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Door sill arrangement in an elevator car

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(56) Related Art
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(57) ABSTRACT

A door sill arrangement (20) comprising a profiled sill element (7) with
5 grooves in which the front sliding
guides (3,12) of the door panels
(23,29) move. Attached to the door
panels (2,32) are two front sliding
guides (3,12) to which are attached
10 upper and lower plastic bars (9,11),
which, when the door panels (2,32)
are opened, are pulled by the front
sliding guides (3,12) towards the
door opening, thus substantially cov-
15 ering the grooves (23,29) in the pro-
filed sill element (7).

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COMPLETE SPECIFICATION
FOR A STANDARD PATENT
ORIGINAL

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Invention Title:

DOOR SILL ARRANGEMENT IN AN ELEVATOR CAR

Details of Associated Provisional Applications:

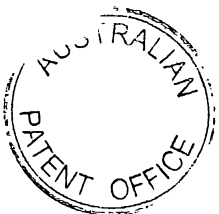
FI 962231 dated 28th May 1996

The following statement is a full description of this invention, including the best method of performing it known to us:

DOOR SILL ARRANGEMENT IN AN ELEVATOR CAR

The present invention relates to a door sill arrangement for an elevator car, as defined in the preamble of claim 1,

- 5 The door sill of an elevator car is generally made of profiled aluminium or a steel tube structure with a groove for the sliding guides of the door panels. Such a door sill structure always remains visible, so in a visual sense it is not a good solution. In the elevator car, the profiled aluminium element, termed aluminium profile in this application, is attached to the car frame structure, and on the landing to the door
- 10 sill base plate or to the shaft wall by means of bolts. The aluminium profile is also provided with holes to allow litter to fall down. Such a sill structure is not favoured by architects because the aluminium profile is exposed to view when the door is open and partly also when it is closed, and also because the groove gathers litter and dirt.
- 15 In some cases the door sill is implemented using a narrow aluminium profile which is hid from view under the door panels when the door panels are closed. However, it is still visible when the door panels are open. It is also possible to attach to this aluminium profile a mat strip consisting of a narrow profiled aluminium strip. The door material is fixed under the mat strip.
- 20 The object of the present invention is to eliminate the drawbacks referred to above. There is provided according to the invention, a door sill arrangement for an elevator car, comprising: a profiled sill element provided with grooves in which the sliding guides of the door panels can move, in conjunction with each groove there is a respective elongated closing element for covering the respective groove in the
- 25 profiled sill element when the door panels are moved to the open position characterized in that: each elongated closing element is attached to a front sliding guide located at the edge of the respective door panel facing to the door opening and that each elongated closing element extends in a direction away from the door panel and is fitted in its respective groove in the profiled sill element.



Advantages:

- easy to extend the floor material right up to the sill clearance
- only the edge of the sill plate is visible when the doors are open
- 5 - no uneven surface; useful e.g. in hospitals
- no dirt can be accumulated inside the door sill profile
- a smooth surface on the side of the shaft
- permits advance opening of the doors, because in this case the grooves are covered by closing elements
- 10 - prevents the accumulation of litter.

In the following, the invention is described by the aid of a few examples of its embodiments by referring to the attached drawings, in which

Fig. 1a presents a landing door sill in side view,

15 Fig. 1b shows how the upper and lower plastic bars are attached to the frames of the front sliding guides,

Fig. 1c presents the grooves of the front sliding guides,

Fig. 2 presents the parts of the door sill of the invention in an exploded view, and

Fig. 3a and 3b illustrate the operation of the door sill of the invention.

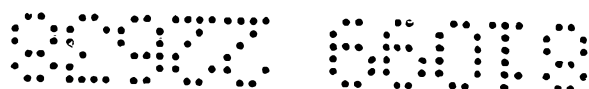


Fig. 1a shows a door sill arrangement according to the invention in side view. The door sill profile is composed of two separate profiled aluminium elements or aluminium profiles. The first aluminium profile 7 is mounted between a sill base plate 6 and sill brackets 8. The solution of the invention comprises door panels 2,32. Door panel 2 is provided with a front sliding guide 3 mounted on lower edge of the door panel, near the side edge facing to the door opening, preferably attached by means of screws, to which sliding guide 3 is further attached, likewise with screws, an upper plastic bar 9 for the front sliding guide 3. The upper plastic bar 9 again is fitted into an upper groove 23 in the first aluminium profile 7. The upper plastic bar 9, which forms a straight elongated closing element closing the groove, is attached to the front sliding guide 3 by means of an anchor pin 19, which in turn is fastened to a metal plate 18 with screws 21.

