

DESCRIPTION

[Title of Invention] ELEVATOR DOOR

[Technical Field]

[0001]

The present invention relates to an elevator door.

[Background Art]

[0002]

Patent Literature 1 (PTL 1) discloses a structure of a door stop portion of an elevator with a type of two doors opening from the center. Specifically speaking, PTL 1 discloses the structure of the door stop portion composed of: a door plate whose door stop top is L-shaped; a Z-shaped fitting which is fixed to the inside of the door plate and is Z-shaped in cross-section; a U-shaped fitting which is fixed to the outside of the door plate and is U-shaped in cross-section; and an elastic body which is placed in a recess of the U-shaped fitting, and part of which protrudes from the recess. The structure of the door stop portion can be simplified by configuring the door stop portion as described above.

[0003]

Patent Literature 2 (PTL 2) discloses the structure of a door stop portion of an elevator of a type composed of two doors, only one of which opens. Specifically speaking, PTL 2 discloses the structure of the door stop portion composed of: a door stop rubber; a mounting bracket which is fastened to a screw part of the door stop rubber and can be inserted into a back side of a landing jamb through a mounting hole in the landing jamb; and a machine screw provided on the mounting bracket. The structure of this door stop portion can make it possible to attach the door stop rubber easily and securely only by working from a landing side.

[Citation List]

[Patent Literature]

[0004]

[PTL 1] Japanese Patent Application Laid-Open (Kokai) Publication No. 1994-115863

[PTL 2] Japanese Patent Application Laid-Open (Kokai) Publication No. 1997-20488

[Summary of Invention]

[Problems to be Solved by the Invention]

[0005]

Meanwhile, when fire occurs it is necessary to suppress ignition of the door stop portion, particularly the door stop rubber, in order to prevent flames at the landing side from spreading to the hoistway side.

[0006]

However, neither PTL 1 nor PTL 2 teaches anything regarding the structure to suppress the ignition of the door stop rubber. Therefore, with the structures of the door stop portions described in PTL 1 and PTL 2, there is a possibility that heat from the landing side may be transmitted from the door to the door stop rubber and this may cause the door stop rubber to ignite.

[0007]

Incidentally, PTL 1 discloses a structure equipped with the Z-shaped fitting; and if the elastic body ignites, it is possible to assume that this Z-shaped fitting can prevent flames from spreading to the hoistway side. However, installation errors actually occur with respect to the Z-shaped fitting attached to the entire area of the door stop portion, so that a gap is generated between the Z-shaped fitting and the door plate and it is impossible to reliably prevent the flames from spreading.

[0008]

The present invention was devised in consideration of the above-described circumstances and proposes an elevator door capable of inexpensively preventing ignition of a door stop rubber.

[Means for Solving the Problems]

[0009]

In order to solve the above-described problem, an elevator door according to the present invention which is an elevator door provided with an opening for inserting a door stop rubber is characterized in that the elevator door includes a cover that prevents flames from spreading from the opening to the inside of the door when the door stop rubber ignites; wherein the cover is provided inside the door and near the opening and has a shape that covers, from inside the door, the opening and the door stop rubber exposed to the inside of the door when the cover is inserted into the opening.

[Advantageous Effects of Invention]

[0010]

According to the present invention, it is possible to prevent the ignition of the door stop rubber at low costs.

[Brief Description of Drawings]

[0011]

[Fig. 1] Fig. 1 is a front-face structure diagram of doors according to this embodiment;

[Fig. 2] Fig. 2 is a cross-sectional structure diagram of the door at a door stop portion;

[Fig. 3] Fig. 3 is a top-face structure diagram of a rubber cover;

[Fig. 4] Fig. 4 is a front-face structure diagram of the rubber cover;

[Fig. 5] Fig. 5 is a cross-sectional structure diagram of a door at a door stop portion according to another embodiment;

[Fig. 6] Fig. 6 is a top-face structure diagram of the rubber cover;

[Fig. 7] Fig. 7 is a front-face structure diagram of the rubber cover; and

[Fig. 8] Fig. 8 is a perspective view of the door stop rubber.

[Mode for Carrying out the Invention]

[0012]

An embodiment of the present invention will be described below in detail with reference to drawings.

[0013]

Fig. 1 illustrates the front-face structure of an elevator door 100 according to this embodiment. The front-face structure of this door 100 is a front-face structure of the door 100 as a landing side is viewed from the inside of a hoistway.

[0014]

The door 100 is of a type composed of two doors which open at their center and two doors 100 move to the right and left, respectively, to open or close. The door 100 is configured by including a door stop rubber 101 at a door stop portion in order to buffer impacts caused by collisions between the doors 100 when the doors 100 are completely closed.

