(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 025 858 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.02.2009 Bulletin 2009/08

(51) Int Cl.:
E06B 9/262 *(2006.01)* ***E06B 9/52*** *(2006.01)*

(21) Application number: **07150443.5**

(22) Date of filing: **27.12.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(30) Priority: **03.08.2007 IT VR20070111**

(71) Applicant: **Genius Italia S.r.L.**
43100 Parma (IT)

(72) Inventor: **Bacchi, Denis**
43058 Sorbolo (PR) (IT)

(74) Representative: **Petraz, Gilberto Luigi et al**
GLP S.r.l.
Piazzale Cavedalis 6/2
33100 Udine (IT)

(54) **Retractable mosquito screen with pleated netting**

(57) A side-mounted or vertically-mounted, pleated mosquito screen comprising netting(10) where one side of the netting (10)is attached to and held by a fixed vertical upright (11) while the other side is attached to a mobile vertical upright (12) where the latter is designed to be locked into a further fixed upright (13) opposite to the first upright on the opposite side of the opening to which the mosquito screen is fitted and where the netting (10) is attached to a pre-tensioning device which uses pull wires (16) located in multiple plugs (17) forming a unit which is substantially vertical so that it can be contained inside the track of the fixed upright (13) and also where the upper wire (16) is led out before the end of the mobile upright is reached and is not led out of the end itself.

EP 2 025 858 A2

Description

TECHNICAL FIELD

[0001] The present invention relates to a mosquito screen with pleated netting with a side or vertical mounting whose characteristic feature is that it uses a system enabling its reduction in height, in the case of a side mounting, or its reduction in width, in the case of a vertical mounting.

[0002] In particular, the present invention comprises a mosquito screen designed so that the screen can be adapted to various sizes of door or window opening by relatively unskilled persons or by the final user without particular problems.

[0003] The present invention relates to the field of accessories for the home and in particular to the sector for mosquito screens and their accessories where these products are distributed in retail shopping centres, hobby shops, DIY stores and also through the customary channels employed by professional installers.

BACKGROUND ART

[0004] According to the background art, mosquito screens are barriers designed to prevent the entry of insects, in particular mosquitoes. These barriers consist of netting which can be applied in various positions but where the most suitable position is clearly in openings such as doors and windows.

[0005] Mosquito screens for doors and windows can be constructed in different ways. The most widely used design, in addition to the fixed screen types, is the version with retractable netting where the screen is detached and folded out of view.

[0006] Retractable mosquito screens of the most widely used types usually involve the use of winding parts such as a rotating roller.

[0007] Pleated mosquito screens of the type currently available are not, however, retractable in any way. They consist of systems with pull wires projecting from the ends of profiles which extend to one or more of the corners of the opening in which the mosquito screen is installed or which extend to other elements at a fixed distance.

[0008] This system is not without its problems and has shortcomings which discourage wider use of this type.

[0009] It should be noted in particular that the doors and windows where mosquito screens are to be installed vary in size and do not have standard measurements. The dimensions of the mosquito screen therefore have to be adjusted accordingly.

[0010] On versions employing conventional technology, adjustment is not possible. Conventional pleated mosquito screens cannot be adjusted to the dimensions of an opening, either by the final user or by a professional installer.

[0011] Adapting a conventional pleated mosquito screen to a specific measurement requires the specialist technical skills and tools that only professional installers possess. As a consequence, most installations of this type are made-to-measure solutions and therefore also involve considerable cost.

[0012] The solutions used up until the present time have been designed for made-to-measure applications and are therefore not suitable for distribution through retail shopping centres, hobby shops or DIY stores. This feature also means that it is not possible to prepare and stock pre-assembled mosquito screens during the winter period.

DESCRIPTION OF THE INVENTION

[0013] The object of the present invention is that of providing a mosquito screen which eliminates or at least reduces the shortcomings described above.

[0014] The present invention also provides a mosquito screen designed and constructed according to criteria which make it suitable for use in most door and window openings and enable the construction of a standard size model or a small range of models consisting of the most common sizes thus avoiding the need to make costly made-to-measure solutions.

[0015] The present invention is constructed in such a way that its height can be shortened making a uniform cut with a cutting knife or similar tool suitable for this purpose.

[0016] This is achieved by means of a mosquito screen with the characteristics described in the main claim.

[0017] The dependent claims describe preferred embodiments of the invention.

[0018] The main advantages of this solution, in addition to those which derive from the simplicity of its construction, principally concern the fact that it is no longer necessary to call on the services of a skilled technician to adapt the screen to the opening measurements since the reduction of the mosquito screen can be performed by installers or final users who do not need to be particularly expert in this work.

[0019] The mosquito screen according to the present invention comprises netting with a mesh suitable for holding back mosquitoes and small insects, which is pleated or, in other words, has multiple zigzag folds where the folds are vertical or horizontal depending on the type of mounting selected (side or vertical).

[0020] On the side-mounted version, one of the netting sides is attached to and held by a fixed vertical upright while the other side is attached to a mobile vertical upright operated by the user.

[0021] Irrespective of the path followed by the wires inside the mobile vertical upright, the invention consists of leading the upper wire out, before the end of the mobile upright and not out through the end as is the case with existing systems.

[0022] This means that the entire upper part above the wire exit is completely free of obstructions and can therefore be cut to the measurement required.

[0023] The wire is then hidden in a special recess in the mobile vertical upright and led on until it reaches the upper end where it is passed through a plug, this being technically equivalent to leading the wire out of the end itself. Both the upper wire and lower wires are led onwards to their respective frame corners where they pass through a plug and to where the tensioners are inserted in the profiles fixed to the wall.

[0024] In the embodiment described below it is possible to eliminate the lower wire so that the passage area is completely free of wires. In addition, the tensioners can be separately inserted in the wall-mounted profile or in the upper guide.

[0025] The presence of tensioners and any springs necessary enable the adjustment of wire tension and of the straightness of the vertical uprights.

DESCRIPTION OF THE DRAWINGS

[0026] Further features and advantages of the invention will become apparent from the description of an embodiment which follows with reference to the annexed drawings, given purely by way of a non-limiting example, in which:

- Figure 1 shows a perspective drawing of the complete mosquito screen according to the present invention where the screen is a single-panel, side-mounted version.
- Figure 2 shows a perspective drawing of the complete mosquito screen according to the present invention where the screen is a double-panel, side-mounted version.
- Figure 3 shows an example cross-section of a mosquito screen according to the present invention.
- Figure 4 shows a cross-section of a single-panel, side-mounted mosquito screen with a single wire and external springs.
- Figure 5 shows a view of a side-mounted mosquito screen with a single wire and internal springs.
- Figure 6 shows a single-panel, side-mounted mosquito screen with a single wire with an external return through the lower plug.
- Figure 7 shows a single-panel, side-mounted mosquito screen with a single wire with an internal return employing a spring or other elastic device for returning the wires and external springs.
- Figure 8 shows a single-panel, side-mounted mosquito screen with a single wire with an internal return employing an eyelet made from plastic and internal springs.
- Figure 9 shows a single-panel, side-mounted mosquito screen with a single wire where the wire path is different from that shown in Figure 4.
- Figure 10 shows a vertical mosquito screen with a single wire with an internal return employing a spring or other elastic device for returning the wires and external springs.
- Figure 11 shows a perspective view of a side-mounted mosquito screen according to the invention with a single, centrally-mounted panel where both the uprights 11 and 12 are mobile.
- Figures 12 and 13 show a perspective view of a variant of the mosquito screen according to the invention with a lower flexible guide with a track made from plastic and with brushes.
- Figures 14 and 15 show a perspective view of a variant of the mosquito screen according to the invention with a lower flexible guide with a track made from plastic but without a wire in the lower part of the opening.
- Figure 16 shows a perspective view of the flexible guide with a plastic track without a wire in the lower part of the compartment.
- Figure 17 shows the spring-loaded pulley assembly and its components which aid the upward travel of the flexible guide inside the vertical upright.
- Figures 18 and 19 show a single-panel, side-mounted mosquito screen with a single wire with an internal return employing a plastic eyelet and an internal spring; this is a variant with a lower flexible guide with a plastic track but without any wire in the lower part of the opening. This variant also features a pulley which aids the upward travel of the flexible guide inside the upright. In Figure 18 the tensioner is inserted in the stop profile fixed to the wall. In Figure 19 the tensioner is inserted in the upper guide.
- Figure 20 shows a variant of the embodiment in Figure 10, that is, a vertical mosquito screen where the wires leave the profile before the end of the profile so that both sides of the profile can be shortened without hindrance.