Front sliding guide 12 is identical with front sliding guide 3 except that it is of a longer structure, extending to the lower groove 29. Front sliding guide 12 is correspondingly attached to a lower plastic bar 11 by means of an anchor pin. The front sliding guides 3,12 are preferably connected to the upper and lower plastic bars 9,11 by their lower ends. The joints between the anchor pins and the front sliding guides 3,12 have a free play that allows upward and downward movement. The elongated plastic bars acting as closing elements can also be replaced with bands or belts.

The back sliding guides 25,26 are preferably placed in the lower parts of the outer edges of the door panels and attached to the door panel 2,32 by means of screws. The back sliding guides 25,26 slide along guide bars

5,27. The sliding element 4 consists of a piece of plastic provided with a groove and attached to the back sliding guide 25,26 by means of screws. The guide bars 5,27 are mounted directly above the first aluminium profile 7.

Fitted into the groove 34 in the middle part of the first aluminium profile 7 is a second aluminium profile 10. Fitted in the groove 29 below it is the lower plastic bar 11. The second aluminium profile 10 is attached to the first aluminium profile 7 by means of thread cutting screws and has a protective plastic cover 33 in front of it. When the plastic bars 9,11 of the front and back sliding guides 3,12 get worn down or dirty and must be replaced in connection with maintenance, the protective plastic cover 33 is first removed from the second aluminium profile 10 and the thread cutting screws behind the plastic cover 33 are unscrewed, whereupon the second aluminium profile 10 can be easily removed and the upper and lower plastic bars can be replaced. Attached with thread cutting screws to the first aluminium profile 7 is also a toe guard 14. The front sliding guides 3,12 are of identical structure, but they are connected to different door panels 2,32, front sliding guide 3 being mounted on the lower edge of door panel 2 near the side edge facing to the door opening, while the second front sliding guide 12 is mounted on the lower edge of door panel 32 near the side edge facing to the door opening. In the bottom left corner of Fig. 1a, the raw edge 16 of the shaft opening is also visible.

Fig. 1b illustrates the attachment of the upper plastic bar 9 to front sliding guide 3. Fraised in the upper plastic bar 9 is an empty space 17. Placed on the bottom of this space is a metal plate 18 for fastening screws

21. The anchor pin 19 connects the frame part 15 of the front sliding guide 3 to the metal plate 18. In a corresponding manner, the lower plastic bar 11 is attached with an anchor pin to the respective sliding guide frame part. In Fig. 1b, only the attachment of sliding guide 3 is shown, because both front sliding guides 3 and 12 are mounted in the same way and they are identical in structure except that front sliding guide 12 is somewhat longer because it must extend to the lower plastic bar 11.

Fig. 1c shows the grooves 23,29 in which the upper and lower plastic bars move. The back wall of groove 23 is formed by the upper front edge 24 of the first aluminium profile 7 and the upper edge 28 of the second aluminium profile. Groove 29 is correspondingly formed by the lower front edge 30 of the first aluminium profile 7 and the lower edge 31 of the second aluminium profile. The second aluminium profile 10 is placed in the middle groove 34 (not visible in the figure).

Fig. 2 shows the parts of the door sill of the invention in an exploded view: the door panels 2,32 and below them the door sill base plate 6, the first aluminium profile 7 and attached to it the front sliding guides 3,12, the upper and lower plastic bars 9,11, the toe guard 14, the second aluminium profile 10, the back sliding guides 25,26, the guide bars 5,27 and a number of different hold fixtures 22, which may vary in respect of design and hole layout as required in each case. These serve in the first place to attach the door sill to the wall.

