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(71) Applicant: **Pliscreen B.V.**
**5531 PP Bladel (NL)**

(72) Inventor: **Kropmans, Jacobus Gerardus**
**3068 AS Rotterdam (NL)**

(74) Representative: **Verhees, Godefridus Josephus Maria**
**Brabants Octrooibureau B.V.**
**De Pinckart 54**
**5674 CC Nuenen (NL)**

(54) **Fly screen for a turn-tilt windows and turn-tilt window provided with the fly screen**

(57) An insect screen 11 for a tilt & turn window 1 has an accordion-shaped netting 13 and two attached profiles 15 and 17. Profile 17 is detachably attached to the window pane 5. The tilt & turn window is provided with means to let the profiles automatically return from the unfolded to the folded position of the netting when profile 17 is detached from the window pane. These means are formed by two helical springs 23 which are each attached at one end to the partial profile 17a and at the other end to a cord 25 which is led by a diversion element to the partial profile 15a.

When opening the window pane 5 the helical springs 23 are extended. When profile 17 is then detached from the window pane 5, the helical springs 23 contract and profile 17 is pulled towards profile 15.

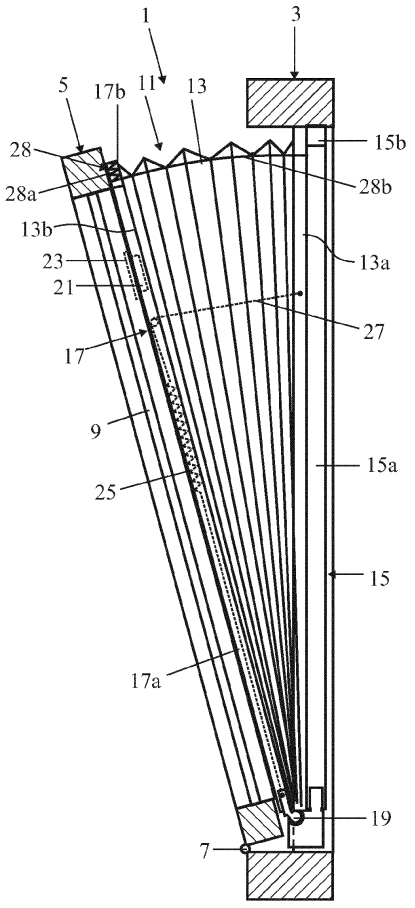


FIG. 4

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## Description

BACKGROUND OF THE INVENTION:

### Field of the invention

**[0001]** The invention relates to an insect screen for a tilt & turn window consisting of a window frame within which a window pane, hingeable around a horizontal tilting axis, is present and connected to it, in which the insect screen is provided with an accordion-shaped netting, which is provided with a first and second end edge in the folding and unfolding direction, and which insect screen comprises two profiles which extend in a U-shape and each of which has two parallel vertical partial profiles, as well as a horizontal partial profile which extends between the two vertical partial profiles and is connected to the first ends of the vertical partial profiles, in which the profiles are connected at their second ends by hinges, in which the first of the profiles is connected to the first end edge of the netting and can be attached to the window frame, and the second profile is connected to the second end edge and can detachably be connected to the window pane, and in which the profiles can be switched between a first position in which the netting between the profiles is folded, and a second position in which it is unfolded.

### Prior art

**[0002]** Such an insect screen is described in NL-A-2006083. The second profile of the insect screen is detachably connected to the window pane, for instance with a magnet. When the window pane is turned open instead of tilted, the second profile is still slightly pulled towards the open position before it disconnects from the window pane. The second profile then remains in the partly open position.

### Summary of the invention

**[0003]** An objective of the invention is to provide an insect screen of the type described in the preamble in which the disadvantage described above does not occur. To this end the insect screen according to the invention is **characterized in that** the insect screen comprises means to let the profiles automatically return from the second position to the first position. This prevents the second profile from remaining in the open position after it is detached from the window pane. Another solution is to prevent the second profile from being taken along when the window pane is turned open. However, this is more difficult to realize than the solution according to the invention.