DESCRIPTION OF ONE EMBODIMENT OF THE INVENTION

[0027] The following description refers to the annexed figures where the numeral 10 generally indicates the pleated netting of a mosquito screen according to the present invention where the netting has a mesh specially designed to hold back mosquitoes and small insects preventing their entry through doors, windows or other openings to which the mosquito screen is fitted.

[0028] The netting 10 of the mosquito screen is pleated, in other words, folded multiple times in a zigzag manner and mounted so that the folds run in a vertical direction.

[0029] One side of the netting is attached to and held by a fixed vertical upright 11 while the other side is attached to a mobile vertical upright 12 designed and shaped to be locked into a further fixed upright 13 opposite to the first upright 11 on the opposite side of the opening to which the mosquito screen is fitted.

[0030] The mosquito screen is designed so that the mobile upright 12 can be moved between the two fixed uprights 11 and 13 thus moving the mosquito net to its

open position or its closed position inside the opening which it occupies.

[0031] In other words, the mosquito screen moves from an open position where it is in contact with the fixed upright 11 and a closed position where it is in contact with the fixed upright 13 and held to the fixed upright 13 by means of magnetic or other suitable means such as plastic hooks.

[0032] The sides of the netting 10 are fixed to their respective uprights by means of retaining strips 14 and 15 which can have a snap fitting or can be inserted in their respective profiles 11 and 12.

[0033] The mosquito screen according to the present invention is fitted with a pre-tensioning device substantially comprising pull wires 16 located in multiple plugs 17 forming a unit which is substantially vertical so that it can be contained inside the track of the fixed upright 13.

[0034] The pull wires 16 in turn pass through special holes made in the upright 12.

[0035] According to the invention, irrespective of the path followed by the pull wires 16 inside the mobile vertical upright 12 (some examples are shown in the Figures from 4 to 10), the upper wire 16 is led out before it reaches the end of the mobile upright and is not led out through the upper end.

[0036] This means that the entire upper part, above the wire exit, of the mobile upright 12 is completely free of obstructions. Both the uprights 11 and 12 and the netting 10 can therefore be cut to the measurement required.

[0037] The wire is then hidden in a special recess in the mobile vertical upright and is led on until it reaches the upper end where it is passed through a plug, this being technically equivalent to leading the wire out of the end of the profile itself.

[0038] Both the upper and lower wires are led onwards to their respective corners where they pass through a plug and into the tensioners inserted in the profiles fixed to the wall.

[0039] The presence of tensioners and any springs necessary enable the adjustment of wire tension and of the straightness of the vertical uprights.

[0040] Figure 4 shows a single-panel, side-mounted mosquito screen with a single wire and externals springs.

[0041] Figure 5 shows a side-mounted mosquito screen with a single wire and internal springs.

[0042] Figure 6 shows a single-panel, side-mounted mosquito screen with a single wire with an external return through the lower plug.

[0043] Figure 7 shows a single-panel, side-mounted mosquito screen with a single wire with an internal return employing a spring or another elastic device for returning the wires and external springs.

[0044] Figure 8 shows a single-panel, side-mounted mosquito screen with a single wire with an internal return employing an eyelet made from plastic and internal springs.

[0045] Figure 9 shows a single-panel, side-mounted mosquito screen with a single wire where the wire path is different from that shown in Figure 4.

[0046] Figure 10 shows a vertical mosquito screen with a single wire with an internal return employing a spring or other elastic device for returning the wires and external springs.

[0047] In the figures, the springs and other elastic devices for returning the wires on the mobile upright are indicated by the number 18 while the pivots are indicated by the number 19.

[0048] It should be noted in Figures 4, 6, 7, 9 and 10 that the external adjuster springs can be moved inside the upright 12 by simply using the springs as joining elements between the pivot 18 and the single wire that is then led out of the uprights as shown in Figures 5 and 8.

[0049] In all the embodiments shown, the single upper wire 20 is led out before the end of the upright 12 thus leaving the entire upper part of the mosquito screen free from any wires which would otherwise interfere with cutting. In the same way, the single wire 21 is held inside the profile 12 up to the end of the profile or can be led out before this as is the case with the single upper wire 20.

[0050] Other embodiments include improvements on the lower guide.

[0051] In the solution described above, the lower guide consists of a U-shaped profile (29) where the upright 12 and the wire 16 coming out of the upright actually run inside the U-shaped profile.

[0052] In a first improved embodiment, the place of the U-shaped lower guide 29 can be taken by an aluminium or PVC guide measuring a few millimetres with two sets of brushes 22, one on either side, where the guide hides the wire 16 which comes out of the upright 12.

[0053] The netting 10 is held by a flexible guide 23 consisting of a set of plastic tracks with brushes (Figures 12 and 13). The flexible guide 23 can travel upwards pushed by the upright 12 and become hidden inside the vertical profiles 11.

[0054] During operation, the flexible guide 23 runs on top of the profile 22. The advantage of this embodiment in comparison with that described initially is that the profile which remains fixed to the floor hides the wire 16 and that the flexible guide with the brushes guarantees a better seal with the pleated netting.

[0055] In a second improved embodiment, shown in Figures 14 to 17, the place of the U-shaped lower guide 29 can be taken by a rectangular-shaped aluminium or PVC guide 24 measuring a few millimetres. In this case the netting 10 is held by a flexible guide 25 (different to that described previously) consisting of a set of plastic tracks with an overturned H-shape as shown in Figures 14, 15 and 16.

[0056] During operation of the mosquito screen, the flexible guide 25 travels up the upright 12. As it travels up inside the upright 12 the first tracks of the flexible guide 25 engage several wires, as shown in Figures 18 and 19 and the flexible guide then carries these wires upwards.

[0057] This arrangement means that unlike the other solutions described previously there are no wires coming

out of the lower part of the upright 12.

[0058] It should be noted that once the mosquito screen is retracted and folded away that the only thing remaining fixed to the floor is the small profile 24 without the presence of the wire 16.

[0059] To facilitate the upward travel of the tracks inside the upright 12 it is possible to use a spring-loaded pulley 26 which pulls in the wire 27 which engages the first track of the flexible guide. The pulley 26 pulls in the wire and thus aids the upward travel of the flexible guide.

[0060] The advantage of this embodiment in comparison with the one already described is that there are no wires leading out of the upright 12 and therefore no wires inside the profile on the floor. This means that the floor-mounted profile can be considerably reduced in size to as little as 3 millimetres and does not have grooves which would otherwise fill with dirt.

[0061] The invention as described above refers to a preferred embodiment. Naturally, while the principle of the invention remains the same, the details of construction and the embodiments may widely vary with respect to what has been described and illustrated purely by way of the example, without departing from the scope of the present invention.