[0015]

Incidentally, in this example, the door stop rubbers 101 are respectfully attached to an upper part and lower part of one of the two doors 100; however, the present

invention is not necessarily limited to this example and the door stop rubber 101 may be also attached to, for example, a central part of the door 100.

[0016]

An A1-A2 cross-section of the door 100 at the door stop portion will be described with reference to Fig. 2 and the top-face structure of a rubber cover at the door stop portion as viewed from a B1 direction will be described with reference to Fig. 3.

[0017]

Fig. 2 illustrates a cross-sectional structure of the door 100 at the door stop portion. The cross-sectional structure of the door 100 illustrated in Fig. 2 corresponds to the A1-A2 cross-section illustrated in Fig. 1.

[0018]

The door 100 is configured of a door stop rubber 101, a rubber cover 102, a light leakage prevention cover 103, and a fixture 104. The door stop rubber 101 is rubber of a general shape and material and is inserted from the landing side into an opening in the door 100 and is then secured to the door 100 by means of elasticity of the rubber itself.

[0019]

The rubber cover 102 is configured in a conical shape without a top and is attached to so that this covers the entire area of the door stop rubber 101 from the inside of the door 100. The rubber cover 102 is formed of, for example, stainless steel.

[0020]

The light leakage prevention cover 103 is attached to a surface of the side of an inside hoistway of the door 100 on the hoistway side and attached so as to block light entering the hoistway from the landing side or entering the landing side from inside the hoistway. Furthermore, the light leakage prevention cover 103 not only blocks the light from inside the hoistway, but also prevents the flames from spreading from inside the hoistway to the landing side or from the landing side to the inside of the hoistway.

[0021]

The fixture 104 is a member for doubly fastening the rubber cover 102 and the light leakage prevention cover 103 together on a surface of the door 100 on the hoistway side. The fixture 104 is, for example, a screw or a rivet.

[0022]

Fig. 3 illustrates a top-face structure of the rubber cover 102. The top-face structure of the rubber cover 102 as illustrated in Fig. 3 is a top-face structure when only the rubber cover 102 is viewed from the B1 direction illustrated in Fig. 1.

[0023]

The rubber cover 102 is composed of a bottom face 1021, a slope 1022, and an inside-door-surface contact part 1023 as viewed from the B1 direction. The bottom face 1021 is located at the opening, into which the door stop rubber 101 is to be inserted, and faces opposite an face of the opposite door stop face of the door stop rubber 101. The slope 1022 is located at the opening in the same manner as the bottom face 1021 and faces opposite a side face of the door stop rubber 101. The inside-door-surface contact part 1023 is located in an area excluding the opening and enters into close contact with the inside surface of the door 100.

[0024]

A front-face structure of the rubber cover 102 as viewed from a C1 direction will be described with reference to Fig. 4.

[0025]

Fig. 4 illustrates the front-face structure of the rubber cover 102. Fig. 4 also illustrates the structure of a D1-D2 cross-section. The front-face structure of the rubber cover 102 as illustrated in Fig. 4 is a front-face structure as viewed from the C1 direction illustrated in Fig. 3.

[0026]

The rubber cover 102 is composed of the bottom face 1021, the slope 1022, and the inside-door-surface contact part 1023 as viewed from the C1 direction. The bottom face 1021, the slope 1022, and the inside-door-surface contact part 1023 correspond to the bottom face 1021, the slope 1022, and the inside-door-surface contact part 1023 which are described with reference to Fig. 3.

[0027]

This embodiment is designed as described above to set the rubber cover 102 which shields the door stop rubber 101 from oxygen by covering the door stop rubber 101, which is exposed to the inside of the door 100, from the inside of the door 100. Thus, even if the door 100 is heated by flames from the landing side, it is possible to suppress the ignition of the door stop rubber 101 inexpensively and

prevent the flames from spreading.

[0028]

Fig. 5 illustrates a cross-sectional structure of the door 100 at a door stop portion according to another embodiment. The cross-sectional structure of the door 100 illustrated in Fig. 5 corresponds to the A1-A2 cross-section illustrated in Fig. 1. In the following explanation, the same reference numerals are assigned to the same members as those described above and descriptions about such members have been omitted and a different structure will be explained below.

[0029]

Part of a door stop rubber 101A is configured to have a recess and the recess side of the door stop rubber 101A is inserted into the opening in the door 100 and is secured to the door 100 by means of elasticity of the rubber itself. A rubber cover 102A is configured to be in a conical shape without a top and to have a protrusion on its bottom face, and is attached so that this covers the entire area of the door stop rubber 101 from the inside of the door 100.