**[0004]** An embodiment of the insect screen according to the invention is **characterized in that** the means comprise of at least one spring which is connected to both profiles and pulls or pushes these to the first position.

**[0005]** In a favourable embodiment the - at least one - spring is implemented as a torsion spring, which is connected at one end with the first profile and at the other end with the second profile, in which the axis of the torsion spring coincides with the hinge axis.

**[0006]** In another favourable embodiment the - at least one - spring is implemented as a helical spring, which extends into one of the partial profiles and which is connected at one end to that partial profile and at the other end to a cable/cord which is diverted by a diversion element present in the partial profile to the other profile and is attached to this other profile.

**[0007]** Another embodiment of the insect screen according to the invention is **characterized in that** the means comprise at least one weight which is adjustable in one of the vertical partial profiles and is connected to a cord/cable which is diverted by a diversion element present in the partial profile to the other profile and is attached to this other profile.

**[0008]** A further embodiment of the insect screen according to the invention is **characterized in that** the insect screen also comprises a wire spring which prevents sagging of the netting, which wire spring comprises a helical spring, which is present in one of the partial profiles, as well as two long arms, which are connected to the ends of the helical spring and stretch out under the upper horizontal part of the netting to support it.

**[0009]** Yet a further embodiment of the insect screen according to the invention is **characterized in that** the netting is locked between the profiles, in which the profiles comprise a part with a C-shaped cross section, in which a strip is present, which clamps an edge of the netting into the profile.

**[0010]** The invention also relates to a tilt & turn window comprising a window frame within which a window pane, hingeable around a horizontal tilting axis, is present and connected to it. With regard to the tilt & turn window the invention is **characterized in that** the tilt & turn window according to the invention comprises an insect screen, which is provided with an accordion-shaped netting, which is provided with a first and second end edge in the folding and unfolding direction, and which insect screen comprises two profiles which extend in a U-shape and each of which has two parallel vertical partial profiles, as well as a horizontal partial profile which extends between the two vertical partial profiles and is connected to the first ends of the vertical partial profiles, in which the profiles are connected at their second ends by hinges, in which the first of the profiles is connected to the first end edge of the netting and is attached to the window frame, and the second profile is connected to the second end edge and is detachably connected to the window pane.

### Brief description of the drawings

**[0011]** The invention will be elucidated more fully below on the basis of drawings in which an embodiment of the insect screen according to the invention is shown. In

these drawings:

Figure 1 shows a tilt & turn window provided with an insect screen according to the invention in the turned open position from the side;
Figure 2 shows the tilt & turn window shown in figure 1 in the tilted open position from the side;
Figure 3 shows a cross-section of the tilt & turn window provided with a first embodiment of the means according to the invention in the closed position;
Figure 4 shows a cross-section of the tilt & turn window shown in figure 3 in the tilted open position;
Figure 5 shows the tilt & turn window shown in figure 4 from above;
Figure 6 shows a detail of the connection between the netting and a profile;
Figure 7 shows a cross-section of the tilt & turn window provided with a second embodiment of the means according to the invention in the open position; and
Figure 8 shows a cross-section of the tilt & turn window provided with a third embodiment of the means according to the invention in the open position.

**Detailed description of the drawings**

**[0012]** The figures 1 and 2 show a tilt & turn window 1 provided with an insect screen 11 according to the invention from the side, respectively in the turned open and the tilted open positions. The tilt & turn window 1 comprises a window frame 3 and a window pane 5, hingeable around a horizontal tilting axis 7 and a vertical turning axis 9, provided with a pane 9, present in it and connected to it.

**[0013]** The figures 3 and 4 show a cross-section of the tilt & turn window 1, respectively in the closed position and the tilted open position. The insect screen 11 has an accordion-shaped netting 13 and two profiles 15 and 17 attached to it. The netting has, seen from folding and unfolding direction, a first end edge 13a, and a second end edge 13b.

**[0014]** The profiles 15 and 17 extend in a U-shape and each has two parallel partial profiles 15a, 17a, as well as a horizontal partial profile 15b, 17b, which extends between the two vertical partial profiles. The horizontal partial profile is connected at the ends to the first ends of the vertical partial profiles. The other, second ends of the vertical profiles are connected to each other by hinges 19.