Claims

1. A side-mounted or vertically-mounted, pleated mosquito screen comprising netting(10) **characterised in that** one side of the netting (10)is attached to and held by a fixed vertical upright (11), while the other side is attached to a mobile vertical upright (12) where the latter is designed to be locked into a further fixed upright (13) opposite to the first upright (11) on the opposite side of the opening to which the mosquito screen is fitted, and **characterised in that** the netting (10) is attached to a pre-tensioning device which uses pull wires (16) located on multiple plugs (17) forming a unit which is substantially vertical so that it can be contained inside the track of the fixed upright (13) and also **characterised in that** the upper wire (16) is led out before the end of the mobile upright and not led out through the end.

2. A side-mounted or vertically-mounted mosquito screen according to the previous claim **characterised in that** the external adjuster springs can be moved inside the upright (12) by simply using the springs as a joining element between the pivot (18) and the single wire that is led out of the uprights.

3. A side-mounted mosquito screen according to one of the previous claims **characterised in that** in all the embodiments the single upper wire (20) is led out before the end of the upright (12) thus leaving the entire upper part of the mosquito screen free from any wires which would otherwise hinder cutting operations.

4. A side-mounted mosquito screen according to one of the previous claims **characterised in that** the single wire (21) is held inside the profile (12) up to the end of the profile or can be led out before this as is the case with the single upper wire (20).

5. A side-mounted mosquito screen according to one of the previous claims **characterised in that** the pull wires (16) pass through specially drilled holes in the mobile upright (12).

6. A side-mounted mosquito screen according to one of the previous claims **characterised in that** irrespective of the path followed by the pull wires (16) inside the mobile vertical upright (12), the upper wire (16) is led out before it reaches the end of the mobile upright and is not led out of the upper end.

7. A side-mounted mosquito screen according to one of the previous claims **characterised in that** the entire upper part, above the wire exit, of the mobile upright (12), of the upright (11) and the netting (10) are completely free and can therefore be cut to the measurement required.

8. A side-mounted mosquito screen according to one of the previous claims **characterised in that** the wire is hidden in a special recess in the vertical upright profile and is led on until it reaches the upper end where it is passed through a plug in a way which is the same as leading the wire out through the end.

9. A side-mounted mosquito screen according to one of the previous claims **characterised in that** both the upper and lower wires are led onwards to their respective corners where they pass through a plug and into the tensioners inserted in the profiles fixed to the wall.

10. A side-mounted mosquito screen according to one of the previous claims **characterised in that** the screen is fitted with tensioners and also, where necessary, springs, which enable the adjustment of the wire tension and of the straightness of the vertical uprights.

11. A side-mounted mosquito screen according to one of the previous claims **characterised in that** the screen has a lower fixed guide with brushes, one on either side, which effectively hide the wire (16) and a flexible guide consisting of plastic tracks and brushes which leave the upright (11) and rest on the floor-mounted fixed guide which has brushes (22) on either side.

12. A side-mounted mosquito screen according to one

of the previous claims **characterised in that** the screen has a flexible guide consisting of plastic tracks (25) which leave the upright (12) and which, as they travel up the upright (12), draw with them the wires thus completely eliminating the floor-mounted wire (16).

13. A side-mounted mosquito screen according to one of the previous claims **characterised in that** the screen has a spring-loaded pulley (26), constructed as shown in the drawing, which facilitates the upward travel of the flexible guide (25) inside the upright (12).

14. A side-mounted mosquito screen according to one of the previous claims **characterised in that** the spring-loaded pulley (26) is employed to roll up a wire (27) when the mosquito screen is opened and closed.

15. A vertically-mounted mosquito screen according to one of the previous claims **characterised in that** one or more of the wires (16) leaves the horizontal profile before the end of the profile is reached in order to leave both ends of the mosquito screen completely free of wires so that both ends can be shortened as required.

