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(54) **SHIELDING SYSTEM FOR GLAZING AND WINDOWS AND RELATED SHIELDING METHOD**

(57) A shielding system (100) for glazing and windows comprising:

- A first fixed profile (101) and a second fixed profile (102);
- a first sliding profile (103) and a second sliding profile (104), interposed between the first fixed profile (101) and the second fixed profile (102), which in use are mobile with respect to said first fixed profile (101) and said second fixed profile (102);

- A pleated fabric (105) fixed at the top to the first sliding profile (103) and at the bottom to the second sliding profile (104);
- A plurality of wires (106) configured to define the movement of the first and second sliding profiles (103, 104);
- An adjustment mechanism (107) for regulating the tension of said plurality of wires (106), comprising a plurality of springs (120).

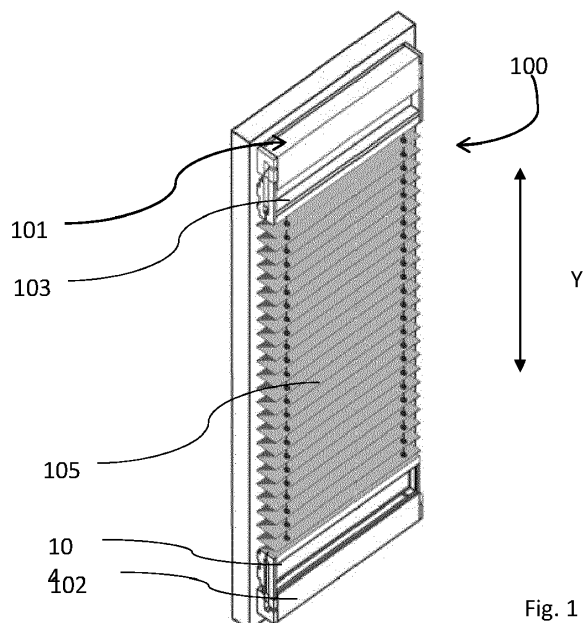


Fig. 1

Description

[0001] The present invention relates to a shielding system for glazing and windows, or frames in general.

[0002] The present invention also relates to a method of shielding for glazing and windows.

[0003] Preferably, the shielding system of the present invention concerns a shielding for blocking, attenuation or filtering of light, solar or artificial, between an external environment and at least one closed environment, through windows or glazing windows with which the closed environment is typically equipped.

[0004] Some shielding systems for windows or window frames are known, in which a horizontal curtain structure includes a plurality of slats, a plurality of wires connected to the slats and suitable for defining the raising/lowering of the slats themselves, and an adjustment device. The adjustment device includes a pulley suitable for moving the wires connected to the slats, and a mechanism for stopping the wires at predetermined positions for the slats.

[0005] These known systems have some drawbacks.

[0006] A first drawback is represented by the fact that these screening systems allow the adjustment of the positioning of the screening system only according to predetermined positions and not according to any desired positioning; this adjustment therefore does not allow the user to adapt the positioning of the screening system on the basis of intrinsic factors for each closed environment (such as, for example, the current positioning of the light source and/or the internal layout of the closed environment). A second drawback is represented by the fact that these screening systems have considerable thicknesses, which makes them unsuitable for installation in correspondence with glass or windows, where there is limited space available (as well as affecting the aesthetic appearance of the closed environment).

[0007] A third drawback is represented by the fact that known screening systems have uncomfortable modes of use, since the force that the user must apply to raise and lower the darkening elements of the screening system is not adjustable, and of complex installations, typically which can only be carried out by a specialized operator and not even by a simple user.

[0008] Scope of the present invention is to provide a shielding system for glazing and windows which has a reduced thickness, is simple to install and which allows the user to adjust the positioning of the screening system according to any position and to regulate the force that must be applied by the user to raise and lower the darkening elements of the shielding system. Furthermore, the aim of the present invention is to provide a shielding method for glass and windows which allows a simple to installation and to be easy to adjust and regulate.

[0009] According to the present invention, a shielding system for glazing and windows is provided, as defined in claim 1.

[0010] According to the present invention, a screening

method for glass and windows is also created, as defined in claim 11.

[0011] For a better understanding of the present invention, a preferred embodiment is now described, purely by way of nonlimiting example, with reference to the attached drawings, in which:

- figure 1 shows a schematic perspective view of a shielding system, according to the invention;
- figure 2 shows a schematic perspective view of an upper portion of the shielding system, according to the invention;
- figure 3 shows a schematic perspective view of a first and second fixed profile of the shielding system applied to a window, according to the invention;
- figure 4 shows a schematic front view of an upper portion of the shielding system, according to the invention;
- figure 5 shows a schematic view of the regulation system of the shielding system, according to the invention;
- figures 6a-6e show schematic views of preferred shapes of some elements of a shielding system, according to the invention;
- figure 7 shows a first and a second fixed profile of the shielding system, according to the invention;
- figure 8 shows a schematic view of an adjustment system of the shielding system according to the invention;
- figure 9 shows a view of a covering element of the shielding system according to the invention;
- figure 10 shows an exploded view of the adjustment system of the shielding system according to the invention.

[0012] The shielding system 100 for glazing or windows according to the present invention, extends along a Y direction, indicated in figure 1. According to a preferred embodiment, said Y direction is longitudinal, i.e. perpendicular to a base plane of a closed environment. According to an alternative embodiment, said Y direction is transversal, i.e. parallel to a base plane of a closed environment. The shielding system 100 is applicable in correspondence with the frame of a glazing or window, and includes a first fixed upper profile 101 arranged at a first end and a second fixed lower profile 102 arranged at a second end of said system 100. The first fixed profile 101 and the second profile 102 are fixed to two opposite ends of the glass to be shielded. The system 100 also includes a first sliding profile 103 and a second sliding profile 104, mobile along said Y direction away from or towards said first fixed profile 102 and said second fixed profile 103.

