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(54) **Elevator door structure.**

(57) An elevator door (1, 2) cooperates with a groove (4, 5) in a sill (3), the groove (4, 5) guiding a bottom (2a, 2b) of an elevator door (1, 2). The door (1, 2) has a guide shoe (6, 7) attached to the bottom thereof and has a shape which extends over a width of the door. The guide shoe (6, 7) has a front edge (6a, 7a) that is approximately flush with a front face (1b, 2b) of the door (1, 2) to prevent objects from being wedged between the bottom of the door (2a, 2b) and the sill (3).

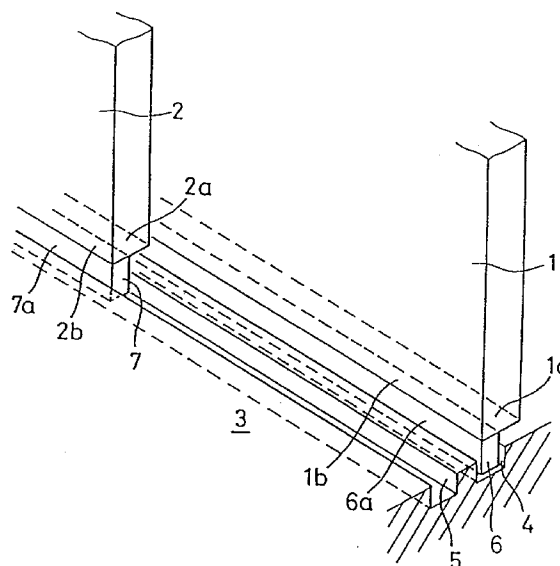


Figure 1

The present invention relates to a door structure and in particular, but not exclusively to an elevator door structure.

A conventional elevator door structure is shown in Figs. 3 and 4. Freely slidable hoistway doors 101, 102 are provided on the platform side of the elevator. Pinshaped guide shoes 103, 104 are installed at the bottom edges 101a, 102a, of the doors. These guide shoes are fitted in the guide grooves 106, 107 of the door sill 105 in a freely slidable state. There is a clearance of approximately 5mm between the bottom edges of the doors and the surface of the door sill.

According to an aspect of the present invention, there is provided a door structure comprising:

a groove in a sill;

a guide shoe arranged at a lower end region of a door, said guide shoe cooperating with said groove to thereby guide said door,

wherein said guide shoe extends along at least part of the width of said door and is so shaped and so arranged with respect to the lower end region of the door that objects are prevented from being wedged between said lower end region of said door and said sill.

The front edge of the guide shoe may be approximately flush with the front of the aforementioned door. The guide shoe may have a shape for cooperating with a shape of the groove to guide the door and to prevent an object from wedging between the bottom of the door and the sill.

When a passenger (specifically a child or the like) is about to enter or leave the car while the door is opening or closing, the passenger may lose his balance, and the tip of his toe may be in front of the door and touch the bottom edge of the door. Even if his toe touches the bottom edge of the door front, as guide shoe is placed between this bottom edge and the surface of the door sill, the toe is prevented from being trapped there. This door structure may be incorporated in the hoistway and/or elevator car doors.

Thus embodiments of the present invention may provide a safe elevator structure. Furthermore embodiments of the invention may provide a structure which is able to minimise the probability that a passenger's foot is injured particularly when the passenger enters or leaves the elevator.

Viewed from a second aspect, the present invention provides a door structure having a groove in a sill, said groove guiding a bottom of a door, said door structure comprising:

a guide shoe attaching to said bottom and having a shape which ranges over a width of said door, said guide shoe having a shape for cooperating with a shape of said groove to guide said door and for preventing an object from wedging between said bottom of said door and said sill.

Viewed from a third aspect, the present invention provides an elevator door structure having a groove

in a sill, said groove guiding a bottom of an elevator door, said structure comprising:

a guide shoe attaching to said bottom and having a shape which ranges over a width of said door, said guide shoe having a front edge that is approximately flush with a front face of said door to prevent objects from being wedged between said bottom of said door and said sill.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1 is a perspective view which illustrates an elevator door structure embodying the present invention;

Fig. 2 is a sectional view of the door structure of Figure 1;

Fig. 3 is a perspective view of the conventional door structure; and

Fig. 4 is a sectional view of the door structure of Figure 3.

An embodiment of the invention will be explained based on Figures 1 and 2 which illustrate an example of an elevator door structure.

