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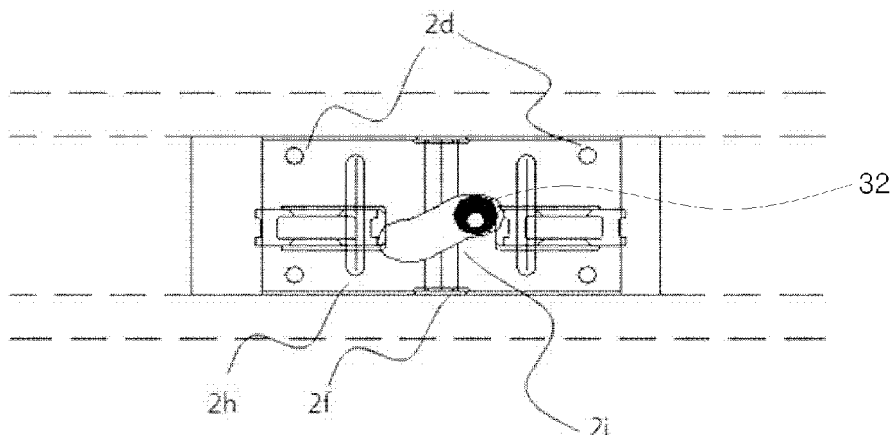
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(54) **SLIDING WINDOW**

(57) A sliding window including: a window frame that is fixed in a wall and is provided with at least one rail therein; and a sash that is provided with a window wheel unit in contact with the rail of the window frame, and is provided with a diverting unit for diverting wheels of the window wheel unit. Due to the diverting unit, the window wheel unit can bring the sash into close contact with or

can release the sash from the window frame, so the sliding window can remove a narrow gap from between the sash and the window frame. Accordingly, not only airtight, watertight, insulating, and soundproof performance can be improved, but also wind pressure resistance performance can be improved.

[Fig. 5a]



Description

TECHNICAL FIELD

[0001] The present invention generally relates to sliding windows. More particularly, the present invention relates to a sliding window in which the structure of a window wheel unit provided in a sliding sash is improved so that the window wheel unit can bring the sash into close contact with the window frame or can release the sash from the window frame.

BACKGROUND ART

[0002] In general, a sliding window is composed of a window frame, and a sash set in the window frame such that the sash can slide along a rail of the window frame. To realize an easy sliding motion of the sash along the rail when opening and closing the window, a window wheel unit is installed in the sash.

[0003] In the related art, to realize an easy sliding motion of the sash in a sliding window, the window wheel unit is installed in the sash with a narrow gap remaining between the window wheel unit and the rail of the window frame. Due to the narrow gap, the sliding window is problematic in that air, water, noise, and heat may freely pass through the narrow gap so the sliding window fails to achieve an original performance objective thereof, for example, airtight, watertight, insulating, and soundproof performance. In an effort to solve the above-mentioned problem, a flap made of hairs may be attached to the window frame and/or to the sash so as to cover the narrow gap. However, the flap may not completely cover the narrow gap.

DISCLOSURE

TECHNICAL PROBLEM

[0004] The present invention is intended to propose a sliding window that can efficiently achieve the original performance objective thereof, for example, airtight, watertight, insulating, and soundproof performance.

[0005] The present invention is also intended to propose a sliding window that can realize a reduction in the number of parts thereof and a simple assembling process, and that can allow a user to easily use the window.

TECHNICAL SOLUTION

[0006] In order to achieve the above objects, according to one aspect of the present invention, there is provided a sliding window including: a window frame fixed in a wall and provided with at least one rail therein; and a sash that is provided with a window wheel unit being in contact with the rail of the window frame, and is provided with a diverting unit for diverting the window wheel unit, wherein the window wheel unit brings

the sash into close contact with the window frame and releases the sash from the window frame by an operation of the diverting unit.

[0007] The window wheel unit may include: an outer housing installed in the sash; an inner housing placed in the outer housing and connected to the outer housing by an adjusting pin; a wheel housing placed in the inner housing and connected to both the inner housing and the outer housing by a locking pin; and a bracket placed in the wheel housing and holding a wheel, wherein the wheel housing is movable in leftward and rightward directions along the adjusting pin while being connected to both the inner housing and the outer housing by the adjusting pin inserted into the bracket by passing through the bracket.