[0013] In use, the first sliding profile 103 and the second sliding profile 104 are placed between the first fixed profile 101 and the second fixed profile 102, and a pleated screening curtain 105 is fixed to them. According to an aspect of the invention said pleated screening curtain

105 consist in a pleated fabric 105.

[0014] According to an aspect of the invention, the system 100 comprises a pleated fabric 105 which is fixed at the top to the first sliding profile 103 and at the bottom to the second sliding profile 104. As shown in figure 1, the pleated fabric 105 is arranged along said Y direction between the first mobile profile 103 and the second sliding profile 104. Preferably, said pleated fabric 105 can be moved and extended along said Y direction integrally with said first sliding profile 103 and second sliding profile 104.

[0015] Preferably, the first mobile profile 103 is configured to interact in contact with said first fixed profile 101.

[0016] The system 100 also includes a plurality of wires 106 connected to the first fixed profile 101, to the second fixed profile 102, to the first sliding profile 103 and to the second sliding profile 104. Preferably, said wires 106 are configured to define the movement of the first and second sliding profiles 103, 104.

[0017] The system 100 also includes an adjustment mechanism 107 for regulating the tension of said wires 106 configured to regulate the movement of the first and second sliding profiles 103, 104.

[0018] According to an aspect of the invention, said adjustment mechanism 107 is arranged internally to the first fixed profile 101 and to the second fixed profile 102.

[0019] In detail, compared to the prior art, one of the advantages of the shielding system 100 is represented by the presence of said adjustment mechanism 107 for regulating the tension of said wires 106 configured to regulate the movement of the first and second sliding profiles 103, 104 and as consequence the movement of the pleated fabric 105, according to any intermediate positioning desired by the user and not according to predetermined positions.

[0020] In other words, a user, by appropriately regulating the tension of the wires 106 through the adjustment mechanism 107, can position the first sliding profile 103 and the second sliding profile 104, and the pleated fabric 105 fixed to them, in any desired position along said Y direction included between the first fixed profile 101 and the second fixed profile 102.

[0021] Furthermore, said adjustment mechanism 107 is arranged internally to said first and second fixed profiles 102, 103, so as to reduce the thickness of the system 100 and make the system 100 itself easier to install.

[0022] According to a further aspect of the invention, the adjustment mechanism 107 includes a plurality of holding devices 110, preferably two holding devices 110 that is an upper holding device and a bottom holding device, each configured to tension said wires 106 according to a desired tension.

[0023] According to an aspect of the invention, each holding device 110 comprises two springs and two cursors 116.

[0024] According to a preferred embodiment, said shielding system 100 comprises a bushing holder blade 118 and a plurality of bushings 117, arranged internally to said bushing holder blade 118, said bushings 117 be-

ing configured to guide said wires 106. According to an aspect of the invention, the system 100 includes a pair of vertical guides, placed in the Y direction, each placed between the first fixed profile 101 and the second fixed profile 102. Each vertical guide is placed respectively between a first end of the first fixed profile 101 and to a first end of the second fixed profile 102, and a second end of the first fixed profile 101 and a second end of the second fixed profile 102. Advantageously, the pair of vertical guides allows the 100 system to completely shield the light and to be totally darkening.

[0025] According to an aspect of the invention, the system 100 includes within each fixed profile, i.e. the first fixed profile 101 and the second fixed profile 102, two sliders each consisting of a spring holder, or slider, 116 housing a spring 120 and having at a first end a fixing point for a wire 106 and at a second end an adjustment device, using an Allen key. Each slider 116 slides inside the fixed profile 101, 102 and the position of the slider itself, being integral with the wire 106, regulates the tension of the wire itself and therefore the resistance to vertical sliding opposed by the shielding constituted by the first and second sliding profile 103, 104 and by the pleated fabric 105. When the sliders 116 are placed at the external ends of the fixed profile 101, the shielding is in the unloaded position and therefore does not oppose any resistance to gravity and is placed entirely at the bottom, in correspondence with the second fixed profile 102.

[0026] The adjustment of the resistance opposed to the vertical sliding, and therefore the adjustment of the position of the pleated fabric 105, is regulated by means of a key, preferably an Allen key, which appropriately tightens the adjustment device in the desired position. Adjustment using a key is easily achievable without dismantling the system 100 but only removing a covering element 108.

[0027] According to one aspect of the invention, the covering element 108 has a longitudinal protrusion which extends in use beyond the edge of the fixed profile 101, 102 in such a way as to increase the darkening capacity of the system 100.

[0028] As shown in the figures, the first and second fixed profiles 101, 102 have a section equipped with a groove through which a wire 106 passes which then fits into a corresponding groove present in the section of each sliding profile 103, 104. Furthermore, the adjustment of the tension of said wires 106 is suitable for defining the force necessary to move the sliding profiles 103, 104 and therefore the pleated fabric 105 between the first fixed profile 101 and the second fixed profile 102. Said force is proportional to the positioning of said spring elements 120, which are appropriately adjusted to guarantee the desired resistance. Even more particularly, said holding device 110 comprises, for each spring element 120, a respective spring holder 116.

[0029] According to a preferred embodiment, the first mobile profile 103 includes, at each of the two respective ends perpendicular to the Y direction, a first cap 113.

[0030] According to a preferred embodiment, the second mobile profile 104 includes, at each of the two respective ends perpendicular to the Y direction, a second cap 114.

[0031] In particular, figures 6a, 6b and 6c respectively show an embodiment of the shielding system 100, in which a preferred path of said wires 106 through said system 100 is illustrated.

