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(72) Inventor: **MATSUDA, Kazuko**
Tokyo 100-8310 (JP)

(71) Applicant: **Mitsubishi Electric Corporation**
Tokyo 100-8310 (JP)

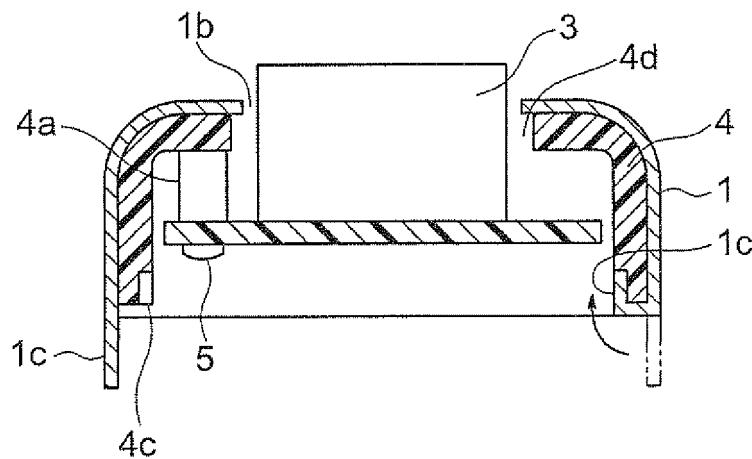
(74) Representative: **HOFFMANN EITLE**
Patent- und Rechtsanwälte
Arabellastrasse 4
81925 München (DE)

(54) **OPERATION DISPLAY DEVICE FOR ELEVATOR**

(57) An elevator operating display has a metal surface plate, internally-mounted equipment, and a resin fixing member. A fixing member is mounted behind the sur-

face plate. An equipment fixing portion for fixing the internally-mounted equipment is formed on the fixing member. The internally-mounted equipment is mounted to the surface plate by means of the fixing member.

FIG. 7



Description**TECHNICAL FIELD**

[0001] The present invention relates to an elevator operating display such as a landing operating panel, a landing display, a car operating panel, or an onboard display, for example.

BACKGROUND ART

[0002] In conventional elevator operating displays, a screw-threaded rod for mounting internally-mounted equipment is welded to a rear surface of a surface plate that is constituted by a thin metal plate such as a stainless-steel plate (see Patent Literature 1, for example). In a second conventional elevator operating display, a surface plate is constituted by a resin-molded part (see Patent Literature 2, for example).

CITATION LIST**PATENT LITERATURE****[0003]**

- [Patent Literature 1]
Japanese Patent Laid-Open No. HEI 5-162936 (Gazette)
- [Patent Literature 2]
Japanese Patent Laid-Open No. 2004-189373 (Gazette)

SUMMARY OF THE INVENTION**PROBLEM TO BE SOLVED BY THE INVENTION**

[0004] In conventional elevator operating displays such as those described above, welding stress may be generated on the front surface of the surface plate by welding the screw-threaded rod if a surface plate that is made of a thin metal plate is used, and in that case, a finishing operation for relieving stress is required, increasing manufacturing costs. If a resin surface plate is used, durability and decorative design are reduced compared to the metal surface plate.

[0005] The present invention aims to solve the above problems and an object of the present invention is to provide an elevator operating display that prevents welding stress from being generated in a surface plate and that can also prevent reductions in durability and decorative design.

MEANS FOR SOLVING THE PROBLEM

[0006] In order to achieve the above object, according to one aspect of the present invention, there is provided an elevator operating display including: a metal surface

plate; internal-mounted equipment; and a resin fixing member that is mounted behind the surface plate, and on which is formed an equipment fixing portion for fixing the internally-mounted equipment.

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EFFECTS OF THE INVENTION

[0007] The elevator operating display according to the present invention enables reductions in durability and decorative design to be prevented by using the metal surface plate, and also prevents welding stress from being generated in the surface plate by forming the equipment fixing portion on the resin fixing member that is mounted behind the surface plate, enabling manufacturing costs to be prevented from being increased in order to relieve welding stress.