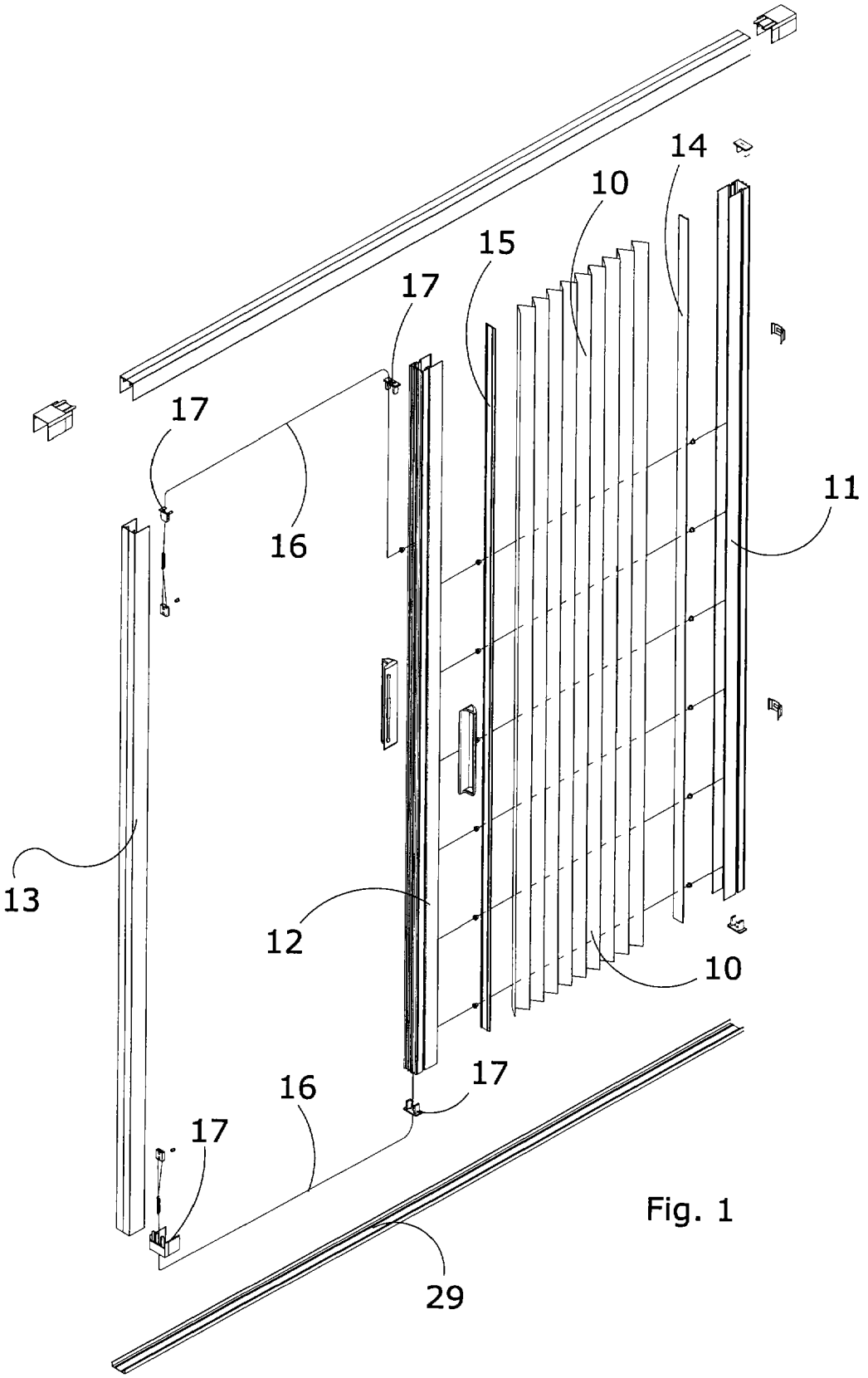

Fig. 1

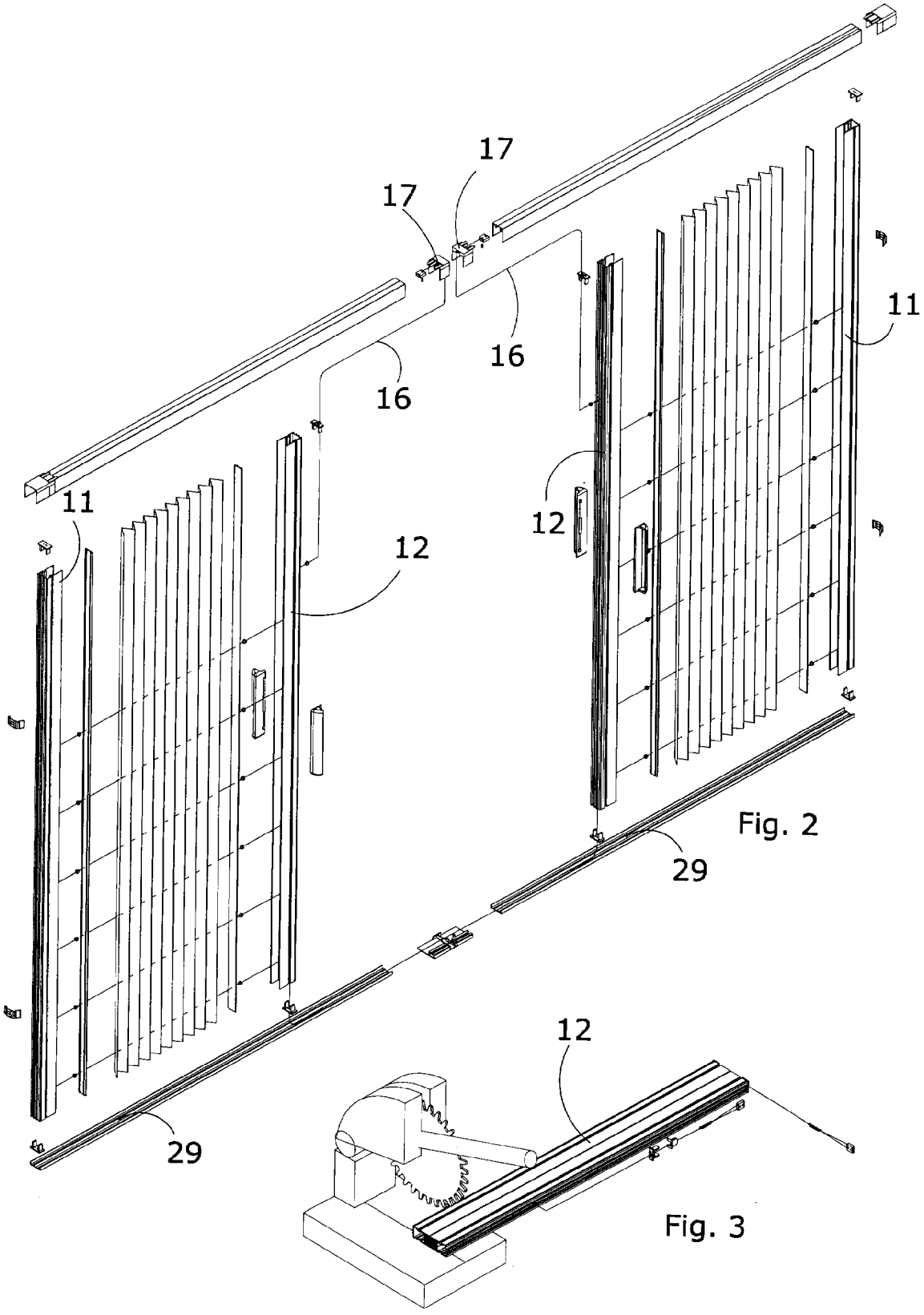

Fig. 2

Fig. 3

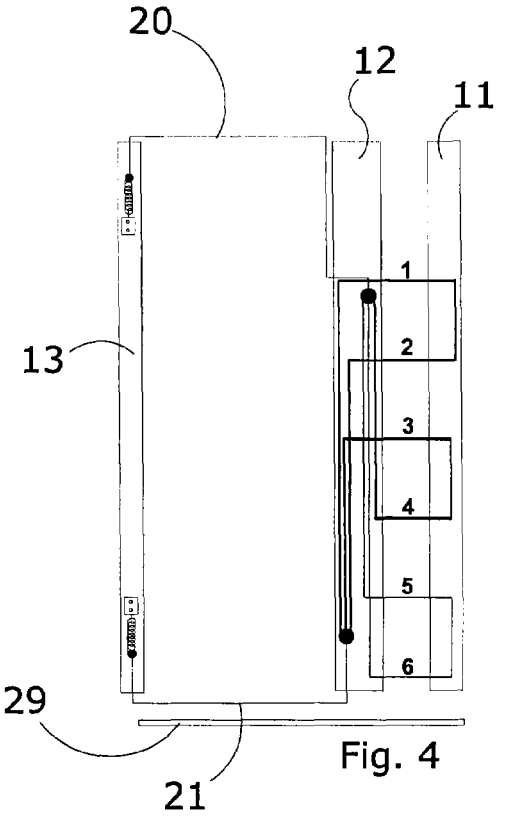

Fig. 4

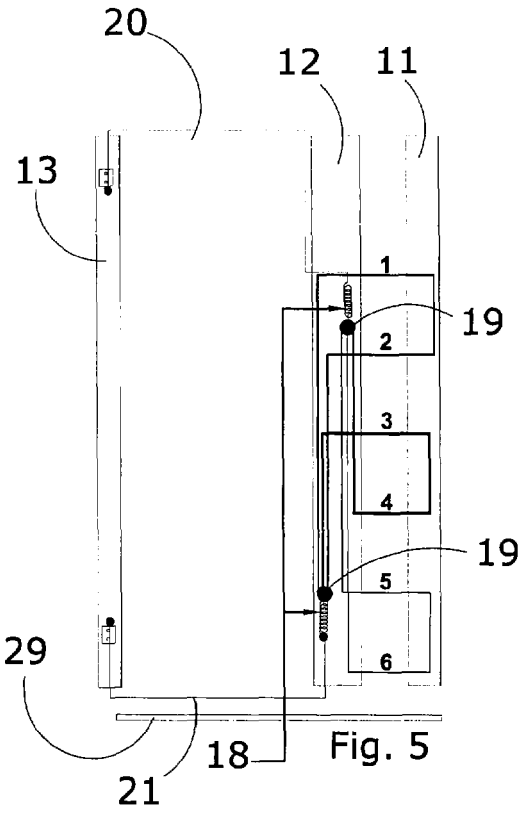