[0032] According to an aspect of the invention, said plurality of wires 106 includes at least a first pair of wires 106a', 106b', connected at the top with a first spring 120a, and at least a second pair of wires 106a'', 106b'' connected at the top with a second spring 120b, each wire 106a', 106b', 106a'', 106b'' being connected at the bottom to a third spring 102c or to a fourth spring 120d, said third spring 120c and said fourth spring 120d being placed internally to the second fixed profile 102.

[0033] In detail, two pairs of said wires 106 crosses said system 100 along said Y direction, in which a respective pair of wires 106 is inserted into a respective spring 120 and crosses the first fixed profile 101, the pleated fabric 105, the first mobile profile 104 and the second fixed profile 102 (in correspondence with said spring elements). Each embodiment differs due to the path of each wire of the plurality of wires 106. Vice versa, the three embodiments shown by figures 6a-6c are united by the fact that a respective wire 106a' and 106a'' of each pair of threads of the plurality of threads 106 begins and ends its path on opposite sides of the system 100, while the other respective wire 106b' and 106b'' of each pair of wires 106 begins and ends its path on the same side of the system 100, with respect to a central line of symmetry and parallel to the Y direction.

[0034] In particular, in the preferred configuration shown in figure 6.a, a first wire 106a' and a second wire 106b' are fixed to the first spring 120a of the pair of springs 120, located on the left side of the shield, while to a second spring 120b of the pair of springs 120, located on the right side of the shielding, a third wire 106a'' and a fourth wire 106b'' are fixed.

[0035] The first wire 106a' runs vertically along the pleated curtain, in the Y direction up to the mobile profile 104 where it extends horizontally on the right side and connects with the fourth spring 120d on the right side. Similarly, the second wire 106a'' runs along the same path in a mirror image, from the second spring 120b on the right side, vertically up to the mobile profile 104 and then horizontally towards the left side to connect with the left third spring 120c. The third wire 106b' connects the left first spring 120a of the pair of springs 120 with the left third spring 120c passing first horizontally up to the right side of the shield, then vertically in the Y direction along the right side and finally downwards and in correspondence with the profile 104, horizontally until it connects with the third spring 120c on the left side of the shield. The fourth wire 106b'' connects the right second spring 120b with the right fourth spring 120d, with a path that mirrors that of the third wire 106b', i.e. horizontally

in the upper part and then vertically in the Y direction along the right side and then at the bottom retraces the horizontal line shield until it connects with the fourth spring 120d. Further preferred configurations with four wires are shown in figures 6.b and 6.c.

[0036] Furthermore, figures 6d and 6e respectively show an embodiment of the shielding system 100, in which the path of said plurality of wires 106 through said system 100 is illustrated. In detail, two triplets of said threads 106 crosses said system 100 along said Y direction, in which a respective triplet of threads 106 is inserted into a respective spring 120 and crosses said first fixed profile 101, said pleated fabric 105, said first mobile profile 104 and said second fixed profile 102 (in correspondence with said spring elements 120). Each of these two embodiments differs due to the different regions in which each element of the system 100 passes through (as reported above) by each triplet of wires 106; vice versa, the two embodiments shown in figures 6d-6e have in common the fact that two respective wires of each triplet of wires 106 begin and end their path on opposite sides of the system 100, while the other respective thread of each triplet of wires 106 begins and ends its path on the same side of the system 100. According to an aspect of the invention, said plurality of wires (106) comprises at least a triplet of wire (106a', 106b', 106c'), connected at the top with a first spring (120a) and at least a second triplet of wires (106a'', 106b'', 106c'') connected at the top with a second spring (120b), each wire (106a', 106b', 106a'', 106b'', 106c', 106c'') being connected at the bottom to a third spring (102c) or to a fourth spring (120d), said third spring (120c) and said fourth spring (120d) being placed internally to the second fixed profile (102).

[0037] According to a further aspect of the invention, said adjustment mechanism 107 is operated manually.

[0038] In particular, the manual operation of the adjustment mechanism 107 consists in the manual adjustment of the tension of said threads 106 by means of an adjustable screw system inside said adjustment mechanism 107 and which cooperates with the two spring elements and/or with the two wire locking spring elements. In this way, the manual activation of the adjustment mechanism 107 allows simple adjustment and does not require the use of motor parts (which would increase the complexity and fallibility of the system 100). Advantageously, the covering element 108 is removable and configured to at least partially cover said adjustment mechanism 107.

[0039] In particular, the covering element 108 allows easy accessibility, for a user, to the adjustment mechanism 107 to manually adjust the tension of said wires 106, so as to obtain the desired positions for the system 100. According to a further aspect of the invention, said system 100 is arranged in correspondence with a surface of a glass window 50 or in correspondence with a guide of a frame of a window frame.

[0040] In particular, said system 100 can be arranged in correspondence with a surface of a glass window fac-

ing towards the inside of the closed environment. In this way, its application is simple to implement.

[0041] Furthermore, said system 100 can be arranged in correspondence with a guide of a frame of a window frame. In other words, said system 100 can be inserted into an internal guide of a frame of a window frame, so that said system 100 is simple to install for a window frame.

[0042] According to a further aspect of the invention, said system 100 consists of an awning. Advantageously, said pleated fabric 105 is a pleated awning.

[0043] According to a further aspect of the invention, said system 100 has a thickness between 15 and 30 mm, preferably 21 mm.

[0044] According to a further aspect of the invention, said system 100 has a width between 110 cm and 280 cm.

[0045] According to a further aspect of the invention, said first fixed profile 101 and/or said second fixed profile 102 present, in correspondence with a respective surface directed in use to the glass, an adhesive system configured to adhere said first fixed profile 101 and/or said second fixed profile 102 to a surface of a glass window or to a guide of a frame of a window.