BRIEF DESCRIPTION OF THE DRAWINGS**[0008]**

- Figure 1 is a front elevation that shows a landing operating panel according to Embodiment 1 of the present invention;
- 25 Figure 2 is a side elevation that shows the landing operating panel from Figure 1;
- Figure 3 is a front elevation that shows part of the landing operating panel from Figure 1;
- 30 Figure 4 is a rear elevation that shows the landing operating panel from Figure 3;
- Figure 5 is a cross section that is taken along line V - V in Figure 3;
- 35 Figure 6 is a cross section that is taken along line VI - VI in Figure 3;
- Figure 7 is a cross section that is taken along line VII - VII in Figure 3;
- 40 Figure 8 is a rear elevation that shows an intermediate state during manufacturing of a surface plate of a landing operating panel according to Embodiment 2 of the present invention;
- Figure 9 is a cross section that is taken along line IX - IX in Figure 8; and
- 45 Figure 10 is a perspective that shows a fixing member of a landing operating panel according to Embodiment 3 of the present invention.

DESCRIPTION OF EMBODIMENTS

[0009] Preferred embodiments of the present invention will now be explained with reference to the drawings.

Embodiment 1

[0010] Figure 1 is a front elevation that shows a landing operating panel according to Embodiment 1 of the present invention, and Figure 2 is a side elevation that shows the landing operating panel from Figure 1. In the figures, a landing operating panel that constitutes an el-

elevator operating display is installed on an elevator landing. A surface plate 1 is constituted by a thin metal plate, and is worked by pressing, etc., to a predetermined shape that is imparted with indentations and protrusions. A plurality of apertures 1a and 1b are disposed on the surface plate 1.

[0011] A display 2 is disposed in the aperture 1a. The display 2 displays information such as present position and direction of operation, etc., of a car (not shown). A call button 3 for calling the car is disposed in the aperture 1b. The display 2 and the call button 3 constitute internally-mounted equipment that is mounted internally in the landing operating panel.

[0012] Next, a construction for mounting the call button 3 onto the surface plate 1 will be explained. Figure 3 is a front elevation that shows part of the landing operating panel from Figure 1, Figure 4 is a rear elevation that shows the landing operating panel from Figure 3, Figure 5 is a cross section that is taken along line V - V in Figure 3, Figure 6 is a cross section that is taken along line VI - VI in Figure 3, and Figure 7 is a cross section that is taken along line VII - VII in Figure 3.

[0013] A resin fixing member 4 is mounted behind the surface plate 1. The fixing member 4 is formed by resin molding so as to have a shape that is parallel to a rear surface of the surface plate 1. The call button 3 is fixed to the fixing member 4 by a plurality of (in this case, two) screws 5. In other words, the call button 3 is mounted to the surface plate 1 by means of the fixing member 4. A plurality of (in this case, two) cylindrical button bearing projections 4a that function as equipment fixing portions for fixing the call button 3 are formed integrally on the fixing member 4.

[0014] A base plate of the call button 3 is placed in contact with tip ends of the button bearing projections 4a. Threaded holes 4b into which the screws 5 are screwed are disposed centrally on the button bearing projections 4a. The screws 5 are passed through the base plate of the call button 3 and screwed into the threaded holes 4b.

[0015] A pair of engaging hooks 4c that are bent inward to engage with the fixing member 4 are disposed on trailing end portions on two sides of the surface plate 1 to the left and right. A state of the engaging hooks 1c before bending is shown in Figures 4 and 5. In Figure 7, states of the engaging hook 1c on the left before bending, and the engaging hook 1c on the right after bending are shown. The engaging hooks 1c are formed on the surface plate 1 in advance.

[0016] A pair of recess portions 4c that function as engaging portions with which the engaging hooks 1c engage are disposed on the fixing member 4. The fixing member 4 is fixed behind the surface plate 1 by inserting the tip end portions of the engaging hooks 1c into the recess portions 4c by bending the engaging hooks 1c to restrict vertical movement of the fixing member 4 relative to the surface plate 1. The fixing member 4 can be fixed to the surface plate 1 so as not to wobble by matching

the shapes of the recess portions 4c to the widths and the lengths of the tip end portions of the engaging hooks 1c. In addition, as shown in Figure 7, an aperture 4d through which the call button 3 is inserted is disposed on the fixing member 4.

[0017] In a landing operating panel of this kind, by using the metal surface plate 1, reductions in durability and decorative design can be prevented, and well-designed shapes can be achieved. By changing the material and the finish of the thin metal plate, variation in the surface plate 1 can also easily be increased.