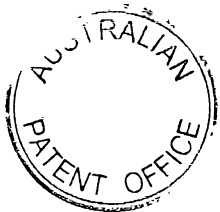
Figures 3a and 3b illustrate the operation of the door sill of the invention. When the door panels 2,32 are opened, the front sliding guides 3,12 attached to them

move with the door panels 2,32 towards the edges of the door opening. At the same time, the upper and lower plastic bars 9,11 attached to the front sliding guides 3,12 move into the door opening area, thus closing the gaps of the grooves 23,29 in the door opening area. When the doors are closed, the upper and lower plastic bars only partially overlap each other. The front sliding guides 3,12 are connected to the ends of the upper and lower plastic bars 9,11, front sliding guide 3 being attached to the left-hand end of the upper plastic bar 9 and front sliding guide 12 to the right-hand end of the lower plastic bar 11. Advance opening of the door is allowed, which means that the opening movement of the door can be started before the elevator car has reached the landing level. At this stage, the upper and lower plastic bars 9,11 do not yet cover the door opening completely. The grooves 23,29 for the front sliding guides 3,12 can be fitted in the lateral surface of the door sill profile 7. When the door is completely open, a flat and smooth surface is formed, leaving only the edge of the door sill plate visible.

It is obvious to a person skilled in the art that different embodiments of the invention are not limited to the examples described above, but that they can be varied within the scope of the claims presented below. The aluminium profiles can be replaced with roll formed section and the frame parts of the back sliding guides can be integrated into a single part. The plastic guides can also be manufactured by the extrusion moulding technique. The door sill fastenings can also be implemented using simpler structures.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS

1. Door sill arrangement for an elevator car, comprising a profiled sill element provided with grooves in which the sliding guides of the door panels can move, in
5 conjunction with each groove there is a respective elongated closing element for covering the respective groove in the profiled sill element when the door panels are moved to the open position characterized in that: each elongated closing element is attached to a front sliding guide located at the edge of the respective door panel facing to the door opening and that each elongated closing element extends in a
10 direction away from the door panel and is fitted in its respective groove in the profiled sill element.
2. The door sill arrangement for an elevator car as defined in claim 1, wherein said closing element is a bar which, in the open position of the door panel, extends substantially across any exposed portion of said profiled sill element.
- 15 3. The door sill arrangement for an elevator car as defined in claim 1, wherein said grooves are fitted on a lateral side surface of said profiled sill element.
4. The door sill arrangement for an elevator car as defined in claim 1, wherein said grooves are fitted on a top surface of said profiled sill element.
- 20 5. The door sill arrangement for an elevator car as defined in claim 1, wherein each said closing element is a plastic bar.



6. An elevator landing arrangement comprising:

a profiled sill element provided with an upper groove and a lower groove;
a first elevator door panel and a second elevator door panel;

5 a first sliding guide attached to said first elevator door panel, said first sliding guide having a first portion located adjacent said upper groove;

a second sliding guide attached to said second elevator door panel, said second sliding guide having a second portion thereof located adjacent said lower groove;

10 an upper closing element attached to said first portion of said first sliding guide, said upper closing element being located in said upper groove; and

a lower closing element attached to said second portion of said second sliding guide, said lower closing element being located in said lower groove, wherein said first elevator door panel is moveable and said second elevator door panel is moveable, said first elevator door panel being moveable in a first direction opposite to a second direction of movement of said second elevator door panel, whereby when said first and second elevator door panels are moved, said upper and lower closing elements cover said upper and lower grooves in substantially all of an area of the profiled sill located between the first and second elevator door panels.

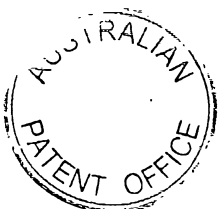
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7. The elevator landing arrangement as defined in claim 6, wherein said upper and lower closing elements are plastic bars.

8. The elevator landing arrangement as defined in claim 6, wherein said profiled sill element consists of a first and a second aluminium profile, said second aluminium profile being fitted to said first aluminium profile so that the combination of the first and second aluminium profiles forms said upper and said lower grooves.

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9. The elevator landing arrangement as defined in claim 6, wherein said upper and lower grooves are fitted on a lateral side surface of said profiled sill element.



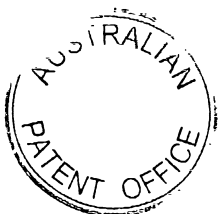
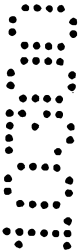
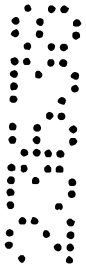
10. The elevator landing arrangement as defined in claim 6, wherein said upper and lower grooves are fitted on a top surface of said profiled sill element.

