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(54) **ELEMENT FOR MOVING MOSQUITO NETS, CURTAINS AND THE LIKE**

ELEMENT ZUM BEWEGEN VON MOSKITONETZEN, VORHÄNGEN UND DERGLEICHEN

ÉLÉMENT DE DÉPLACEMENT DE MOUSTIQUAIRES, RIDEAUX ET SIMILAIRES

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Description

[0001] The present invention relates to an element for moving mosquito nets, curtains and the like.

[0002] As is known, one of the most frequently used solutions for protecting homes and other buildings against annoying insects such as mosquitos, flies, stink-bugs et cetera is to arrange sheets constituted by fine-mesh nets, or continuous sheets of low-thickness fabric, to close windows and doors in order to prevent the entry into the home of said insects even if the respective window or door is open.

[0003] In greater detail, according to a widespread embodiment, such nets and sheets have a perimetric frame that comprises a first rigid post at one of their sides, intended to be fixed to a jamb of the frame of the window, and a second rigid post, at the opposite side.

[0004] The second post is movable to allow the unrolling of the net from a first configuration, in which it is gathered fully at the first post, to a second configuration, in which the net (the sheet) is fully extended to close the installation opening, in order to allow the mosquito net to perform its function as a screen against insects.

[0005] Moreover, the mosquito net is associated with two flexible tracks, which define, in an upward region and in a downward region, a guide for the movement of the second post, preventing its flexing and/or deviation from the optimum path. Each one of said tracks is constituted, therefore, by a plurality of aligned and mutually articulated segments, which form, with the side that faces the net, a typically U-shaped seat to accommodate slidingly the respective end portion of the second post.

[0006] In this manner, when the second post translates to move the mosquito net from the first configuration to the second configuration, the respective end portions slide in the corresponding seats of the tracks, which at the same time arrange themselves flat along the base and the top of the opening delimited by the window (where they are accommodated in fixed profiles that hide them from sight).

[0007] When instead the second post translates in the opposite direction, gathering the net at the first post, each track enters progressively a respective frame that is fixed to the second post.

[0008] The purpose of this solution is to avoid the need for fixed guides arranged on the installation threshold, which might lead the users to trip over them in passing.

[0009] The use of guiding elements constituted by tracks causes the onset of considerable costs, which are unlikely to be absorbed by the retail price of the mosquito net.

[0010] Moreover, it should be noted that the choice to adopt tracks of the type described above imposes considerable space occupations, which force the manufacturers to complicated solutions in order to obtain a correct sizing of the several mutually interconnected elements that constitute the mosquito net.

[0011] It is known to resort to elastic laminas (generally

made of metallic material) as a replacement of the upper guiding track, in order to minimize the costs and reduce the overall space occupation (particularly of the actuation bar, known as handle bar).

[0012] Particularly efficient embodiments that are simple to install of this type of mosquito net (more generically, removable screens) allow, by adopting a single upper lamina and a single lower track, an optimized movement of the actuation bar (handle bar).

[0013] Generally, even for the more efficient type of mosquito net (more generically, removable screen) described earlier, it should be noted that correct operation (confinement of insects outside the installation space) depends on the skill of the user.

[0014] If the user does not close the mosquito net (screen) behind him at each transit, the confinement action cannot be effective.

[0015] WO 2013/064308 A1 discloses an element for moving mosquito nets having a combination of elements as set forth in the pre-characterizing portion of the appended claim 1.

[0016] The aim of the present invention is to solve the problems described above, proposing an element for moving mosquito nets, curtains and the like that has maximum effectiveness in terms of confining insects outside the installation space.

[0017] Within this aim, an object of the invention is to propose an element for moving mosquito nets, curtains and the like that is simple and safe to manufacture, assemble and install.

[0018] Another object of the invention is to propose an element for moving mosquito nets, curtains and the like that requires very little maintenance.

[0019] Another object of the invention is to propose an element for moving mosquito nets, curtains and the like that is strong and efficient.

[0020] Another object of the invention is to propose an element for moving mosquito nets, curtains and the like that has low costs.

[0021] A further object of the present invention is to provide an element for moving mosquito nets, curtains and the like that is relatively simple to provide in practice and is safe in application.

[0022] In accordance with the invention, there is provided an element for moving mosquito nets, as defined in the appended claims.

[0023] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the element for moving mosquito nets, curtains and the like according to the invention, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is an exploded schematic perspective view of a device of the type of a mosquito net, curtain and the like provided with a movement element according to the invention;

Figure 2 is a schematic perspective view of the de-

vice of Figure 1 in the closed configuration;

Figure 3 is an enlarged-scale schematic perspective view of the device of Figure 1 in the open configuration;

Figure 4 is a schematic perspective view of a device of the type of a mosquito net, curtain and the like provided with a movement element according to the invention;

Figure 5 is a schematic perspective view of a device provided with a possible embodiment of the element according to the invention;

Figure 6 is an enlarged-scale schematic perspective view of a portion of an actuation and movement element according to the invention;

Figure 7 is a partially sectional side view of a device of the type of a mosquito net, curtain and the like provided with a possible embodiment of an actuation and movement element according to the invention; Figure 8 is a partially sectional side view of a device of the type of a mosquito net, curtain and the like provided with a further embodiment of an actuation and movement element according to the invention; Figure 9 is a partially sectional side view of a device of the type of a mosquito net, curtain and the like provided with an alternative embodiment of an actuation and movement element according to the invention;

Figure 10 is an enlarged-scale schematic perspective view of a portion of another embodiment of an actuation and movement element according to the invention.

[0024] With particular reference to the figures cited above, the numeral 1 generally designates an element for moving mosquito nets, curtains and the like 2 of the roller type, according to the invention.

[0025] The mosquito nets 2 suitable for the adoption of an actuation and movement element 1 according to the invention comprise a supporting frame for a sheet 3 that can be installed at an opening in an element of the type of a wall and the like.

[0026] The installation openings can be doors, windows, skylights and other similar architectural elements of buildings, prefabricated structures, vehicles, means of transport in general and the like.

[0027] The frame in turn comprises a fixed box 4, which is coupled to an edge of said sheet 3 and is associated stably with a corresponding margin of the opening, and a movable box 5, which contains at least partially the element 1, fixed at the opposite end to the sheet 3.

[0028] The movable box 5 comprises a profiled central portion that is coupled to two end heads: an upper head and a lower head 5a.

[0029] The movable box 5 can translate along respective lower guiding means 6 and upper guiding means 7, on command, along a direction that is substantially perpendicular to the fixed box 4, for transition from a first configuration, in which the sheet 3 is substantially gath-

ered at the fixed box 1, to a second configuration, in which the sheet 3 is extended so as to close the installation opening, and vice versa.

[0030] According to the particular embodiment of the element 1 according to the invention, the lower guiding means 6 comprise a track 6 constituted by a plurality of mutually articulated segments.

[0031] The track 6 can be constituted effectively by segments made of metallic, polymeric, composite material and the like; each segment is articulated to the adjacent ones by means of a respective pivot, pin or other similar element of the type of a hinge.

[0032] The track 6 preferably has a first end 8 that is coupled to the base of the fixed box 4 (and/or coupled to the base of the movable box 5) and a second end 9 that can slide within an internal seat of the movable box 5 (internal seat of the lower head 5a); of course, the alternative, in which the second end 9 can be coupled to an internal seat of the fixed box 4, is provided.

[0033] The upper guiding means 7 comprise a flexible belt 7, which has a first end 10 that is coupled to the top of the fixed box 4 (and/or coupled to the base of the movable box 5) and a second end 11 that can slide within an internal seat of the movable box 5 (internal seat of the lower head 5a); as in the preceding paragraph, the alternative in which the second end 9 can be coupled to an internal seat of the fixed box 4 is provided.

[0034] Said second end 11 is coupled rigidly to the second sliding end 9 of the track 6 downstream of appropriate guiding means 12, which are internal to the lower head 5a of the movable box 5 (and/or to a lower head of the fixed box 4 in the alternative constructive possibility proposed up to now).

[0035] In the movement element 1 according to the invention there are elastic means 13a, 13b, 13c, 13d for forcing the second sliding end 9 of the track 6 toward the bottom of the lower head 5a, with consequent traction of the sheet 3 into the second configuration, in which said sheet 3 is extended so as to close the installation opening.

[0036] It is specified that for the purposes of the practical application of the inventive concept of the present invention the elastic means may be selected preferably among axially acting springs 13b, 13d, pneumatic pistons 13c, gas cylinder actuators, winders with elastic winding 13a and the like, cantilever springs, flexing springs, torsion springs, elastic cables and the like.

[0037] The embodiment is now described in which the tracks 6 and the belt 11 are contained within the movable box 5, although it is specified that protection is claimed also on the embodiment in which said components are contained within the fixed box 4 (since it is fully within the scope of the inventive concept of the present invention, because it is defined exclusively by a different assembly of the same components that cooperate identically).

[0038] In particular, it is specified that in the case of pneumatic pistons 13c and of gas cylinder actuators it is possible to provide versions of the telescopic type in order

to allow containment of space occupation when the sheet 3 is gathered and the opening is not closed (in this condition, the end 9 is proximate to the top of the movable box 5 and therefore occupies the space within which the pneumatic piston 13c and/or the gas cylinder actuator might expand) and at the same time ensure that they apply an action on the end 9 such as to force it elastically to the bottom of the lower head 5a, ensuring that the sheet 3 retains the configuration for closing the opening.

[0039] Moreover, if winders with elastic winding 13a are used as an elastic means, they are preset for the automatic winding (by elastic action of specific internal components) of a cable A, cord and the like on a spool, so that said cable A, cord or the like is wound onto the spool when the winder with elastic winding 13a is in the inactive condition.

[0040] By way of example, a winder with elastic winding 13a can be constituted by an enclosure in which a spool can rotate in contrast with a spring that applies a rotary motion to the spool that is intended to impose a rotation thereof that entails the rewinding of a cable A, cord and the like.

