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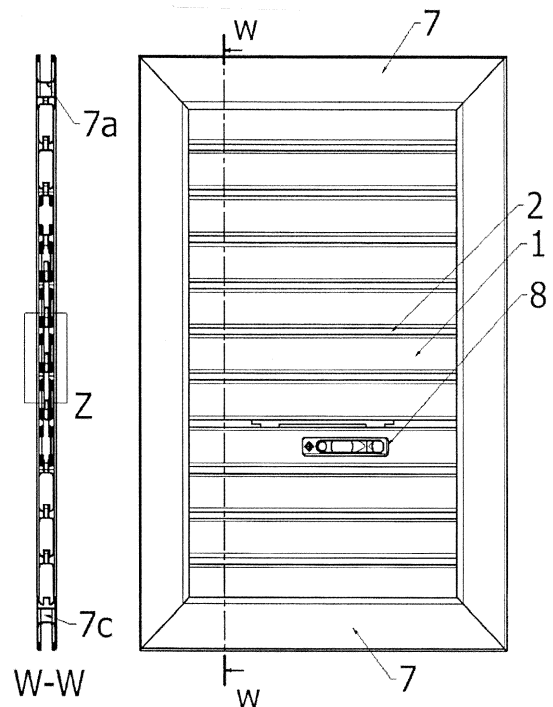
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(54) **MULTILEVEL LOUVRE SYSTEM IN OPENING AND SLIDING DOORS AND WINDOWS WITH ADJUSTABLE VENTILATION AND INSECT'S PROTECTION**

(57) The multilevel shutter blind system in opening and sliding doors and windows with ventilation in compliance with this invention, is characterized by the fact that the ventilation and lighting doors are adjustable by the operator. The adjustment is achieved by parallel linear relocation of the door.

The advantages of this invention is that it offers: Bid adjustable ventilation and lighting openings with insects' protection without modifying the external dimensions of the shutter during the adjustment, sealing of the openings with full grayout and security and that all are for use in flush-type sliding shutters' leafs and in opening shutters with many leafs.

**FIGURE 1****EP 3 438 403 A1**

## Description

**[0001]** The invention refers to a multilevel shutter blind system in opening and sliding doors and windows that permits as a unified total, adjustable ventilation of wide-ranging, with or without insect's protection. It is consisted of four parts:

- a) by at least two metal, synthetic or wooden cross-sections (1), (16) stably adjusted in the frame (7), of the doors and windows, repeated in parallel, horizontally or vertically, in the first vertical level (A), connected in the ends of their two faces by plastic caps (4), which adjust stable distances (D) between them and guaranty their stability with frame (7). They are named as "inner blinds" (1), (16),
- b) by at least two metal, synthetic or wooden cross-sections (2), in parallel and in contact with the sections (1), (16), (3), (17), (23), in parallel repeated between them in the second vertical level (B), in parallel with the first vertical level (A), connected in their ends of their two faces with plastic caps (5), which adjust stable distances (E) between them and guaranty their uniform and parallel movement, inside the special runners (18), which are formed by the stable embodied plastic caps (4) in the frame of the shutter (7), in the "inner- blinds" (1), (16) and the "external blinds" (3), (17) of levels (A) and (C) correspondingly. They move towards two directions in relation to the frame (7), named as "ventilation sections" (2),
- c) by at least two metal, synthetic or wooden cross-sections (3), (17), stably adjusted in the frame (7) of the doors and windows, parallel and in contact with the sections (2), repeated in parallel, horizontally or vertically, in the third vertical level (C) in parallel with the first and the second vertical level (A) and (B), connected in the ends of their two faces by plastic caps (4), which adjust stable distances (F) between them and guaranty their stability with frame (7). They are named as "external blinds" (3), (17),
- d) by at least one assembly of one "operating control" (8), a system of movable parts (10), (11), (12a), (12b), (24) named as "mechanism" (19), of at least two plastic caps (5), embodied in "ventilation sections" (2), which assembly converts the movement of the operator through the operating system (8), to uniform intergraded motion of the "ventilation blinds" (2) of two direction, named as "mechanism of ventilation adjustment" (20).

**[0002]** The blinds system with adjustable ventilation were developed many years ago, especially in Italy, with rotary shifts but only for opening shutters, METRA, with very good ventilation, but with many operating and adjusting problems due to the rotation of the blinds. The rotating blinds change their level by rotation, which they have in their close position, and therefore their horizontal dimension significantly increases as they rotate and hey

over-cover the horizontal dimensions of the frame where they are placed. The problems in the shutters' opening are linearly increased as the shutter's leafs are increasing also. The rotating blinds must remain closed during the opening of the shutters leafs. Those blinds are not used in sliding flush-type shutters and cannot offer insect protection embodied in shutters' leafs.

**[0003]** The most recent systems mainly have stable ventilation of stable opening, with aluminum sections, which are unilevel in only one vertical level, deposited in parallel, with small or big ventilation openings. The big stable openings offer satisfactory ventilation, but do not offer full grayout in the interior and some safety problems are formed by the permanently unprotected ventilation's opening. The small stable openings are the most economically advantageous, with a good quality of safety, but they do not have a good ventilation, good visibility and good grayout. They are used in opening and sliding windows and doors and they do not offer insects protection embodied in the flush leafs.

**[0004]** The advantages of this invention is that the big openings with the adjusted ventilation do not obstacle the functionality of the shutter in multi-leaf shutters, also that the grayout and safety of the area is made at will, that insects protection does not modify the inner or external appearance of the door and window, that the adjusted blinds of the invention cooperate with stable blinds deposited one on the other, as used in previous types of blinds, with a little or without ventilation changing the inner or external appearance of the doors and windows and that the construction of the blinds can be assembled as a single element, as a panel (22), in a different place than their installation area, in the frames of the shutters, especially in big production units, where the specialization and the time of construction is a priority.

**[0005]** The blind system in opening and sliding doors and windows with ventilation pursuant to this invention, has the characteristic that the ventilation, lighting, gray-out and visibility doors are adjustable by the operator, that when they open the ventilation doors independently from their graduated position, a system of insects protection is revealed embodied in the leafs of the shutters.

**[0006]** Also by placing strengthening sections (9), (23) the security level is increased at the desirable level.

Figure 1 shows one view and one vertical section of shutter's leaf sliding or opening. In its frame (7) bears perimetrically in the inner side the stable existing blinds that can be found in the market (6a) (6b) and the lower and external part, the multilevel system of shutter blinds (1), (2), (3) in opening and sliding doors and windows, with adjusted ventilation and insects' protection with a flush-type operating control (8) that can be found in the market, in the inner blind (1).

Figure 2 shows a detail (Z) of the vertical section W-W of figure 1 with the "ventilation blinds" (2) closed in grayout position, the vertical levels (A), (B), (C)

where the blinds of the multilevel systems of blinds of the invention are placed and the plastic caps (4) και (5).

Figure 3 shows a 3-D perspective view of the shutter's leafs view in grayout and security position.

Figure 4 shows a detail (Z) of the vertical section W-W of figure 1 with the "ventilation blinds" (2) open, the ventilation and lighting door (21), the shaded area, the vertical levels (A), (B), (C) where the blinds of the multilevel system of blinds of the invention are found and the distances between the blinds (D), (E) και (F), that are determined by the plastic caps (4) και (5).

Figure 5 shows a 3-D perspective view of the parts of the shutter's leafs in open position for ventilation and lighting.

Figures 6 and 7 show 3-D perspective views focused in the "mechanism of ventilation adjustment" (20) that changes the rotary motion of the operating control (8) to linear motion of the "ventilation blinds" (2) assisted by its caps (4), (5) and the accessories (10), (12a), (12b), (24) that authorize the movement from horizontal linear to vertical linear movement.

Figures 8 and 9 show a 3-D perspective view of the sockets of the security reinforcement for the inner place, with the addition of the "supporting security section" (9).

Figures 10 και 11 show a 3-D perspective view of the "unified security section" (23), with permanent junction, as a uniform section of the "inner blind" (1), (16) and the "external blind" (3), (17) of the levels (A) and (B) correspondingly.

Figures 12 and 13 show a 3-D perspective view of the insects' protection (13) embodied in the invention's system.

Figures 14 and 15 show a 3-D perspective view of the detail (K) of the overall formation of the multilevel systems of shutter's blinds as a unified level (22), in panel's form (22), perimetrically tight and secured by a strap (19).

Figures 16 and 17 show a 3-D perspective view and a 2-D horizontal section of the shutter's leaf, of the canals (18) and the directions of the linear motion of the caps (5) and the "ventilation section" (2) inside the motion channels (18).

Figures 18 and 19 show a 3-D perspective view with the operation of the "mechanism of ventilation adjustment" (20) and a direction towards which the

"ventilation sections" open (2) and also the ventilation doors (21) free for the contact of the inner area with the environment. In the contrary direction from the one shown by the arrows, the "ventilation sections" (2) close the ventilation doors (21).

## Claims

1. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, as a unified total is consisted of four parts:

a) by at least two metal, synthetic or wooden cross-sections (1), (16), stably adjusted in the frame (7), of the doors and windows, repeated in parallel, horizontally or vertically, in the first vertical level (A), connected in the ends of their two faces by plastic caps (4), which adjust stable distances (D) between them and guaranty their stability with frame (7), named as "inner blinds" (1), (16),

b) by at least two metal, synthetic or wooden cross-sections (2), in parallel and in contact with the sections (1), (16), (3), (17), (23) in parallel repeated between them in the second level (B), in parallel with the first vertical level (A), connected in their ends of their two faces by plastic caps (5), which adjust stable distances (E) between them and guaranty their uniform and parallel movement, inside the special runners (18), which are formed by the stable embodied plastic caps (4) in the frame of the shutter (7), in the "inner blinds" (1), (16) and the "external blinds" (3), (17) of levels (A) and (C) correspondingly. They move towards two directions in relation to the frame (7), named as "ventilation sections" (2),

c) by at least two metal, synthetic or wooden cross-sections (3), (17) stably adjusted in the frame (7), of the doors and windows, parallel and in contact with the sections (2), repeated in parallel, horizontally or vertically, in the third vertical level (C) in parallel with the first and the second vertical level (A) and (B), connected in the ends of their two faces by plastic caps (4), which adjust stable distances (F) between them and guaranty their stability with frame (7), named as "external blinds" (3), (17),

d) by at least one assembly of one "operating control" (8), a system of movable parts (10), (11), (12a), (12b), (24), named as "mechanism" (19), of at least two plastic caps (5) embodied in the "ventilation blinds" (2), which assembly converts the movement of the operator through the operating control (8), to uniform intergraded motion of the "ventilation sections" (2) of two direction,

named as "mechanism of ventilation adjustment" (20),

and it is characterized from the fact that the linear graded by the "mechanism of ventilation adjustment" (20) tangential movement of the "ventilation sections" (2), between the "inner blinds" (1), (16) and the "external blinds" (3), (17) opens and closes the ventilation door (21) pursuant to the will of the operator.

2. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1 is **characterized by** the fact that it can be adopted in all shutters' frames (7) of sliding or opening doors and windows.
3. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1 and 2 is **characterized by** the fact that it cooperates and replaces all or parts of the stable existing blinds (6a), (6b), with or without stable ventilation openings, of a shutter.
4. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1 is **characterized by** the fact that the "ventilation sections" (2) have the suitable sockets (15) for the replacement of the edges (14) of the insects' protection screen (13) in the entire length of the sections (2).
5. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1 is **characterized by** the fact that the "inner blinds" (16) and the "external blinds" (17) have sockets (16a), (16b) and (17a), (17b) correspondingly, that support the projections (9a), (9b), (9c) και (9d) of the "supporting security sections" (9) allow gate or crimp-fitting.
6. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1 and 5 is **characterized by** the fact that "supporting security sections" (9) is at least one piece.
7. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1, 2, 3, 4 και 5 is **characterized by** the fact that is one level piece as a total and is placed as a panel (22) inside the frames (7) of the shutters'

leafs.

8. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1 is **characterized by** the fact that the "inner blinds" (1), (16), the "ventilation sections" (2) and the "external blinds" (3), (17) are metallic, synthetic, wooden or a combination of those materials.
9. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1, 2, 3, 5 και 6 is **characterized by** the fact that the stable in the shutter's frame sections (7) of the "inner blind" (1), (16) of the "external blind" (3), (17) and the "supporting security section" (9) are connected as a total and they form a section (23) named as "unified security section" (23).
10. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1, 2, 3, 5 and 9 is **characterized by** the fact that the stable in the shutter's frame sections (7), of the "inner blind" (1), (16) of the "external blind" (3), (17) of "unified security section" (23) and the stable existing blinds (6a), (6b) have the same or different design in the inner level (A) and the external level (C).
11. The multilevel shutter blind system in opening and sliding doors and windows, with adjustable ventilation, with or without insect's protection, pursuant to the claim 1 is **characterized by** the fact that the "mechanism of ventilation adjustment" (20) that opens and closes the ventilation door (21) operates manually or electronically or by combining both ways.