[0046] Preferably, said adhesive system comprises at least one glue. The shielding system 100 as described allows the first and second sliding profiles 103, 104 and the pleated fabric 105 to be positioned in any desired position along said Y direction and between the first fixed profile 101 and the second fixed profile 102, as well as to regulate the force that must be applied by the user to raise and lower the pleated fabric 105 of said screening system 100.

[0047] According to the invention, a shielding method for glazing and window frames includes the following steps:

- Provide a shielding system 100 according to the present invention (as described above);
- Apply said shielding system 100 in correspondence with a surface of a glass window or in correspondence with a guide of a frame of a window frame using the adhesive portion of the first and second fixed profiles;
- Adjust, by means of said adjustment mechanism 107, the tension of said wires 106 to regulate the movement of the pleated fabric 105.

[0048] In detail, compared to the prior art, one of the advantages of the screening method of the present invention is represented by said adjustment mechanism 107 for regulating the tension of wires 106 and to regulate the movement of the pleated fabric 105. Furthermore, said adjustment mechanism 107 is arranged internally to the fixed profile 101, so as to reduce the thickness of the system 100 more and make the system 100 itself easier to install. Furthermore, said system 100 can be arranged in correspondence with a surface of a glass window, facing towards the inside of the closed environ-

ment. In this way, its application is simple to implement.

[0049] Furthermore, said system 100 can be arranged in correspondence with a guide of a frame of a window frame. In other words, said system 100 can be inserted into an internal guide of a frame of a window frame, so that said system 100 is simple to install for a window frame.

[0050] According to an aspect of the invention, the method of screening for glass or window frames includes a step of removing a covering device 108 preceding the adjustment step, and a step of applying the covering device 108 following the adjustment step.

[0051] According to an aspect of the invention, the method of shielding comprises an adjustment phase carried out manually preferably using an Allen key. In particular, the adjustment step is carried out manually, through the manual activation of the adjustment mechanism 107, consists in the manual adjustment of the tension of said wires 106. In this way, the manual activation of the adjustment mechanism 107 allows a simple adjustment and does not involve the use of motor organs (which would increase the complexity and fallibility of the shielding method). Advantageously, the system according to the invention allows to adjust the tension of an already installed shielding system, without requiring its dismantling. In fact, the adjustment takes place via the adjustment mechanism 107 by moving the slide spring holder transversely in the first or second fixed profile 101, 102 and fixing it once the desired tension has been reached using an adjustment key.

[0052] Advantageously, the system according to the invention, by means of the springs, allows the forces to be released not by applying them on the double-sided adhesive that makes the first and second fixed profiles 101, 102 adhere to the glass, but on the spring itself and on the profiles connected to the wires 106.

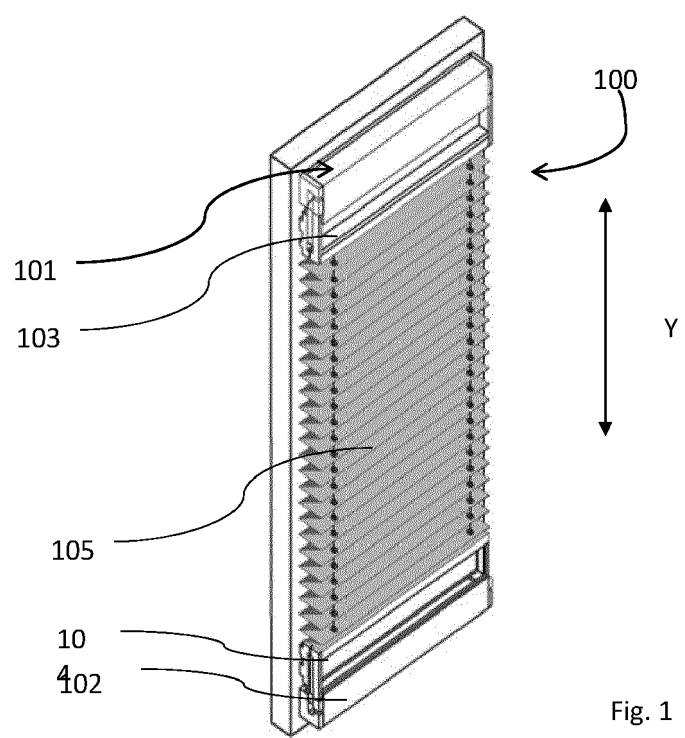
[0053] Finally, it is clear that modifications and variations can be made to the shielding system and the related method, described and illustrated here, without departing from the protective scope of the present invention, as defined in the attached claims.

Claims

1. Shielding system (100) for glazing and windows comprising:

- A first fixed profile (101) arranged at a first end of said system (100) and a second fixed profile (102) arranged at a second end of said system (100) said second end being opposite to the first end;
- a first sliding profile (103) and a second sliding profile (104), interposed between the first fixed profile (101) and the second fixed profile (102), which in use are mobile with respect to said first fixed profile (101) and said second fixed profile