[0018] In addition, by forming the button bearing projections 4a on the resin fixing member 4 that is mounted behind the surface plate 1, welding stress is prevented from being generated in the surface plate 1, enabling the manufacturing costs to be prevented from being increased in order to relieve welding stress.

[0019] Because the engaging hooks 1c are disposed on the surface plate 1, and the fixing member 4 is stopped by bending the engaging hooks 1c, the operation of fixing the fixing member 4 to the surface plate 1 can be further facilitated.

Because the recess portions 4c with which the engaging hooks 1c engage are disposed on the fixing member 4, the fixing member 4 can be fixed stably to the surface plate 1 using a simple construction.

In addition, because the button bearing projections 4a on which the threaded holes 4b are disposed are formed on the fixing member 4, the call button 3 can be fastened to the fixing member 4 by screws using a simple configuration.

Embodiment 2

[0020] Next, Figure 8 is a rear elevation that shows an intermediate state during manufacturing of a surface plate 1 of a landing operating panel according to Embodiment 2 of the present invention, and Figure 9 is a cross section that is taken along line IX - IX in Figure 8. In the landing operating panel that is shown in Figure 1, the number of call buttons 3 is one, but two call buttons 3 are normally required on landing operating panels that are installed on intermediate floors. In answer to that, in Embodiment 2, an aperture 1b for a call button 3 is not disposed during formation of a surface plate 1, and a plurality of sets of (in this case, three pairs of) engaging hooks 1c are formed so as to be spaced apart from each other vertically.

[0021] If only one call button 3 is to be mounted, a central aperture 1b in the figure is additionally machined, and a fixing member 4 is fixed using a pair of engaging hooks 1c that correspond to that aperture 1b. If two call buttons 3 are to be mounted, the two upper and lower apertures 1b in the figure are additionally machined, and two fixing members 4 are respectively fixed by two pairs of engaging hooks 1c that correspond to those apertures 1b. The engaging hooks 1c that are not used may simply be bent or cut off. The rest of the configuration is similar

or identical to that of Embodiment 1.

[0022] By adopting a configuration and manufacturing method of this kind, reductions in part types are enabled.

Embodiment 3

[0023] Next, Figure 10 is a perspective that shows a fixing member 4 of a landing operating panel according to Embodiment 3 of the present invention. In the figure, a plurality of (in this case, one pair of) ribs (reinforcing projections) 4e for reinforcing a surface plate 1 are formed integrally on a rear surface of a fixing member 4. The ribs 4e are formed parallel to a width direction of the fixing member 4. The rest of the configuration is similar or identical to that of Embodiment 1 (button bearing projections 4a are omitted in Figure 10).

[0024] By using a fixing member 4 of this kind, even if a surface plate 1 that is constituted by a thin metal plate is used, strength deficiencies in the surface plate 1 can be overcome.

[0025] Moreover, in Embodiment 3, the ribs 4e are formed parallel to the width direction of the fixing member 4, but the ribs 4e are not limited to this direction, and may also be formed perpendicular to the width direction (lengthwise), for example.

The number of ribs 4e may also be one, or three or more. In addition, a fixing member 4 only for reinforcing the surface plate 1 instead of for mounting internally-mounted equipment may also be additionally mounted to the surface plate 1.

[0026] Furthermore, the numbers of engaging hooks 1c and recess portions 4c are not limited to those of the above examples.

The engaging portions are not limited to the recess portions 4c, and may also be projecting portions with which the engaging hooks 1c engage, for example.

In addition, in the above examples, cases have been explained in which the internally-mounted part that is mounted to the surface plate 1 is the call button 3, but the present invention can be applied to various mounting constructions in which internally-mounted equipment such as the display 2 or a screw seat (not shown) for fixing the surface plate 1 to a wall, etc., is mounted to the surface plate 1, for example. The shape of the fixing member 4 can also be modified to match the shape or purpose of the internally-mounted equipment that is mounted.

Furthermore, the present invention can also be applied to elevator operating displays other than landing operating panels, such as landing displays, car operating panels, and onboard displays, for example.

Claims

1. An elevator operating display comprising:

a metal surface plate;

internally-mounted equipment; and a resin fixing member that is mounted behind the surface plate, and on which is formed an equipment fixing portion for fixing the internally-mounted equipment.

2. An elevator operating display according to Claim 1, wherein an engaging hook that is bent and engaged with the fixing member is disposed on an end portion of the surface plate.

