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(54) **STRETCHING DEVICE FOR A ROLLER CURTAIN**

VORHANGSDEHNUNGSVORRICHTUNG FÜR EINEN ROLLVORHANG

DISPOSITIF D'ÉTIRAGE DE POUR UN STORE

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Description

Field of the invention

[0001] The present invention relates to the field of curtains, such as curtains and sun curtains for outside, in particular of the type that is wound about a winding roller.

[0002] In particular, the invention relates to a stretching device for roller curtains.

Description of the prior art

[0003] As known, a great variety of curtains exists, in particular of roller curtains, i.e. of curtains that are able to move from a rest configuration, in which they are wound about a winding roller, to an operative configuration, in which they are, instead, unwound from the winding roller, in such a way to close an aperture, for example a window, a door, but also a space between two uprights of a support structure such as a gazebo, a pergola, or a canopy. Generally, the roller curtains of prior art, at the free end, i.e. at the end that is not fixed to the winding roller, are "made heavy" by a bar, or end bar. This, besides of assisting the unwinding of the curtain from the winding roller, is also used for engaging the curtain to two lateral guides arranged at opposite sides of the curtain. More precisely, the opposite end portions of the end bar are slidably engaged into respective lateral guides.

[0004] In particular, the roller curtains are usually used in outside environments as barriers against the atmospheric agents, in particular the wind and the sun, and, therefore, have the drawback that, when they are arranged in the operative configuration, i.e. when they are unwound from the winding roller, are exposed to the atmospheric agents, in particular the wind, but also the rain, the snow, etc.

[0005] Many solutions have been adopted in order to solve the above mentioned drawback, and, therefore, in order to prevent that the curtain can be moved from the correct operative position, owing to a sudden wind blow, or to a particularly strong rain, and causing an unwanted "knocking" of the curtain that can cause damages to the curtain same, besides of compromising its main function, i.e. to form a barrier between a determined environment and the atmospheric agents.

[0006] A solution adopted provides to equip the lateral guides, at which the opposite end portions of the end bar slide, with bristles, i.e. with elements having a high friction, in order to contrast, a sudden blow of wind. However, this solution is not satisfactory, because, a modest wind is sufficient in order to win the friction produced by the above mentioned bristles and causes the curtain to exit the lateral guides.

[0007] Other solutions adopted provide to block the end bar by means of pawls, bolts, or similar locking devices.

[0008] However, this solution, besides not being particularly effective and able to satisfactorily solve the prob-

lem, has also an aesthetic impact on the product.

[0009] Analogous drawbacks are noted also in the case in which the curtain provides, at the lateral portions, reinforcement elements, usually round bars, in order to attempt to stiffen the structure.

[0010] In US881507 a system is described for guiding the sliding of the window-screen made of fabric during winding of the same about a winding roller, or the unwinding. The system comprises a bar, about which the screen made of fabric is wound, that is positioned in a first guide channel, which is housed within an outermost second guide channel. The upper portion of the bar is maintained in position by a bracket to which it is fixed by means of rivets. The upper edge of the screen made of fabric is engaged to the bar, at a second turned bracket with respect to the first, and is slidably mounted in the first guide channel in order to allow to unwind the screen made of fabric from the winding roller on which it is wound, or to wind it on the same.

[0011] Another device for tensioning a roller curtain having similar drawbacks is also disclosed in FR2753743.

Summary of the invention

[0012] It is therefore an object of the present invention to provide a stretching device for tensioning a roller curtain that is able to solve the above mentioned drawbacks of the prior art solutions.

[0013] It is in particular an object of the present invention to provide a stretching device for tensioning a roller curtain that can be easily inspected, in such a way to simplify the assembly and installation steps and to carry out ordinary and extraordinary maintenance interventions.

[0014] These and other objects are achieved by the stretching device, according to the invention, for tensioning a roller curtain comprising:

- a flexible curtain;
- a winding/unwinding roller having a support surface and rotatably mounted about a longitudinal rotation axis, said winding/unwinding roller being configured to rotate about the above disclosed longitudinal rotation axis in a first direction of rotation to cause the unwinding of said flexible curtain from said support surface up to obtain an unwound configuration, or in a second direction of rotation, opposite to the first, in order to cause the winding of the flexible curtain about said support surface up to obtain a wound configuration, said flexible curtain having a first extremity portion fixed to said support surface, and a second extremity portion opposite to the first;
- an actuation device adapted to cause said winding/unwinding roller to rotate in said first, or in said second, direction of rotation about said longitudinal rotation axis;

the stretching device adapted to move from a rest configuration, to a stretched configuration, said stretching device being configured to exert, in said stretched configuration, a determined stretching force, substantially horizontal, on said flexible curtain, when the flexible curtain is arranged in said unwound configuration, the stretching device comprising:

- at least a hollow containment body defining a housing and having an inlet mouth to reach said housing, said hollow containment body being positioned laterally to said flexible curtain;
- at least a fixed body housed in said housing;
- at least a movable body configured to slide transversally to said flexible curtain and housed within said housing, said movable body being arranged to engage, in use, a lateral portion of said flexible curtain arranged in said housing through said inlet mouth;

whose main characteristic is to provide furthermore:

- at least a tensioning cable having a first end fixed to a support rotatably mounted about a rotation axis, and a second end fixed to said respective fixed body, or fixed to said respective movable body, said tensioning cable being, furthermore, engaged to said movable body and to said fixed body in at least a respective engagement point, said, or each, engagement point being interposed between said first end and said second end, said support being configured to rotate in a first direction of rotation to subject said tensioning cable to a tractive force such to cause said movable body to move from a position distant from said fixed body to a position close to said fixed body, to exert said determined stretching force substantially horizontal on the flexible curtain, which, therefore, is arranged in a laterally stretched configuration.

[0015] Further features of the invention are defined in the dependent claims.

[0016] More precisely, the, or each, engagement point is interposed between the first end and the second end, and, furthermore, an additional actuation device is provided adapted to cause the support to rotate about the rotation axis in a first direction of rotation to cause the, or each, tensioning cable to be wound about the support, in such a way that the cable is subjected to a determined tractive force adapted to cause the movable body to it engaged, to move from the distant position to the close position with respect to said respective fixed body.

[0017] In particular, furthermore, a plurality of guide members can be provided adapted to define a predetermined path for the, or each, tensioning cable. More in particular, the, or each, path defined by the guide members passes through the, or each, engagement point. More in detail, the, or each, tensioning cable and the above mentioned plurality of guide members are config-

ured to exert at the, or each, engagement point, the above mentioned substantially horizontal force on the movable body and, therefore, a lateral stretching force that is substantially uniform on the flexible curtain.

[0018] Advantageously, a first support is provided configured to rotate about a first rotation axis to wind/unwind the first tensioning cable, and a second support configured to rotate about a second rotation axis to wind/unwind said second tensioning cable.

[0019] Preferably, the first and the second support are positioned at opposite sides with respect to the flexible curtain and are operatively connected to each other in such a way that they can be simultaneously actuated.

[0020] In particular, the first and the second support can be rotatably mounted about a same transmission shaft, at opposite sides.

[0021] Preferably, the second extremity portion of the flexible curtain is fixed to an end bar. More precisely, the end bar is adapted to make the flexible curtain heavy at the second extremity portion, in such a way to maintain it stretched and, therefore, to assist, in particular, the step of winding of the same on the support surface of the winding/unwinding roller.

[0022] In particular, the end bar can have at least an end portion adapted, in use, to engage, free to slide, in a respective inlet mouth of a respective hollow containment body. In this way, the flexible curtain is guided during the winding and unwinding steps on/from the support surface.

[0023] In a possible embodiment of the invention, the, or each, lateral portion of the flexible curtain is engaged, in use, to a support bar. For example, the support bar can be adapted to engage into a slot of which the lateral portion of the flexible curtain is provided.

[0024] Advantageously, the rotation axis of the, or each, support is parallel to the rotation axis of the above mentioned winding/unwinding roller.

[0025] Preferably, at least a return elastic member is, furthermore, provided configured to elastically oppose the displacement of said, or each, movable body from the distant position to the close position with respect to the respective fixed body. In particular, the, or each, return elastic member is adapted to bring the, or each, movable body back from the close position to the distant position with respect to the respective fixed body, when the stretching device is brought from the stretched configuration back to the rest configuration.

[0026] In a preferred embodiment, the, or each, fixed body, and/or the, or each, movable body and/or the, or each, hollow containment body is an extruded profile which extends laterally to the flexible curtain.

[0027] In particular, the, or each, fixed body, and/or the, or each, movable body and/or the, or each, hollow containment body, and/or the, or each, support bar, can extend substantially for the whole length of the flexible curtain arranged in the unwound configuration.

[0028] Advantageously, the above mentioned tensioning cable has an end fixed to an additional winding/un-

winding roller and another end fixed to the fixed body, or to the movable body, of the stretching device. More precisely, when the tensioning cable is wound about the additional winding/unwinding roller, it is subjected to a determined tractive force, which causes the movable body to move towards the fixed body. Therefore, the flexible curtain is subjected to the above mentioned stretching force.

[0029] In a possible embodiment, both the first and the second tensioning cable are rotatably mounted about the same additional winding/unwinding roller, at opposite sides.

[0030] Advantageously, an actuation device is provided configured to selectively cause the winding/unwinding roller to rotate about the longitudinal rotation axis in the first direction of rotation, or in the second direction of rotation.

[0031] In particular, an additional actuation device can be, furthermore, provided configured to selectively cause, as above described, the additional winding/unwinding roller to rotate about its longitudinal rotation axis in a first direction of rotation, in order to cause the winding of the tensioning cable about the additional winding/unwinding roller, and therefore in order to subject the flexible curtain to the above mentioned stretching force, or otherwise in the opposite direction of rotation, in order to bring the tensioning cable in the rest configuration.

Brief description of the drawings

[0032] The invention will now be shown with the following description of its exemplary embodiments, exemplifying but not limitative, with reference to the attached drawings in which:

- Fig. 1 diagrammatically shows an elevational front view of a first embodiment of the stretching device, according to the invention, for a roller curtain;
- Figs. 2 and 3 show in detail two sectioned views according to a horizontal plane and two possible embodiments of the stretching device for roller curtains according to the invention,;
- Fig. 4 shows a partial perspective view of the stretching device for roller curtains of figure 1;
- Fig. 5 diagrammatically shows an alternative embodiment of the stretching device for roller curtains of figure 1;
- Figs. 6 and 7 diagrammatically show sectioned views according to a horizontal plane of the stretching device for roller curtains of figure 5, respectively in a rest configuration, and in a stretched configuration;
- Fig. 8 diagrammatically shows a partial perspective view of an alternative embodiment of the stretching device, according to the invention, for roller curtains;
- Fig. 9 diagrammatically shows a transversal sectioned view of the stretching device of figure 8;
- Figs. 10 and 11 show plan views of an alternative embodiment of the invention for the hollow contain-

ment body, respectively in an assembled configuration, and in an open configuration.

Detailed description of some exemplary embodiments of the invention

[0033] As diagrammatically shown in figure 1, a system 100 for tensioning roller curtains 50, of the type made of a flexible material, in particular a plastic material, such as PVC, or a fabric, in case covered by a film of plastic material, in particular in order to make them waterproof, provides a winding/unwinding roller 10 rotatably mounted about a longitudinal rotation axis 110. In particular, the flexible curtain 50 has a first extremity portion 51a fixed to the support surface 11 of the winding/unwinding roller 10 and a second extremity portion 51b opposite to the first. More in detail, the winding/unwinding roller 10 is configured to rotate about the above mentioned longitudinal rotation axis 110, in a first direction of rotation in order to cause the flexible curtain 50 to be unwound from the support surface 11 up to obtain an unwound configuration (see figure 1), or in a second direction of rotation, opposite to the first direction of rotation, in order to cause the flexible curtain 50 to be wound about the support surface 11, up to obtain a wound configuration. An actuation device 60 is, furthermore, provided adapted to cause the winding/unwinding roller 10 to rotate in the first, or in the second direction of rotation, about the rotation axis 110. More precisely, the actuation device 60 can be an electric motor, or a capstan manually operated, provided with a handle, or an analogous device.