[0041] According to a particular constructive embodiment of unquestionable interest in application, illustrated by way of nonlimiting example in the accompanying Figures 2 and 4, it is specified that the lower head 5a can comprise positively a free guiding pulley 5b coupled to its bottom.

[0042] In the embodiment of Figures 1, 2 and 3, a free guiding pulley 5b coincides with the internal guiding means 12 intended for the guiding of the flexible belt 7: this embodiment is particularly simple and compact and solves effectively all the technical problems described earlier.

[0043] In this case, a cable A, guided by the pulley 5b, has a first end that is coupled rigidly to the elastic means 13a and a second end that is coupled, optionally indirectly, to the second sliding end 9 of the track 6.

[0044] The contraction of the elastic means 13a therefore causes the approach of the sliding end 9 to the bottom of the head 5a, with consequent traction of the sheet 3 into the second configuration for closing the opening.

[0045] It is specified that in this particular embodiment it is preferable to adopt as elastic means winders with elastic winding 13a; however, the possibility is not excluded to adopt axially acting springs (of any type) or even to select a cable A that is made directly of elastically deformable material (for example an elastomer), so that it is the cable A itself that by contracting causes the lowering of the end 9 and therefore the closure of the opening by the sheet 3.

[0046] According to a further embodiment, which is substantially alternative to the preceding one and is shown by way of nonlimiting example in the accompanying Figures 5 and 6, elastic means 13b, 13c are interposed between the top of the movable box 5 (and internally thereto) and the top of the sliding element 9.

[0047] Said elastic means 13b, 13c are in the inactive

condition when the sliding end 9 is arranged proximate to the bottom of the lower head 5a.

[0048] Said means are instead in an elastic compression condition at any raised arrangement of the sliding end 9 with respect to the bottom of the lower head 5a.

[0049] It is therefore evident that the elastic action of the elastic means 13b and 13c is such as to impose their inactive condition, consequently causing the traction of the sheet 3 in the second configuration for closing the opening.

[0050] In practice, the elastic means 13b and 13c apply to the end 9 a constant thrust that is intended to keep it as close as possible to the bottom of the head 5a.

[0051] For this reason, this embodiment indeed uses axially acting springs of the expansion type 13b (shown by way of example in Figure 5), pneumatic pistons 13c, preferably of the telescopic type in order to minimize space occupation (illustrated by way of example in Figure 6), and the like.

[0052] With particular reference to a further possible embodiment of a movement element 1 according to the invention (illustrated by way of nonlimiting example in the accompanying Figure 7), elastic means 13d are interposed between the lower head 5a and the sliding end 9 for the elastic forcing of the sliding end 9 proximate to the bottom of the lower head 5a with consequent traction of the sheet 3 in the second configuration for closing the opening.

[0053] In this case, the elastic means 13d might be constituted by a simple traction spring; the adoption of other types of elastic means (of the type of the ones already cited earlier), in order to minimize space occupation and/or simplify the structure of the invention, is not excluded.

[0054] According to a specific practical application, the end segment of the second end 9 of the track 6 can comprise a protrusion 14, which is elongated along the direction of the axis of the track 6 in that area, for the stable accommodation of the second end 11 of the flexible belt 7 on a lateral end surface thereof.

[0055] In this case it is possible to couple one of the ends of the cable A to said elongated protrusion 14 (as exemplified in Figures 2 and 4) in order to ensure simple and easy fixing for the user.

[0056] The coupling of the end 11 of the flexible belt 7 to the lateral surface of the elongated protrusion 14 can be obtained for example by using a screw or other threaded means, pin and the like, that passes through a through hole of the end 11 and engages in a corresponding cavity of the protrusion 14. If the through hole of the end 11 is slotted (therefore elongated and/or contoured), it is possible to couple the end 11 according to a plurality of different configurations.

[0057] The fixing criteria adopted for the belt 7 may be the same ones used to fix the cable A, although coupling the cable A to the protrusion 14 by adopting a simple interlocking or adhesive bonding is not excluded.

[0058] It is specified that the second box 5 can com-

prise preferably, at its lower head 5a and in the internal seat, a free roller 12 for guiding the flexible belt 7.

[0059] If the pulley 5b (on which the cable A is guided) is present, said free roller 12 is substantially above (in an extreme case, to the side of) said pulley 5b.

[0060] In terms of application, it is specified that the element 1 can comprise an upper deflector 15 to orient the belt 7 from a first direction that is parallel to the top of the installation opening to a second direction that is parallel to the longitudinal axis of the second box 5 and is perpendicular to the first direction.

[0061] In this case, the upper deflector 15 comprises means for adjusting the position of the sliding accommodation surface of the belt 7 in order to tension said belt 7.

[0062] The deflector 15 is located substantially above the fixing point of the elastic means 13a, 13b and 13c to the box 15.

[0063] In this case, the adoption of a slot by means of which the track provided with the surface on which the belt 7 slides is rendered integral with the main body of the deflector 15 allows to couple them mutually according to a plurality of different configurations, allowing to subject the lamina 7 to a different mechanical tension (also modifying the position along which it undergoes the 90° deflection from the first direction to the second direction defined previously).

[0064] It is deemed appropriate to specify that advantageously the flexible belt 7 comprises a first portion 16, which is proximate to the first end 10 and faces and is proximate to the top of the installation opening, a second portion 17 that faces and is proximate to the end front of the second box 5, delimited between the upper deflector 15 and the lower guiding roller 12, and a third portion 18, which is interposed between the second portion 17 and the track 6 inside the seat of the lower head 5a of the second box 5.

[0065] The lengths of the first portion 16 and of the third portion 18 are complementary: in the configuration for closing the installation opening, the length of the first portion 16 is greatest and the length of the third portion 18 is smallest; whereas in the fully gathered configuration, the length of the first portion 16 is smallest and the length of the third portion 18 is greatest. Between these two extreme configurations it is possible to identify a plurality of intermediate configurations in which the lengths of the two portions 16 and 18 assume values that are intermediate with respect to the ones defined earlier.

[0066] At all the configurations identified for the portions 16 and 18 of the belt 7, corresponding arrangements of the end 9 of the tracks 6 occur: this entails that the elastic means 13a, 13b, 13c and 13d can be in an inactive configuration (when the opening is closed completely by the sheet 3) and therefore do not act with any elastic reaction to move said end 9, or in a deformed configuration. In this second condition, the elastic means 13a, 13b, 13c and 13d act on the end 9 to push it toward the bottom of the head 5a.

[0067] It is specified furthermore that in a particularly

interesting embodiment of an element 1 that is simple to install and requires minimal maintenance, the lower head 5a of the second box 5 comprises preferably a lower through cavity, which is arranged proximate to its base and is aligned with the coupling point of the first end 8 of the track 6 to the fixed box 4, for the sliding accommodation of said track 6.

[0068] In practice, the track 6 accesses the internal seat of the lower head 5a of the movable box 5 by sliding through the lower through cavity: said track 6 is accommodated completely within the seat that is internal to the lower head 5a when the movable box 5 is arranged in substantial contact (and rests, when it is facing and proximate) with respect to the first box 4 (a configuration that corresponds to the gathered configuration of the sheet 3); the track 6 is instead rested completely on the threshold of the installation opening when the movable box 5 is arranged in contact (and rests, when it is facing and proximate) with respect to the end wall of the installation opening (a configuration that corresponds to the closure of the installation opening by the sheet 3).

[0069] These two extreme configurations of the track 6 correspond respectively to the configuration of maximum elastic deformation of the elastic means 13a, 13b, 13c and 13d (when the second box 5 is arranged so as to rest on the first box 4 and the opening has no closure) and to the inactive configuration of the elastic means 13a, 13b, 13c and 13d (when the opening is closed by the sheet 3); of course, all the intermediate configurations of the belt 7 correspond to respective intermediate configurations of the elastic means 13a, 13b, 13c and 13d.

[0070] The movable box 5 comprises furthermore an upper passage, which is arranged proximate to its top (upper head) and is aligned with the coupling point of the first end 10 of the flexible belt 7 to the fixed box 4, for the sliding accommodation of the flexible belt 7.

[0071] In practice, the belt 7 accesses the internal seat of the lower head 5a of the movable box 5, sliding through the upper passage: said belt 7 is accommodated completely within the internal seat of the lower head 5a of the movable box 5 (the first portion 16 has the shortest length) when it is arranged in substantial contact (and rests, when it is facing and proximate) with respect to the first box 4 (a configuration that corresponds to the gathered configuration of the sheet 3); the belt 7 is instead rested completely against the upper surface of the installation opening when the movable box 5 is arranged in contact (and rests, when it is facing and proximate) with respect to the end wall of the installation opening (a configuration that corresponds to the closure of the installation opening on the part of the sheet 3).

[0072] The internal seat of the lower head 5a of the movable box 5 has a contoured cross-section provided with specific guiding ribs 19 for respective laterally complementarily shaped portions 20 of the track 6.

[0073] The track 6 therefore can translate within the internal seat of the lower head 5a of the movable box 5 along the direction defined by the ribs 19 (which guide

its complementarily shaped portions 20) during the movement of the second box 5.

[0074] The first box 4 comprises a rotatable cylinder 21, which is arranged along the longitudinal axis of said first box 4 inside it, for the coupling of the initial edge of the sheet 3 and for the gathering winding of said sheet 3.

[0075] Elastic means (for example a spring with torque action, arranged inside said cylinder 21) are preferably interposed between the rotating cylinder 21 and the first box 4 in order to force elastically the rotation of the cylinder 21 in a preset direction, which corresponds generally to the winding, gathering, of the sheet 3 on the cylinder 21.

[0076] It is specified that the sheet 3 is constituted preferably by a fine-mesh net preferably made of polymeric material, metallic material, natural textile fiber and the like.