**[0015]** A first of the profiles 15 is connected to the first end edge 13a of the netting and is attached to window frame 3. The second profile 17 is connected to the second edge 13b of the netting and is detachably connected to window pane 5. The profiles can be switched between a first position in which the netting between the profiles is folded, see figure 3, and a second position in which the netting is unfolded, see figure 4. The second profile of the insect screen is, for instance by a magnet 21, which is connected to the partial profile 17a, detachably connected to the window pane 5, which is for this purpose provided with a ferromagnetic platelet 23.

**[0016]** The tilt & turn window shown in the figures 3 and 4 is provided with means to return the profiles automatically from the unfolded position to the folded position of the netting. These means are formed by two helical springs 25, one in each partial profile 17a. Each helical spring is attached at one end to the partial profile 17a. At the other end of the helical screw a cord 27 is attached that is diverted via a diversion element to partial profile 15a where the cord is attached to this partial profile.

**[0017]** When opening the window pane 5 the helical springs 25 are stretched out. If profile 17 then is loose from the window pane 5 the helical springs 25 contract and profile 17 is drawn towards profile 15 until both profiles are in contact with each other.

**[0018]** In addition, the tilt & turn window has a wire spring 28 that prevents the netting 13 from sagging. This wire spring 28 has a helical spring 28a, which functions as a torsion screw, with on each end of the helical springs the long arms 28b and 28c. In figure 5 the tilt & turn window is shown from above. The screw spring 28a is in the partial profile 17b and the spring arms 28b and 28c stretch out under the upper horizontal part of the netting 13 and support it. At the free ends the arms are bended to a loop 28d and 28e so the ends do not form sharp parts which could damage the netting.

**[0019]** The netting 13 is locked in the profiles 15 and 17. A detail of this lock is shown in figure 6. In the partial profile 15b a strip 30 is pushed or clicked after the netting 13 first is attached with an edge in the partial profile. The C-shape of the partial profile 15b and the width of the strip 30 (width larger than opening in C-shape) ensure that the strip cannot be drawn out of the profile by the netting. The resilience of the netting and/or the clamping between the partial profile and the strip ensure that the netting cannot be easily drawn out between the strip and the partial profile.

**[0020]** Figure 7 shows a detail of the tilt & turn window at the location of the hinge 19. This tilt & turn window is provided with a second embodiment of the means. In this embodiment the means are formed by two torsion springs 29, one at the location of each hinge 19. Each torsion spring 29 is connected at one end to the partial profile 17a and at the other end with a part of the hinge which is connected to the partial profile 15a. The axis of the torsion spring coincides here with the hinge axis.

**[0021]** When opening the window pane 5 the torsion springs 29 are twisted. When profile 17 then is detached from the window pane 5 the torsion springs 29 contract and profile 17 is pulled to profile 15 until both profiles are in contact with each other.

**[0022]** Figure 8 shows the tilt & turn window provided with a third embodiment of the means. In this embodiment the means are formed by two weights 31, one in each partial profile 17a. These weights are adjustable in the partial profiles 17a. A cord 33 is attached to each weight 31 which has been diverted by a diversion element

present in this partial profile 17a to partial profile 15a. The cord 33 is attached at the other end to this partial profile 15a.

**[0023]** When opening the window pane 5 the weights 31 are lifted. When profile 17 then is detached from the window pane 5 the weights 31 slide down and profile 17 is pulled towards profile 15 until both profiles are in contact with each other.

**[0024]** Although in the above the invention is explained on the basis of the drawings, it should be noted that the invention is in no way limited to the embodiment shown in the drawings. The invention also extends to all embodiments deviating from the embodiment shown in the drawings within the context defined by the claims. The weights could also be present in the other partial profile 15a, for instance, or the helical springs can also be present in the other partial profiles 15a. Also one screw spring, which is then present in one of the horizontal partial profiles 15b or 17b, could suffice. The insect screen can also be provided with two of the shown means or all three.