[0034] The system 100 is, then, provided of a stretching device 40 configured to move from a rest configuration, in which it does not exert any force on the flexible curtain 50, to a stretched configuration, in which it is adapted to exert a determined stretching force, in particular a horizontal force, on the flexible curtain 50, when this is arranged in the unwound configuration of figure 1, or 5. According to the invention, the above mentioned stretching device 40 provides a hollow containment body 30 positioned laterally to the above mentioned flexible curtain 50 and defining a housing 35. In particular, the hollow containment body 30 can be provided of an inlet mouth 31, through which it is possible to reach the inside of the housing 35. Into the housing 35 at least a fixed body 41 is provided, in particular fixed to the hollow containment body 30 and, therefore, to a fixed support, such as a wall, or a vertical upright of a support structure, to which the containment body 30 is fixed. More in particular, within the housing 35 a movable body 42 can be also provided engaged, in use, to a respective lateral portion 55 of the flexible curtain 50. In particular, the movable body 42 is slidingly mounted, in such a way to slide along a sliding direction 140 (see figure 4). In particular, the sliding direction 140 is orthogonal to the winding/unwinding direction of the flexible curtain 50, in such a way to exert the above mentioned horizontal force on the curtain 50.

[0035] In an embodiment of the invention shown in detail in the figures 2 and 3, the lateral portion 55 of the flexible curtain 50 can provide a slot 52. More precisely, the slot 52 can be used to engage a support bar 85 to the lateral portion 55 of the flexible curtain 50. The support bar, in particular, extends laterally to the flexible curtain 50, in the case that is shown in figure along a substantially vertical direction, and it is mounted within the hollow containment body 30. More in particular, in an embodiment of the invention, the support bar 85 is slidingly mounted within a seat 142, of which the movable body 42 is provided. In this case, therefore, the movable body 42, advantageously, provides an opening 62, in which, in use, the lateral portion 55 of the flexible curtain 50 is positioned. In other words, the support bar 85 is engaged to the movable body 42, by means of the flexible curtain 50 that is engaged, also this, to the movable body 42 same, at the lateral portion 55. Therefore, when the movable body 42 is actuated by the stretching device 40 to slide towards the fixed body 41, or in the opposite direction, also the support bar 85 moves in the same direction and, therefore, the flexible curtain 50, engaged to it, is arranged in the stretched configuration, or in the rest configuration, respectively.

[0036] According to the invention, the stretching device 40 provides at least a tensioning cable 45 engaged to the movable body 42 in at least an engagement point Pm, for example in 2 engagement points Pm1 and Pm2. More precisely, the tensioning cable 45 is configured to cause a motion, in particular a transversal translation, to the flexible curtain 50, of the movable body 42 in order to move it from a position distant from the fixed body 41, in which no horizontal stretching force is exerted on the flexible curtain 50, which is, therefore, arranged in a rest configuration, to a position close to the fixed body 41, in which the tensioning cable 45 is adapted to exert a determined substantially horizontal force on the movable body 42 that causes the flexible curtain 50 to be laterally stretched, and, therefore, arranged in a laterally stretched configuration. Unlike the prior art solutions, the present invention, allows to guarantee that the flexible curtain 50, when this is arranged in the unwound configuration, is maintained stretched and, therefore, in a correct operative position and it is avoided, in particular, that a sudden blow of wind can cause damages, or that the exiting from the lateral guides, if these are present.

[0037] According to an embodiment of the invention, at least one between the above mentioned fixed body 41 and the above mentioned movable body 42 is an elongated element extending laterally to the flexible curtain 50, substantially for the whole of its length. Advantageously, the hollow containment body 30 can be an extruded profile, in particular made of metallic material, or made of plastic material, which extends laterally to the curtain, substantially for the whole length. Advantageously, at least one between the above mentioned fixed body 41 and the above mentioned movable body 42 can be an extruded profile, in particular made of metallic ma-

terial, or made of plastic material. Furthermore, the possibility is provided that the fixed body 41 is a section bar having substantially a C-shaped cross section fixed by means of screws, bolts, or similar elements, to the hollow containment body 30 (figure 2). Alternatively, the fixed body 41 and the hollow containment body 30 can be a single piece, for example produced by extrusion of metallic material, or plastic material (figure 3).

[0038] The second extremity portion 51b of the flexible curtain 50 is advantageously fixed to an end bar 150. In particular, the end bar 150 has essentially the function to make the flexible curtain 50 heavy at the second extremity portion 51b, in such a way to assist the unwinding of the curtain 50 from the support surface 11 of the winding/unwinding roller 10.

[0039] In the preferred embodiment shown, for example, in figure 1, the tensioning cable 45 has a first end 46 fixed to a support 20 rotatably mounted about a rotation axis 120, and is engaged to the other point Pf, for example a second end 47, to the fixed body 41, and to the movable body 42 at another engagement point Pm. In particular, many engagement points, for example 2 engagement points Pm1 and Pm2, can be provided, at which the tensioning cable 45 is adapted to exert a force, which has a substantially horizontal component, on the movable body 42. This force is, then, transmitted from the movable body 42 to the support bar 85 that is engaged to it, and, therefore, to the flexible curtain 50, which is, instead, engaged to the support bar 85 at slot 52. The engagement points Pm1 and Pm2 are both interposed, in this case, between the first and the second end 46 and 47 of cable 45. In the case shown by way of example in figure 1, the tensioning cable 45 is engaged to the fixed body 41 at five points Pf1-Pf5. Furthermore, an additional actuation device 70 is provided that can be, for example, an electric motor, or otherwise a capstan manually operated, or a similar device, adapted to cause the support 20 to rotate about the rotation axis 120, in a first direction of rotation, or in the opposite direction of rotation. More in detail, the rotation of support 20 about the rotation axis 120 in the first direction of rotation, causes the winding of the tensioning cable 45 about support 20. In this way, the tensioning cable 45 is subjected to a determined tractive force that is transmitted to the movable body 42 at the engagement point, or points, Pm1, Pm2. This causes, therefore, the displacement of movable body 42 from the distant position to the close position with respect to the fixed body 41 and therefore the positioning of curtain 50 in the above mentioned stretched configuration.

[0040] As diagrammatically shown, for example in figure 1, a plurality of guide members 48, 49, for example idler pins, or similar elements as for example idler pulleys, is provided adapted to define a predetermined path for the tensioning cable 45 between the ends 46 and 47. The tensioning cable 45 can be advantageously made of an elastic material, or it can be integral to at least an elastic body 45', for example at least a linear spring.

[0041] More precisely, the above mentioned path

passes through the, or each, engagement point Pm1, Pm2, at which the cable 45 engages the movable body 42, in order to exert the above mentioned substantially horizontal force, which causes the flexible curtain 50 to be laterally stretched, as well as through the, or each engagement point Pf1, Pf2, at which the cable 45, instead, engages the fixed body 41. In the example shown in figure 4, both the guide members 48a fixed to the fixed body 41, and the guide members 49a fixed to the movable body 42 are provided. In the exemplary embodiment shown in figure 4, the guide members 48a are fixed to the fixed body 41 at protruding portions substantially shaped as two wings 44a and 44b, of which it is provided. Analogously, the guide members 48, 49 are fixed to the movable body 42 at protruding portions 43a and 43b, also these, for example, shaped as lateral wings. However, other solutions are possible.

[0042] In the preferred embodiment of the invention shown in the figures from 5 to 7, the stretching device 40 provides a first and a second hollow containment body 30a and 30b arranged at opposite sides with respect to the flexible curtain 50. More precisely, each hollow containment body 30a, or 30b, is adapted to define a housing 35a, or 35b, within each of which a fixed body 41a, 41b and a movable body 42a, 42b, are provided. More precisely, the stretching device 40 provides a first movable body 42a adapted to engage, in use, a first lateral portion 55a of flexible curtain 50, and a second movable body 42b adapted to engage, in use, a second lateral portion 55b at the opposite side with respect to the first movable body 42a. In this case, advantageously, a first and a second tensioning cable 45a and 45b are provided. Each tensioning cable 45a and 45b is configured to be wound/unwound about/from a first support 20a and a second support 20b, respectively. Each support 20a, 20b is rotatably mounted about a rotation axis 120a, 120b in such a way that, analogously to what above described with reference to the case of a single tensioning cable 45, it can apply a determined horizontal stretching force, respectively, on a first and a second movable body 42a and 42b, respectively, at engagement points P1a, P2a, and P1b, P2b in order to cause a motion between a position close, and a position distant, respectively, with respect to a first and to a second fixed body 41a, 41b.

[0043] In particular, the first and the second support 20a, 20b can be rotatably mounted about a same transmission shaft 130, at opposite sides, in such a way to be simultaneously actuated to rotate about a same rotation axis 120. In this way, it is guaranteed that the two tensioning cables 45a and 45b are simultaneously subjected substantially to the same tractive force, and therefore, that they can exert, at the engagement points Pmia, Pmib, with $i=1...n$, of the opposite lateral portions 55a and 55b of curtain 50, substantially the same stretching force. Therefore, this guarantees to maintain the curtain 50 in a correct stretched configuration, in which the curtain same is perfectly stretched. Therefore, it is avoided that, during the use of the curtain, i.e. when it is arranged

in the unwound configuration, folds can be formed, and it is, therefore, guaranteed that the curtain 50 correctly "reacts" to sudden blows of wind, in such a way to prevent damages, or that the curtain is moved from the correct operative position.

[0044] Advantageously, the above mentioned end bar 150, at the opposite end portions 151 and 152, is adapted to engage, free to slide, respective inlet mouths 31a and 31b of the hollow containment bodies 30a and 30b. Practically, therefore, the hollow containment bodies 30a and 30b act as lateral guides during winding and unwinding of flexible curtain 50. More in detail, at the opposite end portions 151 and 152, the end bar 150 can provide engagement portions, for example of removable type, 156 and 157. These can be made of a different material with respect to the one of the bar 150, for example a plastic material, e.g. PVC, nylon or similar materials. As diagrammatically shown in figure 8, the flexible curtain 50 can be engaged to the end bar 150 at a longitudinal slit 155, which extends, advantageously, for the whole of its length, i.e. between the end portions 151 and 152, and if the end portions 156 and 157 are present for the whole length of these too.

[0045] Advantageously, at least a return elastic member 65 is, furthermore, provided, for example one, or more, spiral spring, adapted to oppose the displacement of the, or each, movable body 42 from the position distant from the respective fixed body 41 to the close position. In other words, in order to move the movable body 42 from the distant position to the position close to the fixed body 41, it is necessary to win the elastic force exerted by the, or each, return element 65. Once the stretching device 40 is, instead, brought back in the rest configuration, in which it does not exert the above mentioned horizontal stretching force on the flexible curtain 50, the return elastic element 65 brings the movable body 42, or each movable body 42a, 42b back in the above mentioned position distant from the fixed body 41, or from the respective fixed body 41a, 41b, that means that the return occurs from the condition shown in figure 7 to the condition shown in figure 6, in which the flexible curtain 50 is not horizontally stretched.

[0046] As shown in detail in the figures 8 and 9, the, or each, movable body 42 can be positioned above a respective base body 90 free to slide with respect to it. More in detail, the, or each, base body 90 is a fixed body, and is provided of a slot hole 95 arranged along the sliding direction 140, within which, in use, the support bar 85 is slidably engaged. In a possible embodiment, the base body 90 has a substantially "C-shaped" cross section, and the support bar 85 provides an enlarged portion 92, for example by a nut, a flat washer, or the like, having a diameter greater than the slot hole 95 and is arranged, in use, at the opposite side of the movable body 42 with respect to the base body 90 (figure 9). In this way, the support bar 85, besides of being able to slide along the sliding direction 140, is at least in part free to slide along a direction 185 substantially orthogonal to the sliding di-

rection 140. In particular, the stroke of the support bar 85 along direction 185 is defined between the upper wall 91 of the base body 90 and a base surface 71. At this regard, it is suitable to explain that the hollow containment body 30 as well as the other components above disclosed, in particular the base body 90, can be mounted on a base plate 75 provided of the above mentioned base surface 71.