11. A door sill arrangement in an elevator car substantially as hereinbefore
5 described with reference to and as illustrated in the accompanying drawings.

Dated this 1st day of March 2000

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KONE OY
by their Patent Attorneys
COLLISON & CO



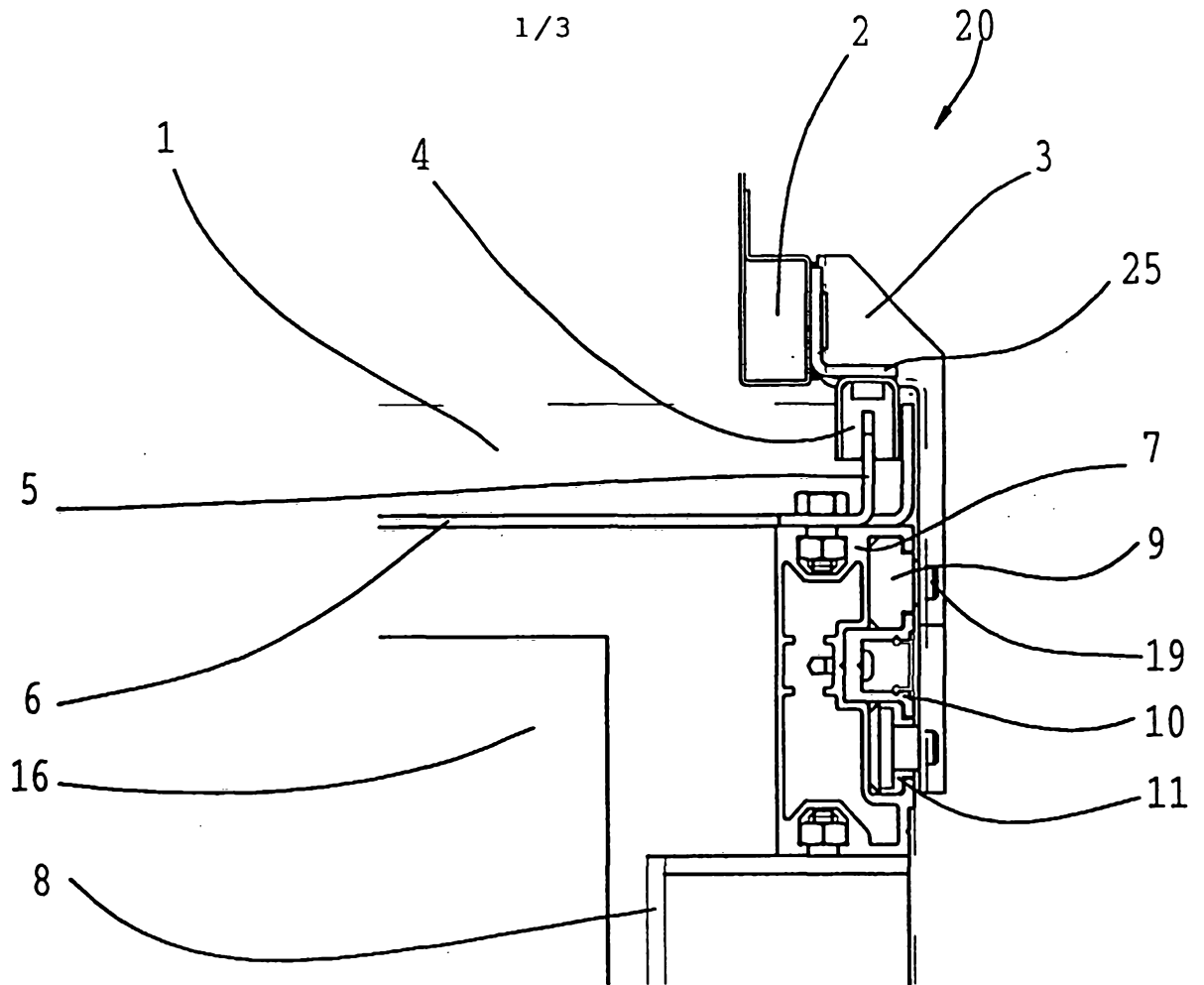


Fig 1.a

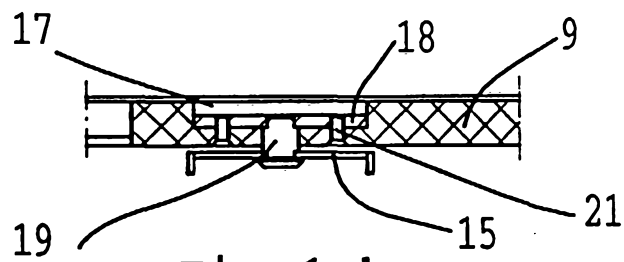


Fig 1.b

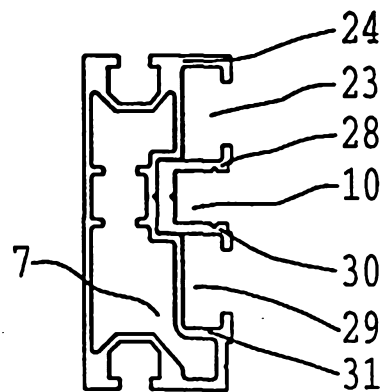


Fig 1.c

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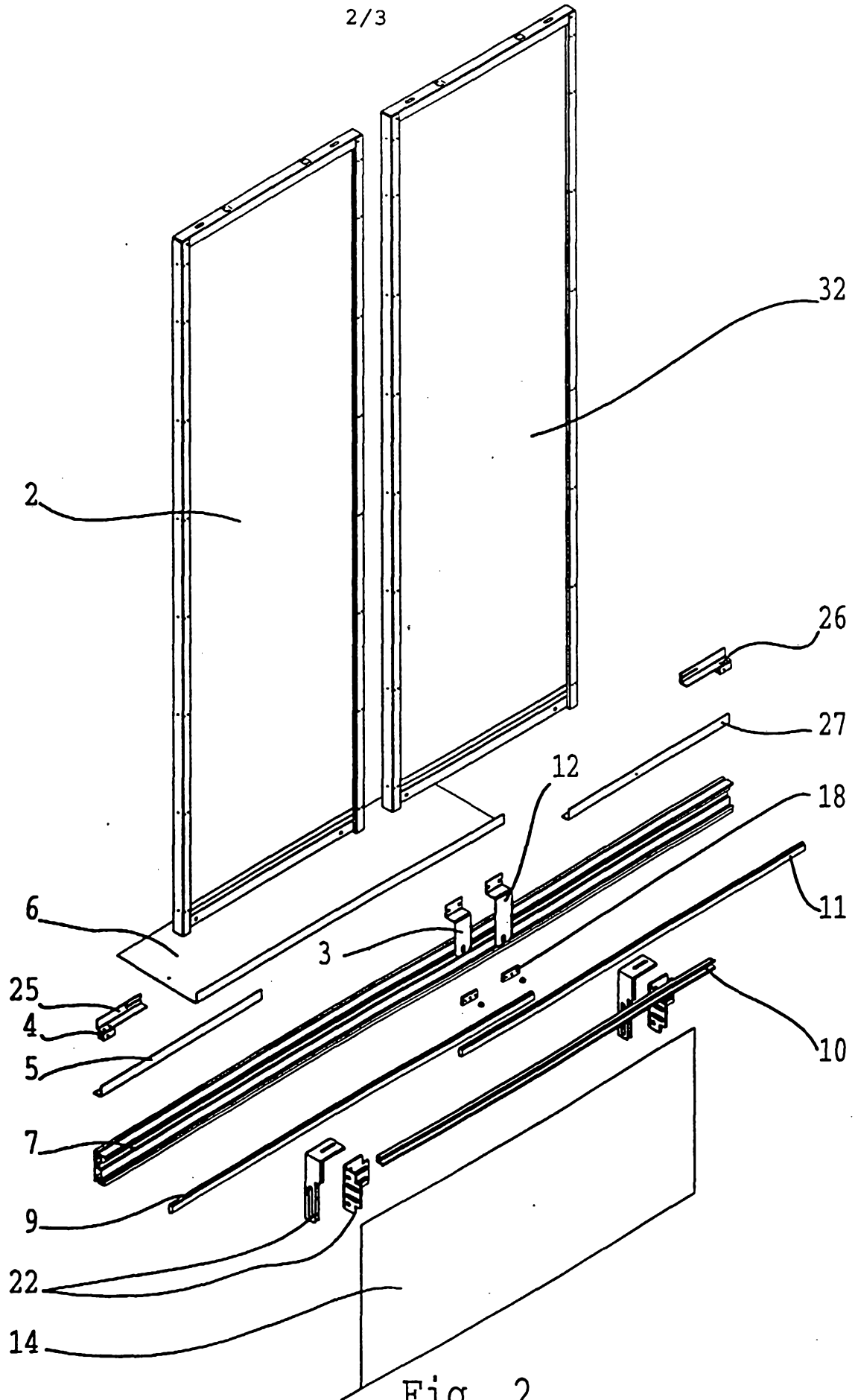