## Claims

1. Insect screen for a tilt & turn window consisting of a window frame within which a window pane, hingeable around a horizontal tilting axis, is present and connected to it, in which the insect screen is provided with an accordion-shaped netting, which is provided with a first and second end edge in the folding and unfolding direction, and which insect screen comprises two profiles which extend in a U-shape and each of which has two parallel vertical partial profiles, as well as a horizontal partial profile which extends between the two vertical partial profiles and is connected to the first ends of the vertical partial profiles, in which the profiles are connected at their second ends by hinges, in which the first of the profiles is connected to the first end edge of the netting and can be attached to the window frame, and the second profile is connected to the second end edge and can detachably be connected to the window pane, and in which the profiles can be switched between a first position in which the netting between the profiles is folded, and a second position in which it is unfolded, **characterized in that** the insect screen comprises means to make the profiles return automatically from the second to the first position.

2. Insect screen according to claim 1, with as characteristic that the means comprise at least one spring connected to both profiles and which pulls or pushes them back to the first position.

3. Insect screen according to claim 2, **characterized in that** the - at least one - spring is a torsion spring which is connected at the end to the first profile and at the other end to the second profile, in which the axis of the torsion spring coincides with the hinge axis.

4. Insect screen according to claim 2 or 3, **characterized in that** the - at least one - spring is a helical spring which extends into one of the partial profiles and is attached at one end to that partial profile and is connected at the other end to a cord/cable which is diverted by a diversion element present in the partial profile to the other profile and is attached to this other profile.

5. Insect screen according to one of the preceding claims, **characterized in that** the means comprise at least one weight which is adjustable in one of the vertical partial profiles and is attached to a cord/cable which is diverted to the other partial profile by a diversion element present in this partial profile and is attached to this other profile.

6. Insect screen according to one of the preceding claims, **characterized in that** the insect screen also comprises a wire spring (28) which prevents sagging of the netting (13), which wire spring comprises a helical spring (28a), which is present in one of the partial profiles (15b, 17b), as well as two long arms (28b, 28c), which are connected to the ends of the helical spring and stretch out under the upper horizontal part of the netting to support it.

7. Insect screen according to one of the preceding claims, **characterized in that** the netting (13) is locked into the profiles (15, 17), in which the profiles comprise a part with a C-shaped cross-section in which a strip (30) is present that clamps one edge of the netting into the profile.

8. Tilt & turn window comprising a window frame within which a window pane, hingeable around a horizontal tilting axis, is present and connected to it, **characterized in that** the tilt & turn window comprises an insect screen, which is provided with an accordion-shaped netting, which is provided with a first and second end edge in the folding and unfolding direction, and which insect screen comprises two profiles which extend in a U-shape and each of which has two parallel vertical partial profiles, as well as a horizontal partial profile which extends between the two vertical partial profiles and is connected to the first ends of the vertical partial profiles, in which the profiles are connected at their second ends by hinges, in which the first of the profiles is connected to the first end edge of the netting and is attached to the window frame, and the second profile is connected to the second end edge and is detachably connected to the window pane.