[0047] Another alternative embodiment of the invention is, finally, shown in the figures 10 and 11. In this case, the hollow containment body 30 provides a first and a second part 131 and 132, respectively provided of mutual engagement members 133 and 134, which allow the positioning between an assembled configuration in which a mutual firm engagement is carried out (figure 10), and an open configuration, in which the two parts 131 and 132 are disengaged (figure 11). In particular, the mutual engagement members 133 and 134 can provide at least an engagement portion 134, for example a teeth, provided at the second part 132, and adapted to snap-engage a free portion 133 of the first part 131. This solution allows to obtain a hollow containment body 30 that can be easily inspected. In this way, not only both the ordinary and extraordinary maintenance interventions are simplified, but also the steps of assembly and installation of the whole system 100. What above described for the case in which the, or each, movable body 42, or 42a, and 42b, is provided constrained to the lateral portion 55, or 55a, and 55b, of the flexible curtain 50 through the slot 52, or 52a and 52b, and the support bar 85, engaged to it, is to be considered valid also in the case in which the movable body 42, or 42a, and 42b, is constrained to the above mentioned lateral portion by using a different solution, for example by the so called "zip" system.

[0048] In an embodiment of the invention not shown in the figures, the, or each, movable body 42 is slidingly mounted on a guide arranged along the above mentioned sliding direction 140.

[0049] Even though in the figures from 1 to 10, a structure is shown having substantially vertical development, the stretching device 40, and the corresponding tensioning system 100, according to the present invention, can be also used to stretch a flexible curtain 50, which, in operative conditions, is arranged on a substantially horizontal plane, i.e. also in the case of a flexible curtain 50 that is used in support structures such as canopy colonnades, gazebos, and the like.

Claims

1. A stretching device (40) for tensioning a roller curtain (50), the roller curtain comprising:

- a flexible curtain (50);
- a winding/unwinding roller (10) having a support surface (11) and rotatably mounted about

a longitudinal rotation axis (110), said winding/unwinding roller (10) being configured to rotate about the above mentioned longitudinal rotation axis (110) in a first direction of rotation to cause said flexible curtain (50) to be unwound from said support surface (11) up to obtain an unwound configuration, or in a second direction of rotation, opposite to the first, in order to cause the flexible curtain (50) to be wound about said support surface (11) up to obtain a wound configuration, said flexible curtain (50) having a first extremity portion (51a) fixed to said support surface (11) and a second extremity portion (51b) opposite to the first extremity portion (51a);

- an actuation device (60) arranged to cause said winding/unwinding roller (10) to rotate in said first, or in said second, direction of rotation about said longitudinal rotation axis (110);

said stretching device (40) being arranged to move from a rest configuration, to a stretched configuration, said stretching device (40) being configured to exert, in said stretched configuration, a determined stretching force, substantially horizontal, on said flexible curtain (50), when said flexible curtain (50) is arranged in said unwound configuration, said stretching device (40) comprising:

- at least a hollow containment body (30) defining a housing (35) and having an inlet mouth (31) to reach said housing (35), said hollow containment body (30) being positionable laterally to said flexible curtain (50) ;
- at least a fixed body (41) housed, in use, in said housing (35) ;
- at least a movable body (42) configured to slide transversally to said flexible curtain (50) and housed within said housing (35), said movable body (42) being arranged to engage, in use, a lateral portion (52) of said flexible curtain (50) positioned through said inlet mouth (31);

said stretching device (40) being **characterised in that** it further comprises:

- at least a tensioning cable (45,45a,45b) having a first end (46, 46a, 46b) fixed to a support (20, 20a, 20b) rotatably mounted about a rotation axis (120, 120a, 120b) and a second end (47,47a,47b) fixed to said respective fixed body (41,41a,41b), or fixed to said respective movable body (42,42a,42b) of said tensioning device (40), said tensioning cable (45, 45a, 45b) being engaged to said fixed body (41) and to said movable body (42) in at least a respective engagement point (Pf, Pm), said, or each, engagement point (Pf,Pm) being interposed between said first end (46,46a,46b) and said second end

(47,47a,47b), said support (20, 20a, 20b) being configured to rotate about said rotation axis (120, 120a, 120b) in a first direction of rotation to subject said tensioning cable (45, 45a, 45b) to a tractive force such that it causes said movable body (42) to move from a position distant from said fixed body (41), to a position close to said fixed body (41), in order to exert said determined substantially horizontal stretching force on said flexible curtain (50), which is, therefore, arranged in a laterally stretched configuration.

2. The stretching device (40) for tensioning a roller curtain (50), according to claim 1, and furthermore providing:

- a first hollow containment body (30a) defining a first housing (35a) and having an inlet mouth (31a) to reach said first housing (35a), said first hollow containment body (30a) being positioned at a first side with respect to said flexible curtain (50);
- a first fixed body (41a) housed in said first housing (35a);
- a first movable body (42a) configured to slide transversally to said flexible curtain (50) and housed within said first housing (35a), said first movable body (42a) being arranged to engage, in use, a first lateral portion (52a) of said flexible curtain (50) that is positioned through said inlet mouth (31a);
- a second hollow containment body (30b) defining a second housing (35b) and having an inlet mouth (31b) to reach said second housing (35b), said second hollow containment body (30b) being positioned at a second side, opposite to the first side, with respect to said flexible curtain (50);
- a second fixed body (41b) housed in said second housing (35b);
- a second movable body (42b) configured to slide transversally to said flexible curtain (50) and housed within said second housing (35b), said second movable body (42b) being arranged to engage, in use, a second lateral portion (52b) of said flexible curtain (50) positioned through said inlet mouth (31b);

and wherein are, furthermore, provided:

- a first and a second tensioning cable (45a,45b) respectively engaged to said first and to said second fixed body (41a, 41b) in at least an engagement point (Pfa, Pfb), and to said first and to said second movable body (42a, 42b) in at least a respective engagement point (Pma, Pmb), each said first and second tensioning ca-

ble (45a, 45b) having a first end (46a, 46b) fixed to a respective support (20a, 20b) rotatably mounted about a rotation axis (120a, 120b), said respective support (20a, 20b) being configured to rotate about said rotation axis (120a, 120b) in a first direction of rotation to cause, respectively, said first and said second movable body (42a, 42b) to move from a distant position, respectively, from said first and said second fixed body (41a, 41b), to a close position in such a way to subject said flexible curtain (50) to a lateral stretch at the respective side.

3. The stretching device (40) for tensioning a roller curtain (50), according to any previous claim, wherein an additional actuation device (70) is, furthermore, provided configured to operate said rotation of said support (20, 20a, 20b) about said rotation axis (120, 120a, 120b) in a first direction of rotation to cause said, or each, tensioning cable (45, 45a, 45b) to be wound about said support (20, 20a, 20b).
4. The stretching device (40) for tensioning a roller curtain (50), according to claim 1, wherein at said, or each, engagement point (Pf, Pm) a respective guide member (48, 48a, 48b, 49a, 49b) is provided in such a way to define a predetermined path for said, or each, tensioning cable (45, 45a, 45b) passing through said engagement points (Pf, Pm), said, or each, tensioning cable (45, 45a, 45b) and said plurality of guide members (48, 48a, 48b, 49a, 49b) being configured to exert at said, or each, engagement point (Pma, Pmb), said substantially horizontal force on said movable body (42).
5. The stretching device (40) for tensioning a roller curtain (50), according to claim 1 wherein a first support (20a) configured to rotate about a first rotation axis (120a) to wind/unwind said first tensioning cable (45a), and a second support (20b) configured to rotate about a second rotation axis (120b) to wind/unwind said second tensioning cable (45b) are provided, said first and second support (20a,20b) arranged at opposite sides with respect to said flexible curtain (50) and being operatively connected in such a way to be simultaneously operated.
6. The stretching device (40) for tensioning a roller curtain (50), according to claim 5, wherein said first and said second support (20a, 20b) are rotatably mounted about a same transmission shaft (130), at opposite sides.
7. The stretching device (40) for tensioning a roller curtain (50), according to any previous claim, wherein, at least a return elastic member (65) is provided configured to elastically oppose the displacement of said, or each, movable body (42, 42a, 42b) from said

distant position to said close position to the respective fixed body (41, 41a, 41b), said, or each return elastic member (65) being arranged to bring said, or each, movable body (42, 42a, 42b) back from said close position to said close position with respect to the respective fixed body (41, 41a, 41b), when said stretching device (40) is brought back from said stretched configuration to said rest configuration.

8. The stretching device (40) for tensioning a roller curtain (50), according to any previous claim, wherein said hollow containment body (30) comprises a first and a second part (131, 132), respectively provided of mutual engagement members (133, 134) of removable type, whereby said first and said second part (131, 132) of said hollow containment body (30) are able to move between an assembled configuration, in which they are firmly engaged, and an open configuration, in which they are disengaged.
9. The stretching device (100) for tensioning a roller curtain (50), according to any previous claim, wherein said, or each, fixed body (41, 41a, 41b), said, or each, movable body (42, 42a, 42b), and said, or each, hollow containment body (30, 30a, 30b) is an extruded profile which extends laterally to said flexible curtain (50) arranged in said unwound configuration, substantially for the whole of its length.
10. The stretching device (40) for tensioning a roller curtain (50), according to any previous claim, wherein said, or each, movable body (42) is slidingly mounted along a sliding direction (140) orthogonal to an unwinding/winding direction of said flexible curtain (50), in such a way to exert on it said substantially horizontal force.
11. The stretching device (40) for tensioning a roller curtain (50), according to claim 10, wherein said, or each, movable body (42) is positioned above a respective base body (90) free to slide with respect to it, said, or each, base body (90) being provided with a slot hole (95) arranged along said sliding direction (140) within of which, in use, it is arranged to slidingly engage a support bar (85).
12. The stretching device (40) for tensioning a roller curtain (50), according to any previous claim, wherein said, or each, movable body (42, 42a, 42b) is slidingly mounted on a guide positioned along said sliding direction (140).
13. The stretching device (40) for tensioning a roller curtain (50), according to any previous claim, wherein, said second extremity portion (51b) of said flexible curtain (50) is fixed to an end bar (150), said end bar (150) having at least an end portion (151, 152), arranged, in use, to engage free to slide in a respective

inlet mouth (31a, 31b) of a respective hollow containment body (30a, 30b).

14. The stretching device (40) for tensioning a roller curtain (50), according to claim 13, wherein, at said opposite end portions (151, 152), said end bar (150) provides engagement portions of removable type (156, 157) arranged to be engaged, respectively, in said first and in said second inlet mouth (31a, 31b) of said first and of said second hollow containment body (30a, 30b), said end bar (150) and said end portions (156, 157) providing a longitudinal slit (155) at which said flexible curtain (50) is arranged to engage.
15. A system (100) for tensioning a roller curtain (50) **characterised in that** it comprises a roller curtain (50) comprising:
 - a flexible curtain (50);
 - a winding/unwinding roller (10) having a support surface (11) and rotatably mounted about a longitudinal rotation axis (110), said winding/unwinding roller (10) being configured to rotate about the above mentioned longitudinal rotation axis (110) in a first direction of rotation to cause said flexible curtain (50) to be unwound from said support surface (11) up to obtain an unwound configuration, or in a second direction of rotation, opposite to the first, in order to cause the flexible curtain (50) to be wound about said support surface (11) up to obtain a wound configuration, said flexible curtain (50) having a first extremity portion (51a) fixed to said support surface (11) and a second extremity portion (51b) opposite to the first extremity portion (51a);
 - an actuation device (60) arranged to cause said winding/unwinding roller (10) to rotate in said first, or in said second, direction of rotation about said longitudinal rotation axis (110);
 - and a stretching device (40) for tensioning the roller curtain according to any claim from 1 to 14.