ADVANTAGEOUS EFFECTS

[0008] In the sliding window of the present invention, to allow an easy sliding motion of a sash along a rail when opening and closing the window, respective window wheel units are installed in the upper and lower parts of the sash. Here, the window wheel units are configured such that, when closing the window, the window wheel units can bring the sash into close contact with the window frame or can release the sash from the window frame. Thus, in the sliding window, no narrow gap remains between the sash and the window frame, so the airtight, watertight, insulating, and soundproof performance of the window is improved and wind pressure resistance performance is also improved. Further, the respective window wheel units are installed in the upper and lower parts of the sash, with a diverting unit combined with each of the respective window wheel units, so the sliding window of the present invention can realize a locking function formed by a guide housing and can remarkably improve the crime prevention performance.

DESCRIPTION OF DRAWINGS

[0009]

FIG. 1 is a sectional view illustrating a sliding window according to the present invention;

FIG. 2 is a plan view of a sash according to the present invention;

FIGS. 3 and 4 are front views illustrating in detail a window wheel unit according to the present invention;

FIG. 5 illustrates the operation of the window wheel unit according to the present invention in several views;

FIGS. 6 and 7 are a side view and a rear view illus-

- trating an assembled state of the window wheel unit and a diverting unit according to the present invention, respectively;
- FIGS. 8 and 9 are perspective views illustrating a diverting unit set in an upper part of the sash according to the present invention;
- FIG. 10 is a perspective view illustrating manipulation for a handle;
- FIG. 11 is a perspective view illustrating an operation of the window wheel unit actuated by the diverting unit when manipulating the handle;
- FIG. 12 illustrates a released state and a close contact state of the sash relative to the window frame which are realized by manipulating the handle in sectional views; and
- FIG. 13 is a photograph in which another embodiment of the present invention is shown.

BEST MODE

[0010] Reference will now be made in greater detail to exemplary embodiments of the present invention, examples of which are illustrated in the accompanying drawings. The exemplary embodiments described hereinbelow are provided for fully conveying the scope and spirit of the invention to those skilled in the art, so it should be understood that the embodiments may be changed to a variety of embodiments and the scope and spirit of the invention are not limited to the embodiments described hereinbelow.

[0011] FIG. 1 is a sectional view illustrating a sliding window according to the present invention.

[0012] As shown in FIG. 1, the sliding window of the present invention includes: a window frame 1 b that is set in a wall and is formed in the shape of a frame; and a sash 1 a installed inside the window frame 1 b and formed in the shape of a frame for holding panes of glass therein.

[0013] In a lower part of the sash 1 a, a window wheel unit 2 is installed. The window wheel unit 2 includes: wheels that are in sliding contact with a rail 1 c of the window frame 1 b so as to realize an easy sliding motion of the sash 1 a along the rail 1 c; and a window wheel unit 2 that has elements bringing the sash 1 a into close contact with the window frame 1 b or releasing the sash 1 a from the window frame 1 b.

[0014] The window wheel unit 2 includes: an outer housing 2a, an inner housing 2b, and a wheel housing

2g that are sequentially placed in a direction from the outside to the inside. In an upper part of the window wheel unit 2, a diverting unit 3 is installed. The diverting unit 3 actuates the window wheel unit 2, and diverts the window wheel unit 2 to the left or right.

[0015] The diverting unit 3 includes: a connector 31 that extends along a side surface and a lower surface of the sash 1 a from a handle manipulated by a user and transmits power; a cam 32 installed in the window wheel unit 2 and connected to the connector 31; a slot hole formed in each of the outer housing 2a and the inner housing 2b; and a guide hole 2i formed in the wheel housing 2g.

[0016] The diverting unit 3 may be configured in a European turn-only style form.

[0017] When a user opens or closes the window by manipulating the handle, the wheel housing 2g is moved to the left or right, and brings the sash 1 a into close contact with the window frame 1 b or releases the sash 1 a from the window frame 1 b. Here, the material of the diverting unit 3 is not limited, but the diverting unit 3 may be made of a plastic material that can reduce friction between the diverting unit 3 and the cam 32.

[0018] FIG. 2 is a plan view of the sash 1 a according to the present invention.

[0019] The window wheel unit 2 is mounted to the lower part of the sash 1 a by locking screws 2d tightened to respective locking screw holes. Here, it is possible to adjust the gap between the sash 1a and the window wheel unit 2 by tightening or loosening an adjusting screw 2e, so the sash 1a can be easily set in the window frame 1b.