Fig. 5

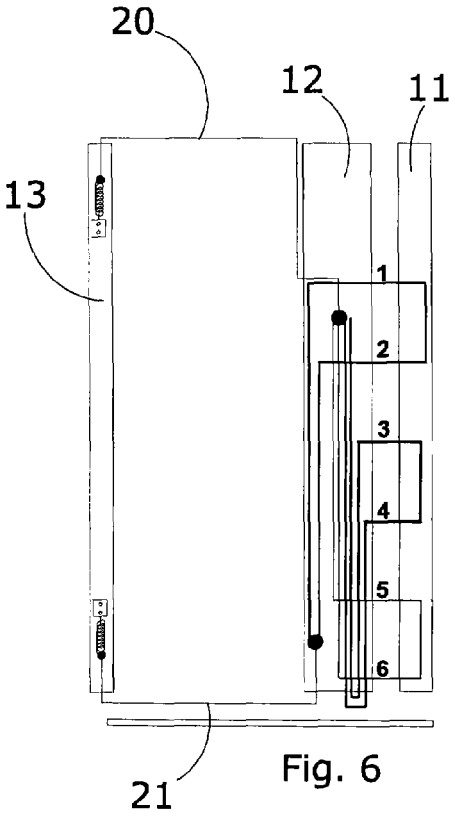

Fig. 6

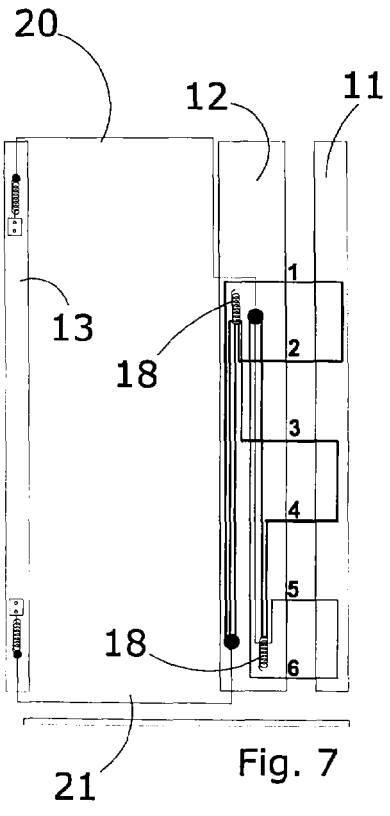

Fig. 7

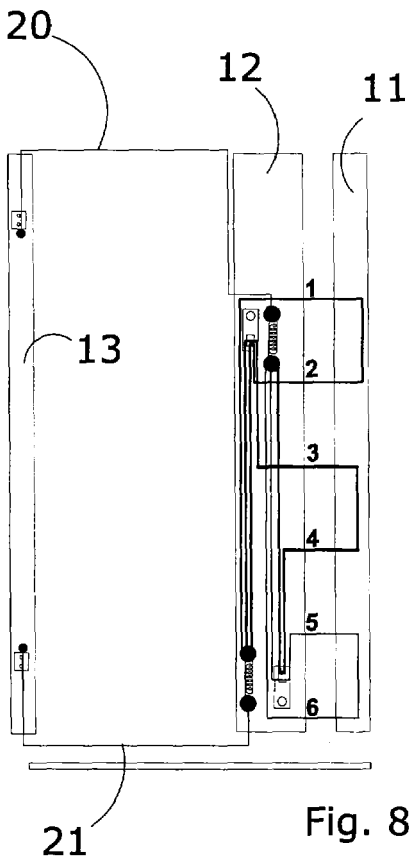

Fig. 8