Fig. 2

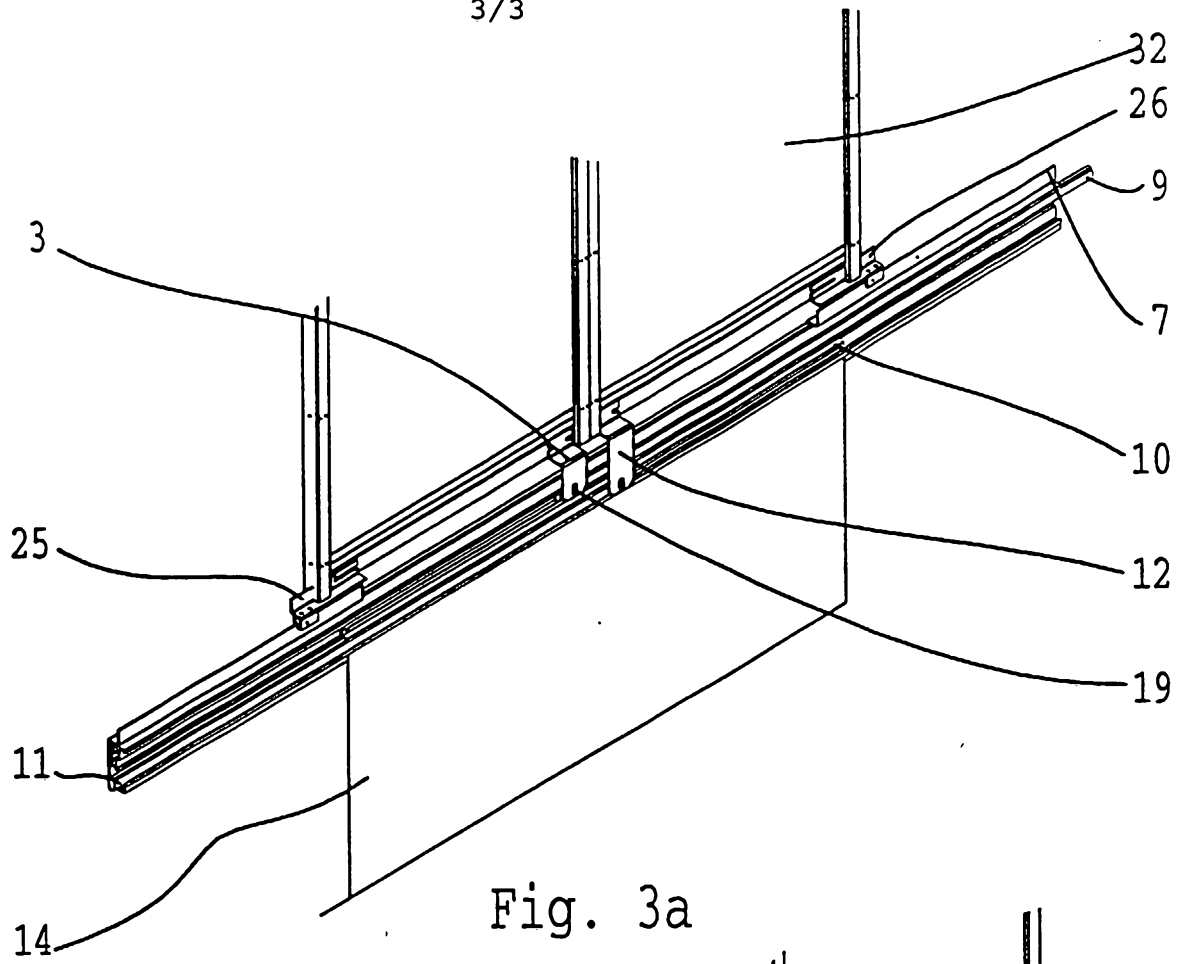