In Figs 1 and 2, the doors 1, 2 which open and close the entrance are shown on a platform side of the elevator (i.e. hoistway doors). As is known in the art, the doors are suspended from above so that they may slide freely. At the door bottoms, each door is guided by a sill 3 that has two guide grooves 4, 5. Each groove has an approximately rectangular-shaped section.

Each door has a guide shoe 6, 7 that is installed on the bottom edges 2a, 2b thereof that is fitted into the guide grooves 4, 5 in a freely slidable state. The guide shoes are linear and range over almost the entire width of the bottom edges of the doors (i.e. that width of the door which the passenger can engage with his or her feet).

The guide shoes 6, 7 are illustrated on the front side (center left side in Fig. 2) of the bottom edges and the front edges 6a, 7a are almost flush with the front of the doors 1b, 2b. Thus, on the front side of the doors, the guide shoes are placed between the bottom edges of the doors and the surface of the door sill 3 and the clearance that existed in the prior art has disappeared. Passage holes (not illustrated in the figures) are formed on the bottom of the guide grooves. These holes allow dirt to pass through to prevent that dirt from accumulating in the groove and jamming the free sliding of the doors.

Although the invention has been shown and described with respect to a best mode embodiment thereof, it should be understood by those skilled in the art that various other changes, omissions and additions in the form and detail thereof may be made therein without departing from the scope of the invention. While this embodiment has been described in relation to hoistway doors, needless to mention, it

can also be applied to the door structure on the car side.

Claims

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1. A door structure comprising:
 - a groove (4, 5) in a sill (3);
 - a guide shoe (6, 7) arranged at a lower end
region (2a, 2b) of a door, said guide shoe coop- 10
erating with said groove to thereby guide said
door,
 - wherein said guide shoe extends along at
least part of the width of said door and is so shap- 15
ed and so arranged with respect to the lower end
region (2a, 2b) of the door that objects are pre-
vented from being wedged between said lower
end region of said door and said sill.
2. A door structure as claimed in claim 1, wherein 20
said guide shoe (6, 7) has a front edge (6a, 7a)
that is approximately flush with a front face (1a,
1b) of said door (1, 2).
3. A door structure as claimed in claim 1 or 2, 25
wherein said groove (4, 5) has a rectangular
shape and said guide shoe (6, 7) has a corre-
sponding rectangular shape.
4. A door structure as claimed in any one of claims 30
1 to 3, wherein said guide shoe extends along
substantially the entire width of said door.
5. A door structure as claimed in any one of claims 35
1 to 4, wherein said door structure is an elevator
door structure.

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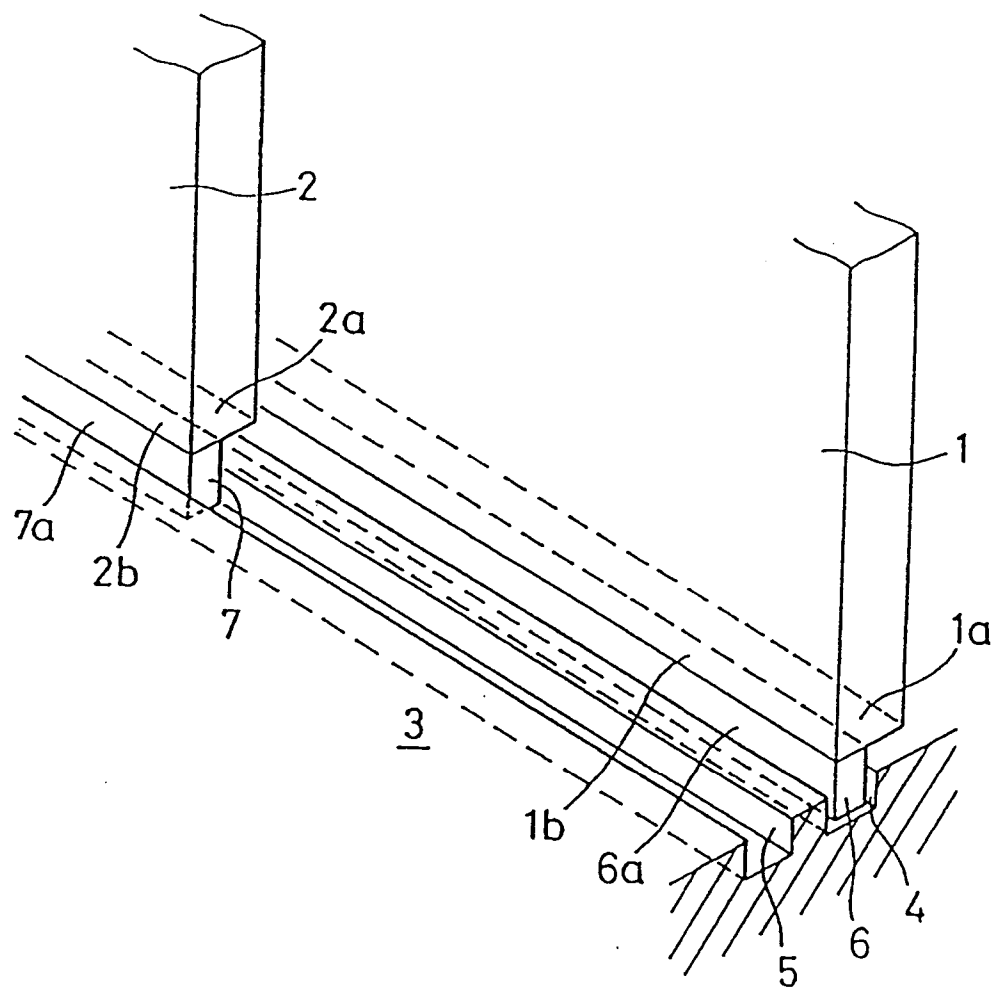