45 Patentansprüche

1. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50), der Rollvorhang umfassend:
 - einen flexiblen Vorhang (50);
 - eine Auf-/Abwickelrolle (10), die eine Stützfläche (11) aufweist und drehbar um eine Längsdrehachse (110) montiert ist, wobei die Auf-/Abwickelrolle (10) konfiguriert ist, um um die oben erwähnte Längsdrehachse (110) in einer ersten Drehrichtung zu drehen, um zu bewirken, dass der flexible Vorhang (50) von der Stützfläche (11) abgewickelt wird, bis eine abgewickelte

Konfiguration erlangt ist, oder in einer zweiten Drehrichtung, die der ersten entgegengesetzt ist, um zu bewirken, dass der flexible Vorhang (50) um die Stützfläche (11) aufgewickelt wird, bis eine aufgewickelte Konfiguration erlangt ist, wobei der flexible Vorhang (50) einen ersten Endabschnitt (51a), der an der Stützfläche (11) befestigt ist, und einen zweiten Endabschnitt (51b), der dem ersten Endabschnitt (51a) entgegengesetzt ist, aufweist;
 - eine Betätigungsverrichtung (60), die angeordnet ist, um zu bewirken, dass die Auf-/Abwickelrolle (10) in die erste oder in die zweite Drehrichtung um die Längsdrehachse (110) dreht;

wobei die Streckvorrichtung (40) angeordnet ist, um sich von einer Ruhekonfiguration in eine gestreckte Konfiguration zu bewegen, wobei die Streckvorrichtung (40) konfiguriert ist, um in der gestreckten Konfiguration eine bestimmte Streckkraft im Wesentlichen horizontal, auf den flexiblen Vorhang (50) auszuüben, wenn der flexible Vorhang (50) in der abgewickelten Konfiguration angeordnet ist, die Streckvorrichtung (40) umfassend:

- mindestens einen hohlen Einschlusskörper (30), der ein Gehäuse (35) definiert und eine Einlassöffnung (31) aufweist, um das Gehäuse (35) zu erreichen, wobei der hohle Einschlusskörper (30) seitlich von dem flexiblen Vorhang (50) positioniert werden kann;
- mindestens einen festen Körper (41), der in der Verwendung in dem Gehäuse (35) untergebracht ist;
- mindestens einen beweglichen Körper (42), der konfiguriert ist, um quer zu dem flexiblen Vorhang (50) zu gleiten und in dem Gehäuse (35) untergebracht ist, wobei der bewegliche Körper (42) angeordnet ist, um in der Verwendung einen seitlichen Abschnitt (52) des flexiblen Vorhangs (50) einzugreifen, der durch die Einlassöffnung (31) positioniert ist;

wobei die Streckvorrichtung (40) **dadurch gekennzeichnet ist, dass** sie ferner Folgendes umfasst:

- mindestens ein Spannseil (45, 45a, 45b), das ein erstes Ende (46, 46a, 46b), das an einer Halterung (20, 20a, 20b) befestigt ist, die drehbar um eine Drehachse (120, 120a, 120b) montiert ist, und ein zweites Ende (47, 47a, 47b), das an dem jeweiligen festen Körper (41, 41a, 41b) oder an dem jeweiligen beweglichen Körper (42, 42a, 42b) der Streckvorrichtung (40) befestigt ist, wobei das Spannseil (45, 45a, 45b) mit dem festen Körper (41) und dem beweglichen Körper (42) an mindestens einem jeweiligen Eingriffspunkt (Pf, Pm) in Eingriff ist, wobei der oder jeder

Eingriffspunkt (Pf, Pm) zwischen dem ersten Ende (46, 46a, 46b) und dem zweiten Ende (47, 47a, 47b) angeordnet ist, wobei die Halterung (20, 20a, 20b) konfiguriert ist, um in eine erste Drehrichtung um die Drehachse (120, 120a, 120b) zu drehen, um das Spannseil (45, 45a, 45b) einer Zugkraft zu unterziehen, sodass es bewirkt, dass der bewegliche Körper (42) sich von einer Position distant von dem festen Körper (41) zu einer Position nahe dem festen Körper (41) zu bewegen, um die bestimmte, im Wesentlichen horizontale Streckkraft auf den flexiblen Vorhang (50) auszuüben, der daher in einer seitlich gestreckten Konfiguration angeordnet ist.

2. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach Anspruch 1 und ferner bereitstellend:

- einen ersten hohlen Einschlusskörper (30a), der ein erstes Gehäuse (35a) definiert und eine Einlassöffnung (31a) aufweist, um das erste Gehäuse (35a) zu erreichen, wobei der erste hohle Einschlusskörper (30a) an einer ersten Seite in Bezug auf den flexiblen Vorhang (50) positioniert ist;
- einen ersten festen Körper (41a), der in dem ersten Gehäuse (35a) untergebracht ist;
- einen ersten beweglichen Körper (42a), der konfiguriert ist, um quer zu dem flexiblen Vorhang (50) zu gleiten und in dem ersten Gehäuse (35a) untergebracht ist, wobei der erste bewegliche Körper (42a) angeordnet ist, um in der Verwendung einen ersten seitlichen Abschnitt (52a) des flexiblen Vorhangs (50) einzugreifen, der durch die Einlassöffnung (31a) positioniert ist;
- einen zweiten hohlen Einschlusskörper (30b), der ein zweites Gehäuse (35b) definiert und eine Einlassöffnung (31b) aufweist, um das zweite Gehäuse (35b) zu erreichen, wobei der zweite hohle Einschlusskörper (30b) an einer zweiten Seite gegenüber der ersten Seite in Bezug auf den flexiblen Vorhang (50) positioniert ist;
- einen zweiten festen Körper (41b), der in dem zweiten Gehäuse (35b) untergebracht ist;
- einen zweiten beweglichen Körper (42b), der konfiguriert ist, um quer zu dem flexiblen Vorhang (50) zu gleiten und in dem zweiten Gehäuse (35b) untergebracht ist, wobei der zweite bewegliche Körper (42b) angeordnet ist, um in der Verwendung einen zweiten seitlichen Abschnitt (52b) des flexiblen Vorhangs (50) einzugreifen, der durch die Einlassöffnung (31b) positioniert ist;

und wobei ferner Folgendes bereitgestellt ist:

- ein erstes und ein zweites Spannseil (45a,

- 45b), die mit dem ersten bzw. dem zweiten festen Körper (41a, 41b) an mindestens einem Eingriffspunkt (Pfa, Pfb) und mit dem ersten und dem zweiten beweglichen Körper (42a, 42b) an mindestens einem jeweiligen Eingriffspunkt (Pma, Pmb) in Eingriff sind, wobei das erste und das zweite Spannseil (45a, 45b) jeweils ein erstes Ende (46a, 46b) aufweisen, das an einer jeweiligen Halterung (20a, 20b) befestigt ist, die drehbar um eine Drehachse (120a, 120b) montiert ist, wobei die jeweilige Halterung (20a, 20b) konfiguriert ist, um in einer ersten Drehrichtung um die Drehachse (120a, 120b) zu drehen, um zu bewirken, dass sich der erste bzw. der zweite bewegliche Körper (42a, 42b) aus einer von dem ersten bzw. dem zweiten festen Körper (41a, 41b) entfernten Position auf eine Weise in eine geschlossene Position bewegt, um den flexible Vorhang (50) an der jeweiligen Seite einer seitlichen Streckung auszusetzen.
3. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach einem vorherigen Anspruch, wobei eine zusätzliche Betätigungsvorrichtung (70) ferner bereitgestellt ist, die konfiguriert ist, um die Drehung der Halterung (20, 20a, 20b) in einer ersten Drehrichtung um die Drehachse (120, 120a, 120b) zu bewirken, um zu bewirken, dass das oder jedes Spannseil (45, 45a, 45b) um die Halterung (20, 20a, 20b) gewickelt wird.
4. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach Anspruch 1, wobei an dem oder jedem Eingriffspunkt (Pf, Pm) ein jeweiliges Führungselement (48, 48a, 48b, 49a, 49b) auf eine Weise bereitgestellt ist, um einen vorbestimmten Weg für das oder jedes Spannseil (45, 45a, 45b) zu definieren, das durch die Eingriffspunkte (Pf, Pm) verläuft, wobei das oder jedes Spannseil (45, 45a, 45b) und die Vielzahl von Führungselementen (48, 48a, 48b, 49a, 49b) konfiguriert sind, um an dem oder jedem Eingriffspunkt (Pma, Pmb) die im Wesentlichen horizontale Kraft auf den beweglichen Körper (42) auszuüben.
5. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach Anspruch 1, wobei eine erste Halterung (20a), die konfiguriert ist, um um eine erste Drehachse (120a) zu drehen, um das erste Spannseil (45a) aufzuwickeln/abzuwickeln, und eine zweite Halterung (20b), die konfiguriert ist, um um eine zweite Drehachse (120b) zu drehen, um das zweite Spannseil (45b) aufzuwickeln/abzuwickeln, bereitgestellt sind, wobei die erste und die zweite Halterung (20a, 20b) an gegenüberliegenden Seiten in Bezug auf den flexiblen Vorhang (50) angeordnet und funktionsfähig auf eine Weise verbunden sind, dass sie gleichzeitig betätigt werden.
6. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach Anspruch 5, wobei die erste und die zweite Halterung (20a, 20b) an gegenüberliegenden Seiten drehbar um eine gleiche Übertragungs-
welle (130) montiert sind.
7. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach einem vorherigen Anspruch, wobei mindestens ein elastisches Rückstellelement (65) bereitgestellt ist, das konfiguriert ist, um der Verschiebung des oder jedes beweglichen Körpers (42, 42a, 42b) aus der entfernten Position in die nahe Position zu dem jeweiligen festen Körper (41, 41a, 41b) elastisch entgegenzuwirken, wobei das oder jedes elastische Rückstellelement (65) angeordnet ist, um den oder jeden beweglichen Körper (42, 42a, 42b) aus der nahen Position zurück in die nahe Position in Bezug auf den jeweiligen festen Körper (41, 41a, 41b) zu bringen, wenn die Streckvorrichtung (40) aus der gestreckten Konfiguration zurück in die Ruhekonfiguration gebracht wird.
8. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach einem vorherigen Anspruch, wobei der hohle Einschlusskörper (30) einen ersten und einen zweiten Teil (131, 132) umfasst, die jeweils mit gegenseitigen Eingriffselementen (133, 134) vom abnehmbaren Typ bereitgestellt sind, wobei der erste und der zweite Teil (131, 132) des hohlen Einschlusskörpers (30) in der Lage sind, sich zwischen einer zusammengesetzten Konfiguration, in der sie fest in Eingriff sind, und einer offenen Konfiguration, in der sie nicht in Eingriff sind, zu bewegen.
9. Streckvorrichtung (100) zum Spannen eines Rollvorhangs (50) nach einem vorherigen Anspruch, wobei der oder jeder feste Körper (41, 41a, 41b), der oder jeder bewegliche Körper (42, 42a, 42b) und der oder jeder hohle Einschlusskörper (30, 30a, 30b) ein extrudiertes Profil ist, das sich seitlich zu dem flexiblen Vorhang (50) erstreckt, der in der abgewickelten Konfiguration angeordnet ist, im Wesentlichen über seine gesamte Länge.
10. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach einem vorherigen Anspruch, wobei der oder jeder bewegliche Körper (42) entlang einer Gleitrichtung (140) orthogonal zu einer Ab-/Aufwickelrichtung des flexiblen Vorhangs (50) gleitend auf eine Weise montiert ist, um auf ihn die im Wesentlichen horizontale Kraft auszuüben.
11. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach Anspruch 10, wobei der oder jeder bewegliche Körper (42) über einem jeweiligen Basiskörper (90) positioniert ist, der in Bezug auf diesen frei gleiten kann, wobei der oder jeder Basiskörper (90) mit einem Schlitzloch (95) versehen ist, das ent-

lang der Gleitrichtung (140) angeordnet ist, innerhalb dessen er in der Verwendung angeordnet ist, um gleitend eine Haltestange (85) einzugreifen.

12. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach einem vorherigen Anspruch, wobei der oder jeder bewegliche Körper (42, 42a, 42b) gleitend auf einer Führung montiert ist, die entlang der Gleitrichtung (140) positioniert ist. 5
13. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach einem vorherigen Anspruch, wobei der zweite Endabschnitt (51b) des flexiblen Vorhangs (50) an einer Endstange (150) befestigt ist, wobei die Endstange (150) mindestens einen Endabschnitt (151, 152) aufweist, der in der Verwendung angeordnet ist, um frei gleitend in eine entsprechende Einlassöffnung (31a, 31b) eines entsprechenden hohlen Einschlusskörpers (30a, 30b) einzugreifen. 10 15 20
14. Streckvorrichtung (40) zum Spannen eines Rollvorhangs (50) nach Anspruch 13, wobei die Endstange (150) an den gegenüberliegenden Endabschnitten (151, 152) Eingriffsabschnitte (156, 157) eines abnehmbaren Typs aufweist, die angeordnet sind, um jeweils in die erste und die zweite Einlassöffnung (31a, 31b) des ersten und des zweiten hohlen Einschlusskörpers (30a, 30b) einzugreifen, wobei die Endstange (150) und die Endabschnitte (156, 157) einen Längsschlitz (155) bereitstellen, an dem der flexible Vorhang (50) angeordnet ist, um einzugreifen. 25 30
15. System (100) zum Spannen eines Rollvorhangs (50) **dadurch gekennzeichnet, dass** es einen Rollvorhang (50) umfasst, umfassend: 35
 - einen flexiblen Vorhang (50);
 - eine Auf-/Abwickelrolle (10), die eine Stützfläche (11) aufweist und drehbar um eine Längsdrehachse (110) montiert ist, wobei die Auf-/Abwickelrolle (10) konfiguriert ist, um in einer ersten Drehrichtung um die oben erwähnte Längsdrehachse (110) zu drehen, um zu bewirken, dass der flexible Vorhang (50) von der Stützfläche (11) abgewickelt wird, bis eine abgewickelte Konfiguration erlangt ist, oder in einer zweiten Drehrichtung, die der ersten entgegengesetzt ist, um zu bewirken, dass der flexible Vorhang (50) um die Stützfläche (11) aufgewickelt wird, bis eine aufgewickelte Konfiguration erlangt ist, wobei der flexible Vorhang (50) einen ersten Endabschnitt (51a), der an der Stützfläche (11) befestigt ist, und einen zweiten Endabschnitt (51b), der dem ersten Endabschnitt (51a) entgegengesetzt ist, aufweist; 40 45
 - eine Betätigungsverrichtung (60), die angeord-

net ist, um zu bewirken, dass die Auf-/Abwickelrolle (10) in die erste oder in die zweite Drehrichtung um die Längsdrehachse (110) dreht; und eine Streckvorrichtung (40) zum Spannen des Rollvorhangs nach einem Anspruch von 1 bis 14.

Revendications

1. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50), le rideau à rouleau comprenant :

- un rideau souple (50) ;
- un rouleau d'enroulement/déroulement (10) possédant une surface support (11) et monté rotatif autour d'un axe de rotation longitudinal (110), ledit rouleau d'enroulement/déroulement (10) étant conçu pour tourner autour de l'axe de rotation longitudinal (110) susmentionné dans un premier sens de rotation pour provoquer le déroulement dudit rideau souple (50) de ladite surface support (11) jusqu'à obtenir une configuration déroulée, ou dans un second sens de rotation, opposé au premier, pour provoquer l'enroulement du rideau souple (50) autour de ladite surface support (11) jusqu'à obtenir une configuration enroulée, ledit rideau souple (50) possédant une première partie d'extrémité (51a) fixée à ladite surface support (11) et une seconde partie d'extrémité (51b) opposée à la première partie d'extrémité (51a) ;
- un dispositif d'actionnement (60) conçu pour faire tourner ledit rouleau d'enroulement/déroulement (10) dans ledit premier ou dans ledit second sens de rotation autour dudit axe de rotation longitudinal (110) ;

ledit dispositif d'étirage (40) étant conçu pour passer d'une configuration de repos à une configuration étirée, ledit dispositif d'étirage (40) étant conçu pour exercer, dans ladite configuration étirée, une force d'étirement déterminée, sensiblement horizontale, sur ledit rideau souple (50), lorsque ledit rideau souple (50) est agencé dans ladite configuration déroulée, ledit dispositif d'étirage (40) comprenant :

- au moins un corps de confinement creux (30) définissant un logement (35) et comportant une bouche d'entrée (31) pour atteindre ledit logement (35), ledit corps de confinement creux (30) pouvant être positionné latéralement par rapport audit rideau souple (50) ;
- au moins un corps fixe (41) situé, lors de l'utilisation, dans ledit logement (35) ;
- au moins un corps mobile (42) conçu pour coulisser transversalement vers ledit rideau souple (50) et situé à l'intérieur dudit logement (35), ledit

corps mobile (42) étant agencé pour engager, lors de l'utilisation, une partie latérale (52) dudit rideau souple (50) positionné à travers ladite bouche d'entrée (31) ;

ledit dispositif d'étirage (40) étant **caractérisé en ce qu'il** comprend en outre :

- au moins un câble tendeur (45, 45a, 45b) possédant une première extrémité (46, 46a, 46b) fixée à un support (20, 20a, 20b) monté rotatif autour d'un axe de rotation (120, 120a, 120b) et une seconde extrémité (47, 47a, 47b) fixée audit corps fixe respectif (41, 41a, 41b) ou fixée audit corps mobile respectif (42, 42a, 42b) dudit dispositif tendeur (40), ledit câble tendeur (45, 45a, 45b) étant engagé avec ledit corps fixe (41) et avec ledit corps mobile (42) dans au moins un point d'engagement respectif (Pf, Pm), ledit ou chaque point d'engagement (Pf, Pm) étant intercalé entre ladite première extrémité (46, 46a, 46b) et ladite seconde extrémité (47, 47a, 47b), ledit support (20, 20a, 20b) étant conçu pour tourner autour dudit axe de rotation (120, 120a, 120b) dans un premier sens de rotation pour soumettre ledit câble tendeur (45, 45a, 45b) à une force de traction telle qu'elle amène ledit corps mobile (42) à se déplacer d'une position éloignée dudit corps fixe (41), à une position rapprochée dudit corps fixe (41), afin d'exercer ladite force d'étirage sensiblement horizontale déterminée sur ledit rideau souple (50), qui est, par conséquent, disposé dans une configuration latéralement étirée.

2. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50), selon la revendication 1, et fournissant en outre :

- un premier corps de confinement creux (30a) définissant un premier logement (35a) et possédant une bouche d'entrée (31a) pour atteindre ledit premier logement (35a), ledit premier corps de confinement creux (30a) étant positionné sur un premier côté par rapport audit dit rideau souple (50) ;
 - un premier corps fixe (41a) logé dans ledit premier logement (35a) ;
 - un premier corps mobile (42a) conçu pour coulisser transversalement par rapport audit rideau souple (50) et logé à l'intérieur dudit premier logement (35a), ledit premier corps mobile (42a) étant conçu pour engager, lors de l'utilisation, une première partie latérale (52a) dudit rideau souple (50) qui est positionné à travers ladite bouche d'entrée (31a) ;
 - un second corps de confinement creux (30b)

définissant un second logement (35b) et possédant une bouche d'entrée (31b) pour atteindre ledit second logement (35b), ledit second corps de confinement creux (30b) étant positionné sur un deuxième côté, opposé au premier côté, par rapport audit rideau souple (50) ;

- un second corps fixe (41b) logé dans ledit second logement (35b) ;

- un second corps mobile (42b) conçu pour coulisser transversalement par rapport audit rideau souple (50) et logé à l'intérieur dudit second logement (35b), ledit second corps mobile (42b) étant conçu pour engager, lors de l'utilisation, une seconde partie latérale (52b) dudit rideau souple (50) positionné à travers ladite bouche d'entrée (31b) ;

et dans lequel sont en outre pourvus :

- un premier et un second câble tendeur (45a, 45b) engagés respectivement avec ledit premier et ledit second corps fixe (41a, 41b) dans au moins un point d'engagement (Pfa, Pfb), et avec ledit premier et ledit second corps mobile (42a, 42b) dans au moins un point d'engagement respectif (Pma, Pmb), chacun desdits premier et second câbles tendeurs (45a, 45b) possédant une première extrémité (46a, 46b) fixée à un support respectif (20a, 20b) monté rotatif autour d'un axe de rotation (120a, 120b), ledit support respectif (20a, 20b) étant conçu pour tourner autour dudit axe de rotation (120a, 120b) dans un premier sens de rotation pour provoquer le passage, respectivement, desdits premier et second corps mobiles (42a, 42b) d'une position éloignée, respectivement, dudit premier et dudit second corps fixe (41a, 41b), à une position rapprochée de manière à soumettre ledit rideau souple (50) à un étirage latéral au niveau du côté respectif.

3. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon l'une quelconque des revendications précédentes, un dispositif d'actionnement supplémentaire (70) étant, en outre, pourvu conçu pour opérer ladite rotation dudit support (20, 20a, 20b) autour dudit axe de rotation (120, 120a, 120b) dans un premier sens de rotation pour provoquer l'enroulement dudit ou de chaque câble tendeur (45, 45a, 45b) autour dudit support (20, 20a, 20b).

4. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon la revendication 1, au niveau dudit ou de chaque point d'engagement (Pf, Pm) un élément de guidage respectif (48, 48a, 48b, 49a, 49b) étant pourvu de manière à définir un trajet prédéterminé pour ledit ou chaque câble tendeur (45, 45a, 45b) passant par lesdits points d'engagement (Pf,

- Pm), ledit ou chaque câble tendeur (45, 45a, 45b) et ladite pluralité d'éléments de guidage (48, 48a, 48b, 49a, 49b) étant conçus pour exercer au niveau dudit ou de chaque point d'engagement (Pma, Pmb) ladite force sensiblement horizontale sur ledit corps mobile (42).
5. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon la revendication 1, un premier support (20a) étant conçu pour tourner autour d'un premier axe de rotation (120a) pour enrouler/dérouler ledit premier câble tendeur (45a) et un second support (20b) conçu pour tourner autour d'un second axe de rotation (120b) pour enrouler/dérouler ledit second câble tendeur (45b) étant pourvu, lesdits premier et second supports (20a, 20b) étant disposés sur des côtés opposés par rapport audit rideau souple (50) et étant reliés fonctionnellement de façon à être actionnés simultanément.
 6. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon la revendication 5, lesdits premier et second supports (20a, 20b) étant montés rotatifs autour d'un même arbre de transmission (130), sur des côtés opposés.
 7. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon l'une quelconque des revendications précédentes, au moins un élément élastique de rappel (65) étant pourvu conçu pour s'opposer élastiquement au déplacement dudit ou de chaque corps mobile (42, 42a, 42b) de ladite position éloignée à ladite position rapprochée du corps fixe respectif (41, 41a, 41b), ledit ou chaque élément élastique de rappel (65) étant conçu pour ramener ledit ou chaque corps mobile (42, 42a, 42b) de ladite position rapprochée à ladite position rapprochée par rapport au corps fixe respectif (41, 41a, 41b), lorsque ledit dispositif d'étirage (40) est ramené de ladite configuration étirée à ladite configuration de repos.
 8. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon l'une quelconque des revendications précédentes, ledit corps de confinement creux (30) comprenant une première et une seconde partie (131, 132), respectivement pourvues d'éléments d'engagement mutuel (133, 134) de type amovible, ladite première et ladite seconde partie (131, 132) dudit corps de confinement creux (30) pouvant se déplacer entre une configuration assemblée, dans laquelle elles sont fermement engagées, et une configuration ouverte, dans laquelle elles sont désengagées.
 9. Dispositif d'étirage (100) pour tendre un rideau à rouleau (50) selon l'une quelconque des revendications précédentes, ledit ou chaque corps fixe (41, 41a, 41b), ledit ou chaque corps mobile (42, 42a, 42b) et ledit ou chaque corps de confinement creux (30, 30a, 30b) étant un profil extrudé qui s'étend latéralement vers ledit rideau souple (50) disposé dans ladite configuration déroulée, sensiblement sur toute sa longueur.
 10. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon l'une quelconque des revendications précédentes, ledit ou chaque corps mobile (42) étant monté coulissant le long d'une direction de coulissement (140) orthogonale à une direction de déroulement/enroulement dudit rideau souple (50), de manière à exercer sur lui ladite force sensiblement horizontale.
 11. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon la revendication 10, ledit ou chaque corps mobile (42) est positionné au-dessus d'un corps de base respectif (90) libre de coulisser par rapport à lui, ledit ou chaque corps de base (90) étant pourvu d'un trou de fente (95) disposé le long de ladite direction de coulissement (140) à l'intérieur duquel, lors de l'utilisation, il est disposé pour engager de manière coulissante une barre support (85).
 12. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon l'une quelconque des revendications précédentes, ledit ou chaque corps mobile (42, 42a, 42b) étant monté coulissant sur un guide positionné le long de ladite direction de coulissement (140).
 13. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon l'une quelconque des revendications précédentes, ladite seconde partie d'extrémité (51b) dudit rideau souple (50) étant fixée à une barre d'extrémité (150), ladite barre d'extrémité (150) possédant au moins une partie d'extrémité (151, 152), agencée, lors de l'utilisation, pour s'engager librement pour coulisser dans une bouche d'entrée respective (31a, 31b) d'un corps de confinement creux respectif (30a, 30b).
 14. Dispositif d'étirage (40) pour tendre un rideau à rouleau (50) selon la revendication 13, au niveau desdites parties d'extrémité opposées (151, 152), ladite barre d'extrémité (150) fournissant des parties d'engagement de type amovible (156, 157) agencées pour être engagées, respectivement, dans ladite première et dans ladite seconde bouche d'entrée (31a, 31b) dudit premier et dudit second corps de confinement creux (30a, 30b), ladite barre d'extrémité (150) et lesdites parties d'extrémité (156, 157) fournissant une fente longitudinale (155) au niveau de laquelle ledit rideau souple (50) est agencé pour s'engager.
 15. Système (100) pour tendre un rideau à rouleau (50) caractérisé en ce qu'il comprend un rideau à rou-

leau (50) comprenant :