3. An elevator operating display according to Claim 2, wherein an engaging portion with which the engaging hook engages is disposed on the fixing member.

4. An elevator operating display according to Claim 1, wherein:

the internally-mounted equipment is fixed to the equipment fixing portion by a screw; and a threaded hole into which the screw is screwed is disposed on the equipment fixing portion.

5. An elevator operating display according to Claim 1, wherein a rib for reinforcing the surface plate is disposed on the fixing member.

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FIG. 1

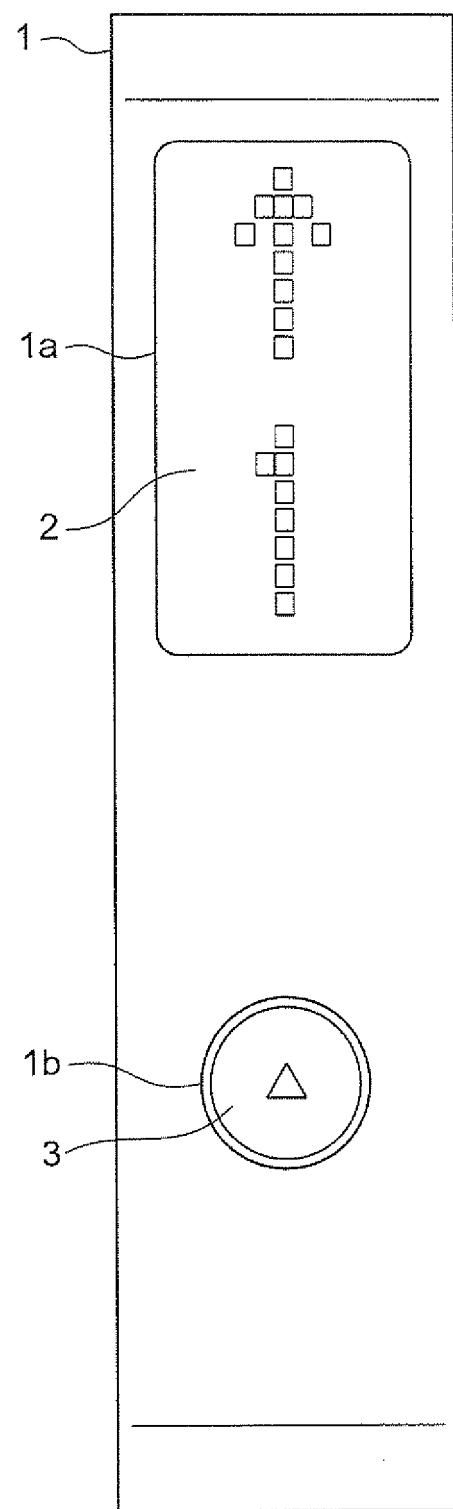


FIG. 2

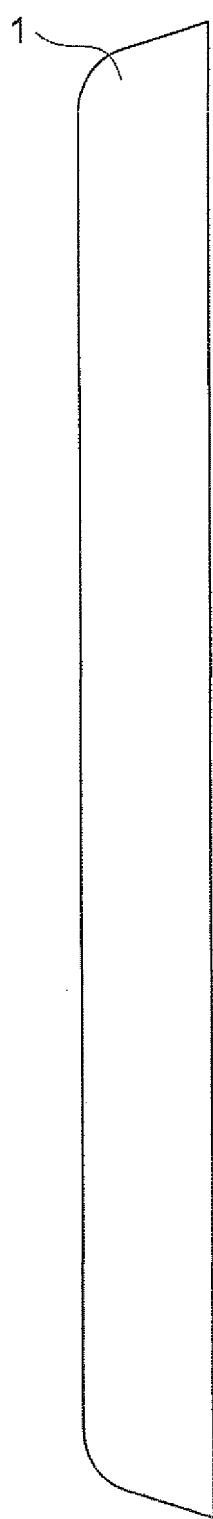


FIG. 3