FIGURE 1

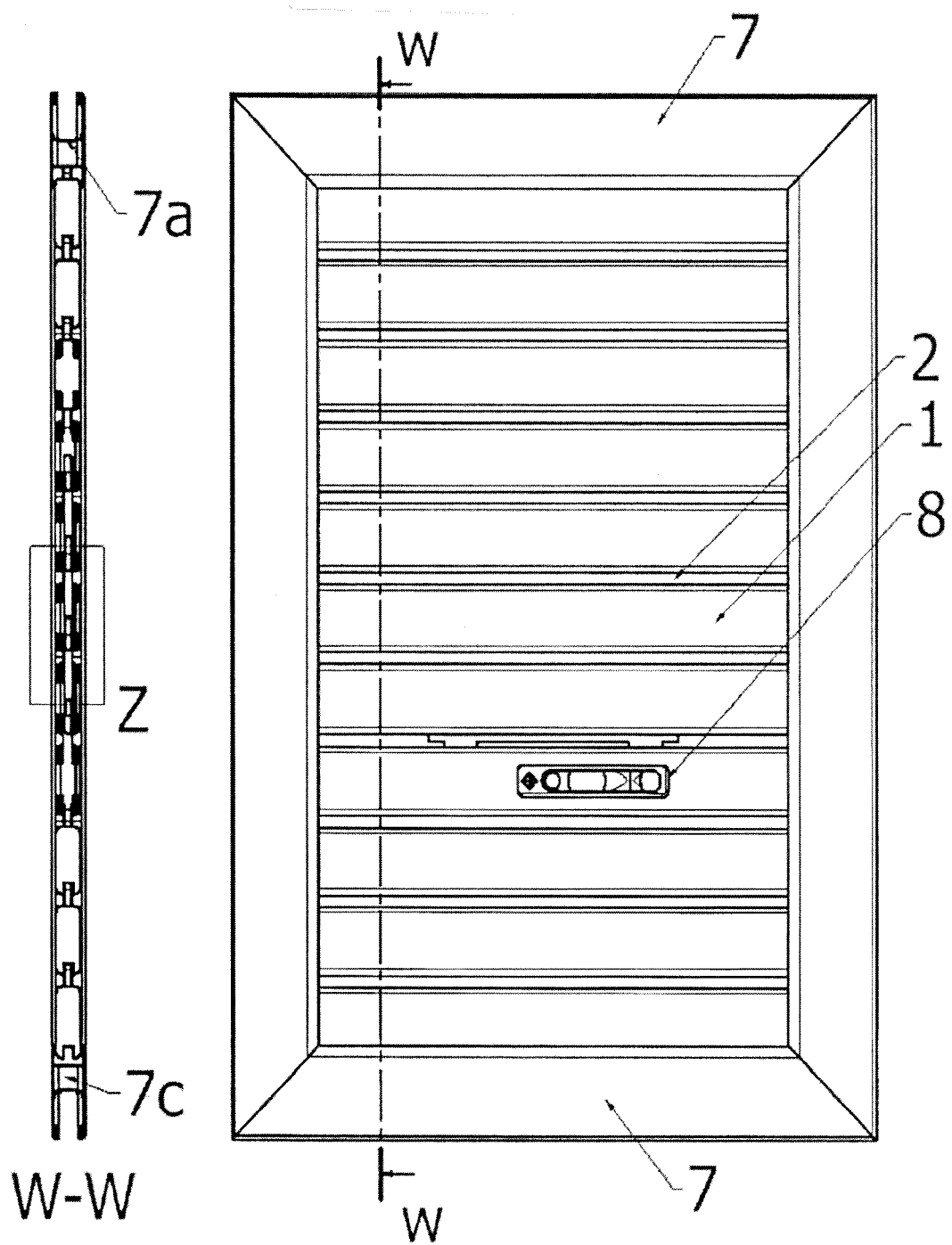


FIGURE 2

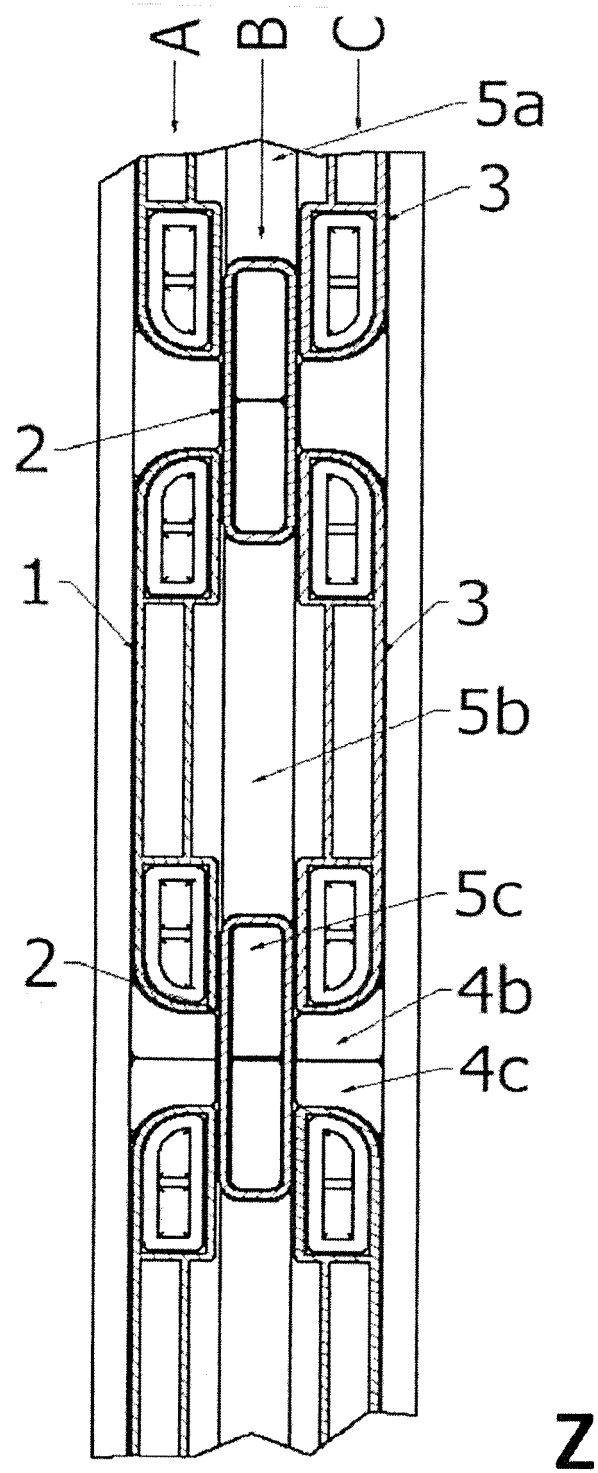


FIGURE 3

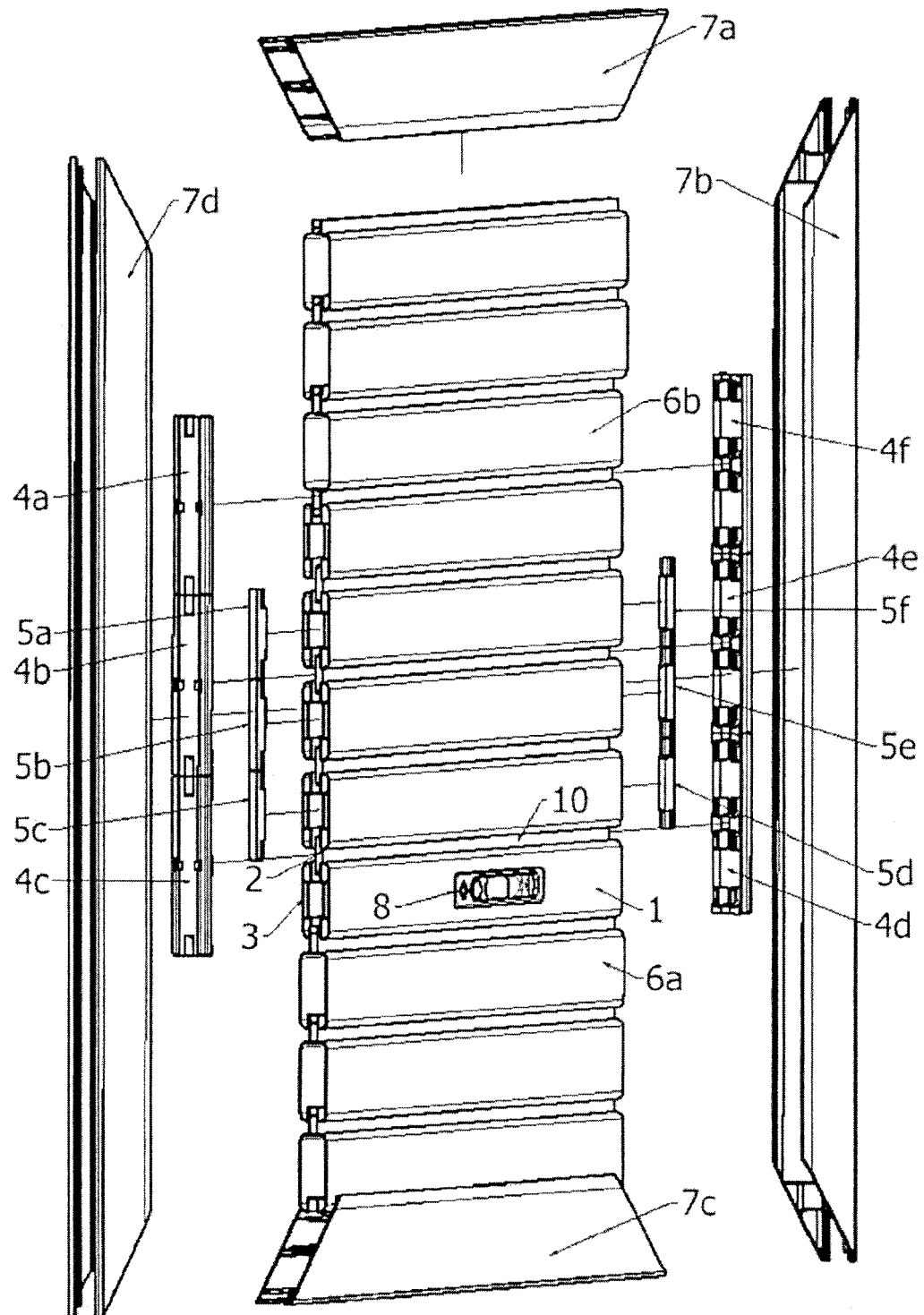


FIGURE 4

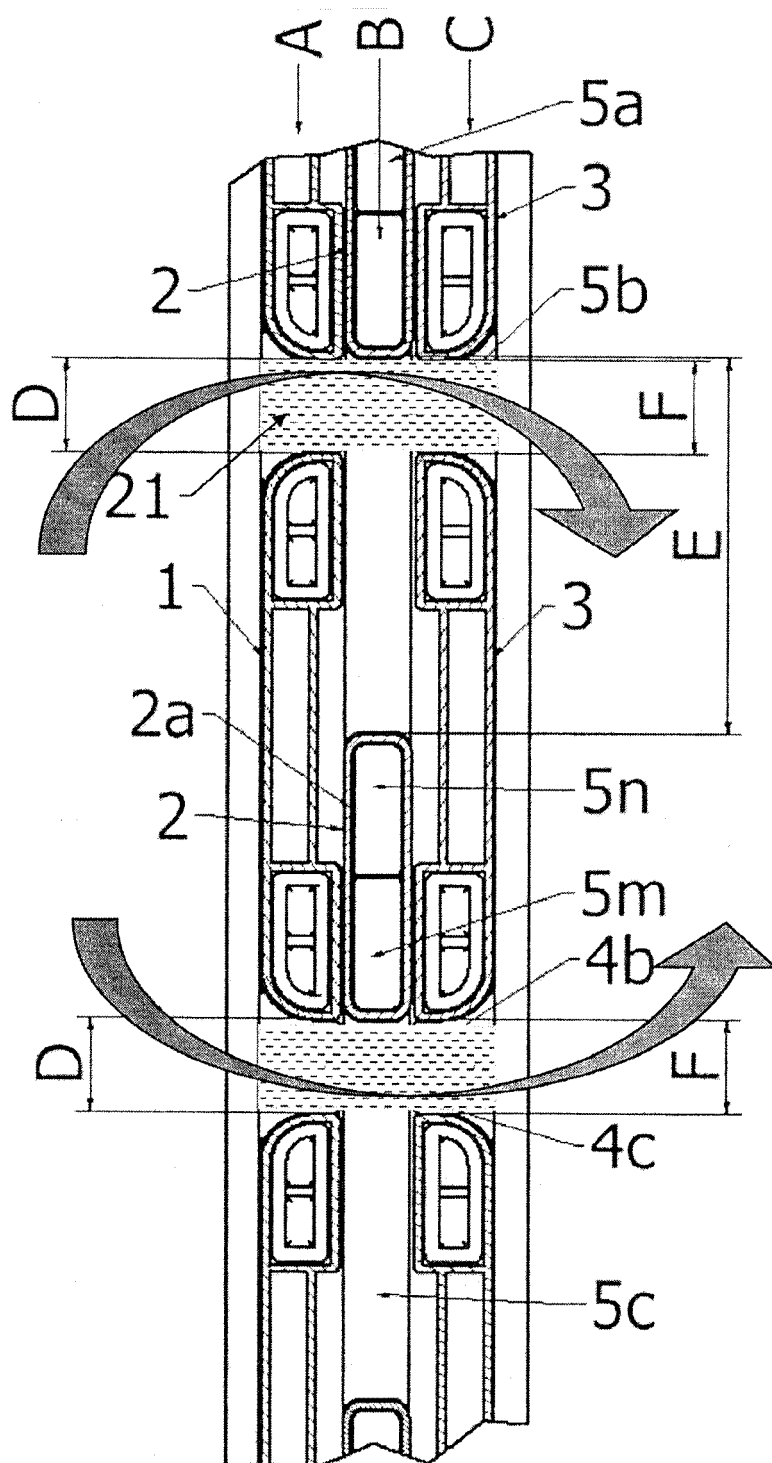




FIGURE 5

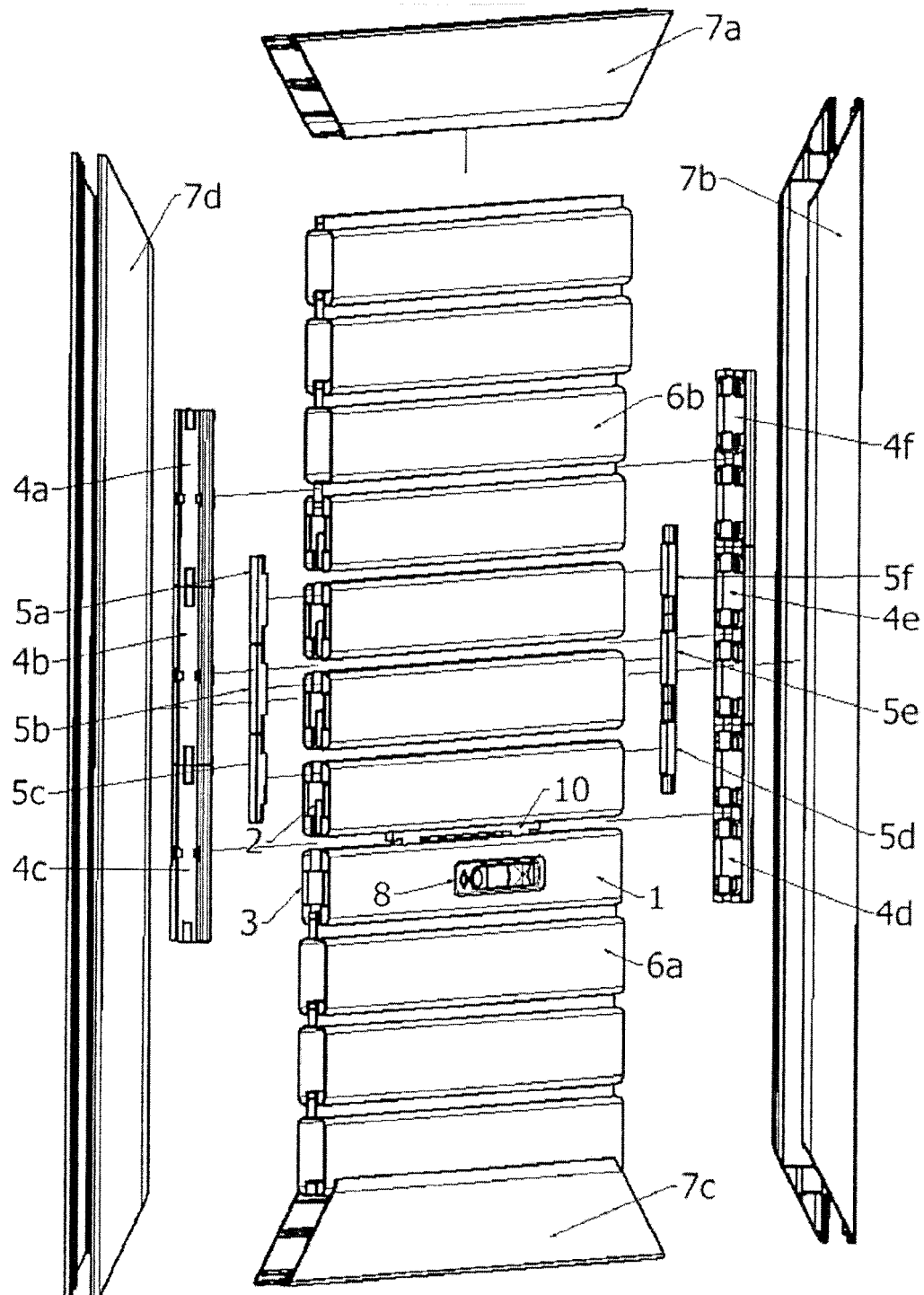


FIGURE 6

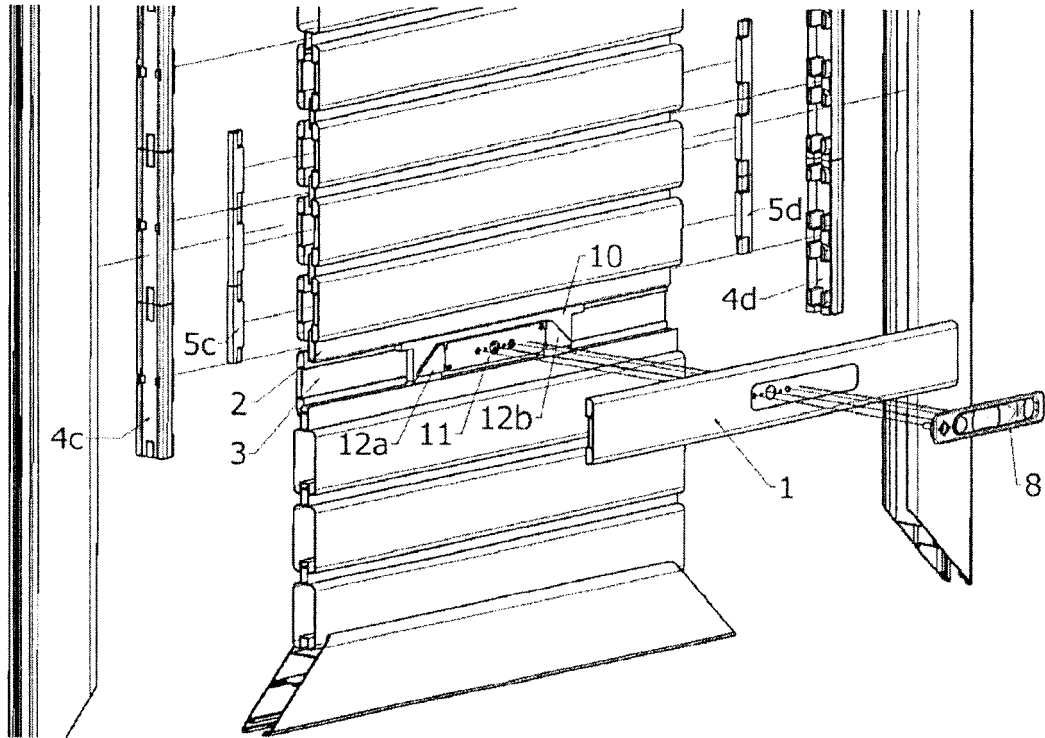


FIGURE 7

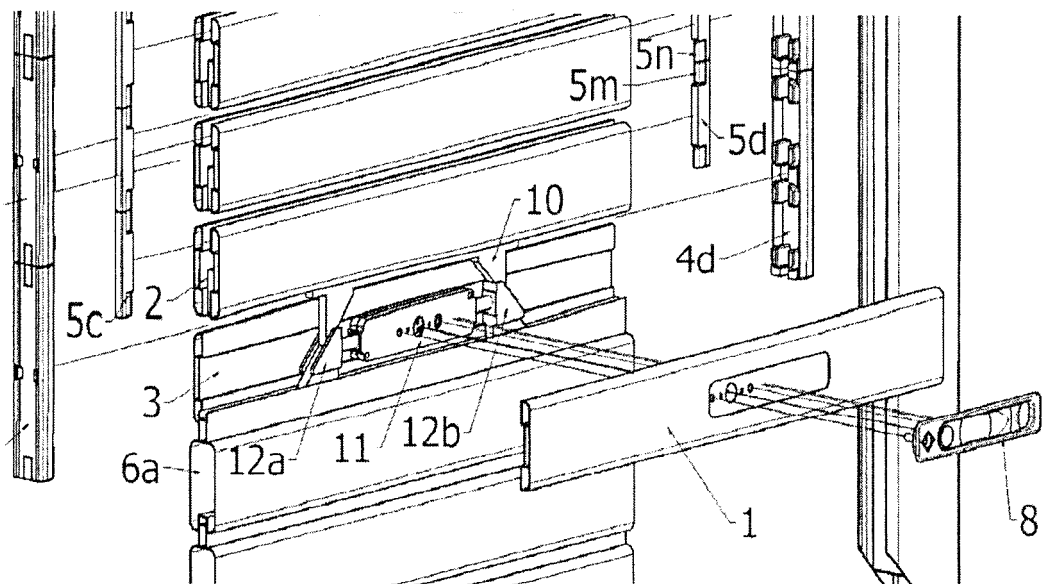


FIGURE 8

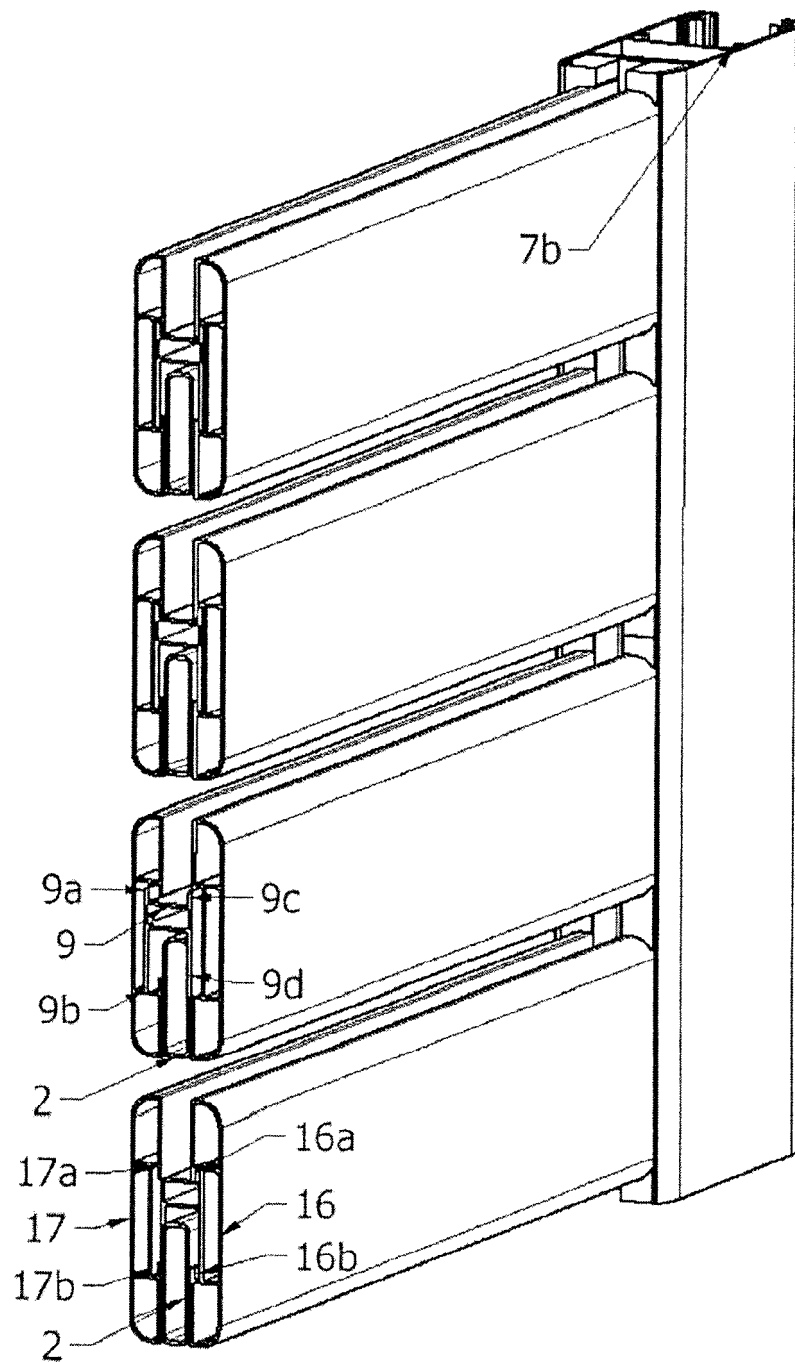