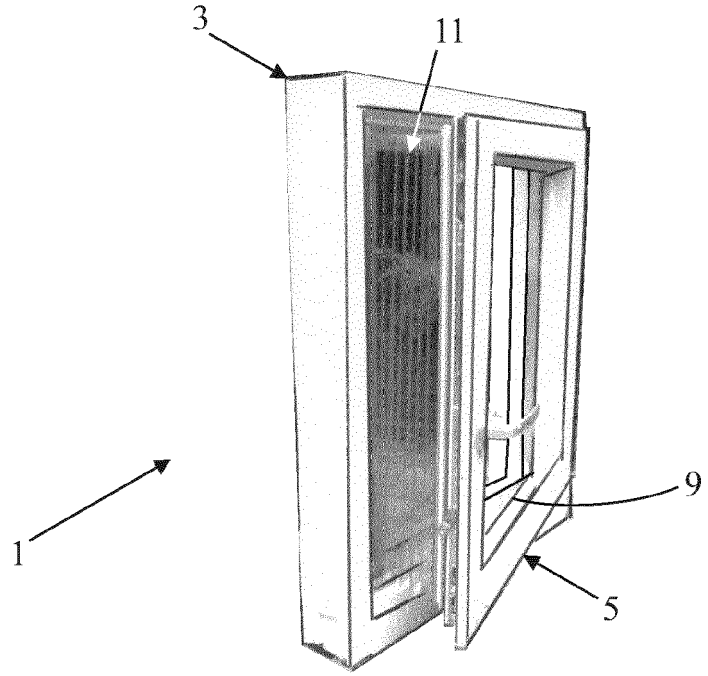



FIG. 1

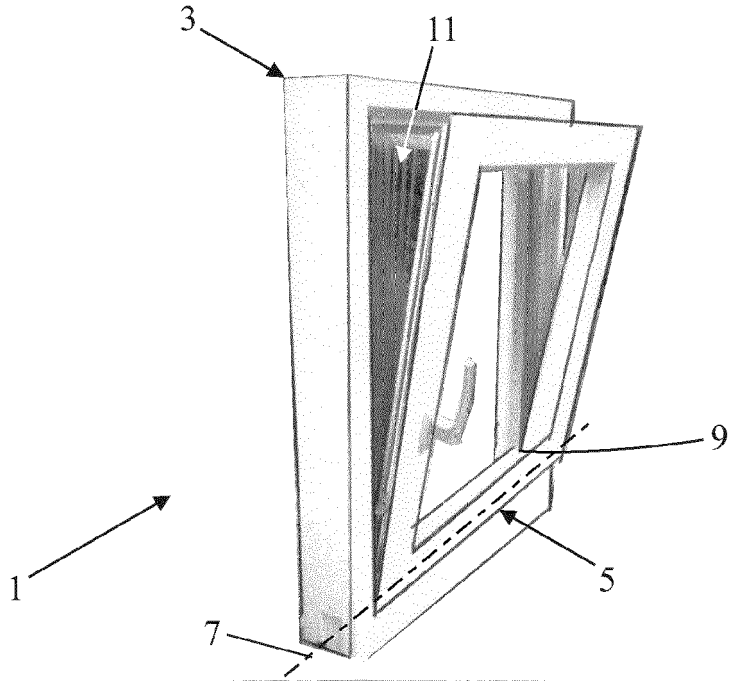



FIG. 2

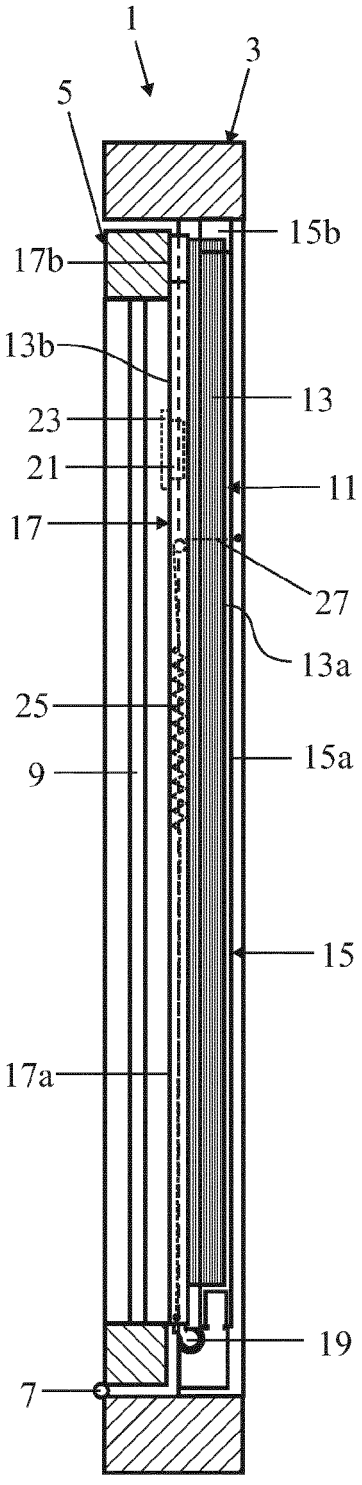

1
3
5
15b
17b