- un rideau souple (50) ;
 - un rouleau d'enroulement/déroulement (10) possédant une surface support (11) et monté rotatif autour d'un axe de rotation longitudinal (110), ledit rouleau d'enroulement/déroulement (10) étant conçu pour tourner autour de l'axe de rotation longitudinal (110) susmentionné dans un premier sens de rotation pour provoquer le déroulement dudit rideau souple (50) de ladite surface support (11) jusqu'à obtenir une configuration déroulée, ou dans un second sens de rotation, opposé au premier, afin de provoquer l'enroulement du rideau souple (50) autour de ladite surface support (11) jusqu'à obtenir une configuration enroulée, ledit rideau souple (50) possédant une première partie d'extrémité (51a) fixée à ladite surface support (11) et une seconde partie d'extrémité (51b) opposée à la première partie d'extrémité (51a) ;
 - un dispositif d'actionnement (60) conçu pour faire tourner ledit rouleau d'enroulement/déroulement (10) dans ledit premier ou dans ledit second sens de rotation autour dudit axe de rotation longitudinal (110) ;
- et un dispositif d'étirage (40) pour tendre le rideau à rouleau selon l'une quelconque des revendications 1 à 14.

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Fig. 1

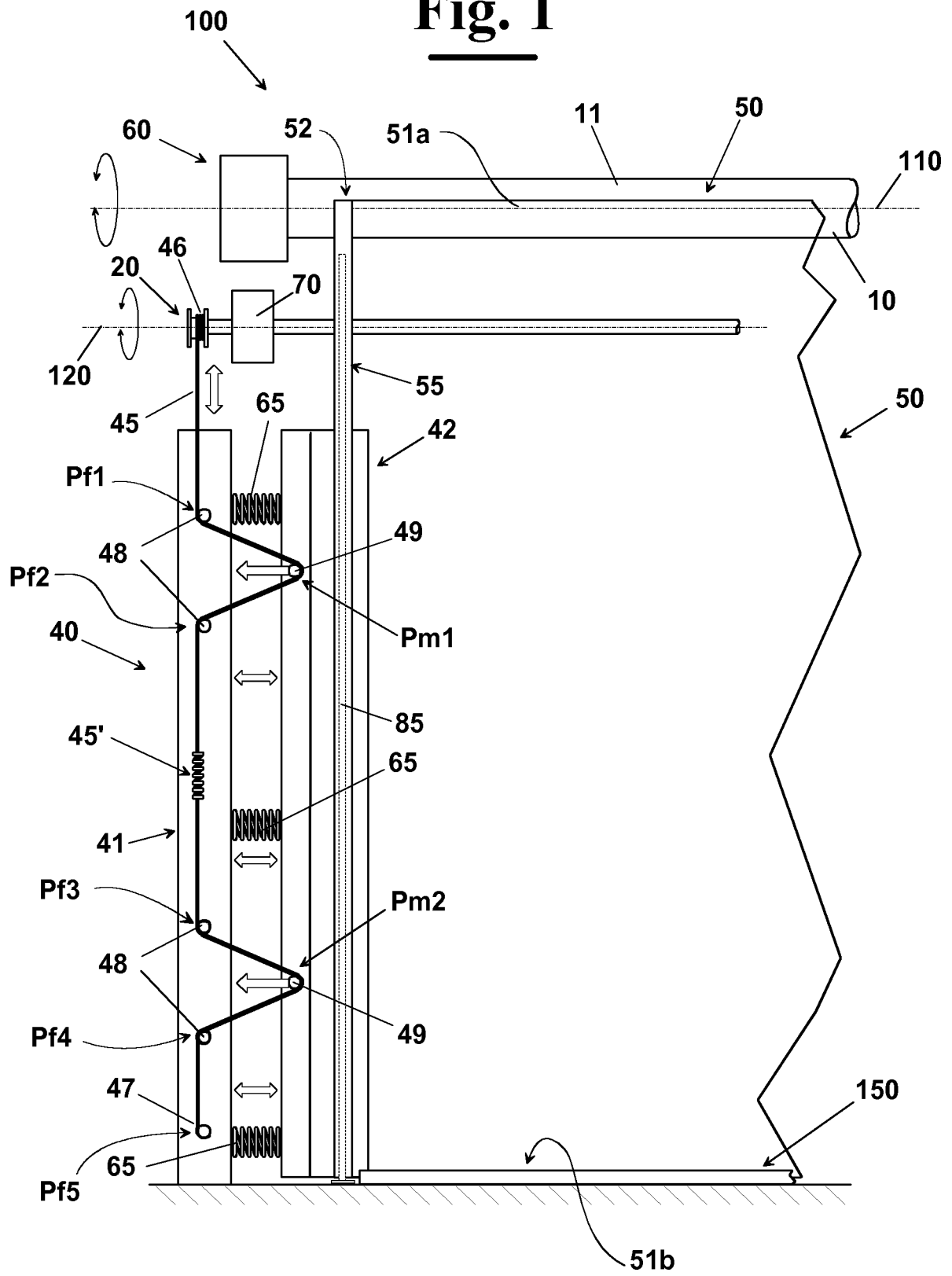


Fig. 2

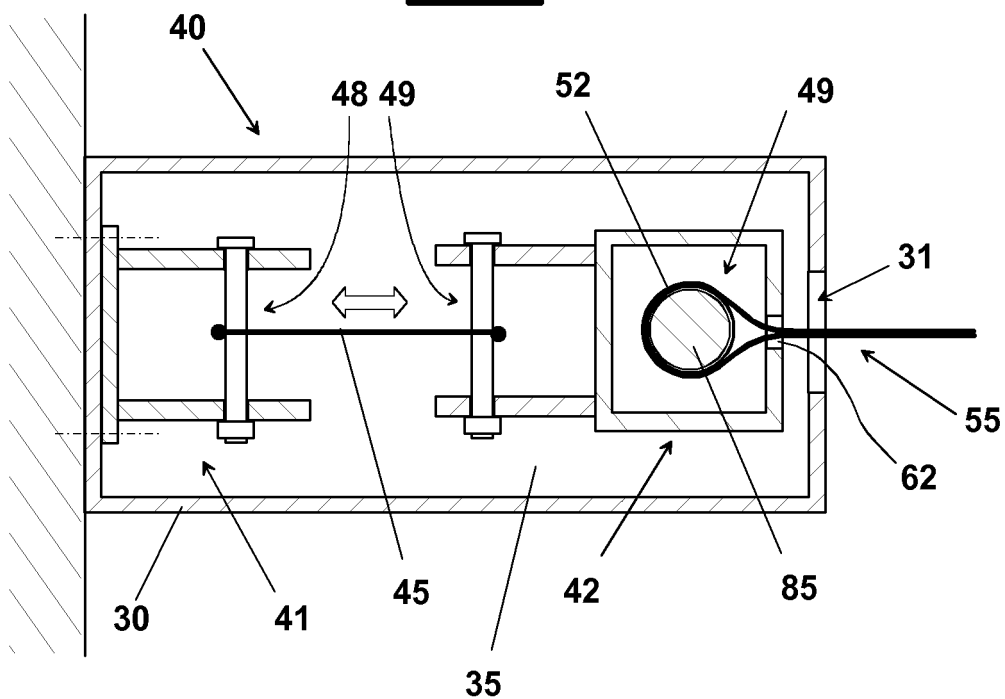


Fig. 3

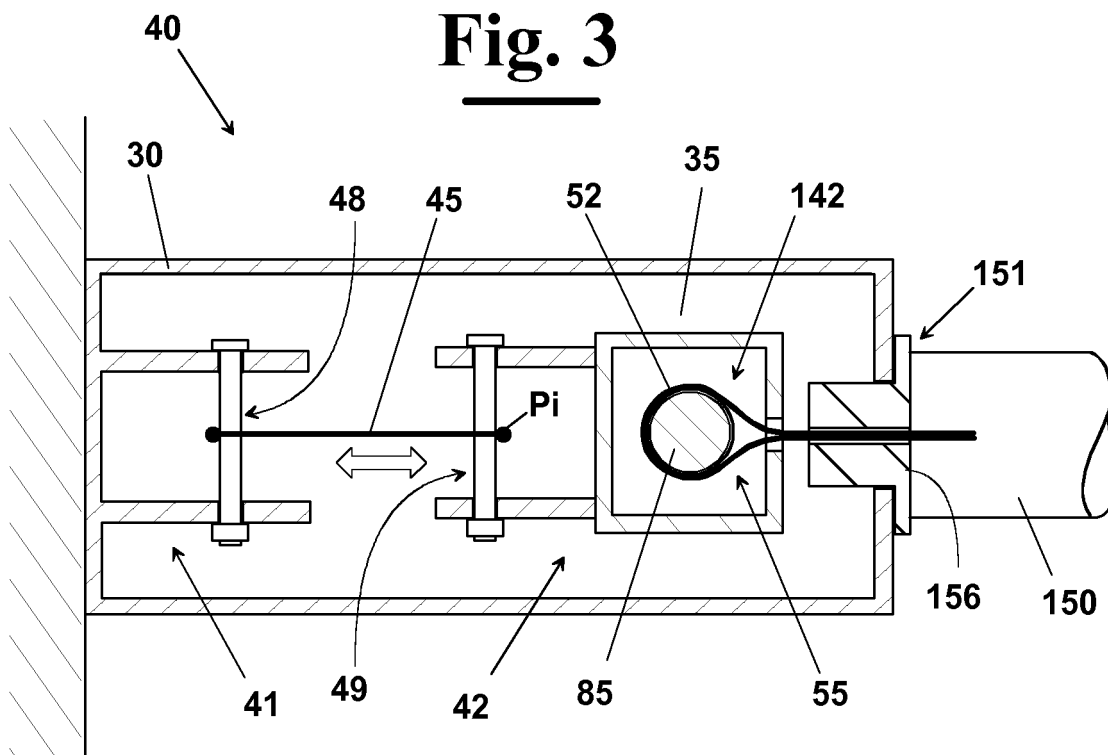


Fig. 4

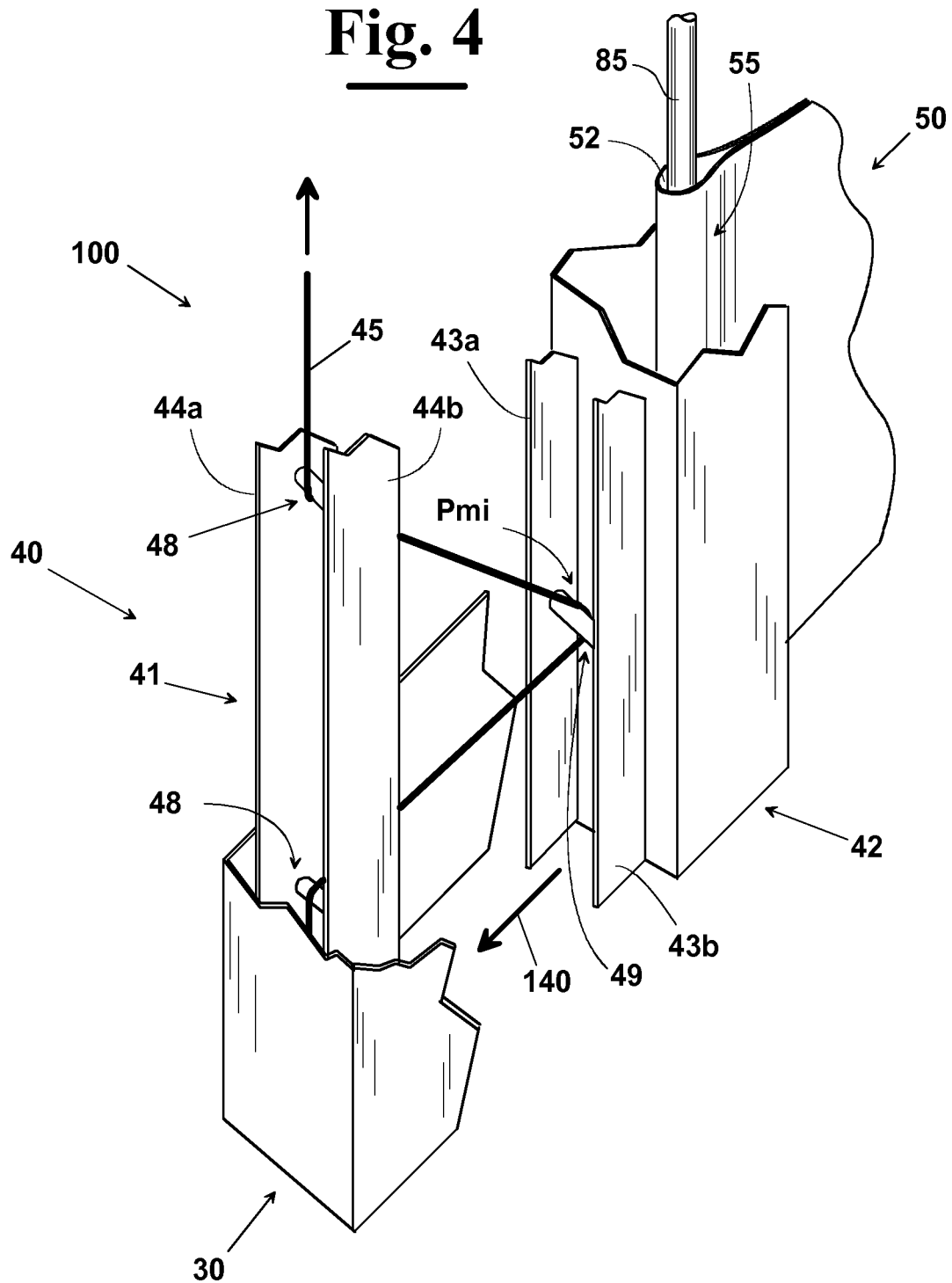


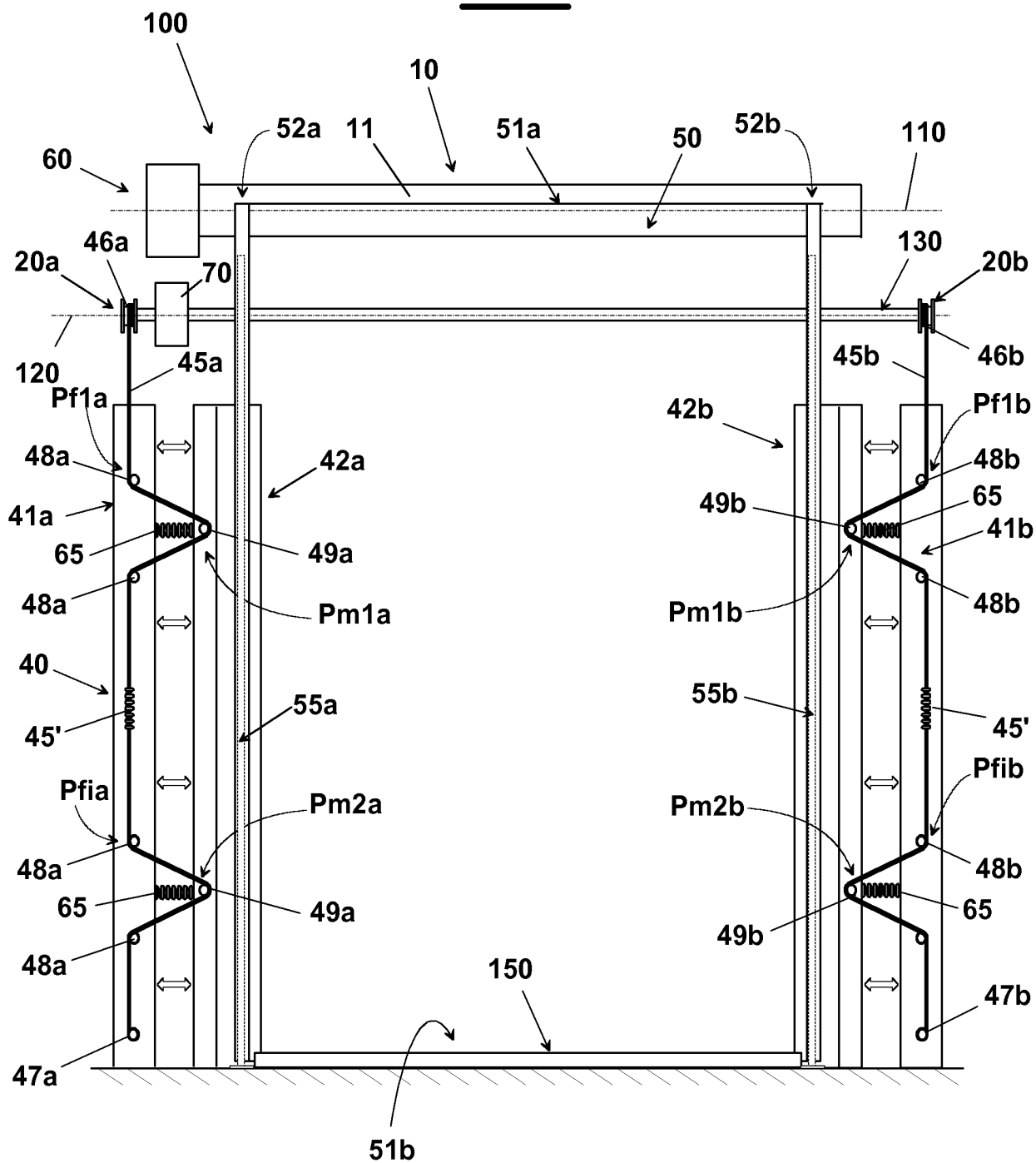
Fig. 5

Fig. 6

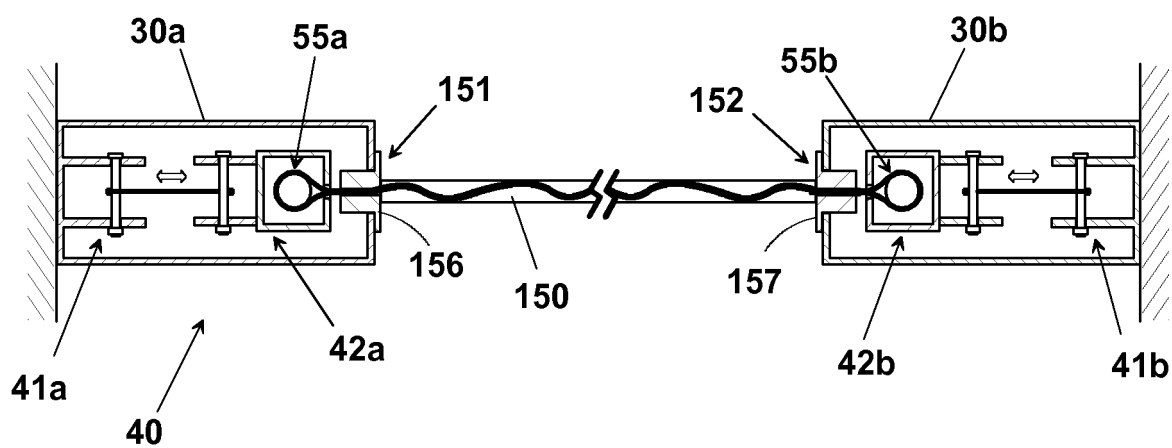


Fig. 7

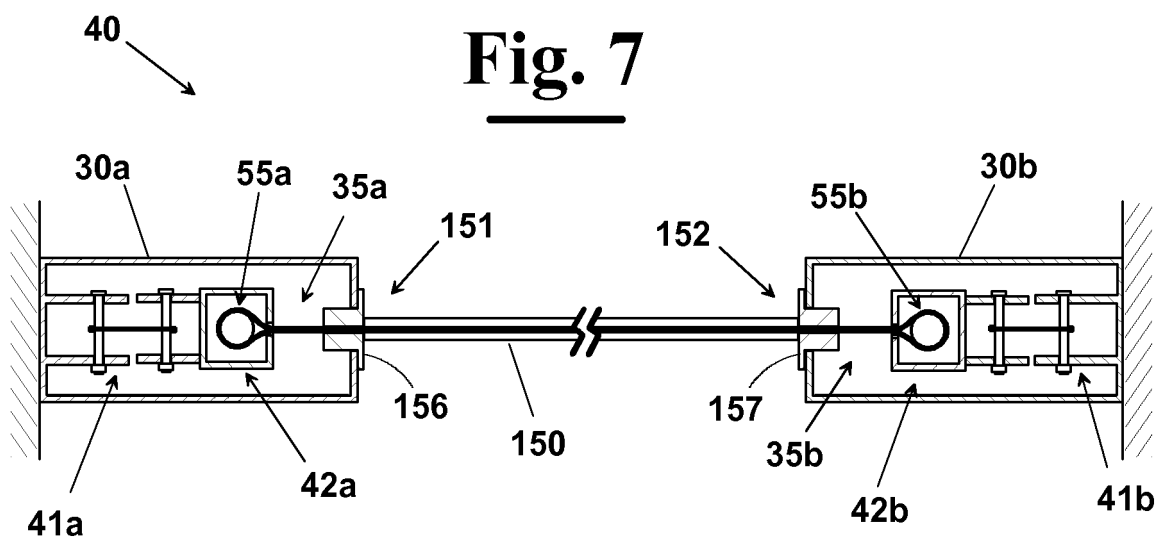


Fig. 8

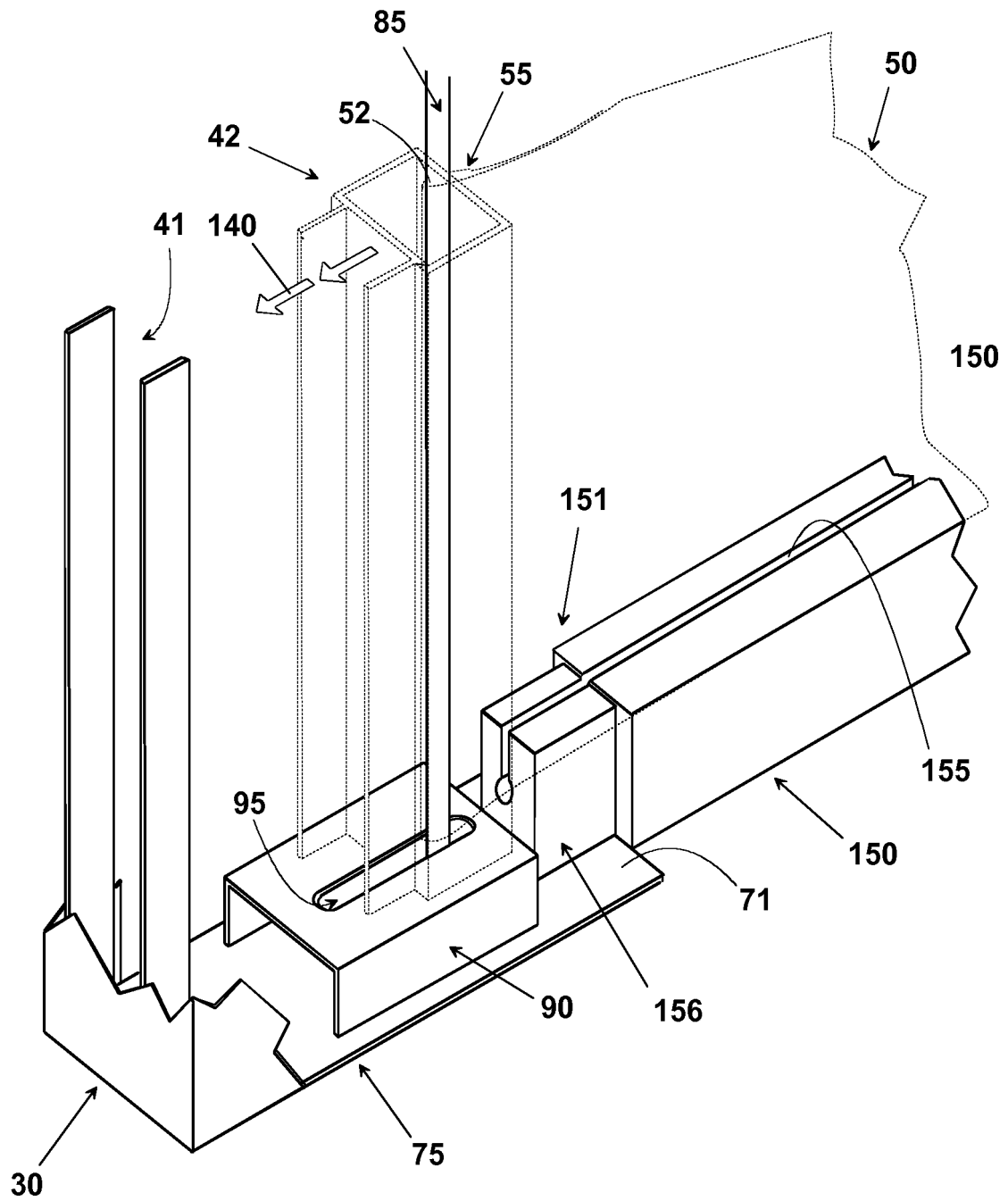


Fig. 9

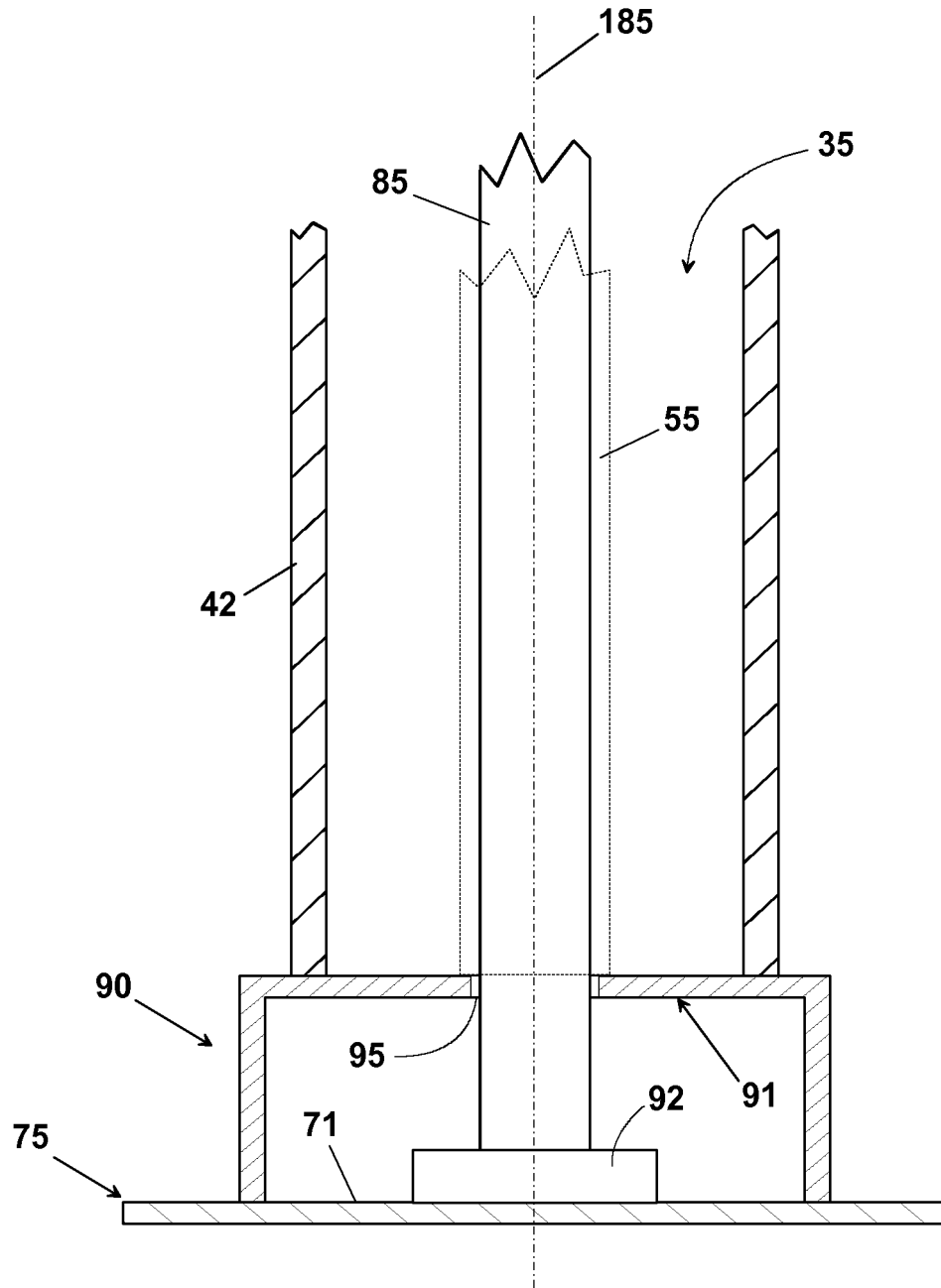


Fig. 10

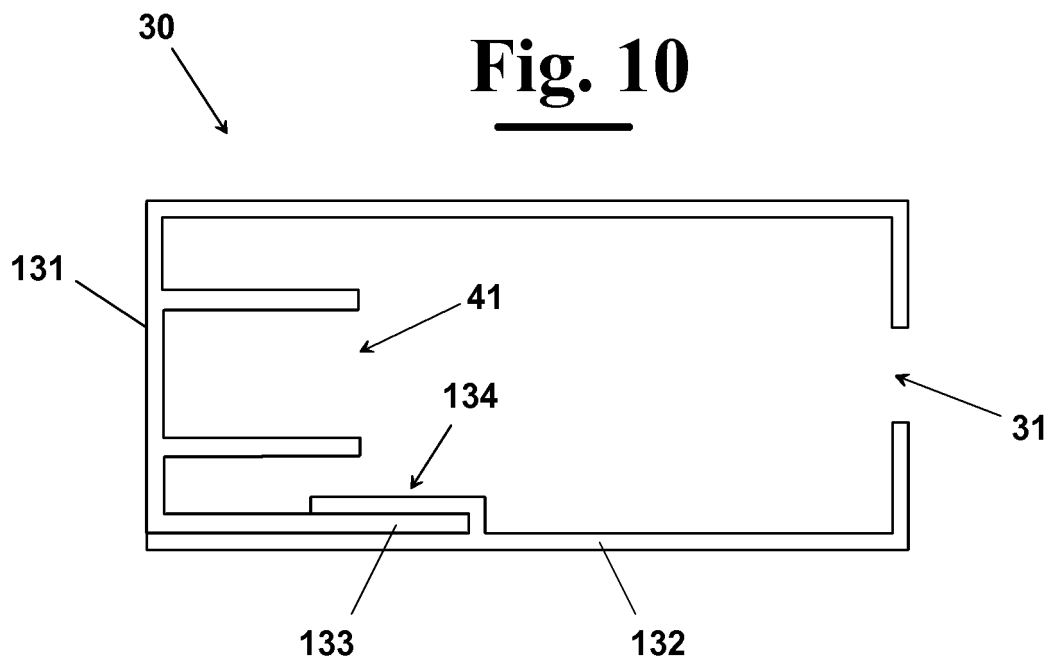
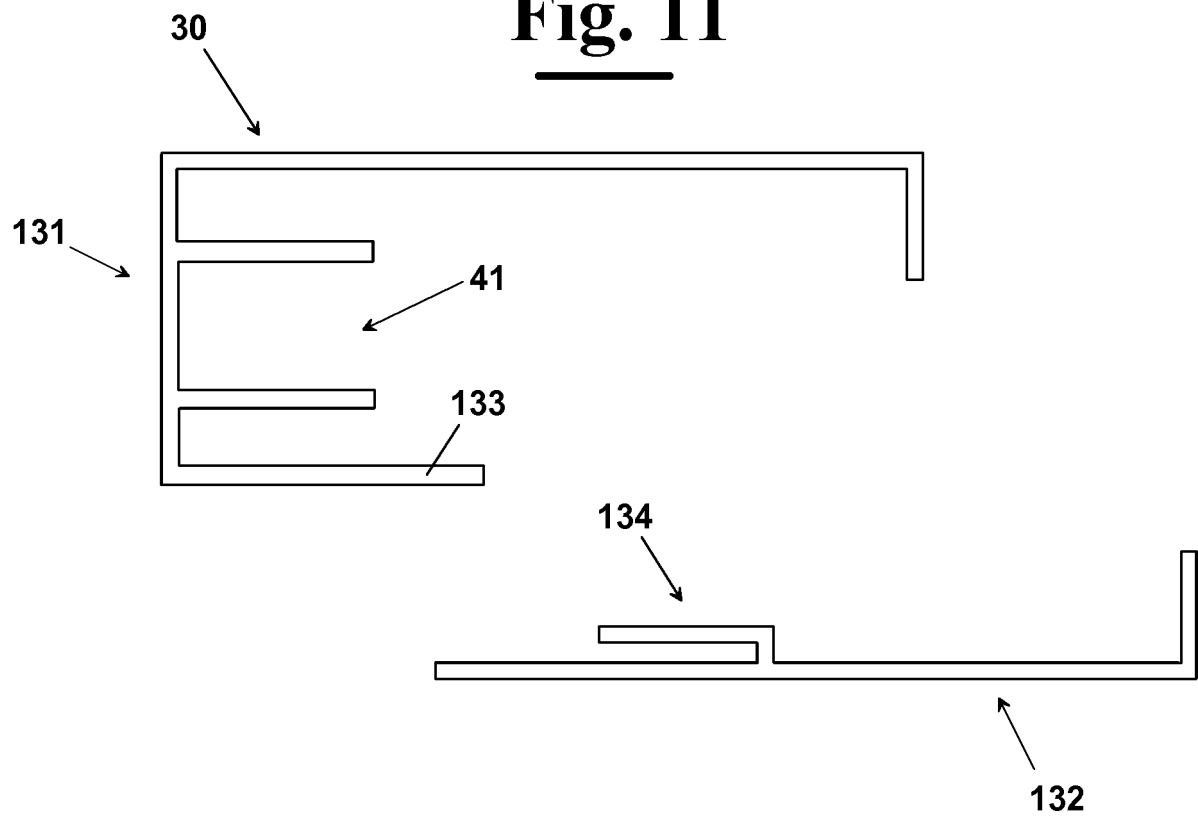


Fig. 11



REFERENCES CITED IN THE DESCRIPTION

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