- (102);
- A pleated fabric (105) fixed at the top to the first sliding profile (103) and at the bottom to the second sliding profile (104);
 - A plurality of wires (106) configured to define the movement of the first and second sliding profiles (103, 104);
 - An adjustment mechanism (107) for regulating the tension of said plurality of wires (106), placed internally to said first fixed profile (101) and to said second fixed profile (102), comprising a plurality of springs (120).
2. System (100) according to claim 1 **characterized in that** said plurality of wires (106) includes at least a first pair of wires (106a', 106b'), connected at the top with a first spring (120a) and at least a second pair of wires (106a'', 106b'') connected above with a second spring (120b), each wire (106a', 106b', 106a'', 106b'') being connected below with a third spring (102c) or with a fourth spring (120d), said third spring (120c) and said fourth spring (120d) being placed internally to the second fixed profile (102).
 3. System (100) according to claim 1 **characterized in that** said plurality of wires (106) comprises at least a triplet of wire (106a', 106b', 106c'), connected at the top with a first spring (120a) and at least a second triplet of wires (106a'', 106b'', 106c'') connected at the top with a second spring (120b), each wire (106a', 106b', 106a'', 106b'', 106c', 106c'') being connected at the bottom to a third spring (102c) or to a fourth spring (120d), said third spring (120c) and said fourth spring (120d) being placed internally to the second fixed profile (102).
 4. System (100) according to claim 1, **characterized in that** said adjustment mechanism (107) comprises a plurality of holding devices (110), each configured to tension said wires (106) according to a desired tension.
 5. System (100) according to claim 1 **characterized in** comprising a pair of vertical guides, placed in a Y direction, each placed between the first fixed profile (101) and the second fixed profile (102) to respectively join their first and their second end.
 6. System (100) according to claim 4, **characterized in that** each holding device (110) comprises two spring elements and two sliders (116).
 7. System (100) according to one or more of the previous claims, wherein said adjustment mechanism (107) can be operated manually.
 8. System (100) according to one or more of the previous claims, wherein said first fixed profile (101) and/or said second fixed profile (102) comprise a covering element (108) configured to at least partially cover said adjustment mechanism (107).
 9. System (100) according to one or more of the previous claims, wherein said system (100) is arranged in correspondence with a surface of a glass window or in correspondence with a guide of a frame of a window frame.
 10. System (100) according to one or more of the previous claims, wherein said system (100) consists of an awning.
 11. Shielding method **characterized by** comprising the following phases:
 - of providing a shielding system (100) according to one or more of the previous claims;
 - of applying said screening system (100) in correspondence with a surface of a glass window or in correspondence with a guide of a frame of a window frame;
 - of adjusting the tension of said wires (106), using said adjustment mechanism (107) arranged inside said first and second fixed profiles (101, 102), in such a way as to regulate the movement of the pleated fabric (105).
 12. Shielding method according to claim 11, **characterized in** comprising a step of removing a covering element (108) preceding said adjusting step, and a step of applying said covering element (108) subsequent to said adjusting step.



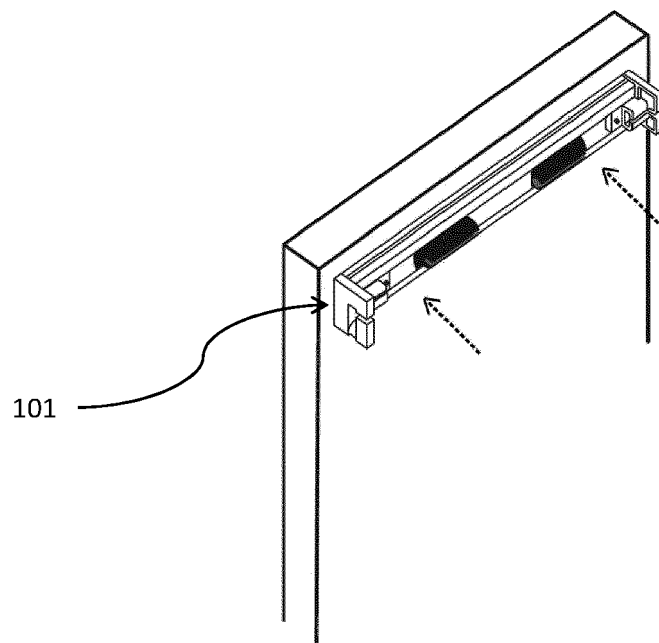


Fig. 2

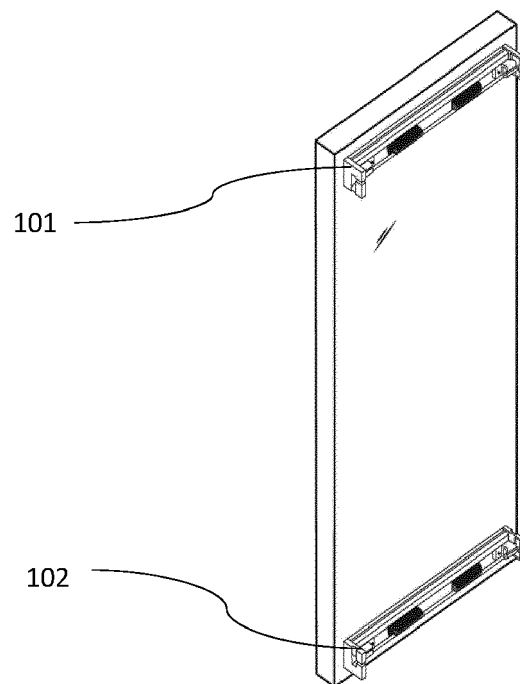
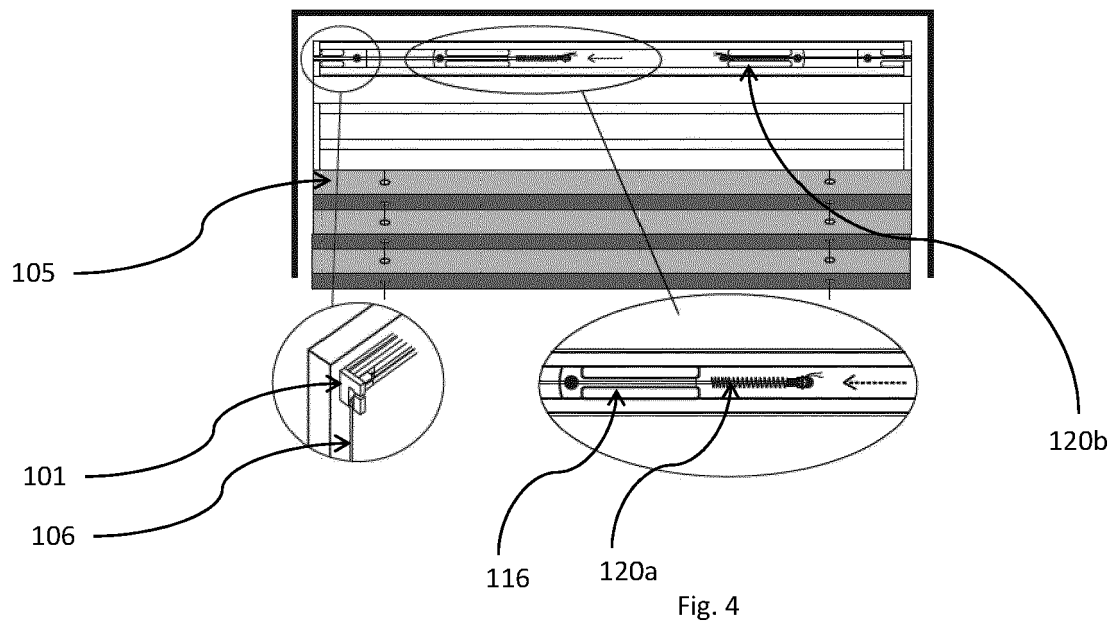


