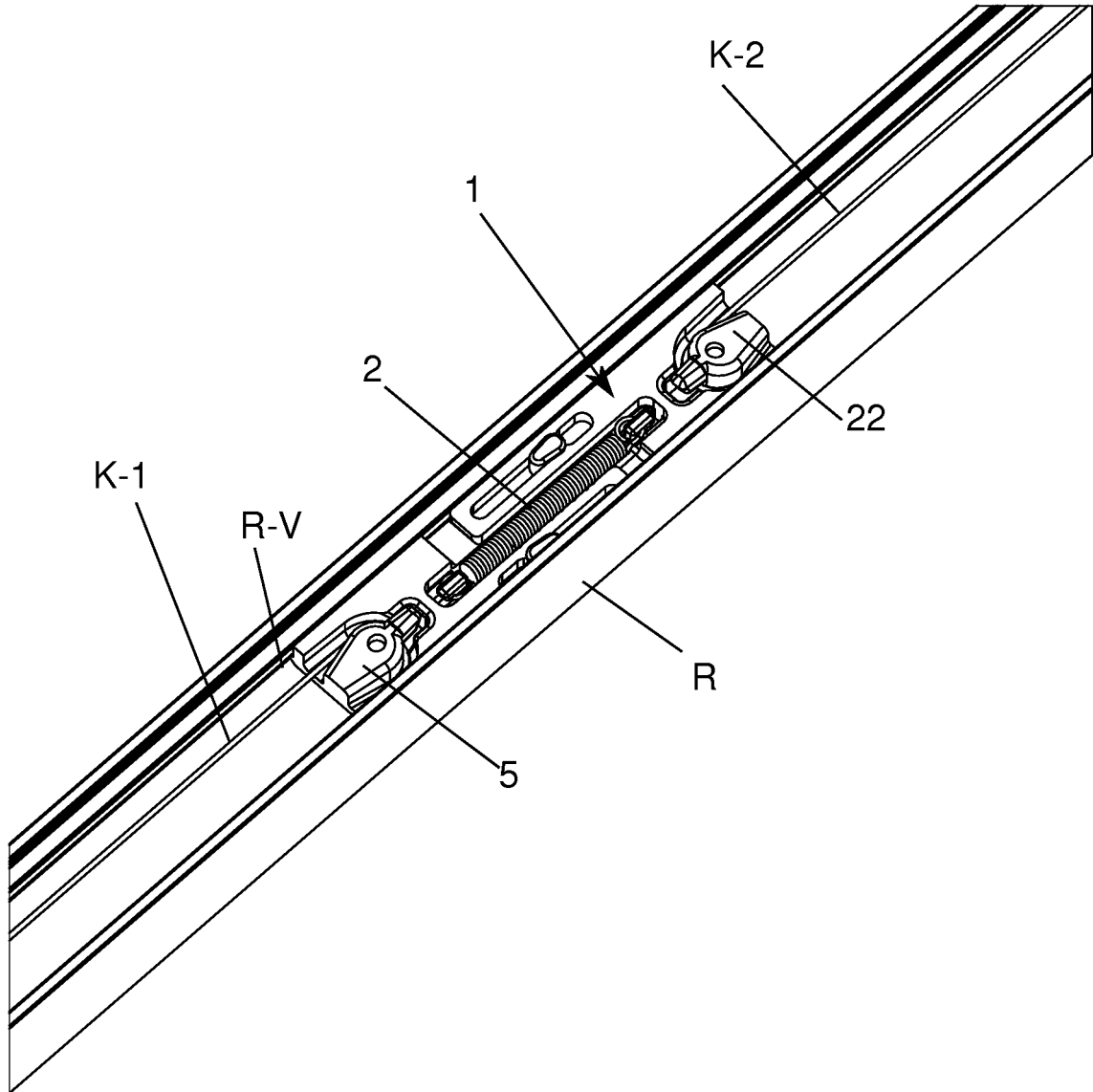


FIG. 4

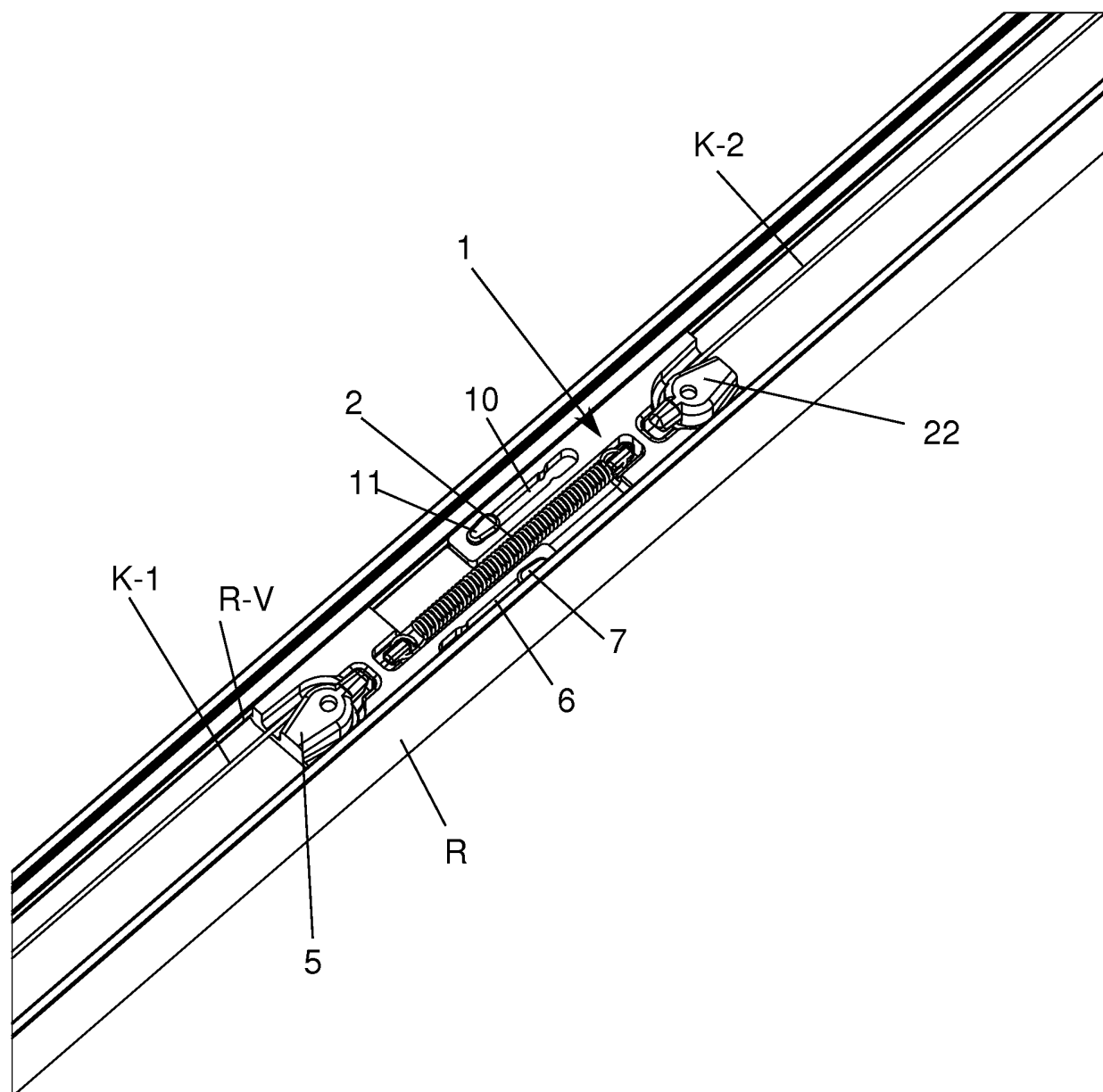