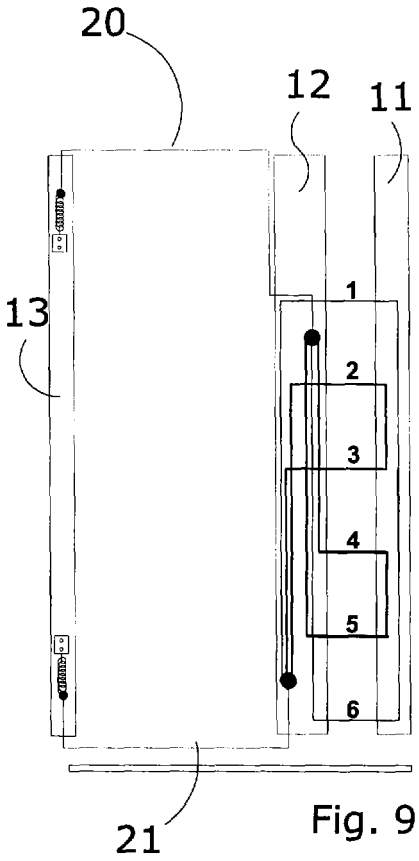

Fig. 9

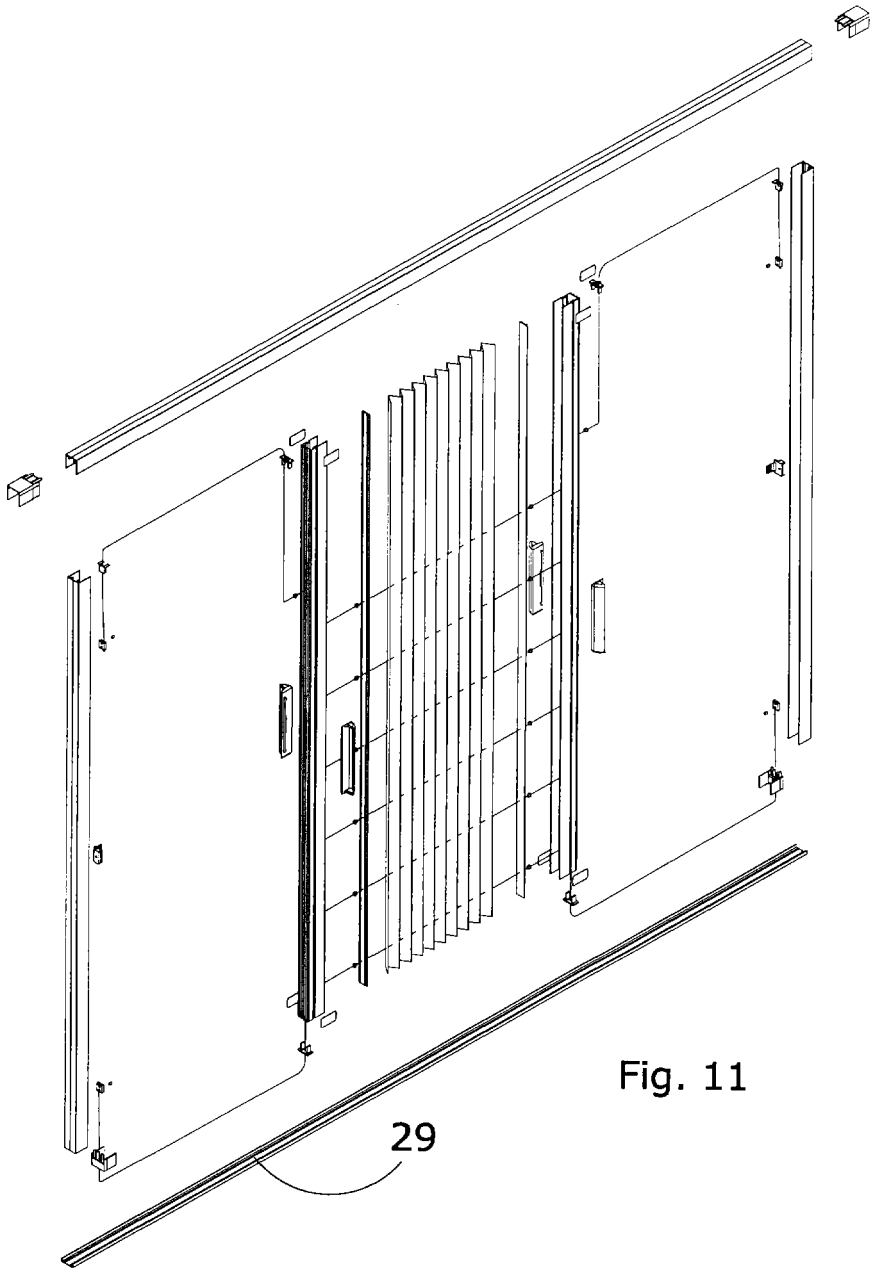

Fig. 11

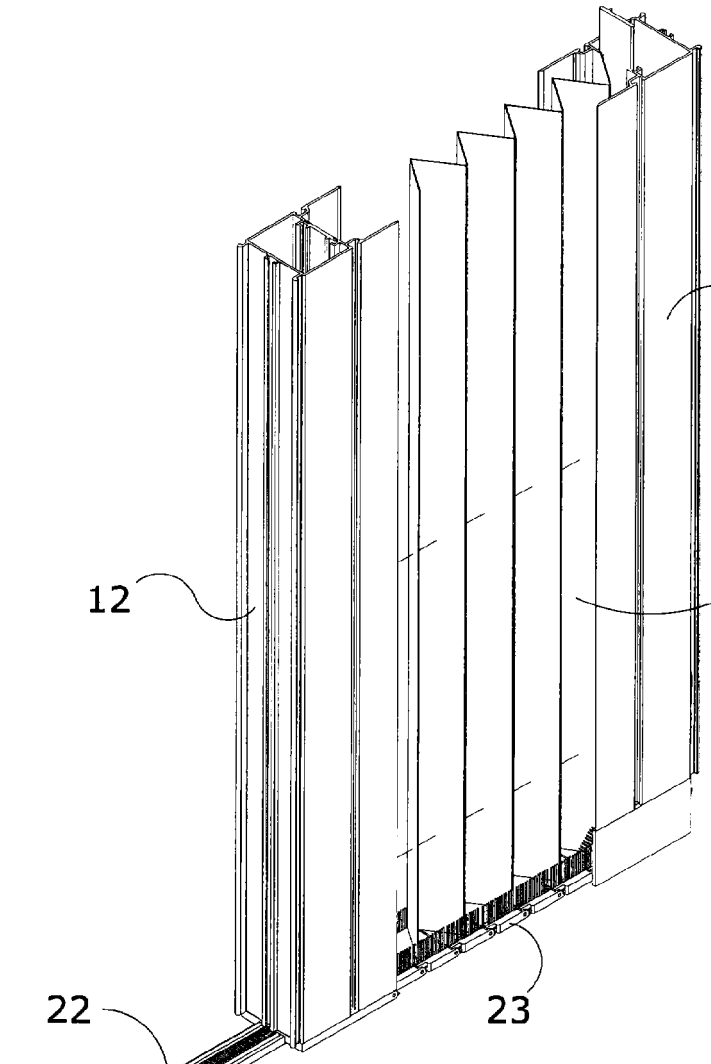

Fig. 12

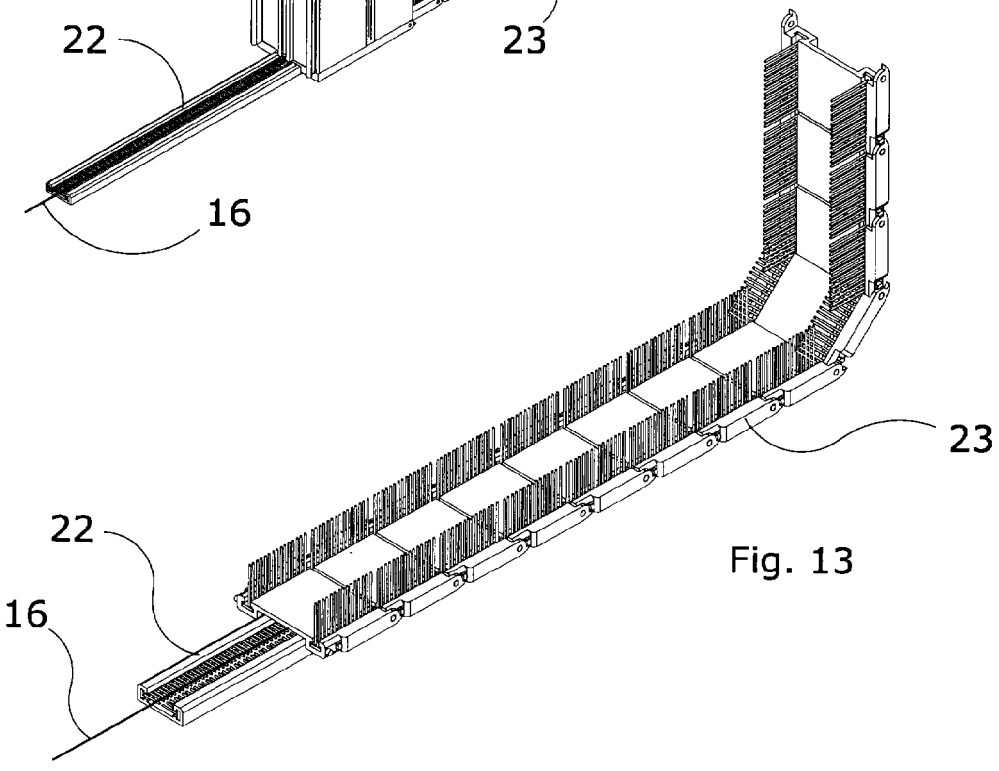

Fig. 13