[0020] With reference to FIG. 1, to avoid interference between the locking screws 2d and the diverting unit 3, setting the locking screws 2d with sufficient intervals remaining between the locking screws 2d and the diverting unit 3 is required.

[0021] The diverting unit 3 may be installed in a seat groove 10 that is formed in the bottom surface (the lower surface) of the sash 1 a.

[0022] FIGS. 3 and 4 are front views illustrating in detail the window wheel unit 2 according to the present invention.

[0023] As described above, the window wheel unit 2 includes the outer housing 2a, the inner housing 2b (see FIG. 7), the wheel housing 2g, and the wheels 2c.

[0024] The outer housing 2a is the outermost housing of the window wheel unit 2, with the locking screw holes formed in the outer housing 2a. The outer housing 2a is mounted to the lower part of the sash 1 a by the locking screws 2d tightened to respective locking screw holes. Here, the outer housing 2a may be configured with a width of 30mm or greater, for example, a width of 30mm to 50mm.

[0025] The inner housing 2b is provided inside the outer housing 2a and is coupled to the outer housing 2a by an adjusting pin 2f. The adjusting screw 2e is connected to an end of the inner housing 2b after passing through

the outer housing 2a. When the adjusting screw 2e is rotated to be tightened or loosened, the adjusting pin 2f is moved upward and downward so as to adjust the gap between the sash 1a and the window wheel unit 2. For example, when the adjusting screw 2e is rotated to be moved forward or rearward, the inner housing 2b is moved forward or rearward, and the adjusting pin 2f is moved upward or downward. Due to the upward or downward movement of the adjusting pin 2f, a bracket 4 connected to the adjusting pin 2f is moved upward or downward, so that the sash 1a is moved upward or downward. Thus, in the sliding window of this invention, it is possible to adjust the height of the sash 1a.

[0026] In other words, when rotating the adjusting screw 2e, the inner housing 2b connected to the adjusting screw 2e is biased to be moved forward or rearward inside the outer housing 2a. When the inner housing 2b is biased to be moved forward or rearward by the adjusting screw 2e, the inner housing 2b is stopped by both the outer housing and a locking pin after the inner housing 2b is moved to a predetermined distance. In other words, when the inner housing 2b is biased to be moved further after the bottom surface of the inner housing comes into contact with the locking pin, the bottom surface of the inner housing 2b forcibly moves the locking pin upward and downward, so the sash is moved upward and downward.

[0027] Here, each of the slot hole H1 of the outer housing 2a and the slot hole H2 of the inner housing 2b may be configured as a longitudinal hole, as shown in the drawings.

[0028] The wheel housing 2g is a housing placed inside the inner housing 2b. The wheel housing 2g is firmly connected to the inner housing 2b by the locking pin 2h provided at at least each side of the wheel housing 2g so that the wheel housing 2g is not movable upward or downward relative to the inner housing 2b. In the wheel housing 2g, at least two wheels 2c are mounted to the bracket 4 made of metal. Here, the wheel housing 2g is configured in such a way that the wheel housing 2g can be stably moved along the adjusting pin 2f to the left or right in a state in which the wheel housing 2g is stably connected to both the inner housing 2b and the outer housing 2a by the adjusting pin 2f passing through the center of the bracket 4. To this end, it is required to define a moving space between the wheel housing 2g and the locking pin 2h.

[0029] FIGS. 5a, 5b, and 5c are views illustrating the operation of the diverting unit according to the present invention.

[0030] As shown in the drawings, the diverting unit 3 may include: the connector 31 that extends along the side surface and the lower surface of the sash 1a from the handle manipulated by a user and transmits power; the cam 32 installed in the window wheel unit 2 and connected to the connector 31; the slot hole formed in each of the outer housing 2a and the inner housing 2b; and the guide hole 2i formed in the wheel housing 2g.

[0031] In the diverting unit 3, the connector is mounted to a locking slot formed in the sash at a location above the upper part of the window wheel unit, and the cam is commonly combined with slot holes 2aH and 2bH of the outer and inner housings and with the guide hole 2i of the wheel housing.