[0077] The possibility is not excluded to use a sheet 3 made of an ordinary fabric with a continuous mesh (or a continuous polymeric film) in order to obtain partitions for separation between different environments instead of mosquito nets.

[0078] The flexible belt 7 is instead preferably made of metallic material, polymeric material, composite material and the like.

[0079] Favorably, the present invention solves the problems described above, proposing a movement element 1 for mosquito nets 2, curtains and the like that has maximum effectiveness in terms of confinement of insects outside the installation space.

[0080] Thanks to the presence of the elastic means 13a, 13b, 13c and 13d, the box 5 in fact automatically tends to place itself in the position for closing the opening with the sheet 3, even when the user does not manually impose such configuration: this, of course, by minimizing the time for which the sheet 3 is not arranged so as to close the opening, certainly reduces also the number of insects that can enter through said opening.

[0081] Advantageously, the element 1 for moving mosquito nets, curtains and the like has a simple and safe installation.

[0082] Its assembly is in fact very simple and the person who performs the installation does not have to arrange and size elements that are interposed between the track 6 and the belt 7: assembly is therefore easier and its quality does not depend to an important extent on the skill of the person who performs the installation (since the operations of arranging and sizing the interposed elements, which are instead provided in elements of the known type, are not required).

[0083] Advantageously, the element for moving mosquito nets, curtains and the like according to the invention requires very little maintenance.

[0084] In fact the adoption of very solid components that are scarcely subject to wear, abrasion and mechanical yielding, such as the track 6 and the lamina 7, which are mutually interconnected without interposing other more delicate elements, gives the assembly 1 according

to the invention optimum strength, which ensures a considerable reduction in maintenance interventions.

[0085] Conveniently, the element 1 for moving mosquito nets, curtains and the like is therefore particularly strong and efficient: the track 6 and the lamina 7 will in fact ensure its safe and stable operation in any configuration in which the movable box 5 might be.

[0086] Positively, the element 1 for moving mosquito nets, curtains and the like has low costs, since it can be provided by adopting a substantially smaller number of components (at the most, an equal number) with respect to the number of the elements of the known type; however, at the same time it is easy and quick to install (reducing labor costs).

[0087] It is therefore deemed evident that the actuation and movement element 1 for mosquito nets, curtains and the like is characterized by safe practical application.

[0088] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; furthermore all the details may be replaced by other technically equivalent elements.

[0089] For example, the possibility is provided to arrange on the top of the first end 8 of the track 6 a ballast B with the purpose of facilitating the automatic closure of the mosquito net when the movable box 5 is left in an intermediate configuration by the user.

[0090] Adopting the ballast B is particularly convenient in the embodiment shown by way of example in Figures 1, 2 and 3, since due to the fact that the free guiding pulley 5b (intended to guide the cable A or other component equivalent thereto) and the internal guiding means 12 (intended to guide the flexible belt 7) coincide in a single component, the action of the ballast is conveniently combined and spread over all the moving elements within the movement element 1.

Claims

1. An element for moving mosquito nets (2), curtains and the like, of the roller type comprising a supporting frame for a sheet (3) that can be installed at an opening in an element of the type of a wall and the like, said frame comprising a fixed box (4), which is coupled to one edge of said sheet (3) and is associated stably with a corresponding edge of the opening, and a movable box (5), which contains at least partially said element (1), which is fixed at the opposite end to said sheet (3) and can translate along respective lower and upper guiding means (6, 7) on command, along a direction that is substantially perpendicular to said fixed box (4), for transition from a first configuration, in which said sheet (3) is substantially gathered, to a second configuration, in which said sheet (3) is extended so as to close said opening, and vice versa, said lower guiding means (6) comprising a track (6) that is constituted by a plurality of mutually

articulated segments that have a first end (8), which is coupled to a first component selected between the base of said fixed box (4) and the lower head (5a) of said movable box (5), and a second end (9), which can slide within an internal seat of a second component selected between the lower head (5a) of said movable box (5) and the base of said fixed box (4), said upper guiding means (7) comprising a flexible belt (7), **characterized in that** said flexible belt (7) has a first end (10) coupled to a third component, selected between the top of said fixed box (4) and the top of said movable box (5), and a second end (11), which can slide within a seat that is internal to either the lower head (5a) of said movable box (5) or the fixed box (4), and is coupled rigidly to said second sliding end (9) of said track (6) downstream of adapted guiding means (12) that are internal to the installation box (4, 5), elastic means (13a, 13b, 13c, 13d) being provided to force said second sliding end (9) of said track (6) toward the bottom of the installation box (4, 5), with consequent traction of said sheet (3) in said second configuration, wherein said sheet (3) is extended so as to close said opening.

2. The element according to claim 1, **characterized in that** said elastic means are selected preferably among axially acting springs (13b, 13d), pneumatic pistons (13c), gas cylinder actuators, winders with elastic winding (13a) and the like, cantilever springs, flexing springs, torsion springs, elastic cables and the like.
3. The element according to claim 1, **characterized in that** said lower head (5a) comprises a free guiding pulley (5b), which is coupled to its said bottom, a cable (A), guided by said pulley (5b), having a first end that is coupled rigidly to said elastic means (13a) and a second end that is coupled, optionally indirectly, to said second sliding end (9) of said track (6), the contraction of said elastic means (13a) causing the approach of said sliding end (9) to said bottom of said head (5a), with consequent traction of said sheet (3) in said second configuration for closing said opening.
4. The element according to claim 1, **characterized in that** between the top of said movable box (5) and the top of said sliding end (9) there are interposed elastic means (13b, 13c), said elastic means (13a, 13b) being in the inactive condition when said sliding end (9) is proximate to said bottom of said lower head (5a) and in a condition of elastic compression at any raised arrangement of said sliding head (9) with respect to said bottom of said lower head (5a), the elastic action of said elastic means (13b, 13c) toward the inactive condition causing the traction of said sheet (3) into said second configuration for closing

said opening.

5. The element according to claim 1, **characterized in that** elastic means (13d) are interposed between said lower head (5a) and said sliding end (9) for the elastic forcing of said sliding end (9) proximate to said bottom of said lower head (5a), with consequent traction of said sheet (3) in said second configuration for closing said opening.
6. The element according to claim 1, **characterized in that** the end portion of said second end (9) of said track (6) comprises a protrusion (14) that is elongated along the direction of the axis of the track (6) **in that** area, for the stable accommodation of said second end (11) of said flexible belt (7) on a lateral surface thereof.
7. The element according to claim 1, **characterized in that** said second box (5) comprises, proximate to its lower base and said internal seat of the lower head (5a), a free roller (12) for guiding said flexible belt (7).
8. The element according to claim 3, **characterized in that** it comprises an upper deflector (15) for the orientation of the belt (7) from a first direction that is parallel to the top of the installation opening to a second direction that is parallel to the longitudinal axis of said second box (5) and is perpendicular to said first direction, said upper deflector (14) comprising means for adjusting the position of the sliding accommodation surface of said belt (7) in order to tension said belt (7).
9. The element according to one or more of the preceding claims, **characterized in that** said flexible belt (7) comprises a first portion (16), which is proximate to said first end (10) that faces and is proximate to the top of said installation opening, a second portion (17), which faces and is proximate to the end front of said second box (5), delimited between said upper deflector (15) and said lower guiding roller (12), and a third portion (18), which is interposed between said second portion (17) and said track (6) within said seat of the lower head (5a) of said second box (5), the lengths of said first portion (16) and of said third portion (18) being complementary, in a configuration for closing said opening the length of said first portion (16) being greatest and the length of said third portion (18) being smallest and in the fully gathered configuration the length of said first portion (16) being smallest and the length of said third portion (18) being greatest.
10. The element according to claim 1, **characterized in that** said second box (5) comprises a lower through cavity, which is arranged proximate to its lower head (5a) and is aligned with the point for the coupling of

the first end (8) of said track (6) to said fixed box (4), for the sliding accommodation of said track (6), and an upper passage, which is arranged proximate to its top and is aligned with the point for the coupling of the first end (10) of said flexible belt (7) to said fixed box (4), for the sliding accommodation of said flexible belt (7).

Patentansprüche

1. Element zum Bewegen von Moskitonetzen (2), Vorhängen und dergleichen des Rollentyps, das einen Stützrahmen für ein Tuch (3) umfasst, der an einer Öffnung in einem Element vom Typ einer Wand und dergleichen installiert werden kann, wobei der Rahmen einen festen Kasten (4), der mit einem Rand des Tuchs (3) gekoppelt ist und stabil mit einem entsprechenden Rand der Öffnung verbunden ist, und einen beweglichen Kasten (5), der zumindest teilweise das Element (1) enthält und der an dem entgegengesetzten Ende an dem Tuch (3) befestigt ist und entlang jeweiligen unteren und oberen Führungsmitteln (6, 7) auf Befehl entlang einer Richtung, die im Wesentlichen senkrecht zu dem festen Kasten (4) ist, zum Übergang von einer ersten Konfiguration, in der das Tuch (3) im Wesentlichen gerafft ist, zu einer zweiten Konfiguration, in der das Tuch (3) ausgefahren ist, verschoben werden kann, um die Öffnung zu schließen und umgekehrt, umfasst, wobei die unteren Führungsmittel (6) eine Schiene (6) umfassen, die aus einer Vielzahl von miteinander gelenkartig verbundenen Segmenten besteht, die ein erstes Ende (8), das an eine erste Komponente gekoppelt ist, die zwischen der Basis des festen Kastens (4) und dem unteren Kopf (5a) des beweglichen Kastens (5) ausgewählt ist, und ein zweites Ende (9), das innerhalb eines inneren Sitzes einer zweiten Komponente gleiten kann, die zwischen dem unteren Kopf (5a) des beweglichen Kastens (5) und der Basis des festen Kastens (4) ausgewählt ist, aufweisen, wobei die oberen Führungsmittel (7) einen flexiblen Riemen (7) umfassen, **dadurch gekennzeichnet, dass** der flexible Riemen (7) ein erstes Ende (10), das an eine dritte Komponente gekoppelt ist, die zwischen der Oberseite des festen Kastens (4) und der Oberseite des beweglichen Kastens (5) ausgewählt ist, und ein zweites Ende (11), das innerhalb eines Sitzes gleiten kann, der sich entweder im Inneren des unteren Kopfes (5a) des beweglichen Kastens (5) oder des festen Kastens (4) befindet und starr an das zweite gleitende Ende (9) der Schiene (6) nachgelagert von angepassten Führungsmitteln (12) gekoppelt ist, die sich im Inneren des Installationskastens (4, 5) befinden, aufweist, wobei elastische Mittel (13a, 13b, 13c, 13d) vorgesehen sind, um das zweite gleitende Ende (9) der Schiene (6) in Richtung des Bodens des Installationskastens (4, 5)

zu zwingen, mit daraus folgendem Zug des Tuchs (3) in die zweite Konfiguration, wobei das Tuch (3) ausgefahren wird, um die Öffnung zu schließen.