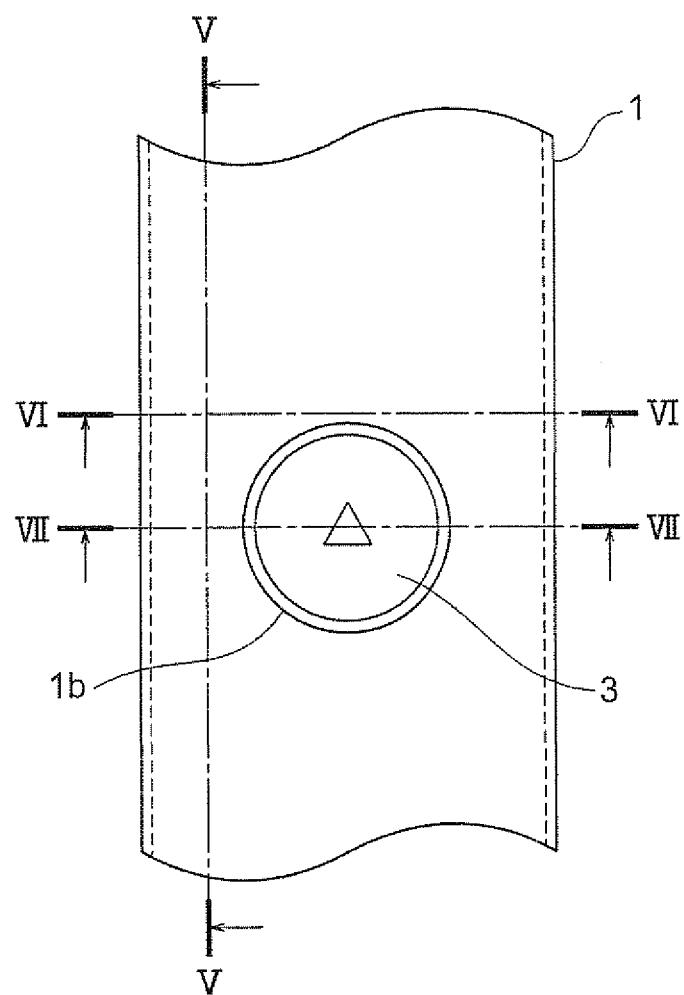


FIG. 4

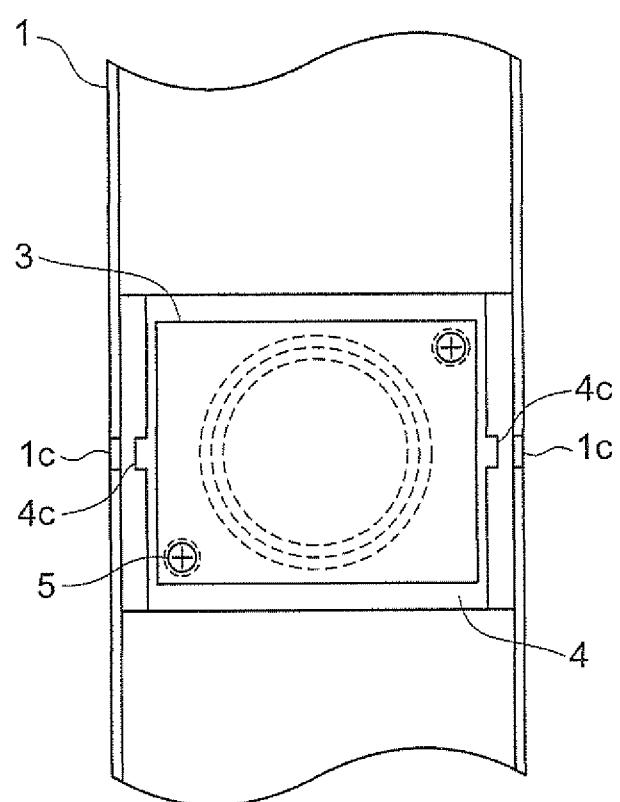


FIG. 5

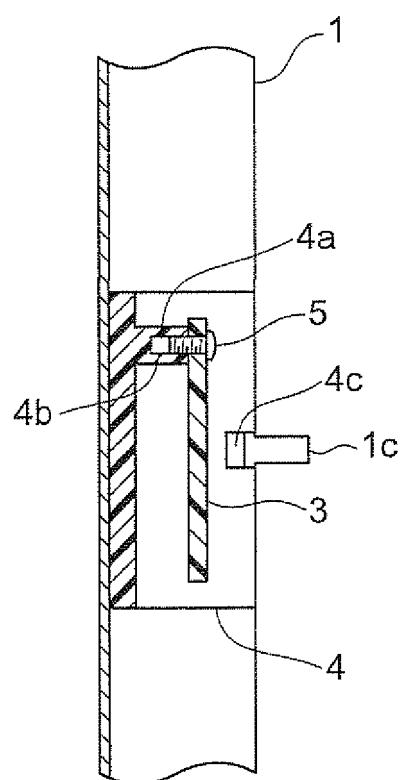


FIG. 6

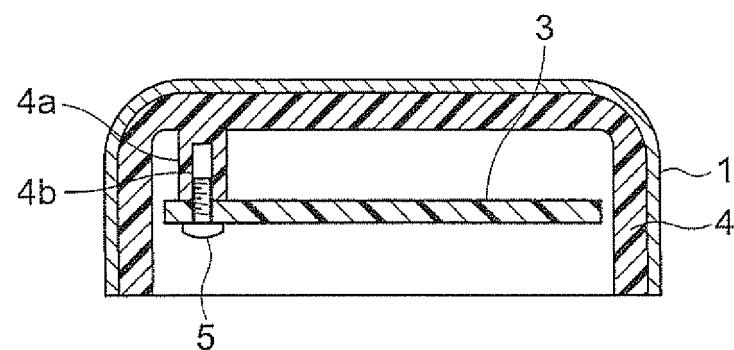


FIG. 7

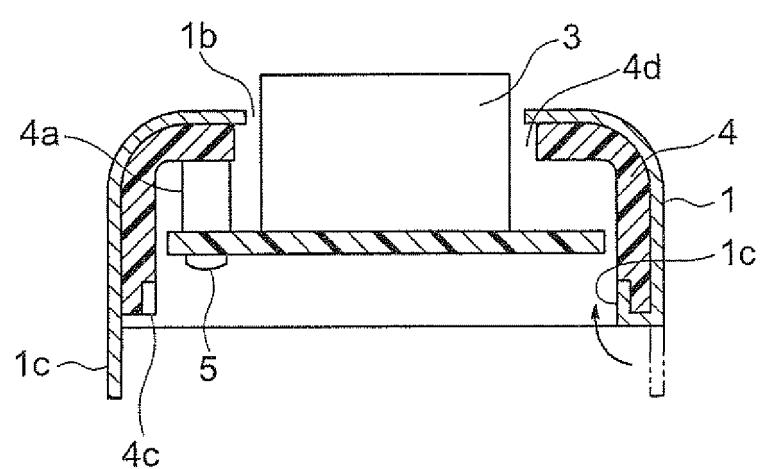


FIG. 8

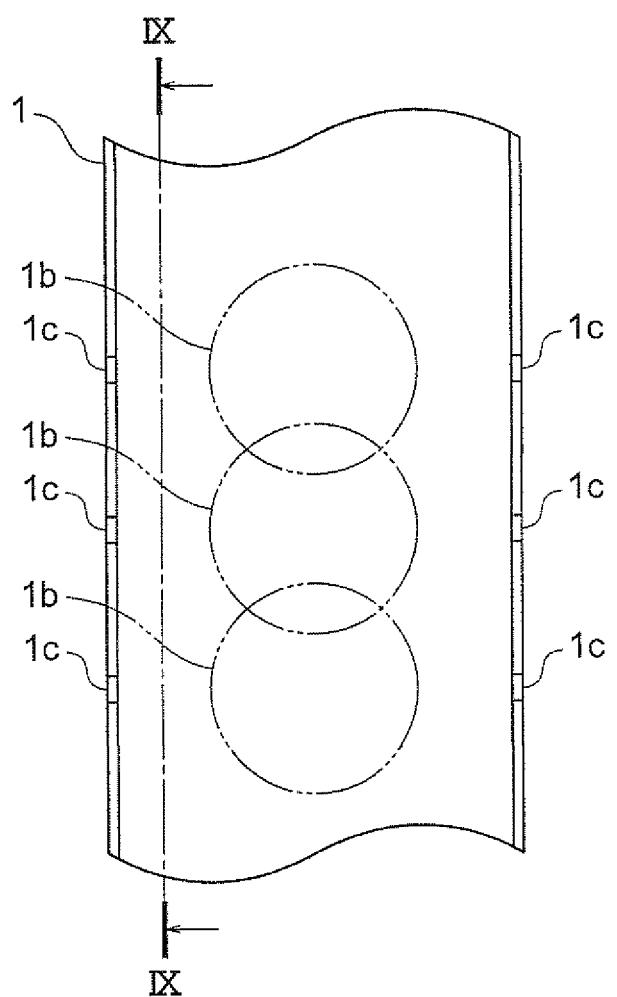


FIG. 9

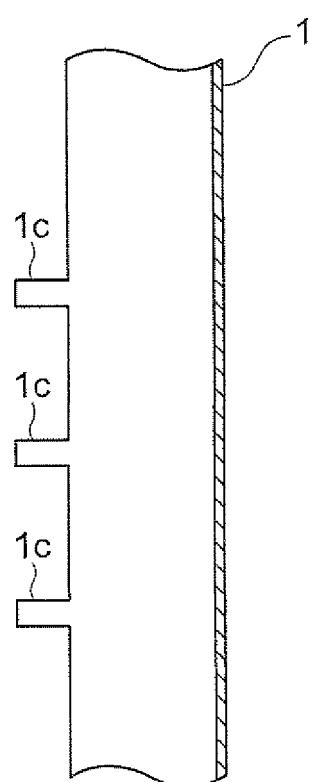
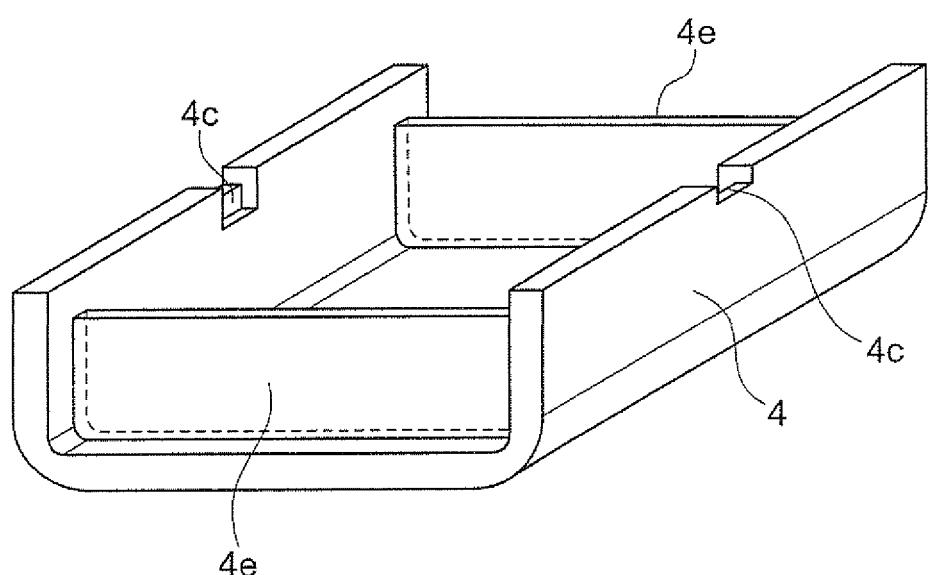


FIG. 10



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2009/070228

A. CLASSIFICATION OF SUBJECT MATTER
B66B1/46(2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B66B1/46

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2010
Kokai Jitsuyo Shinan Koho 1971-2010 Toroku Jitsuyo Shinan Koho 1994-2010