Fig. 3a

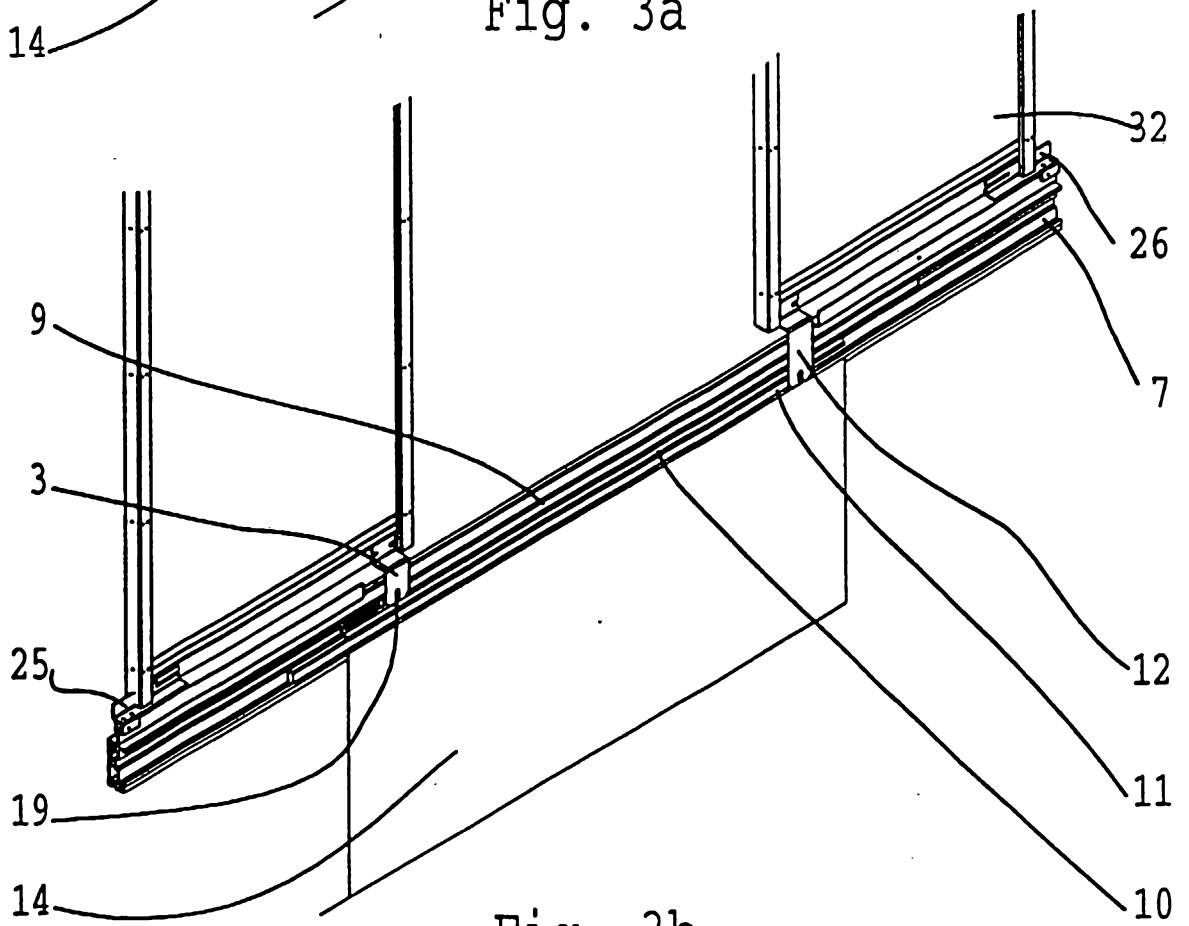


Fig. 3b