2. Element nach Anspruch 1, **dadurch gekennzeichnet, dass** die elastischen Mittel vorzugsweise aus axial wirkenden Federn (13b, 13d), pneumatischen Kolben (13c), Gaszylinderaktuatoren, Wicklern mit elastischer Wicklung (13a) und dergleichen, Auslegerfedern, Biegefedern, Torsionsfedern, elastischen Kabeln und dergleichen ausgewählt sind.
3. Element nach Anspruch 1, **dadurch gekennzeichnet, dass** der untere Kopf (5a) eine freie Führungsrolle (5b), die an seinen Boden gekoppelt ist, umfasst, wobei ein von der Rolle (5b) geführtes Kabel (A) ein erstes Ende, das starr an die elastischen Mittel (13a) gekoppelt ist, und ein zweites Ende, das wahlweise indirekt an das zweite gleitende Ende (9) der Schiene (6) gekoppelt ist, aufweist, wobei das Zusammenziehen der elastischen Mittel (13a) die Annäherung des gleitenden Endes (9) an den Boden des Kopfes (5a) mit daraus folgendem Zug des Tuches (3) in die zweite Konfiguration bewirkt, um die Öffnung zu schließen.
4. Element nach Anspruch 1, **dadurch gekennzeichnet, dass** zwischen der Oberseite des beweglichen Kastens (5) und der Oberseite des gleitenden Endes (9) elastische Mittel (13b, 13c) eingeschoben sind, wobei die elastischen Mittel (13a, 13b) sich in dem inaktiven Zustand befinden, wenn sich das gleitende Ende (9) in der Nähe des Bodens des unteren Kopfes (5a) befindet, und sich in einem Zustand elastischer Kompression bei jeder erhöhten Anordnung des gleitenden Kopfes (9) in Bezug auf den Boden des unteren Kopfes (5a) befinden, wobei die elastische Wirkung der elastischen Mittel (13b, 13c) in Richtung des inaktiven Zustands den Zug des Tuchs (3) in die zweite Konfiguration bewirkt, um die Öffnung zu schließen.
5. Element nach Anspruch 1, **dadurch gekennzeichnet, dass** elastische Mittel (13d) zwischen dem unteren Kopf (5a) und dem gleitenden Ende (9) eingeschoben sind, um das gleitende Ende (9) elastisch in die Nähe des Bodens des unteren Kopfes (5a) zu zwingen, mit daraus folgendem Zug des Tuches (3) in die zweite Konfiguration, um die Öffnung zu schließen.
6. Element nach Anspruch 1, **dadurch gekennzeichnet, dass** der Endabschnitt des zweiten Endes (9) der Schiene (6) einen Vorsprung (14) umfasst, der entlang der Richtung der Achse der Schiene (6) in diesem Bereich zur stabilen Aufnahme des zweiten Endes (11) des flexiblen Riemens (7) an einer Seitenfläche davon verlängert ist.

7. Element nach Anspruch 1, **dadurch gekennzeichnet, dass** der zweite Kasten (5) in der Nähe seiner unteren Basis und des inneren Sitzes des unteren Kopfes (5a) eine freie Laufrolle (12) zum Führen des flexiblen Riemens (7) umfasst. 5
8. Element nach Anspruch 3, **dadurch gekennzeichnet, dass** es eine obere Ablenkeinrichtung (15) für die Ausrichtung des Riemens (7) von einer ersten Richtung, die parallel zu der Oberseite der Einbauöffnung ist, in eine zweite Richtung, die parallel zu der Längsachse des zweiten Kastens (5) und senkrecht zu der ersten Richtung ist, umfasst, wobei die obere Ablenkeinrichtung (14) Mittel zum Anpassen der Position der gleitenden Aufnahme­fläche des Riemens (7) umfasst, um den Riemen (7) zu spannen. 10
9. Element nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der flexible Riemen (7) einen ersten Abschnitt (16), der sich in der Nähe des ersten Endes (10) befindet und der Oberseite der Einbauöffnung zugewandt ist und sich in deren Nähe befindet, einen zweiten Abschnitt (17), der dem Vorderende des zweiten Kastens (5) zugewandt ist und sich in dessen Nähe befindet, begrenzt zwischen der oberen Ablenkeinrichtung (15) und der unteren Führungslaufrolle (12), und einen dritten Abschnitt (18), der zwischen dem zweiten Abschnitt (17) und der Schiene (6) innerhalb des Sitzes des unteren Kopfes (5a) des zweiten Kastens (5) eingeschoben ist, umfasst, wobei die Längen des ersten Abschnitts (16) und des dritten Abschnitts (18) komplementär sind, wobei in einer Konfiguration zum Schließen der Öffnung die Länge des ersten Abschnitts (16) am größten und die Länge des dritten Abschnitts (18) am kleinsten und in der vollständig gerafften Konfiguration die Länge des ersten Abschnitts (16) am kleinsten und die Länge des dritten Abschnitts (18) am größten ist. 20 25 30 35 40
10. Element nach Anspruch 1, **dadurch gekennzeichnet, dass** der zweite Kasten (5) einen unteren durchgehenden Hohlraum, der in der Nähe seines unteren Kopfes (5a) angeordnet ist und mit dem Punkt für die Kopplung des ersten Endes (8) der Schiene (6) an dem festen Kasten (4) zur gleitenden Aufnahme der Schiene (6) ausgerichtet ist, und einen oberen Durchgang, der in der Nähe seiner Oberseite angeordnet ist und mit dem Punkt für die Kopplung des ersten Endes (10) des flexiblen Riemens (7) an dem festen Kasten (4) zur gleitenden Aufnahme des flexiblen Riemens (7) ausgerichtet ist, umfasst. 45 50

Revendications

1. Un élément pour déplacer des moustiquaires (2), ri-

deaux et similaires, de type à rouleaux comprenant un cadre de support pour une feuille (3) qui peut être installé au niveau d'une ouverture dans un élément de type mur et similaire, ledit cadre comprenant un carter fixe (4), qui est accouplé à un bord de ladite feuille (3) et est associé de façon stable à un bord correspondant de l'ouverture, et un carter mobile (5), qui contient au moins partiellement ledit élément (1), qui est fixé à l'extrémité opposée à ladite feuille (3) et peut translater le long de moyens de guidage (6, 7) inférieur et supérieur respectifs sur commande, dans une direction qui est sensiblement perpendiculaire audit carter fixe (4), pour passer d'une première configuration, dans laquelle ladite feuille (3) est sensiblement réunie, à une seconde configuration, dans laquelle ladite feuille (3) est étendue de sorte à fermer ladite ouverture, et vice versa, ledit moyen de guidage (6) inférieur comprenant une glissière (6) qui est constituée d'une pluralité de segments mutuellement articulés qui ont une première extrémité (8), qui est accouplée à un premier élément sélectionné entre la base dudit carter fixe (4) et la tête inférieure (5a) dudit carter mobile (5), et une seconde extrémité (9), qui peut coulisser à l'intérieur d'un siège interne d'un deuxième élément sélectionné entre la tête inférieure (5a) dudit carter mobile (5) et la base dudit carter fixe (4), ledit moyen de guidage (7) supérieur comprenant une courroie souple (7), **caractérisée en ce que** ladite courroie souple (7) a une première extrémité (10) accouplée à un troisième élément, sélectionné parmi la partie supérieure dudit carter fixe (4) et la partie supérieure dudit carter mobile (5), et une seconde extrémité (11), qui peut coulisser entre un siège interne à la tête inférieure (5a) dudit carter mobile (5) ou du carter fixe (4), et est accouplée de façon rigide à ladite seconde extrémité coulissante (9) de ladite glissière (6) en aval d'un moyen de guidage (12) adapté qui est à l'intérieur du carter d'installation (4, 5), un moyen élastique (13a, 13b, 13c, 13d) est fourni pour forcer ladite seconde extrémité coulissante (9) de ladite glissière (6) vers la partie inférieure du carter d'installation (4, 5), avec la traction conséquente de ladite feuille (3) dans ladite seconde configuration, ladite feuille (3) étant étendue de sorte à fermer ladite ouverture.