13b
13
23
21
11
17
27
13a
25
15a
9
15
17a
19
7

FIG. 3

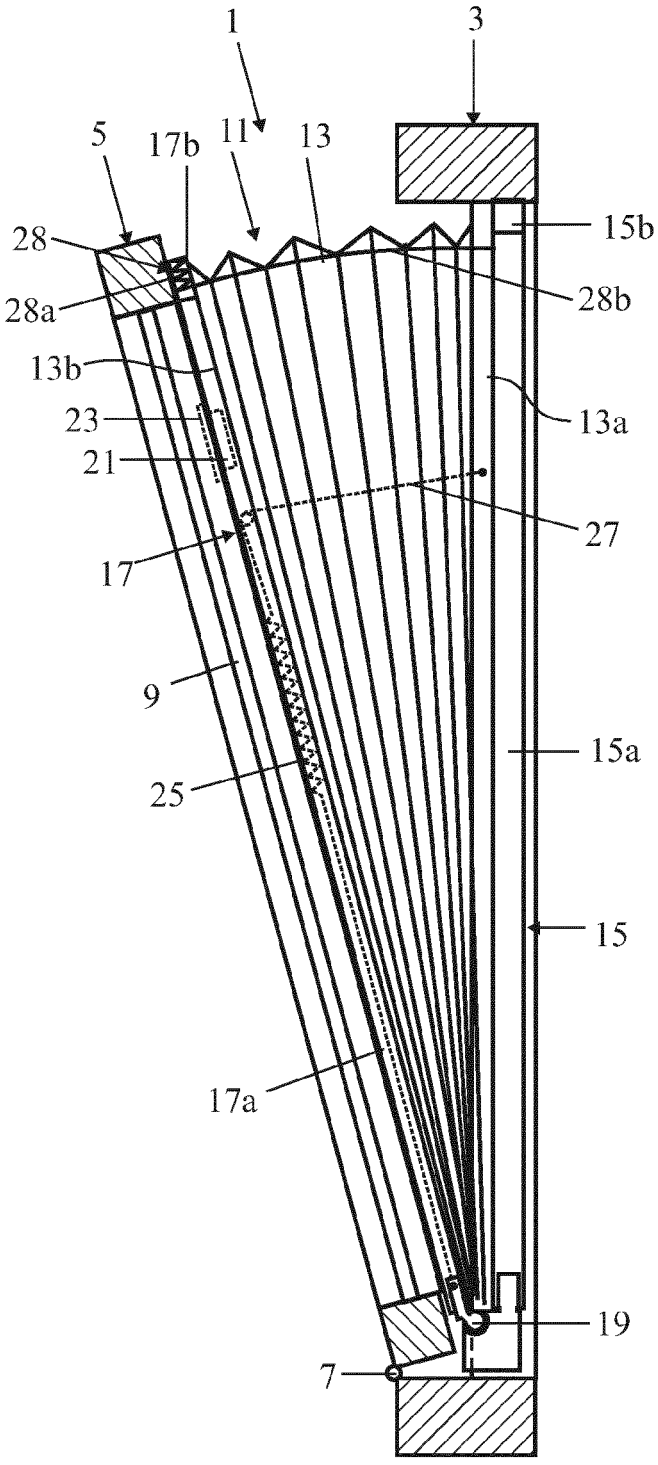

1
3
5
17b
11
13
15b
28
28b
28a
13b
13a
23
21
27
17
9
15a
25