Fig. 3



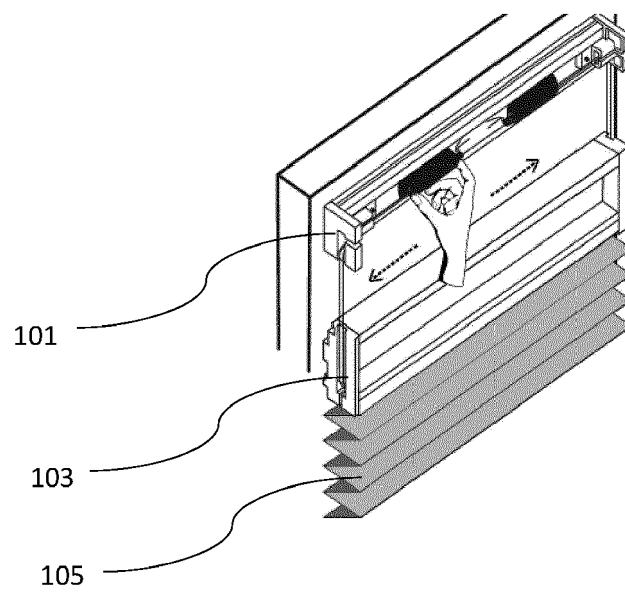
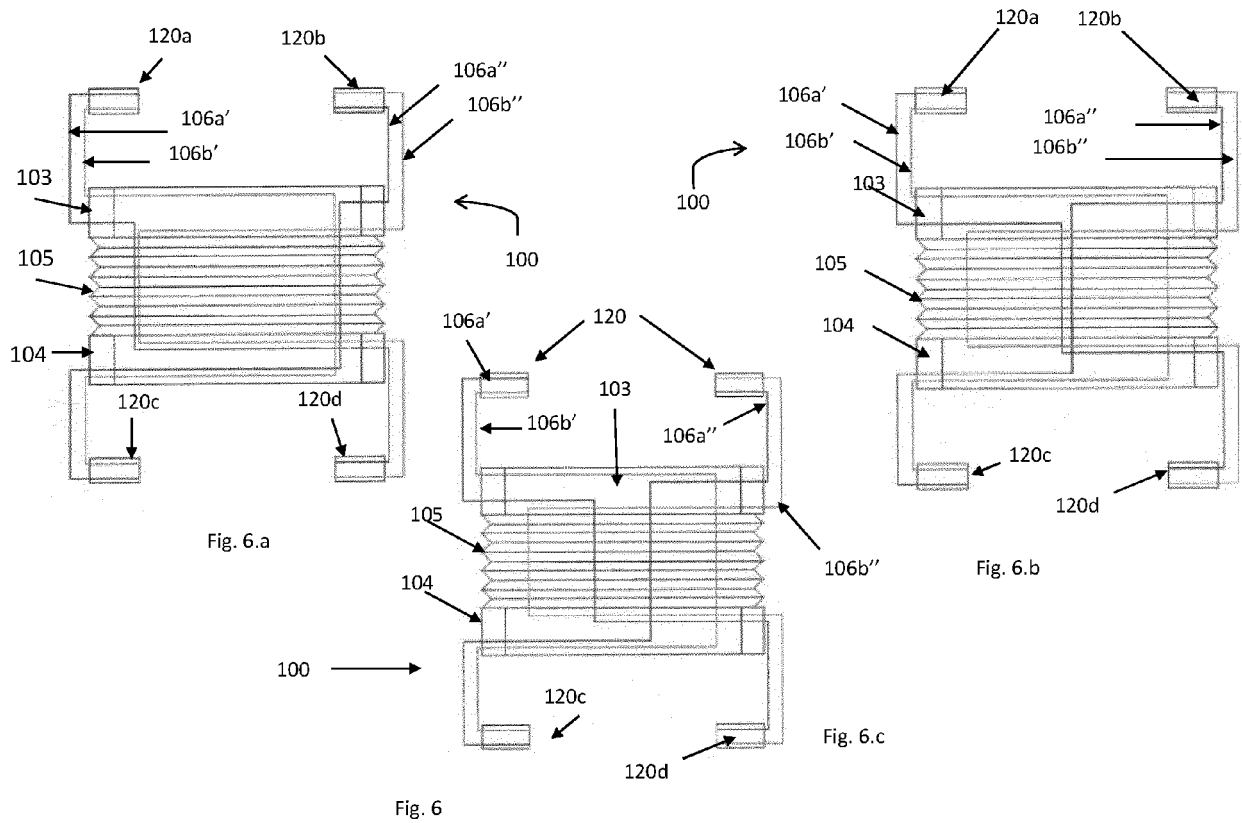