2. Un élément selon la revendication 1, **caractérisé en ce que** lesdits moyens élastiques sont sélectionnés préférentiellement parmi des ressorts à action axiale (13b, 13d), des pistons pneumatiques (13c), des actionneurs de cylindre à gaz, des enrouleurs avec enroulement élastique (13a) et similaires, des ressorts en porte-à-faux, des ressorts de flexion, des ressorts de torsion, des câbles élastiques et similaires. 55

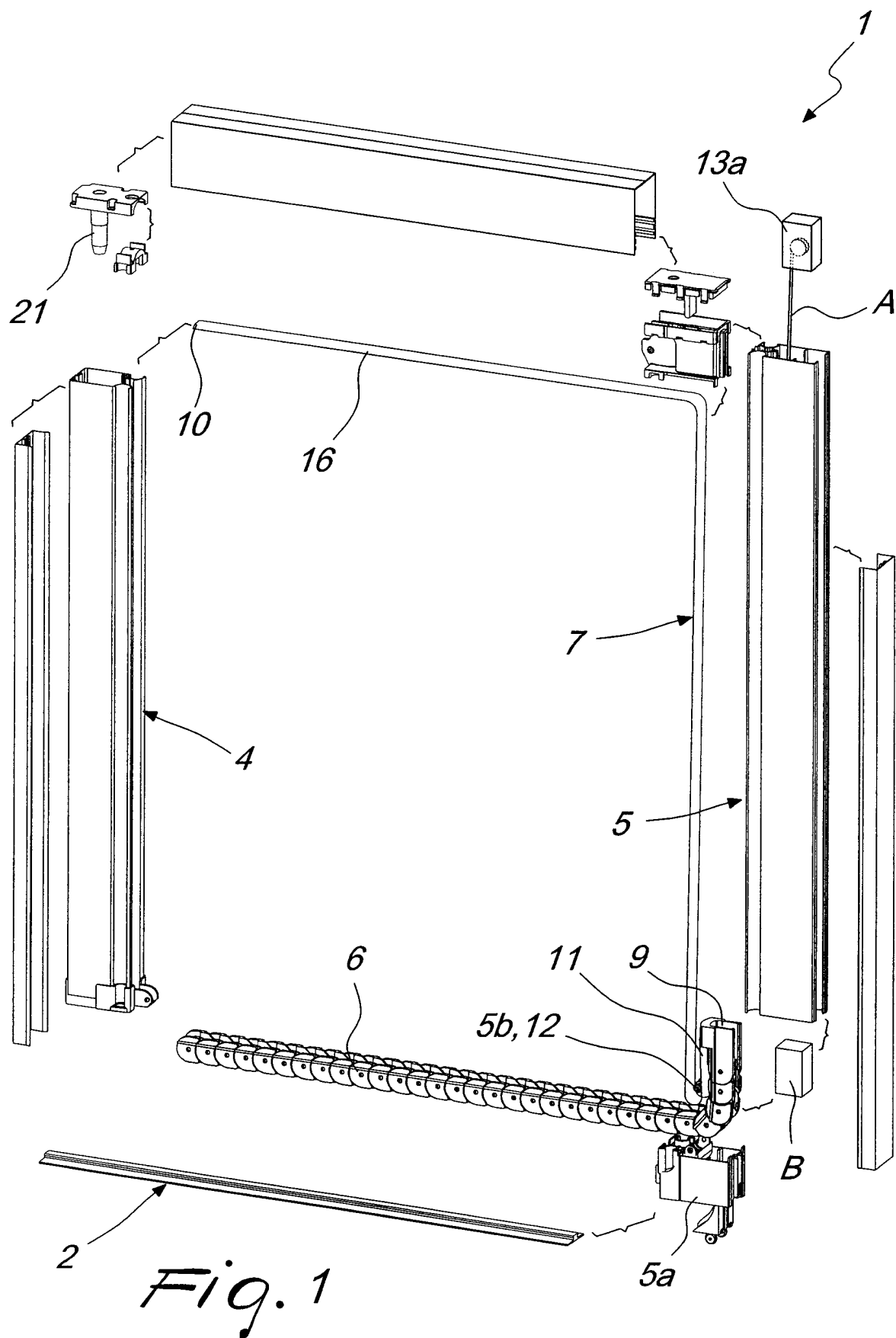
3. Un élément selon la revendication 1, **caractérisé en ce que** ladite tête inférieure (5a) comprend une pou-

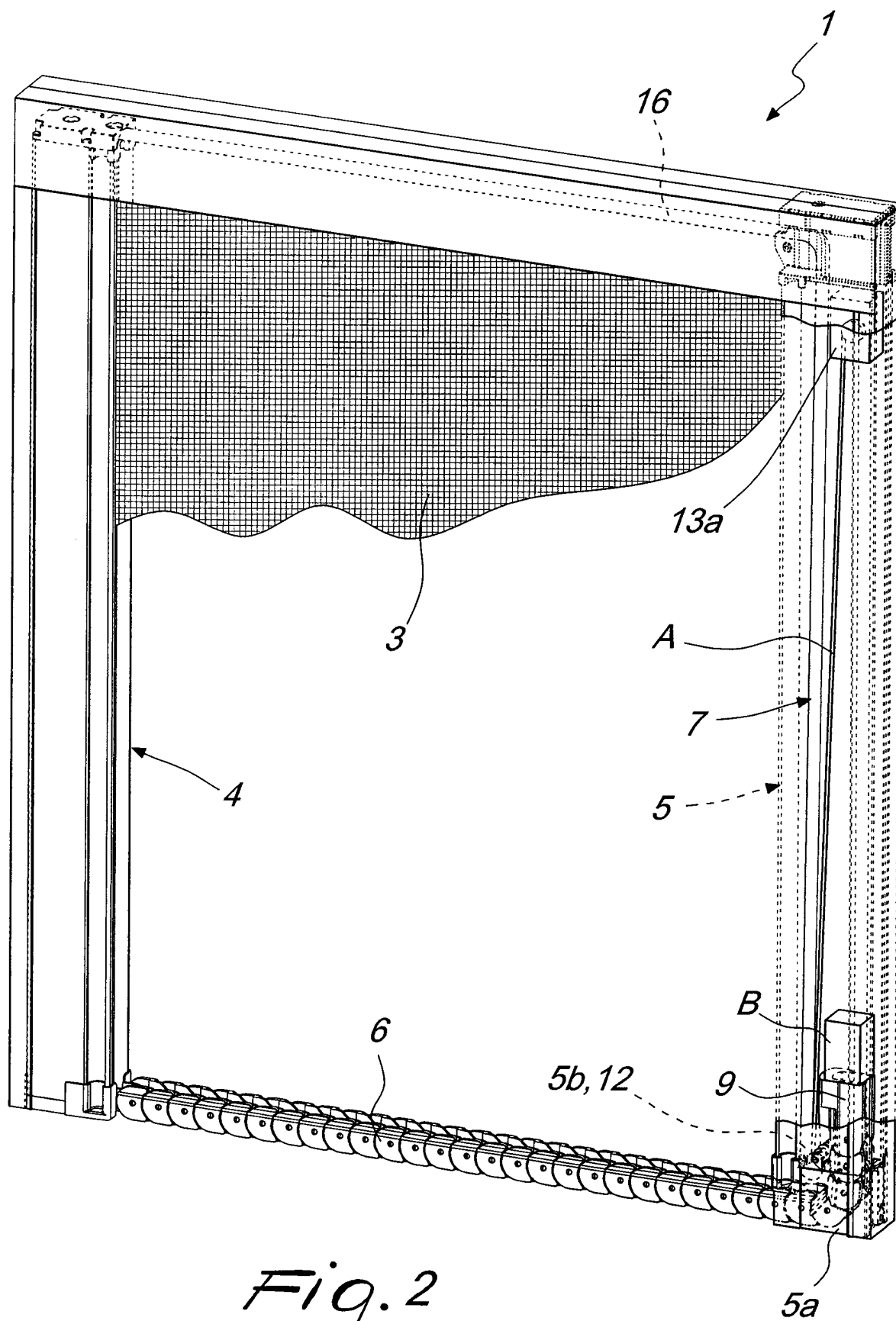
lie de guidage libre (5b) qui est accouplée à sa partie inférieure, un câble (A) guidé par ladite poulie (5b), dont une première extrémité est accouplée de manière rigide auxdits moyens élastiques (13a) et une seconde extrémité est accouplée, optionnellement de façon indirecte, à ladite seconde extrémité coulissante (9) de ladite glissière (6), la contraction desdits moyens élastiques (13a) entraînant l'approche de ladite extrémité coulissante (9) vers la partie inférieure de ladite tête (5a), avec une traction consécutive de ladite feuille (3) dans la seconde configuration de sorte à fermer ladite ouverture.