15
17a
19
7

FIG. 4

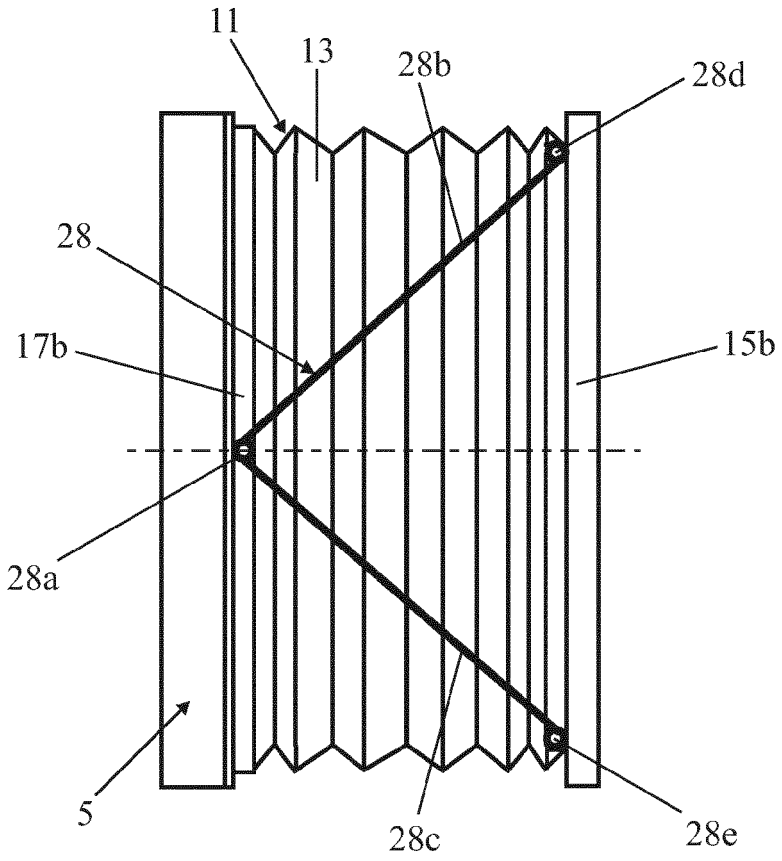



FIG. 5

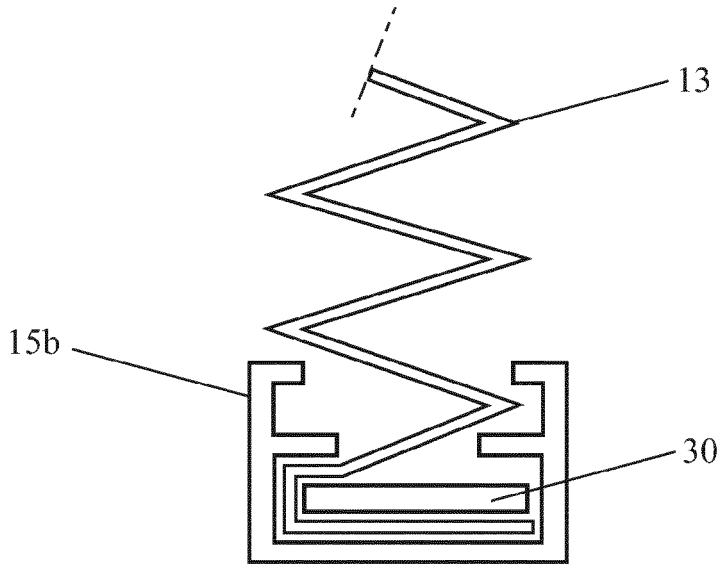
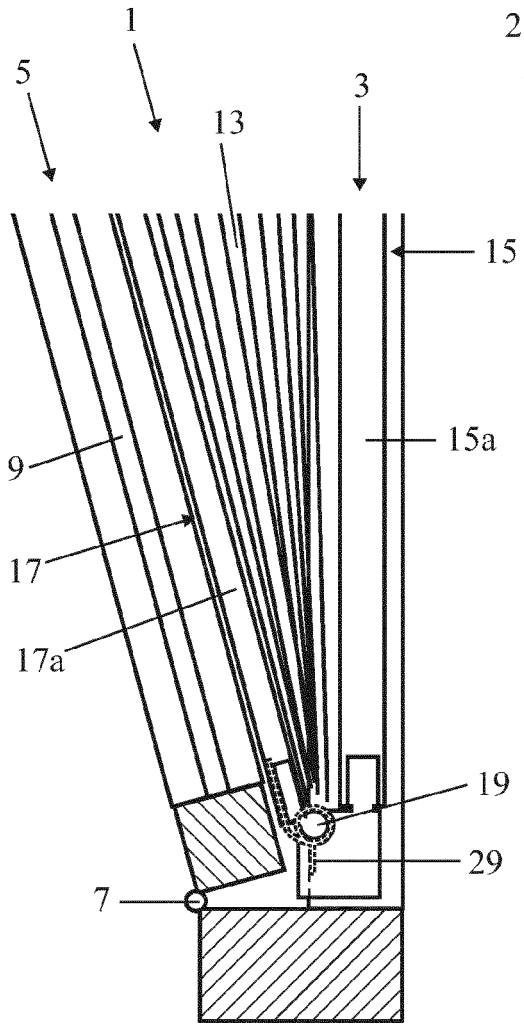