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 123997/1987 (Laid-open No. 29368/1989) (Fujitec Co., Ltd.), 21 February 1989 (21.02.1989), specification, page 4, line 17 to page 5, line 17; fig. 2 (Family: none)	1-5

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
05 February, 2010 (05.02.10)Date of mailing of the international search report
16 February, 2010 (16.02.10)Name and mailing address of the ISA/
Japanese Patent Office

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Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2009/070228

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 87280/1983 (Laid-open No. 192086/1984) (Mitsubishi Electric Corp.), 20 December 1984 (20.12.1984), specification, page 2, lines 6 to 18 & KR 20-1987-0001372 Y	1-5
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 53574/1991 (Laid-open No. 138137/1992) (Nisshinbo Industries, Inc.), 24 December 1992 (24.12.1992), paragraph [0016]; fig. 1 (Family: none)	2-3
Y	JP 2005-179791 A (Nagai Button Co., Ltd.), 07 July 2005 (07.07.2005), paragraphs [0015] to [0017]; fig. 3 to 4 (Family: none)	2-3
Y	JP 56-144955 A (Toyo Kogyo Co., Ltd.), 11 November 1981 (11.11.1981), fig. 2 (Family: none)	5

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REFERENCES CITED IN THE DESCRIPTION

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- JP HEI5162936 B [0003]
- JP 2004189373 A [0003]