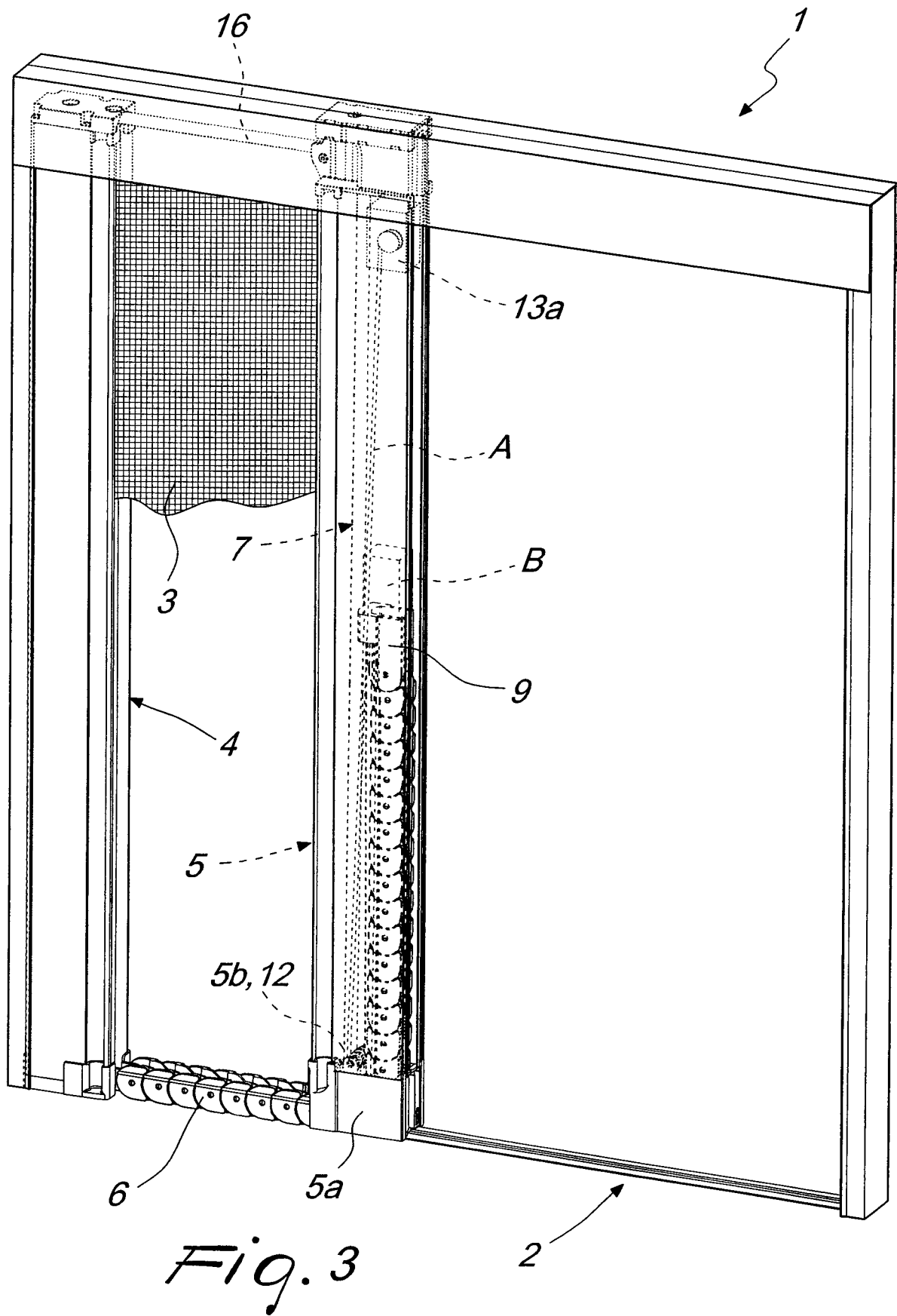
4. Un élément selon la revendication 1, **caractérisé en ce qu'**entre la partie supérieure dudit carter mobile (5a) et la partie supérieure de ladite extrémité coulissante (9) sont intercalés des moyens élastiques (13b, 13c), lesdits moyens élastiques (13a, 13b) étant dans un état inactif lorsque ladite extrémité coulissante (9) est proche de la partie inférieure de ladite tête inférieure (5a) et dans un état de compression élastique lorsque ladite tête coulissante (9) est relevée de quelque manière que ce soit par rapport à la partie inférieure de ladite tête inférieure (5a), l'action élastique desdits moyens élastiques (13b, 13c) vers l'état inactif entraînant la traction de ladite feuille (3) dans la seconde configuration de sorte à fermer ladite ouverture.
5. Un élément selon la revendication 1, **caractérisé en ce que** lesdits moyens élastiques (13d) sont intercalés entre ladite tête inférieure (5a) et ladite extrémité coulissante (9) pour le forçage élastique de ladite extrémité coulissante (9) proche de la partie inférieure de ladite tête inférieure (5a), avec une traction consécutive de ladite feuille (3) dans ladite seconde configuration de sorte à fermer ladite ouverture.
6. Un élément selon la revendication 1, **caractérisé en ce que** la partie terminale de ladite seconde extrémité (9) de ladite glissière (6) comprend une protubérance (14) qui s'étend le long de la direction de l'axe de la glissière (6) dans cette zone, pour l'accueil stable de ladite seconde extrémité (11) de ladite courroie souple (7) sur une surface latérale de celle-ci.
7. Un élément selon la revendication 1, **caractérisé en ce que** ledit second carter (5) comprend, proche de sa base inférieure et dudit siège interne de la tête inférieure (5a), un rouleau libre (12) pour guider ladite courroie souple (7).
8. Un élément selon la revendication 3, **caractérisé en ce qu'**il contient un déflecteur supérieur (15) pour l'orientation de la courroie (7) à partir d'une première direction parallèle à la partie supérieure de l'ouver-

ture de l'installation vers une seconde direction parallèle à l'axe longitudinal dudit second carter (5) et est perpendiculaire à ladite première direction, ledit déflecteur supérieur (14) comprenant des dispositifs de réglage de position de la surface d'accueil coulissante de ladite courroie (7) de sorte à mettre sous tension ladite courroie (7).

9. Un élément selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite courroie souple (7) comprend une première partie (16) proche de ladite première extrémité (10) qui fait face et est proche de la partie supérieure de ladite ouverture de l'installation, une seconde partie (17) qui fait face et est proche de la face arrière dudit second carter (5), délimité entre ledit déflecteur supérieur (15) et ledit rouleau de guidage inférieur (12), et une troisième partie (18) qui est intercalée entre ladite seconde partie (17) et ladite glissière (6) dans ledit siège de la tête inférieure (5a) dudit second carter (5), les longueurs de ladite première partie (16) et de ladite troisième partie (18) étant complémentaires, dans une configuration de fermeture de ladite ouverture, la longueur de ladite première partie (16) est plus longue et la longueur de la troisième partie (18) est plus courte, et dans une configuration entièrement réunie, la longueur de la première partie (16) est plus courte et la longueur de la troisième partie (18) est plus longue.
10. Un élément selon la revendication 1, **caractérisé en ce que** ledit second carter (5) comprend une cavité traversante inférieure située proche de sa tête inférieure (5a) et alignée avec le point d'accouplement de la première extrémité (8) de ladite glissière (6) audit carter fixe (4), pour l'accueil coulissant de ladite glissière (6), et un passage supérieur situé près de sa partie supérieure et aligné avec le point d'accouplement de la première extrémité (10) de ladite courroie souple (7) audit carter fixe (4), pour l'accueil coulissant de ladite courroie souple (7).