FIG. 5

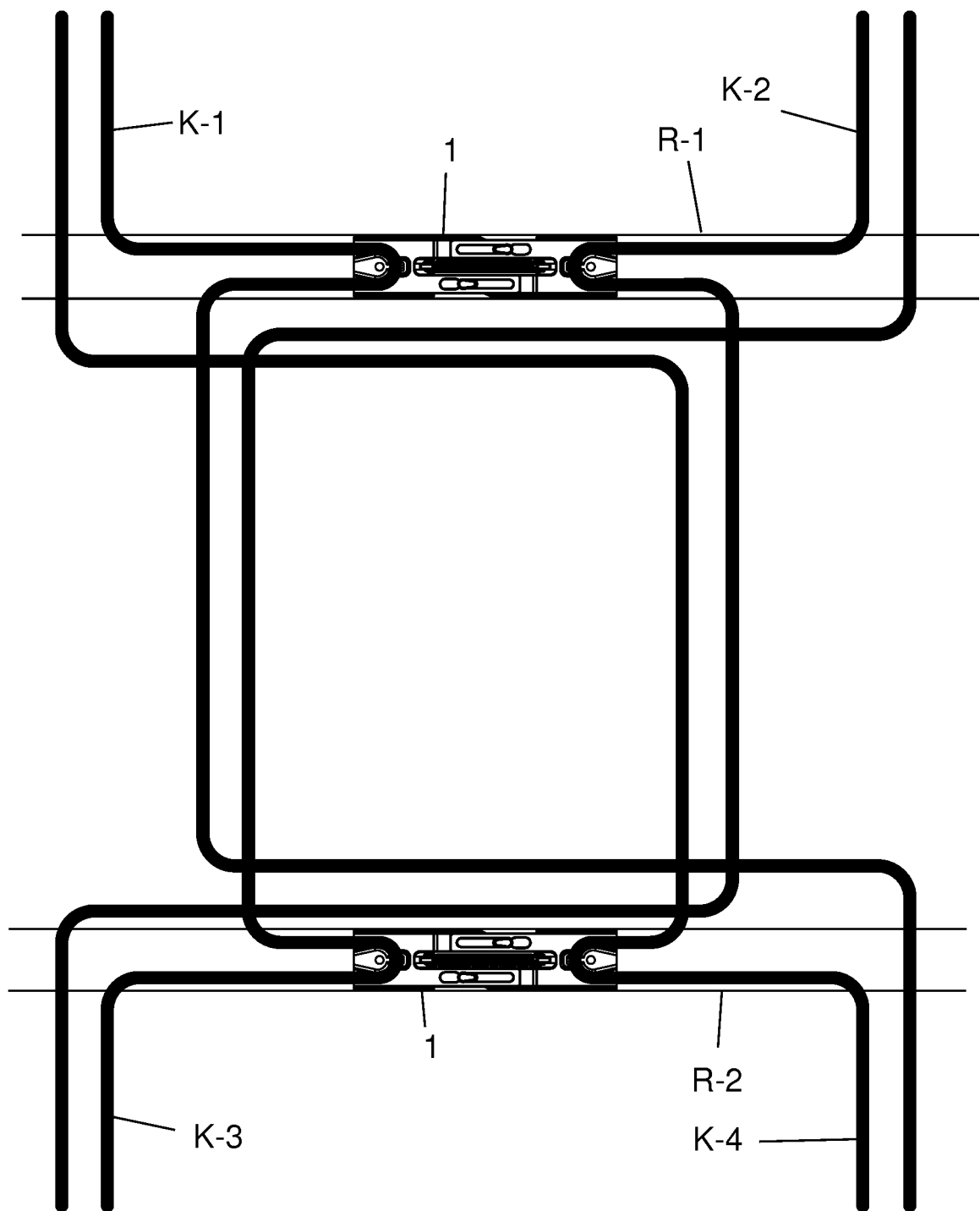


FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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