[0030]

In a state where the door stop rubber 101A and the rubber cover 102A are set, the protrusion of the door stop rubber 101A engages with the recess of the rubber cover 102A. This engagement between the recess and the protrusion makes the door stop rubber 101A hardly come off from the door 100.

[0031]

Fig. 6 illustrates a top-face structure of the rubber cover 102A. The top-face structure of the rubber cover 102A illustrated in Fig. 6 is a top-face structure when only the rubber cover 102A is viewed from the B1 direction as illustrated in Fig. 1.

[0032]

The rubber cover 102A is composed of a protrusion 1021A, a bottom face 1022A, a slope 1023A, and an inside-door-surface contact part 1024A as viewed from the B1 direction. The protrusion 1021A is located at the opening into which the door stop rubber 101A is to be inserted, and engages with the recess in the door stop rubber 101A.

[0033]

The bottom face 1022A is located at the opening in the same manner as the protrusion 1021A and faces opposite a surface area, excluding the protrusion, of

the face of the opposite door stop of the door stop rubber 101A. The slope 1023A is located at the opening in the same manner as the protrusion 1021A and faces opposite a side face of the door stop rubber 101A. The inside-door-surface contact part 1024A is located in an area excluding the opening and enters into close contact with the inside surface of the door 100.

[0034]

A front-face structure of the rubber cover 102A as viewed from an E1 direction will be explained with reference to Fig. 7.

[0035]

Fig. 7 illustrates the front-face structure of the rubber cover 102A. At the same time, Fig. 7 also illustrates the structure of an F1-F2 cross-section. The front-face structure of the rubber cover 102A illustrated in Fig. 7 is a front-face structure as viewed from the E1 direction as illustrated in Fig. 6.

[0036]

The rubber cover 102A is composed of the protrusion 1021A, the bottom face 1022A, the slope 1023A, and the inside-door-surface contact part 1024A as viewed from the E1 direction. The protrusion 1021A, the bottom face 1022A, the slope 1023A, and the inside-door-surface contact part 1024A correspond to the protrusion 1021A, the bottom face 1022A, the slope 1023A, and the inside-door-surface contact part 1024A which are explained with reference to Fig. 6.

[0037]

Fig. 8 illustrates a perspective structure of the door stop rubber 101A. The door stop rubber 101A is configured to have a recess 1011A as described above and this recess 1011A engages with the protrusion 1021A of the rubber cover 102A.

[0038]

The other embodiment is designed as described above to set the rubber cover 102A which shields the door stop rubber 101A from oxygen by covering the door stop rubber 101A, which is exposed to the inside of the door 100, from the inside of the door 100. Since the rubber cover 102A is provided with the protrusion 1021A which engages with the recess 1011A of the door stop rubber 101A, it is possible to make the door stop rubber 101A hardly come off from the door 100. At the same time, even if the door 100 is heated by flames from the landing side, it is possible to suppress the ignition of the door stop rubber 101A inexpensively and prevent the

flames from spreading.

[Reference Signs List]

[0039]

100 door

101, 101A door stop rubber

102, 102A rubber cover

CLAIMS

[Claim 1]

An elevator door provided with an opening for inserting a door stop rubber, the elevator door comprising a cover that prevents flames from spreading from the opening to the inside of the door when the door stop rubber ignites, wherein the cover is placed inside the door and near the opening and has a shape that covers, from inside the door, the opening and the door stop rubber exposed to the inside of the door when the cover is inserted into the opening.

[Claim 2]

The elevator door according to claim 1, wherein a portion of the cover that covers the door stop rubber and the opening has a shape in conformity with a surface of the door stop rubber and a portion other than the portion that covers the door stop rubber and the opening has a plate shape; the portion of the plate shape closely touches an inside surface of the door; and the portion of the plate shape in close contact with the inside surface of the door is partly secured to the door by a fixture.

[Claim 3]

The elevator door according to claim 2, further comprising a light leakage prevention cover, wherein the light leakage prevention cover closely touches an outside surface of the door and is secured, together with the cover, to the door by the fixture.

[Claim 4]

The elevator door according to claim 1, wherein the openings are provided in a manner distributed in a height direction of the door; wherein the cover is provided in accordance with the openings.

[Claim 5]

The elevator door according to claim 1, wherein the door stop rubber has a recess on a face on a side to be inserted into the opening; wherein the cover has a protrusion on its face opposite the recess; and the recess engages with the protrusion when the door stop rubber is

inserted into the opening.