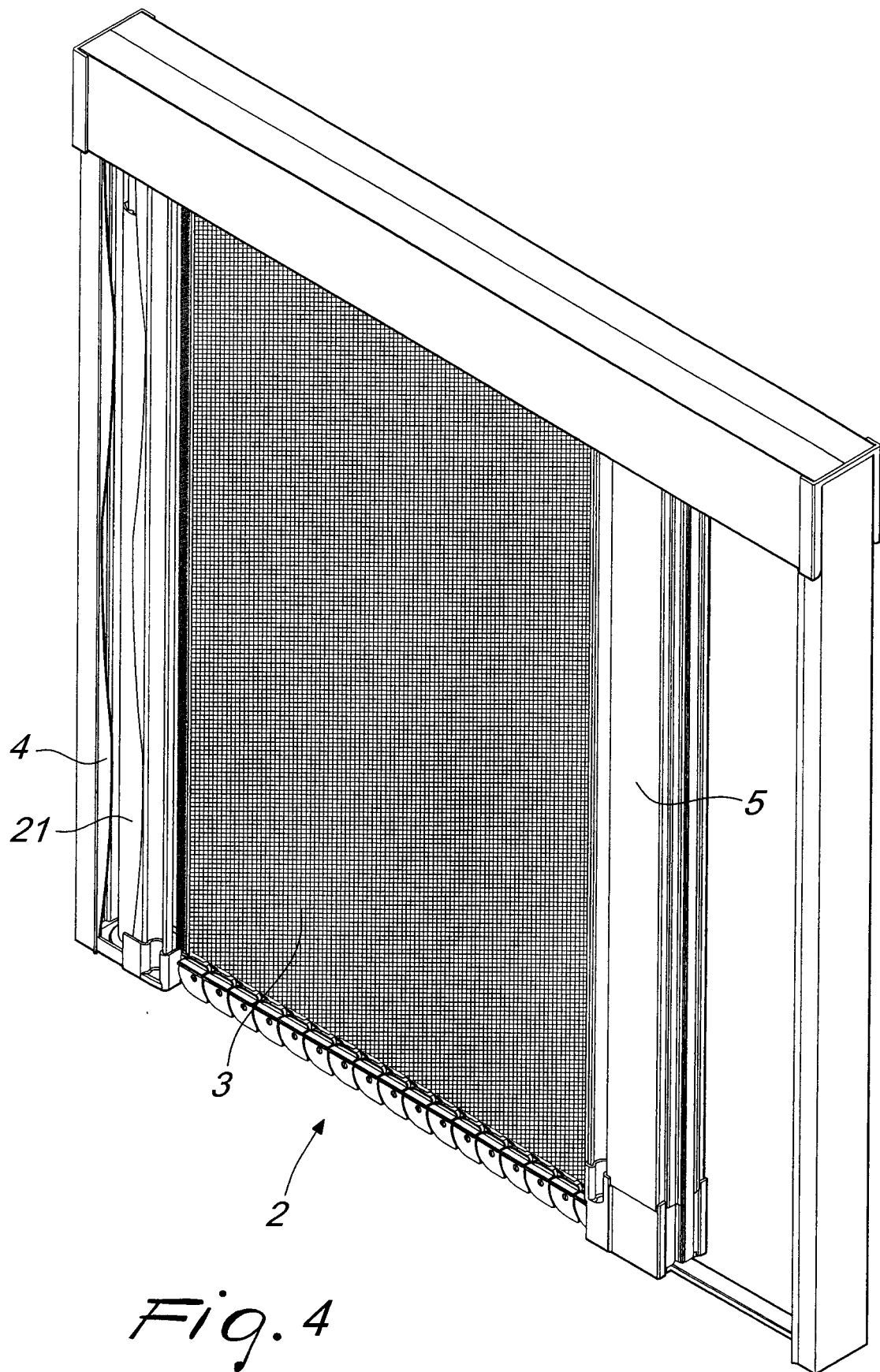


Fig. 4

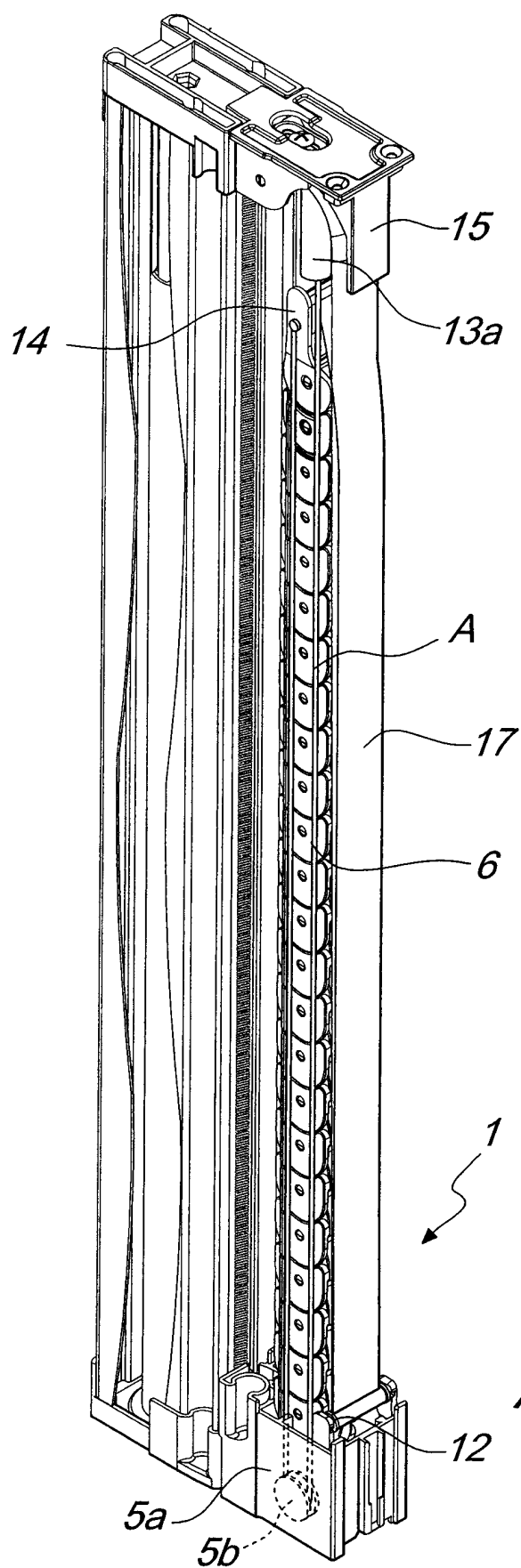
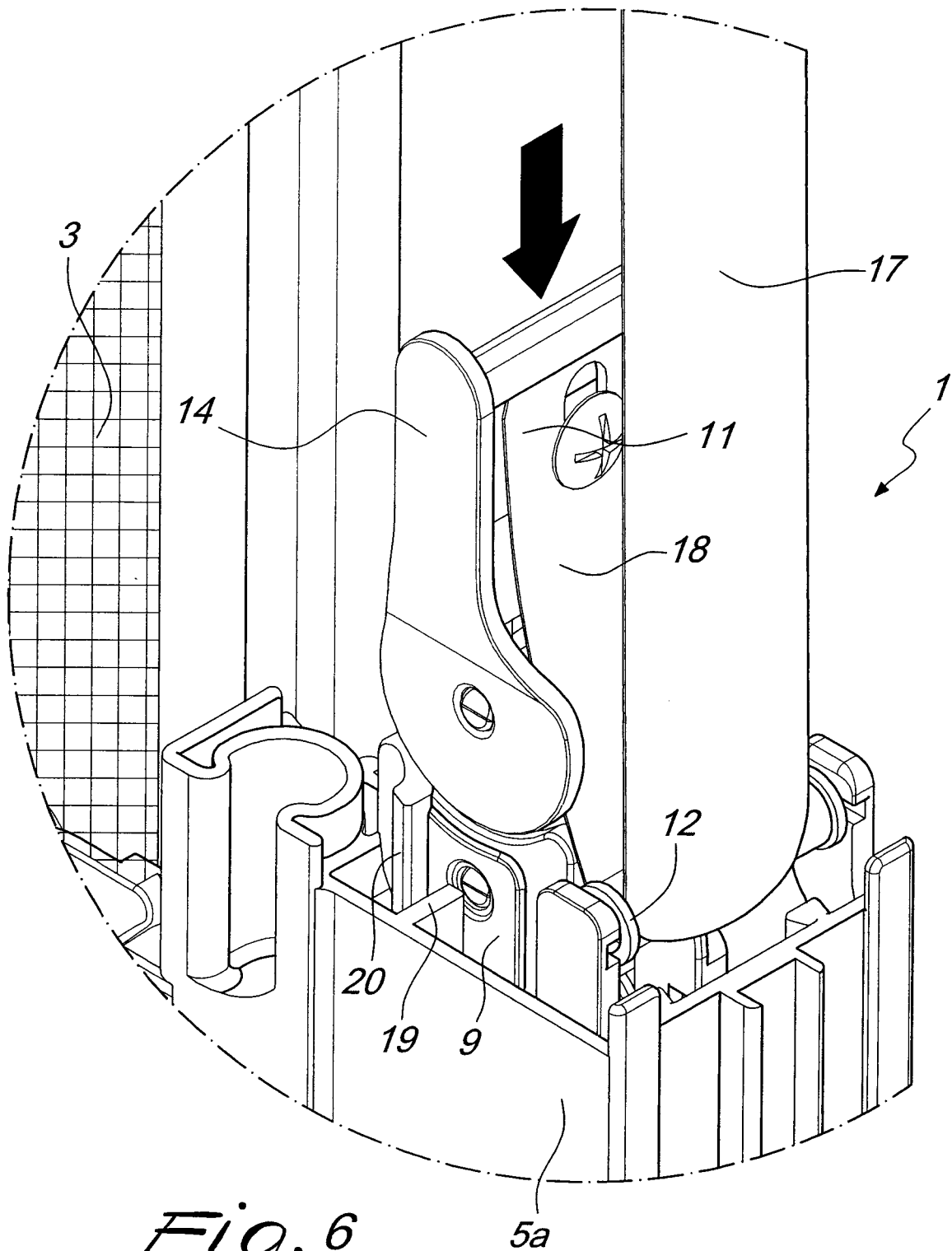
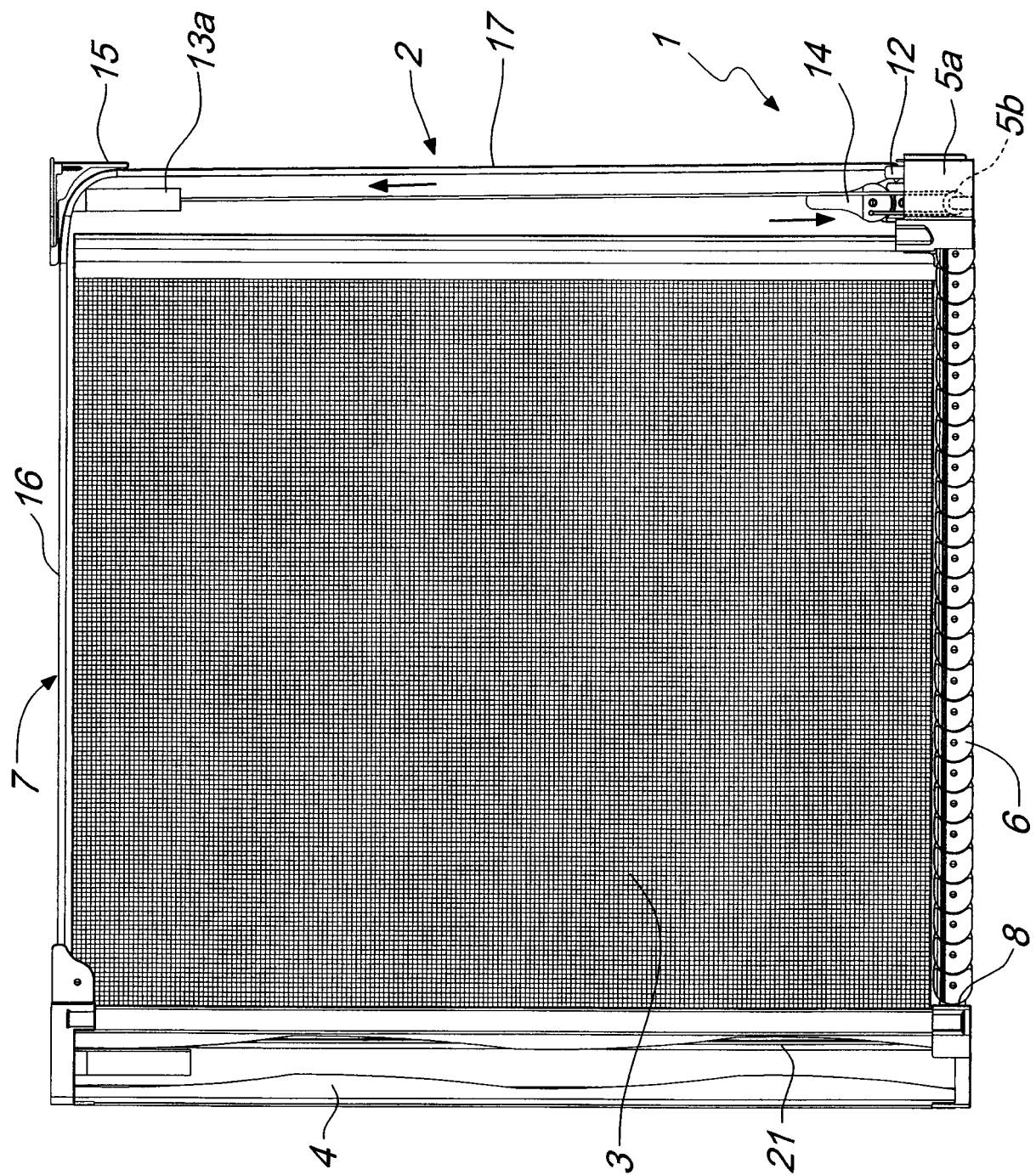
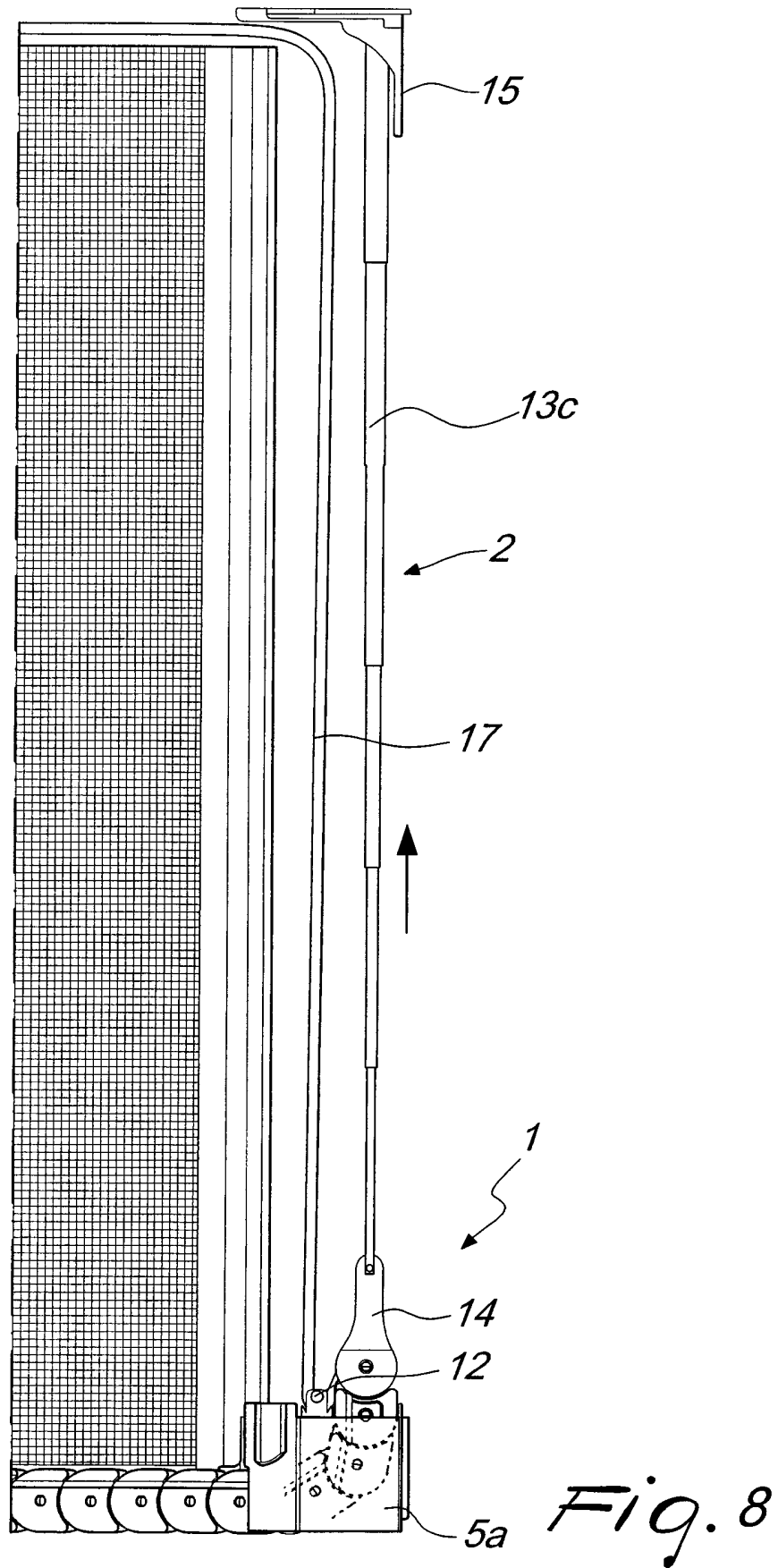