FIGURE 9

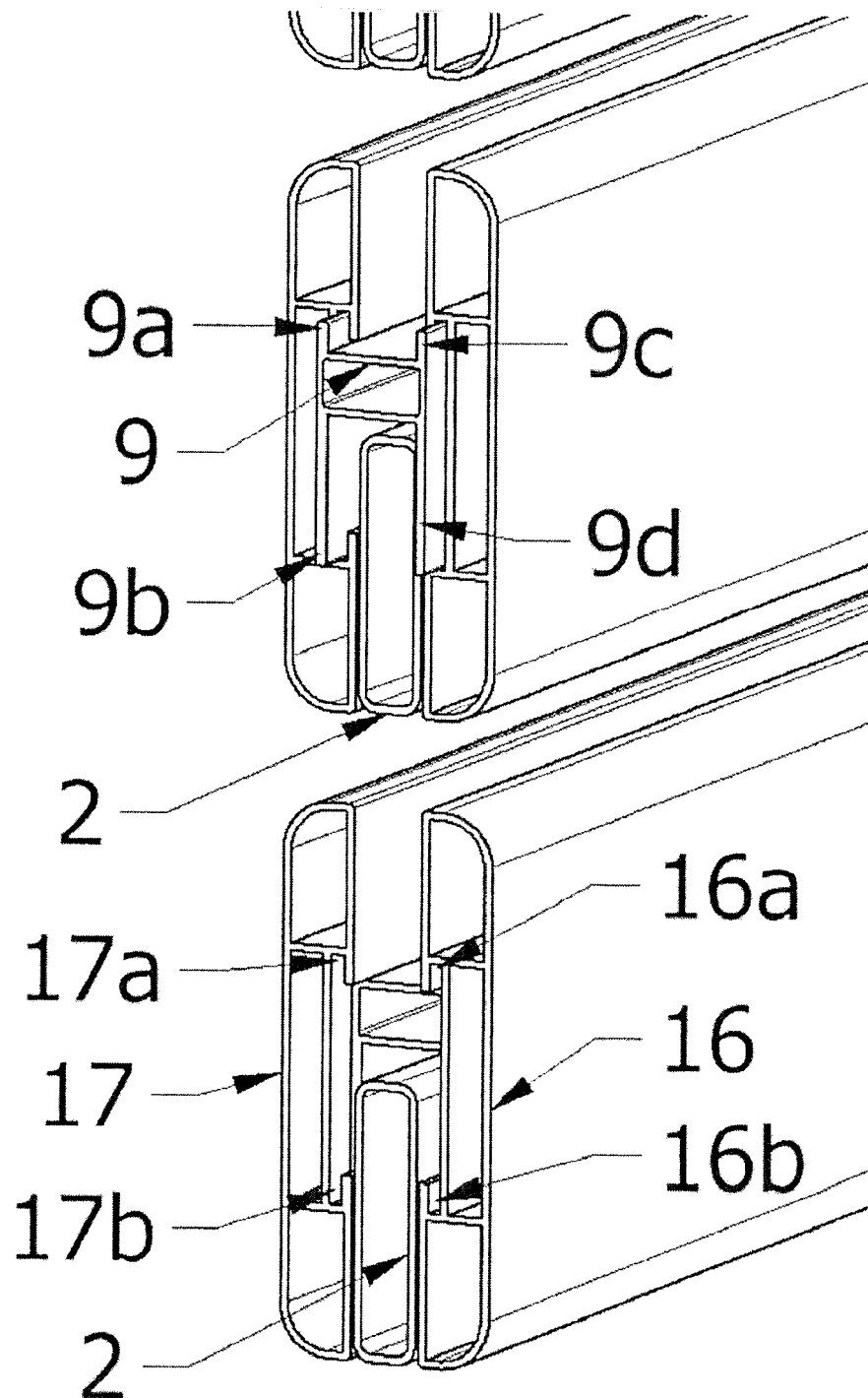


FIGURE 10

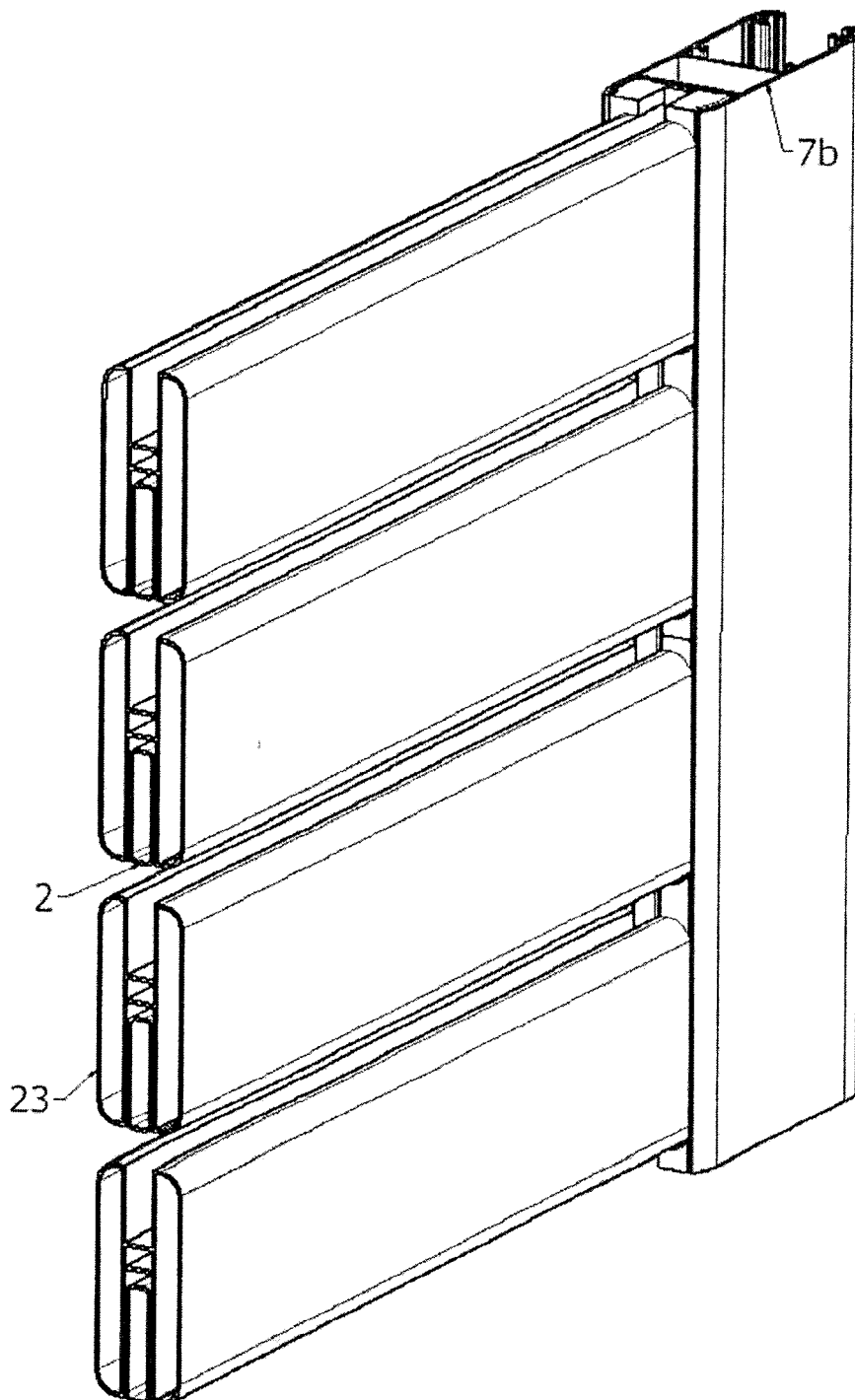


FIGURE 11

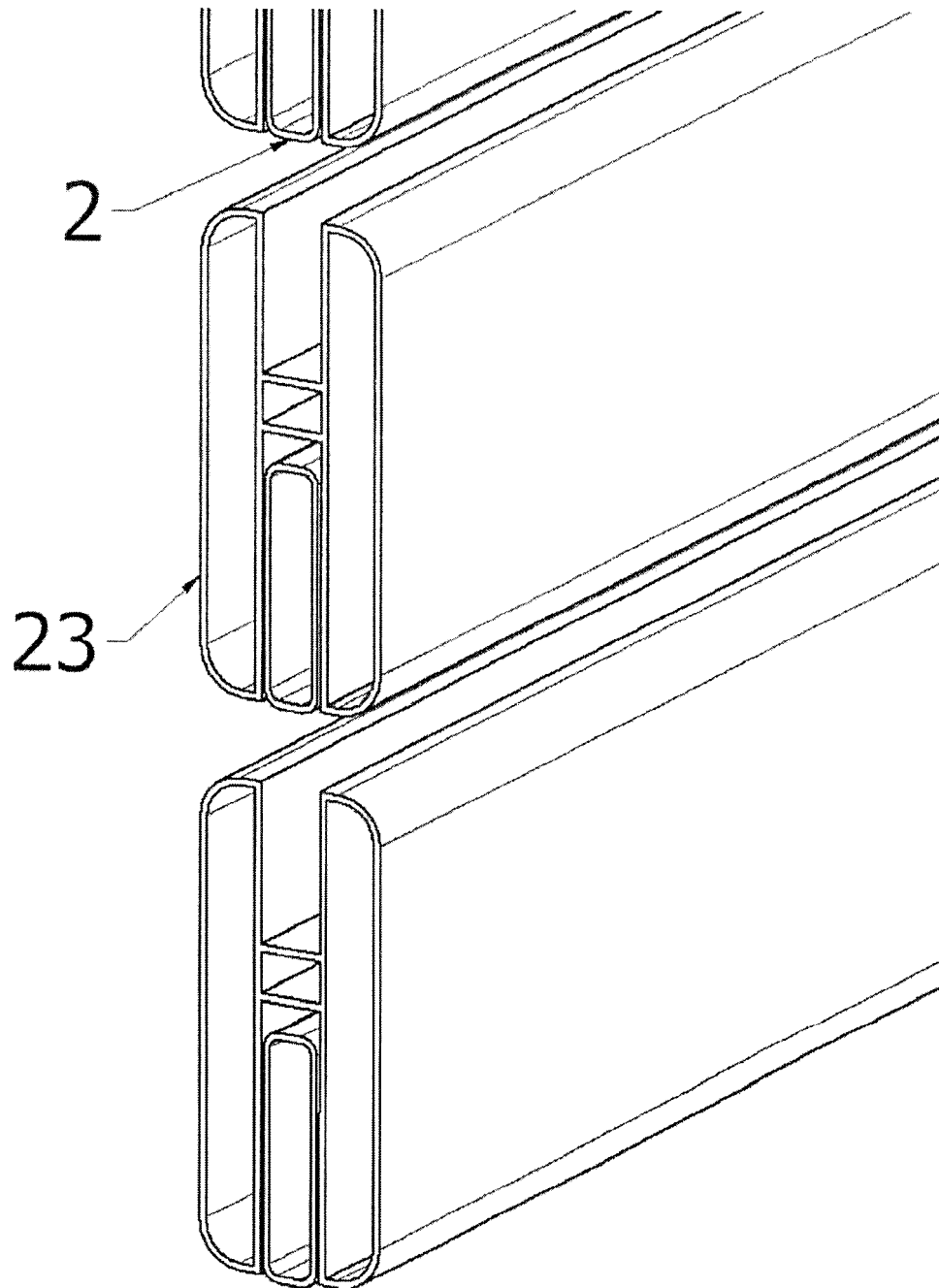


FIGURE 12

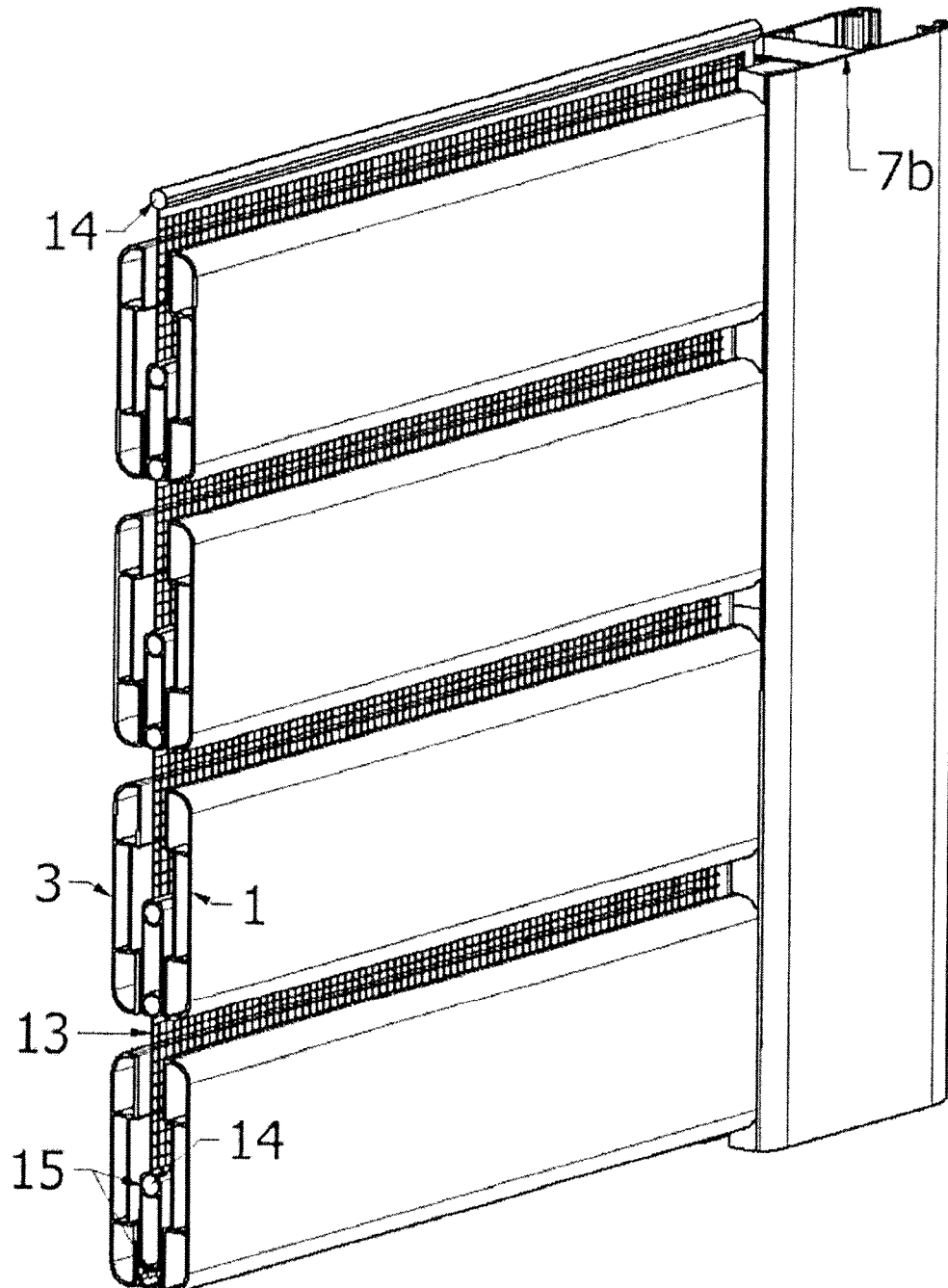


FIGURE 13

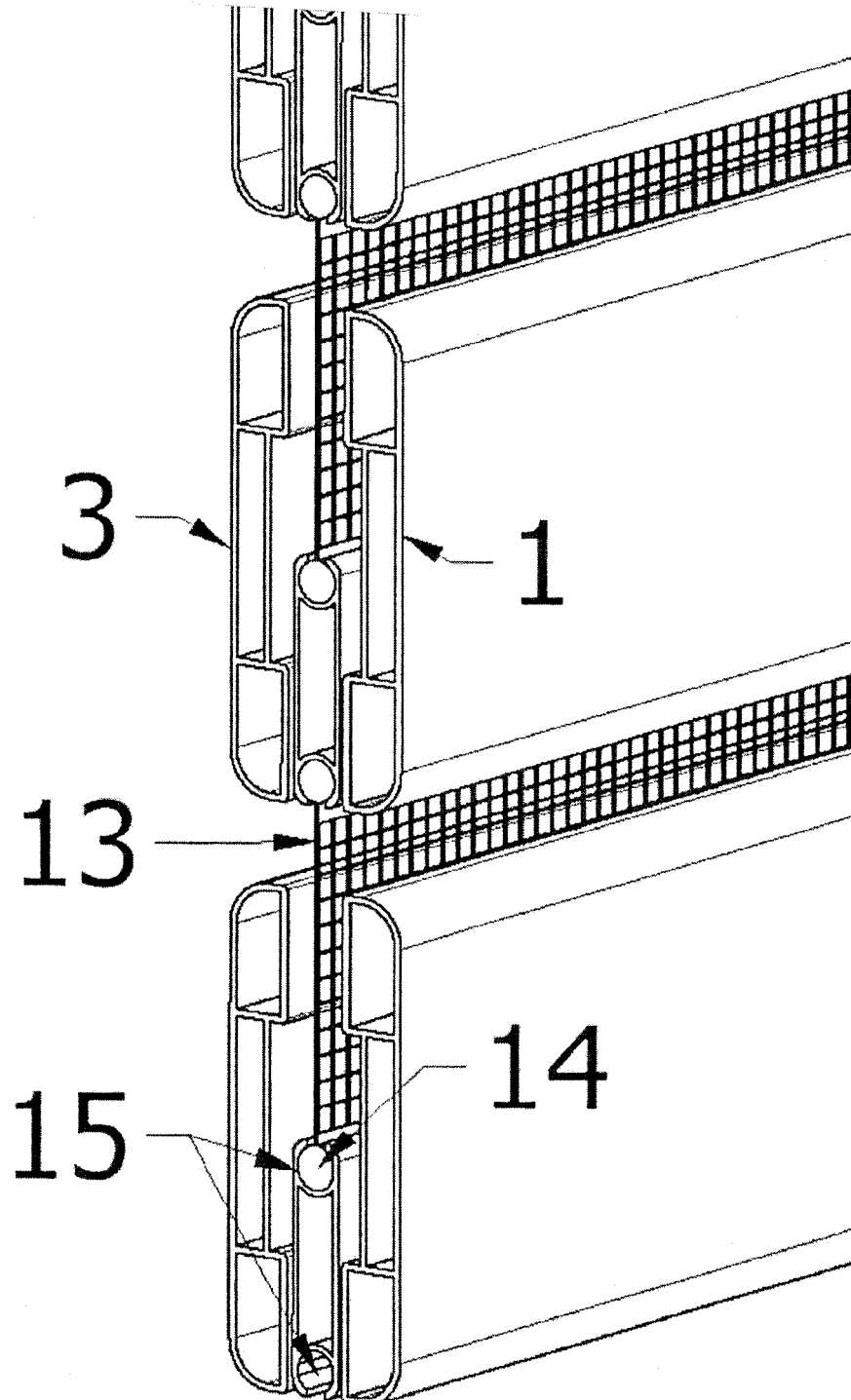




FIGURE 14

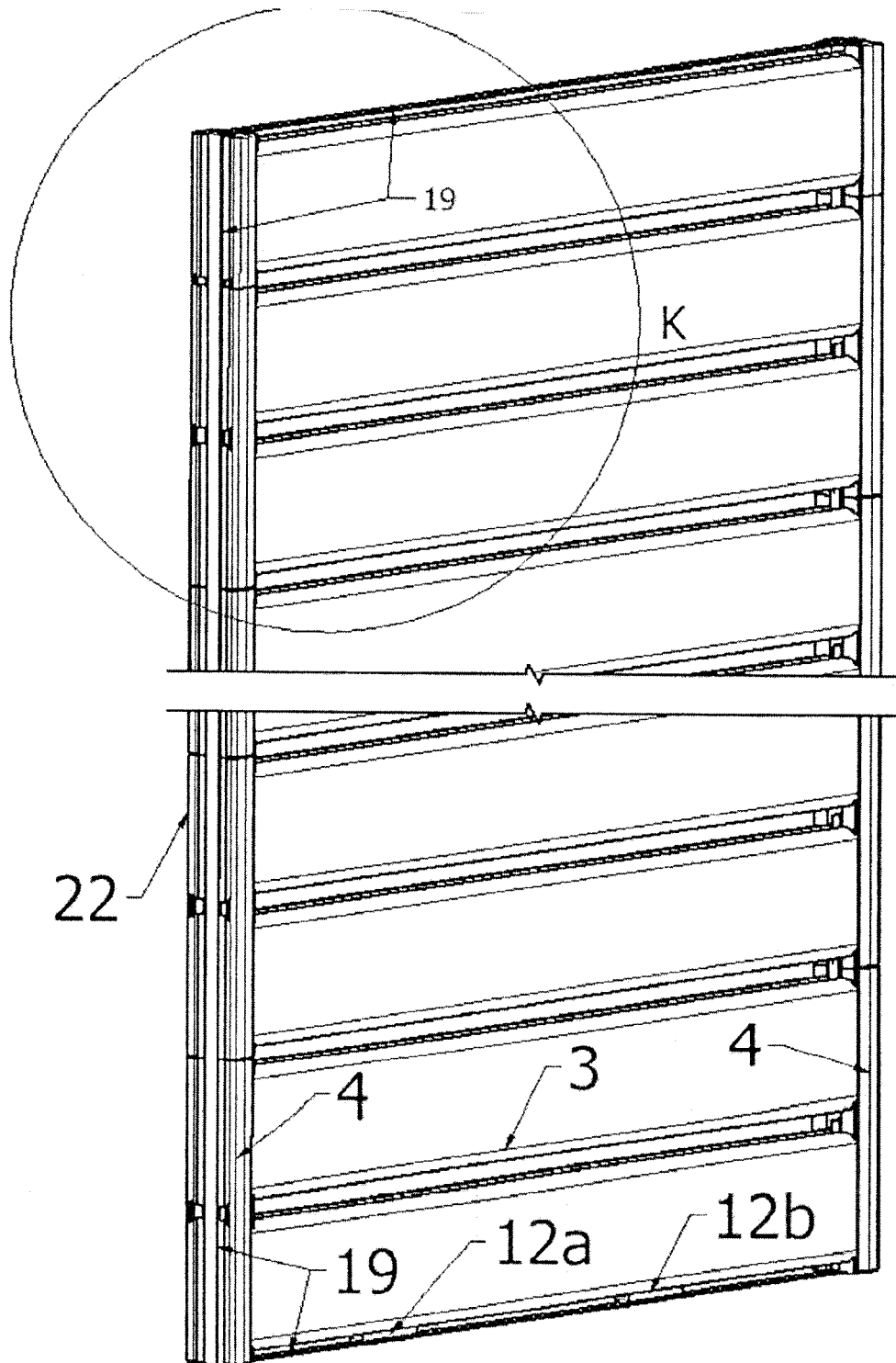


FIGURE 15

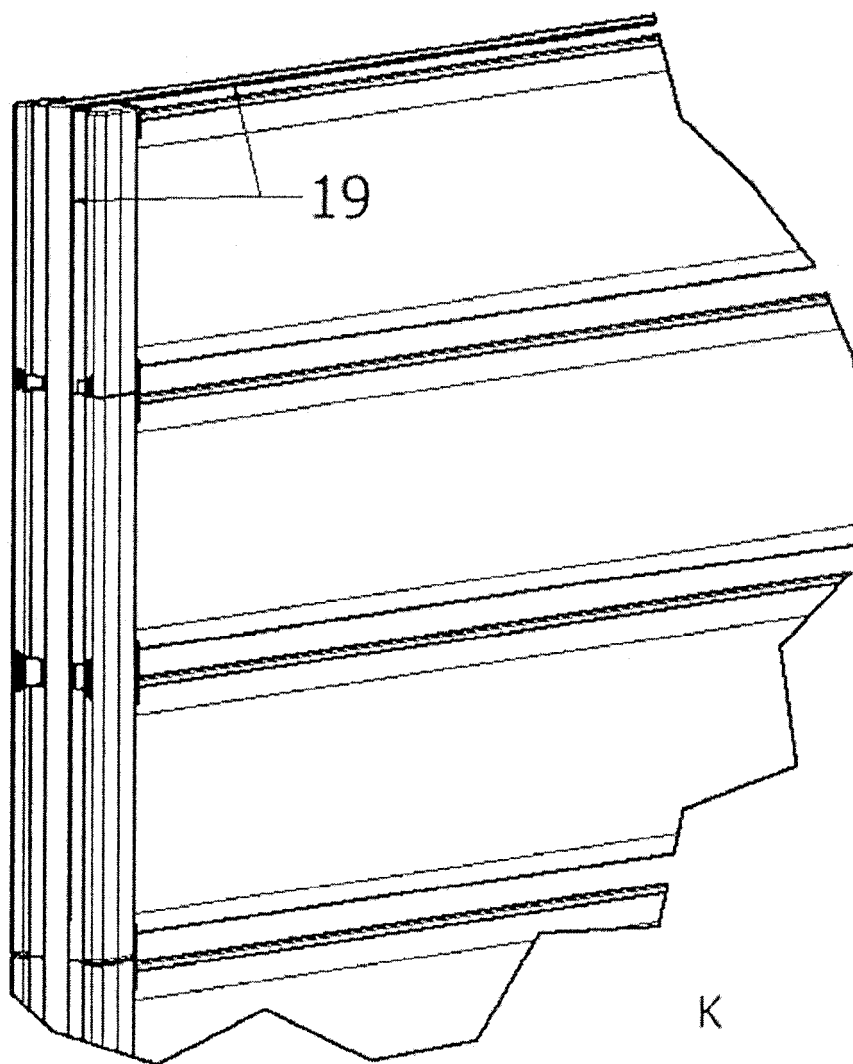


FIGURE 16

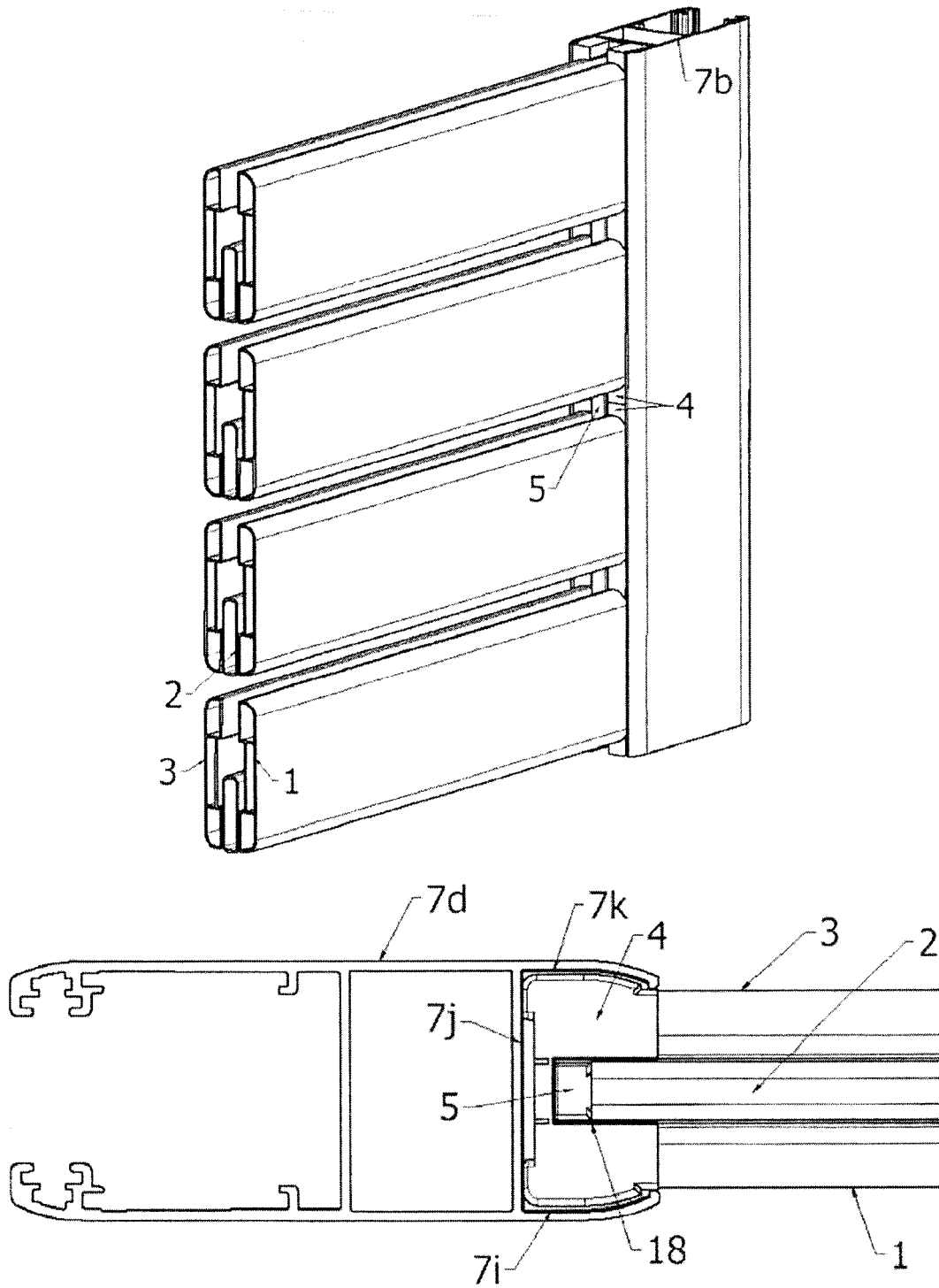