FIG. 6


1
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13
3
15
15a
9
17
17a
19
29
7

FIG. 7

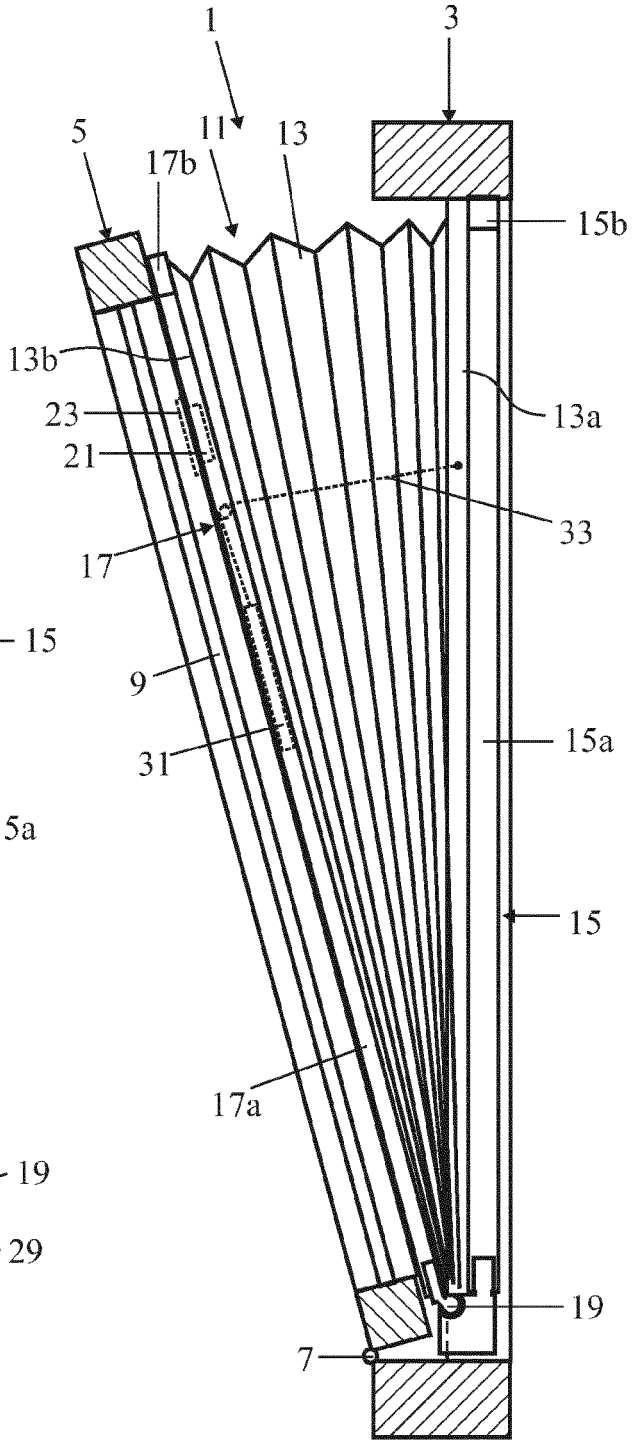
1
3
5
11
13
17b
15b
13b
23
13a
21
33
17
9
31
15a
15
17a
19
7

FIG. 8

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# EUROPEAN SEARCH REPORT

Application Number
EP 13 17 4445

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
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TECHNICAL FIELDS SEARCHED (IPC)

E06B

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 24 October 2013 | Peschel, Gerhard |

CATEGORY OF CITED DOCUMENTS

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1

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 17 4445

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24-10-2013

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