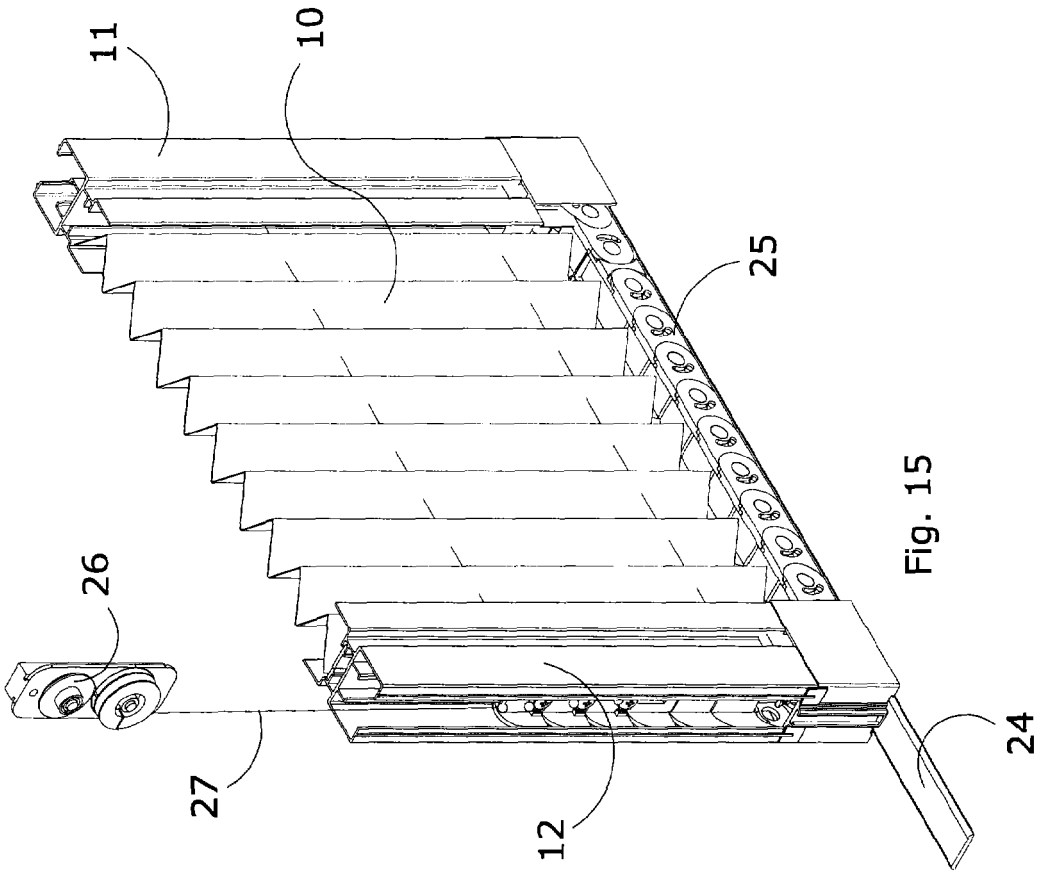

Fig. 15

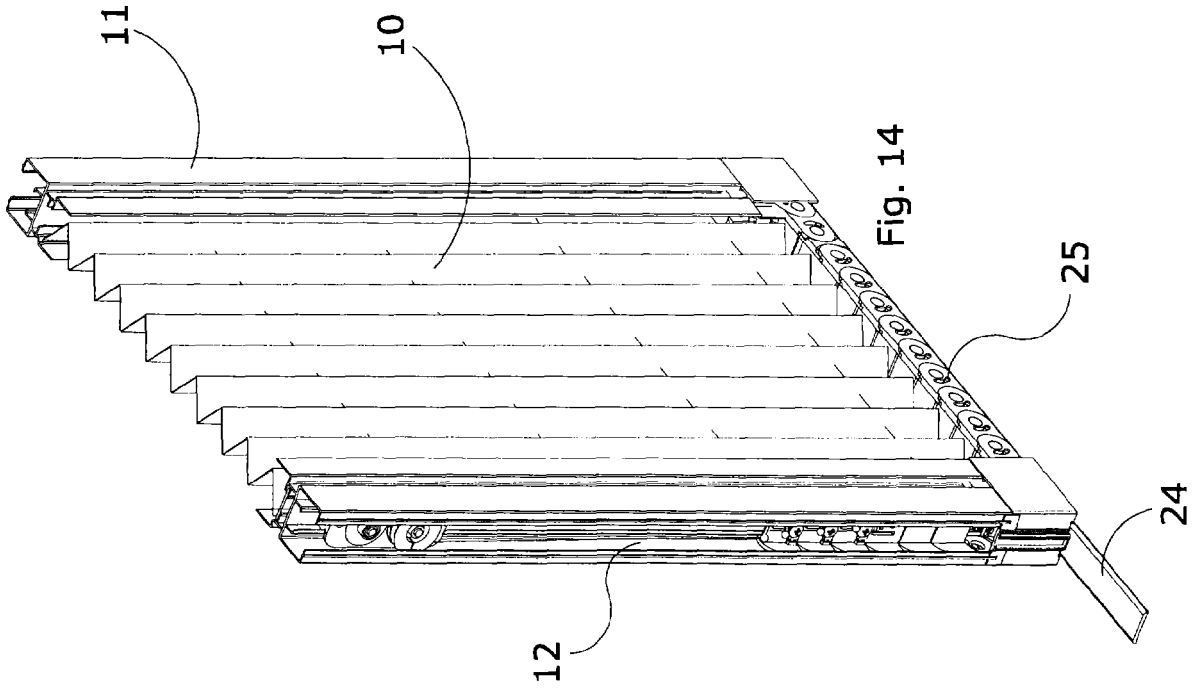

Fig. 14

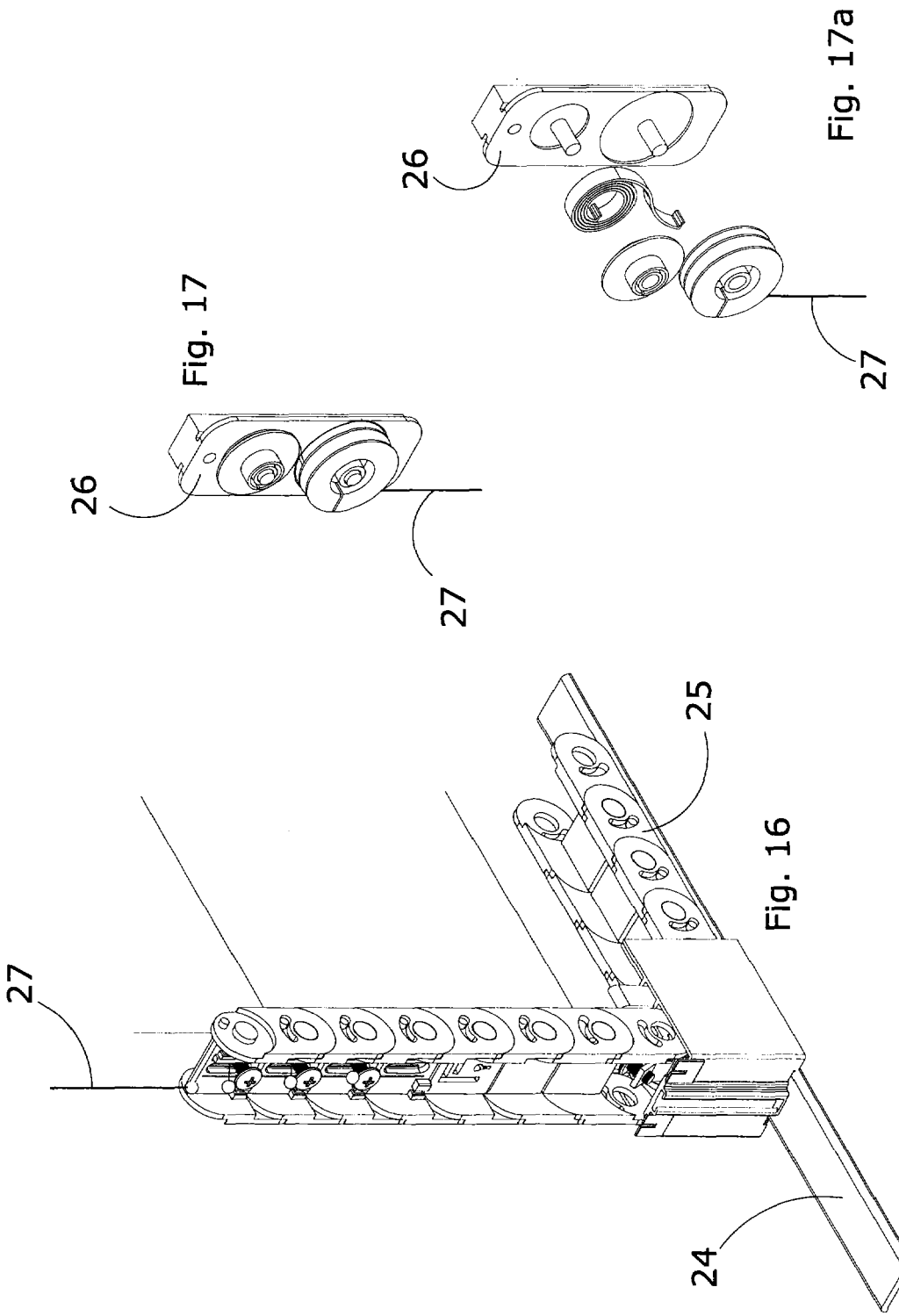

Fig. 16

Fig. 17

Fig. 17a