FIGURE 17

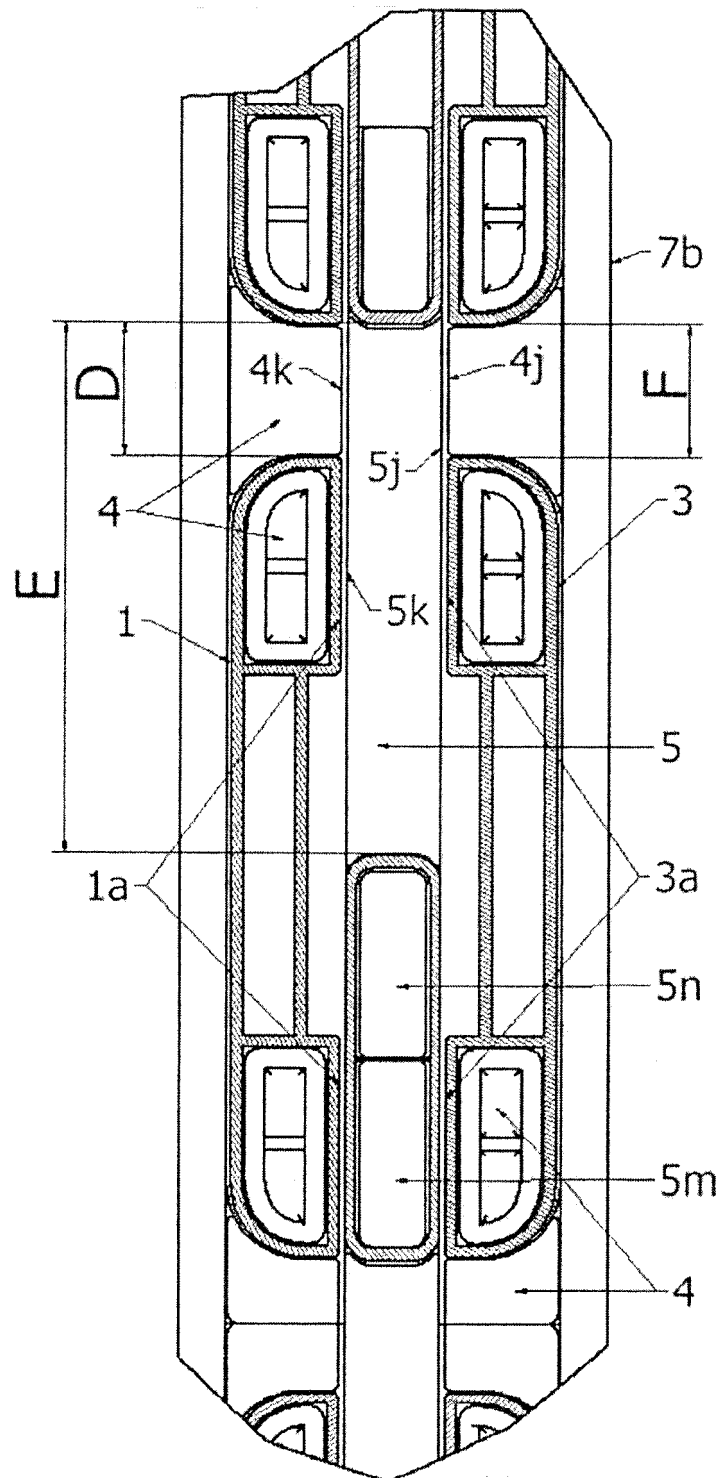


FIGURE 18

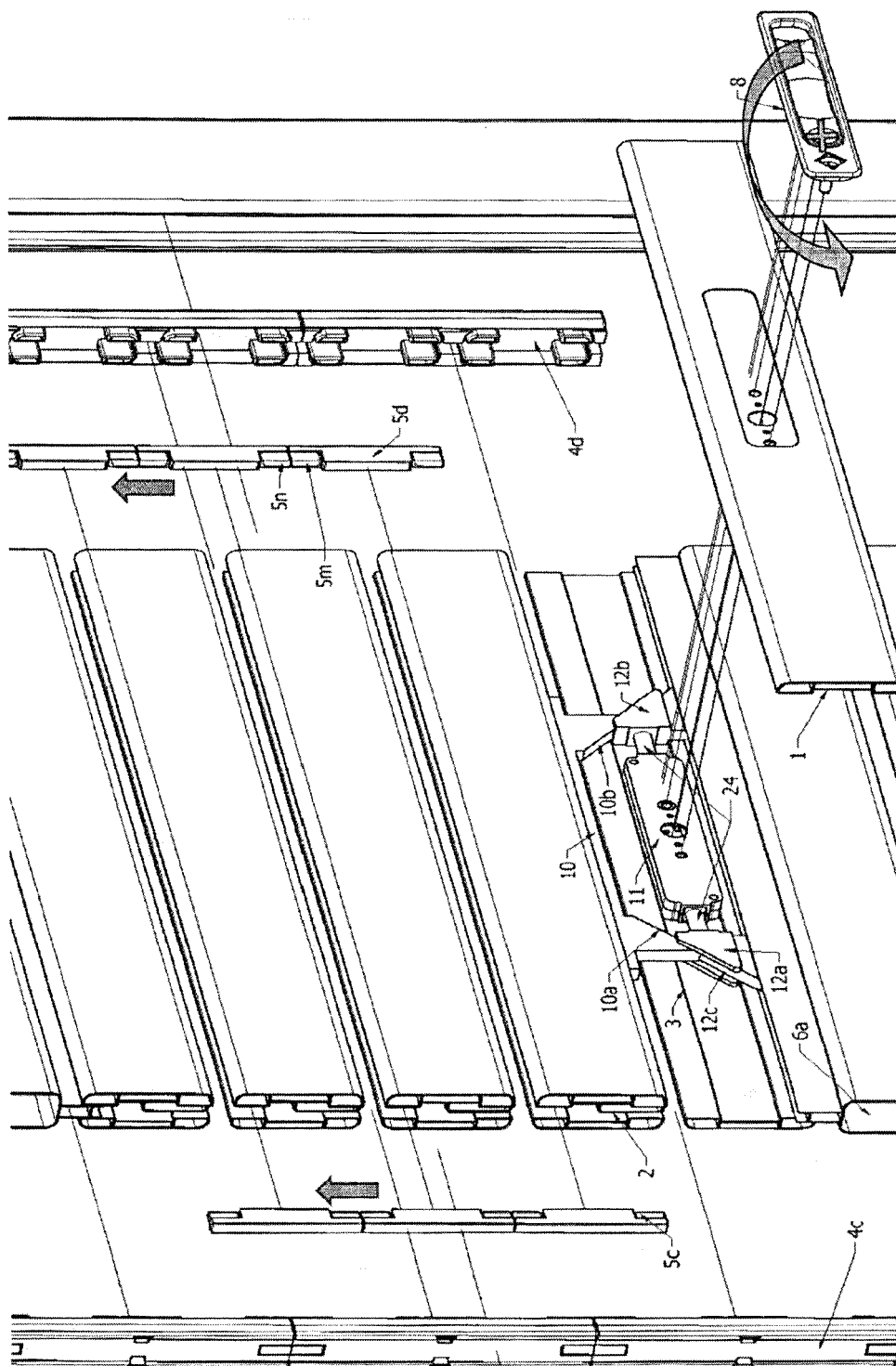
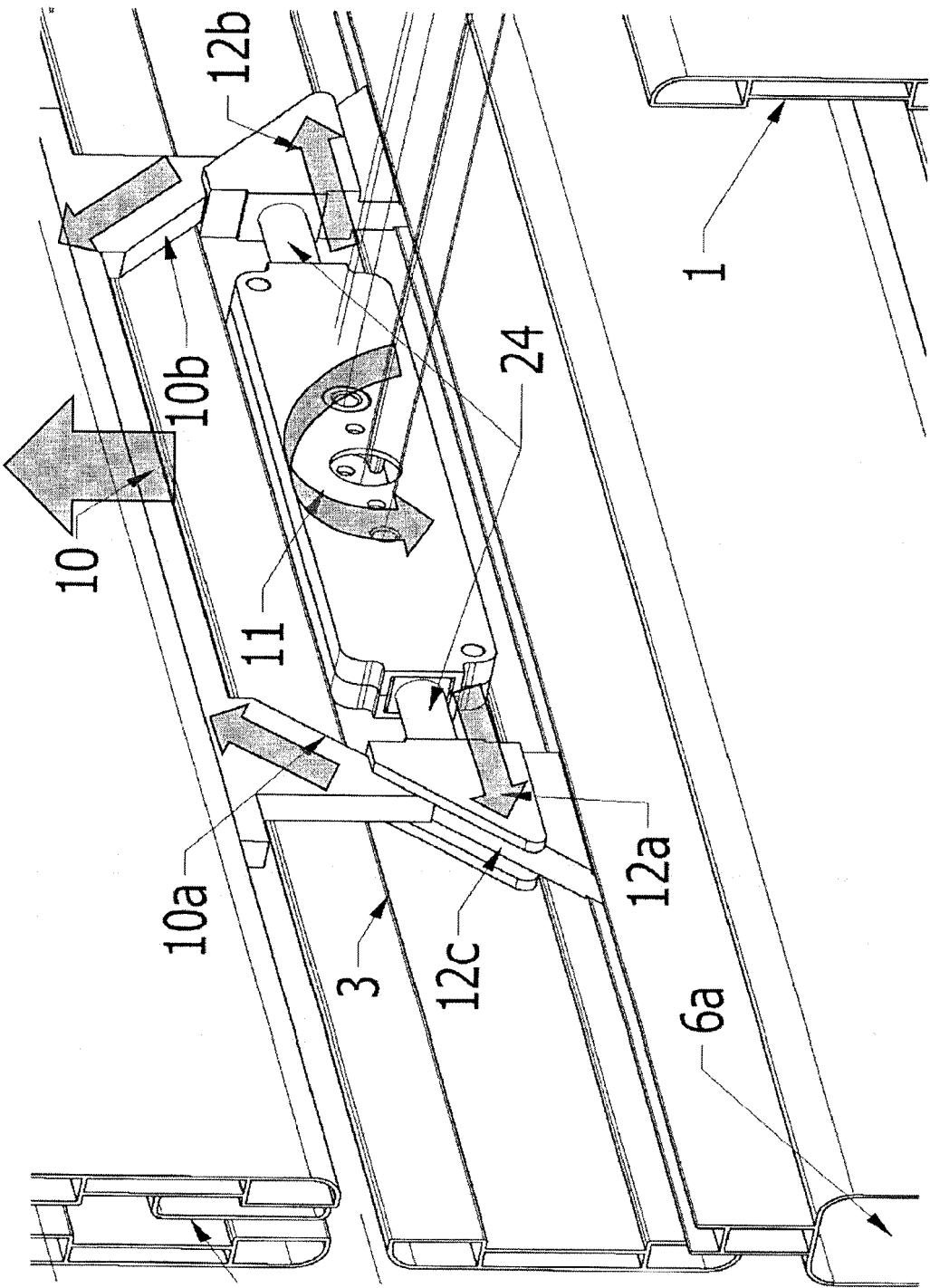


FIGURE 19





## EUROPEAN SEARCH REPORT

Application Number  
EP 18 38 6022

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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) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 1 939 312 A (MURRAY LARKIN A)<br>12 December 1933 (1933-12-12)<br>* page 2, lines 95-111; figures 9-10 *<br>----- | 1-11                                                        | INV.<br>E06B7/082                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                      |                                                             | TECHNICAL FIELDS SEARCHED (IPC)         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                      |                                                             | E06B                                    |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                      |                                                             |                                         |
| Place of search<br><b>Munich</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                      | Date of completion of the search<br><b>22 November 2018</b> | Examiner<br><b>Kofoed, Peter</b>        |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                      |                                                             |                                         |

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EPO FORM 1503 03/82 (P04C01)

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82