Fig. 5





7. 6. 17



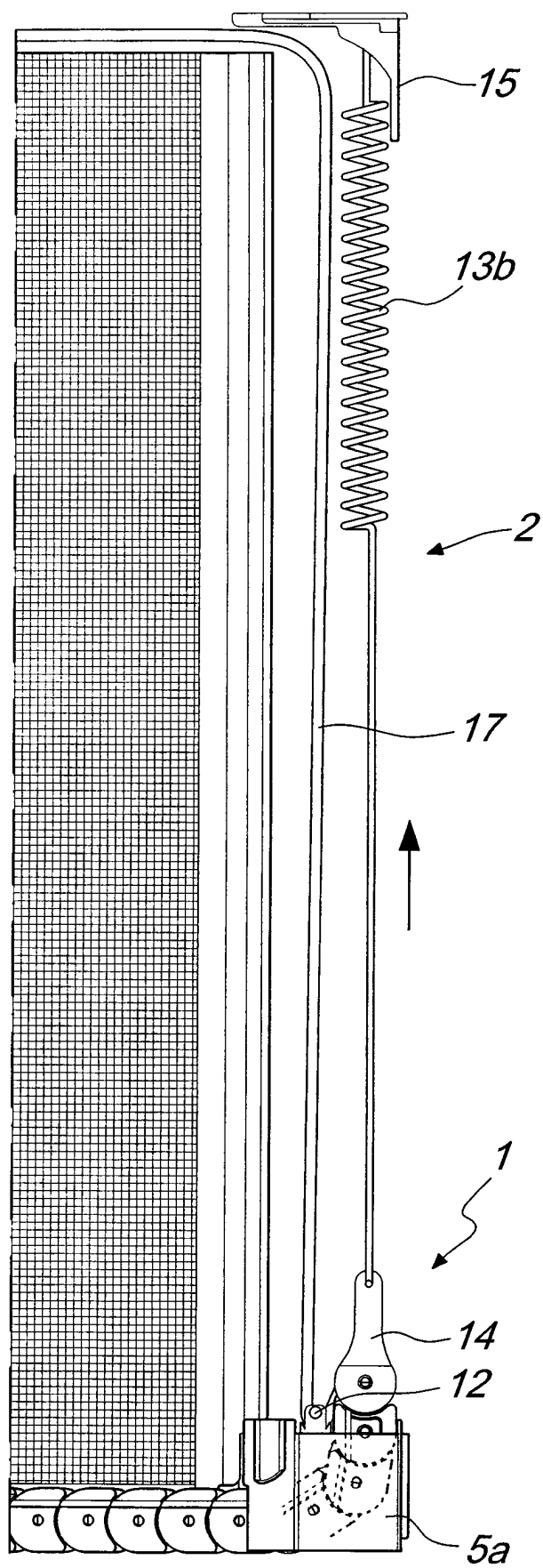


Fig. 9

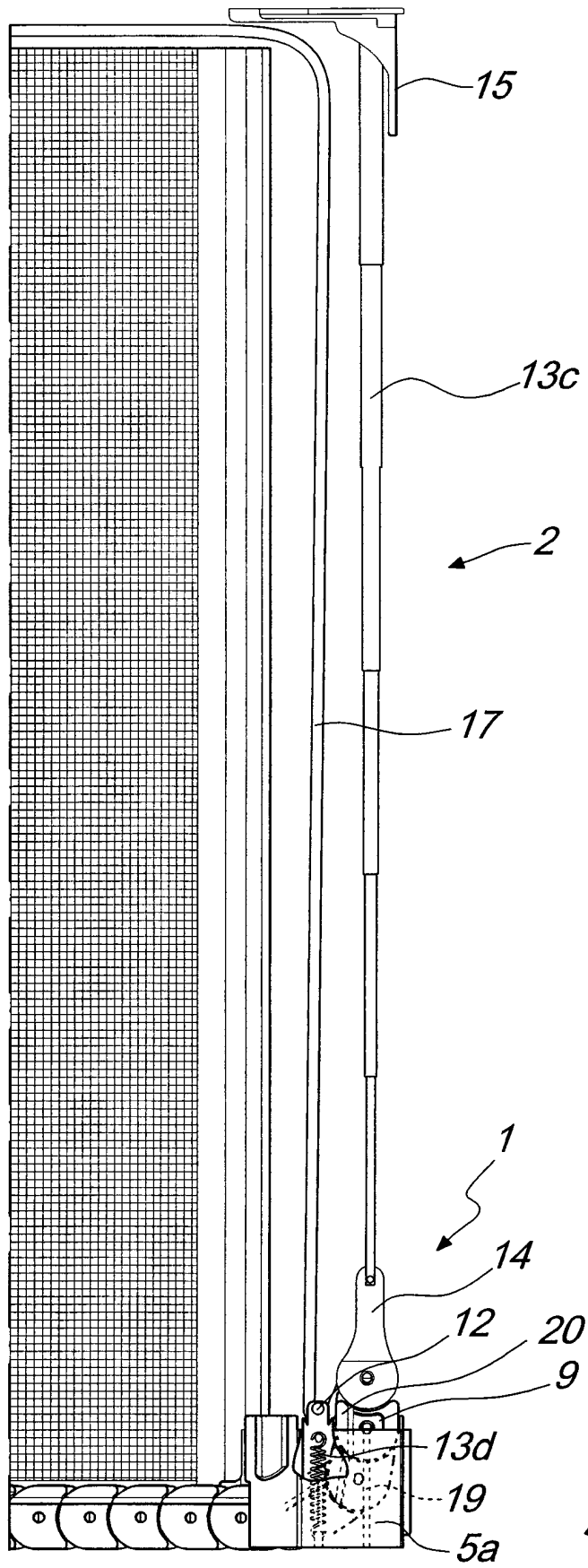


Fig. 10

REFERENCES CITED IN THE DESCRIPTION

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