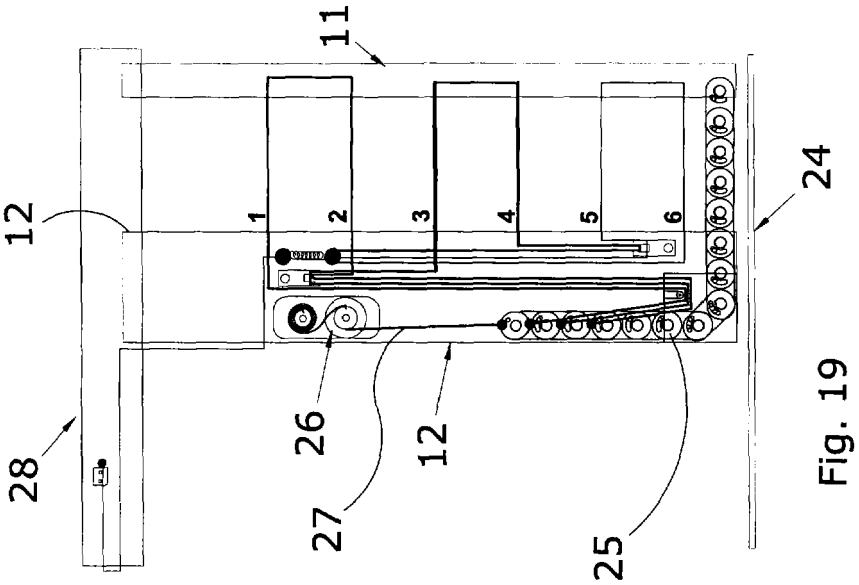

Fig. 19

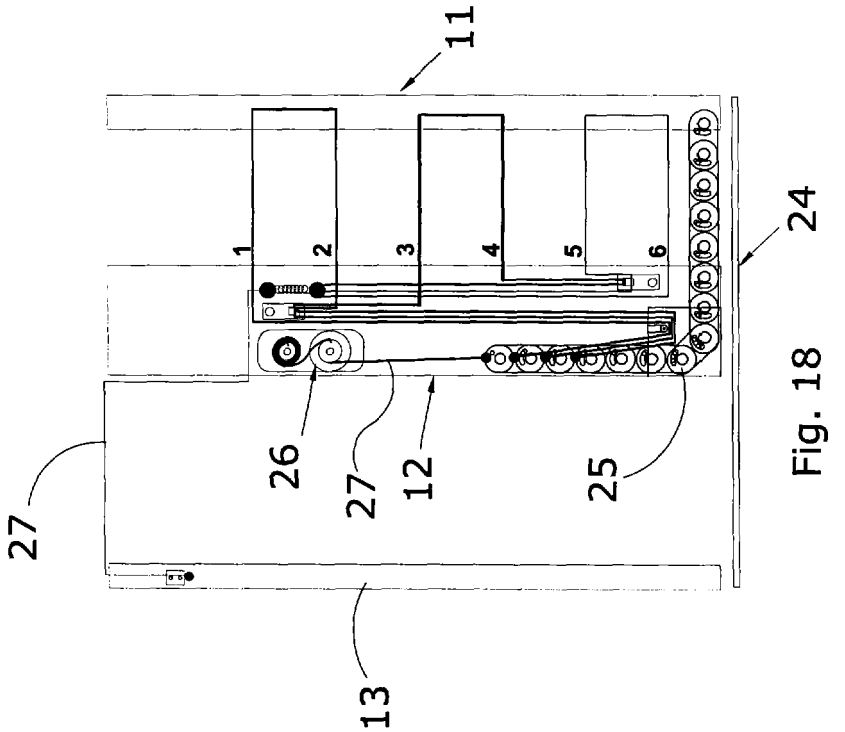

Fig. 18

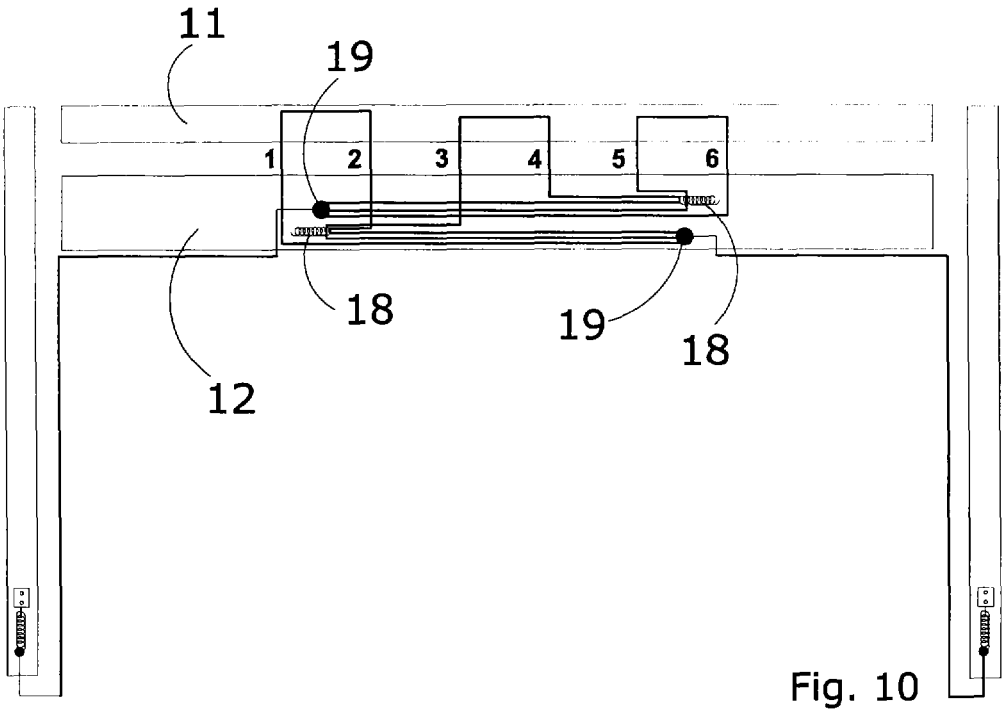

Fig. 10

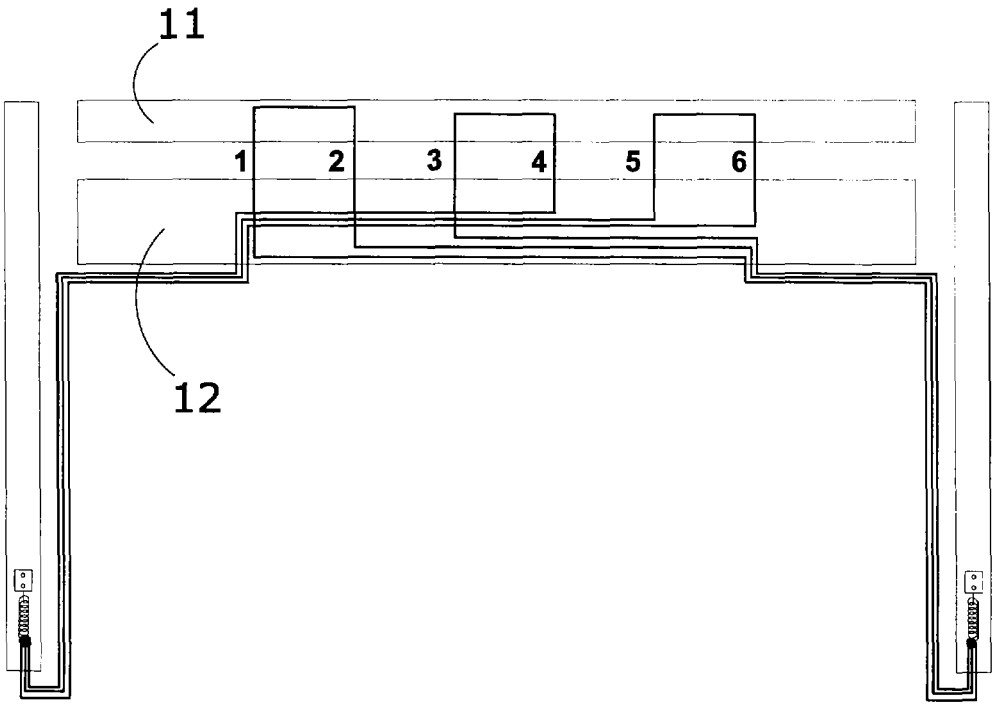

Fig. 20