Figure 1

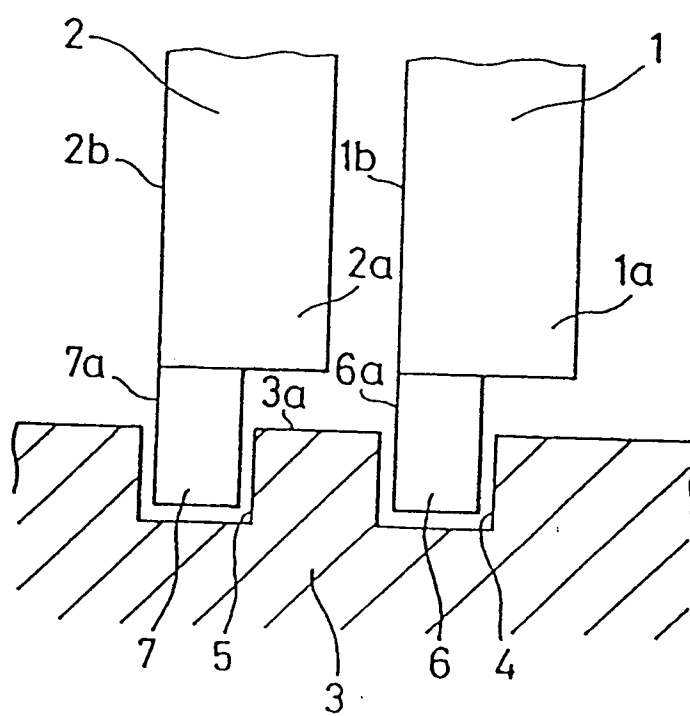


Figure 2

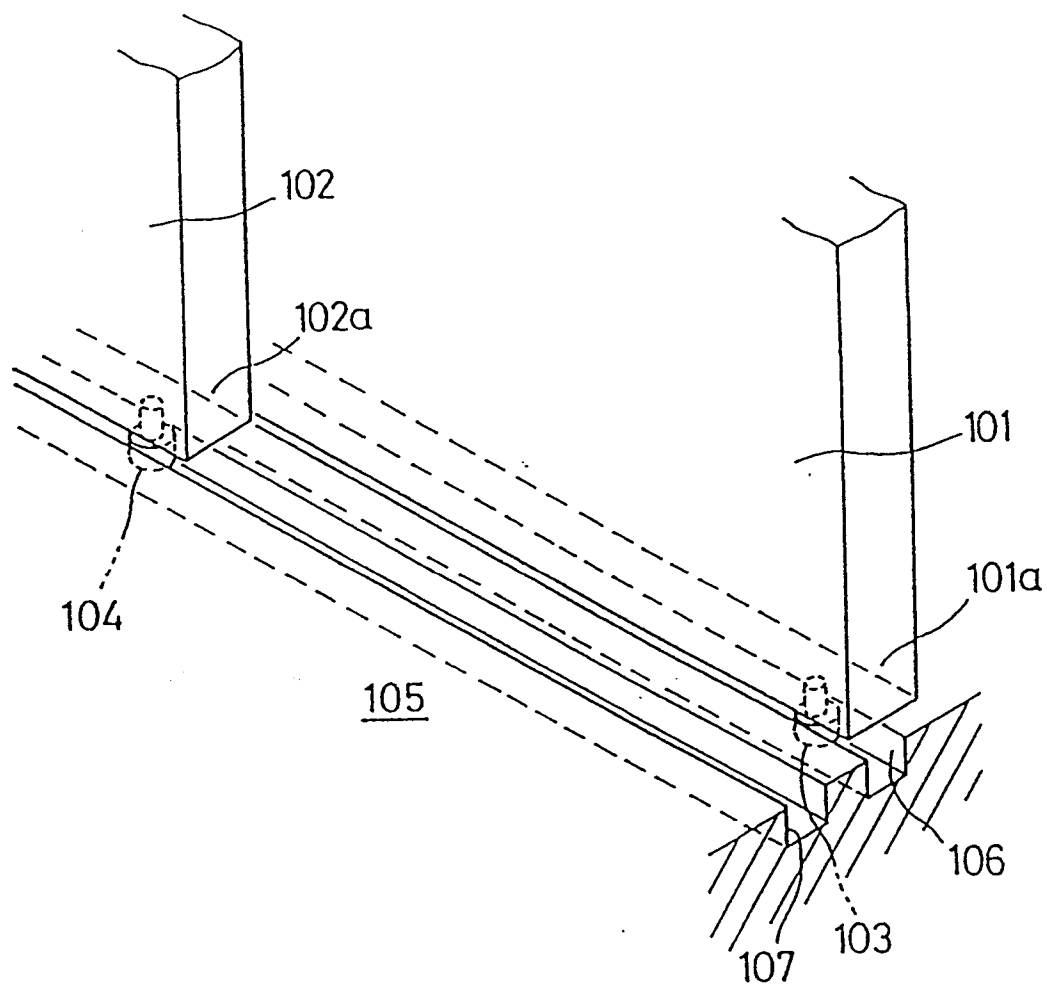


Figure 3

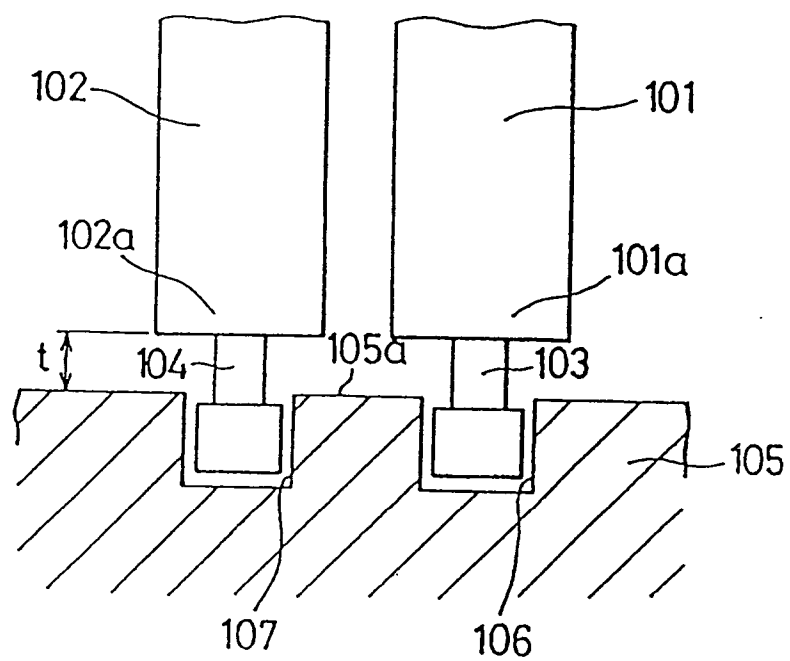


Figure 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 30 9740

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
P,X	FR-A-2 685 313 (OTIS ELEVATOR COMPANY) * page 4, line 16 - line 21 * * figures *	1-5	B66B13/30 E06B3/46
X	EP-A-0 418 510 (INVENTIO AG) * column 3, line 40 - line 48 * * figure 7 *	1-5	
X	EP-A-0 472 845 (INVENTIO AG) * column 3, line 11 - line 20 * * figure 18 *	1,5	
A		2	
A	DE-C-703 754 (W. KORNHASS)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			B66B E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 1 March 1994	Examiner Salvador, D
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