Fig. 5



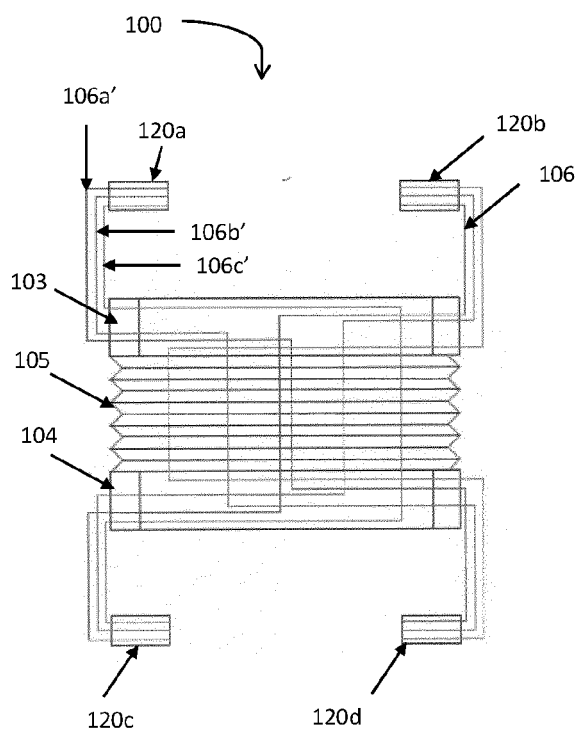


Fig. 6d

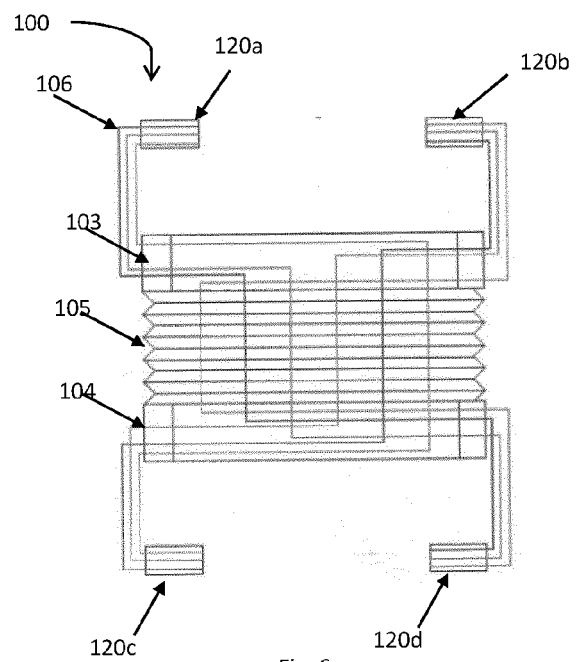


Fig. 6e

Fig. 6

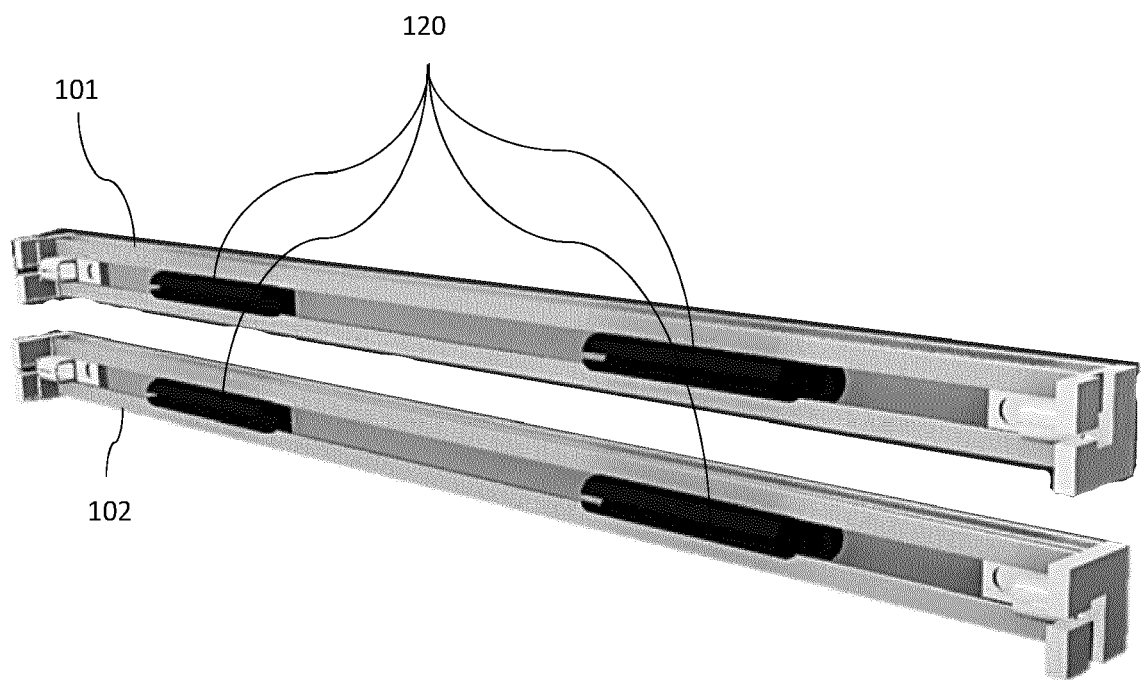


Fig. 7

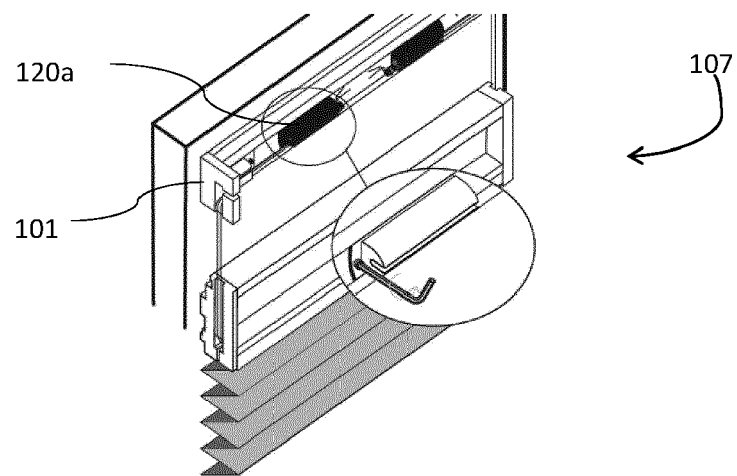


Fig. 8

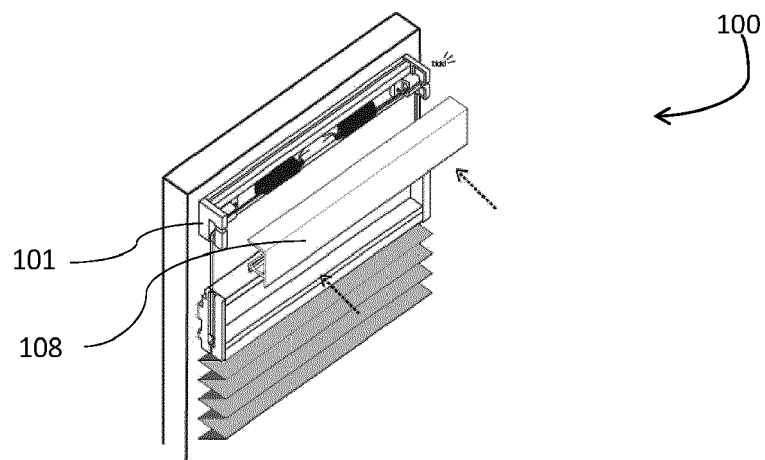


Fig. 9

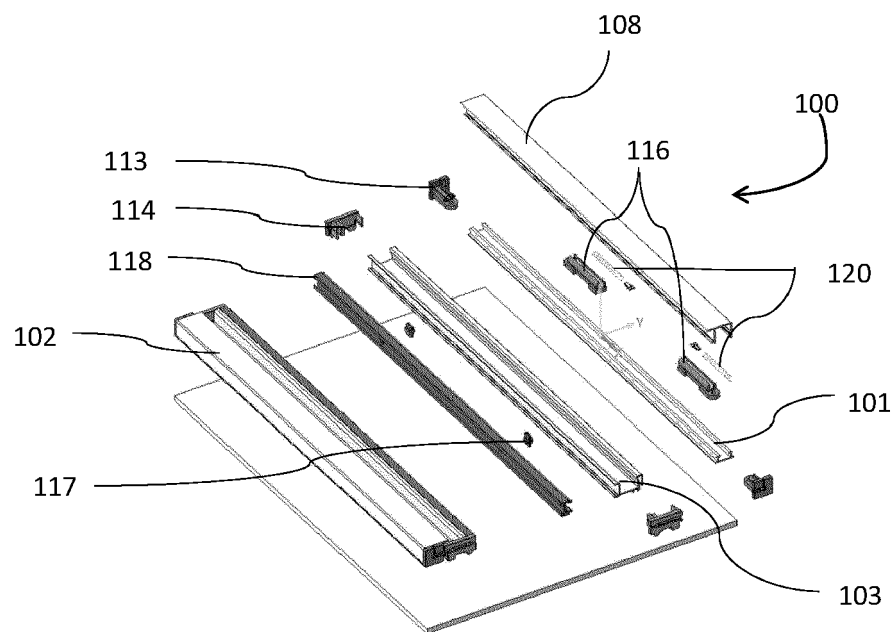


Fig. 10



EUROPEAN SEARCH REPORT

Application Number

EP 23 20 9698

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 733 711 A (SCHOEN SIEGFRIED [NL]) 29 March 1988 (1988-03-29)	1, 4, 5, 7-11	INV. E06B9/262
A	* column 2, lines 39-41, 56-57; figures 3, 5 * * column 1, lines 60-68 *	2, 3, 6, 12	E06B9/322
A	US 2014/076504 A1 (ANTHONY JAMES M [US] ET AL) 20 March 2014 (2014-03-20) * paragraphs [0034], [0037], [0050], [0051]; figures 4A, 6, 15, 16 *	1-12	
A	EP 1 681 433 A2 (SCHUECO INT KG [DE]) 19 July 2006 (2006-07-19) * figures 1-4 *	1-12	
A	US 2005/006035 A1 (LAI TONY [US]) 13 January 2005 (2005-01-13) * figures 1, 2, 4A, 11, 12 *	1-12	
A	CA 2 410 834 A1 (NIEN MADE ENTPR CO LTD) 5 February 2004 (2004-02-05) * figures 8-10 *	1-12	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) E06B

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EPO FORM 1503 03.82 (P04C01)

Place of search

Munich

Date of completion of the search

22 January 2024

Examiner

Bourgoin, J

CATEGORY OF CITED DOCUMENTS

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E : earlier patent document, but published on, or after the filing date
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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