[0032] The upper part of each of the outer housing 2a and the inner housing 2b of the window wheel unit is holed by forming a slot hole having a longitudinal shape in each of the outer housing 2a and the inner housing 2b. Further, the wheel housing 2g is holed by forming the guide hole in the wheel housing 2g, so the cam 32 to which the power generated from the handle manipulated by a user is transmitted is commonly set in the outer housing 2a, the inner housing 2b, and the wheel housing 2g. When the handle is manipulated by the user, the outer housing 2a and the inner housing 2b may be rectilinearly moved to the left or right according to the shapes of the slot holes formed in the upper parts of the outer housing 2a and the inner housing 2b, and the wheel housing 2g set in the inner housing 2b is horizontally moved forward or rearward according to the shape of the guide hole 2i formed in the wheel housing 2g.

[0033] In this case, the wheels of the window wheel unit 2 are biased to be horizontally moved forward or rearward. However, in a practical sliding window, the wheels are not moved on the rail, so the sash is horizontally moved forward or rearward while the weight (including the weight of panes of glass) is supported by the locking pin 2h.

[0034] Accordingly, when a user manipulates the handle, the wheel housing is moved to the left or right, so the sash is brought into close contact with the window frame or is released from the window frame. Here, when the sliding window is opened, the sash is released from the window frame. However, when the sliding window is closed, the sash is brought into close contact with the window frame.

[0035] FIGS. 6 and 7 are a side view and a rear view illustrating a wheel 2c which constitutes the window wheel unit 2 combined with the sash 1a and which is in contact with a lower rail 1c of the window frame 1b, and a diverting unit 3 set in the upper part of the window wheel unit 2.

[0036] FIGS. 8 and 9 illustrate another diverting unit 3 which is set in the upper part of the sash 1a and which functions to bring the sash 1a into close contact with the window frame 1b or to release the sash 1a from the window frame 1b. This diverting unit 3 includes: a guide pin 2k that is in contact with the window frame 1b and is connected to the cam of the diverting unit 3; and a guide housing 2j that is provided between the guide pin 2k and the diverting unit 3.

[0037] FIG. 10 is a view illustrating manipulation for the handle.

[0038] FIG. 11 is a view illustrating an operation of the window wheel unit 2 actuated by the diverting unit 3 when manipulating the handle. Here, for example, when the

window wheel unit 2 is moved from the left to the right, the sash 1 a is brought into close contact with the window frame 1 b. On the contrary, when the window wheel unit 2 is moved from the right to the left in response to manipulation for the handle, the sash 1 a is released from the window frame 1 b.

[0039] FIGS. 12a and 12b are views illustrating a released state and a close contact state of the sash realized by manipulating the handle as described above with reference to FIGS. 10 and 11. When the window is opened, the sash is released from a gasket G attached to the window frame, a narrow gap is formed between the sash and the window frame, so the sash can slide on the rail. However, when the window is closed, the sash comes into close contact with the gasket G attached to the window frame, the gasket G seals the gap between the sash and the window frame, thereby realizing airtight, watertight, insulating, and soundproof performance.

[0040] As described above, the window wheel unit 2 of the present invention realizes a reduction in the number of parts and a simple assembling process. Further, due to the window wheel unit 2, it is possible to remove a gap between the sash 1 a and the window frame 1 b, so the present invention can realize improved airtight, watertight, insulating, and soundproof performance and can improve wind pressure resistance performance. Further, in the present invention, the window wheel unit 2 actuated by the diverting unit 3 may be installed in each of the upper and lower parts of the sash 1 a, so the present invention remarkably improve crime prevention performance due to a locking function of the guide housing 2j. In the present invention, the close contact state, locked state, and released state of the sash relative to the window frame may be sequentially realized by manipulating the handle.

[0041] FIG. 13 illustrates another embodiment of the present invention. As shown in FIG. 13, to improve the operational efficiency of the sliding window of the present invention, a wheel guide 20 may be provided in each window wheel unit 2.

[0042] In this embodiment, the wheel guide 20 is provided at each side of the wheel 2c of the window wheel unit 2 by protruding downward in parallel with the wheel 2c. When the sash 1 a is brought into close contact with the window frame 1 b or is released from the window frame 1 b by the operation of the window wheel unit 2, the wheel guide 20 can efficiently disperse the weight of the window wheel unit 2 to the left and right, so the window wheel unit 2 can be efficiently operated in a stably supported state.

[0043] Although the preferred embodiments of the present invention have been disclosed in the detailed description with reference to with the accompanying drawings, it should be understood that the terminology used herein is for the purpose of describing particular embodiments only and is not intended to limit the meaning of elements or to limit the scope and spirit of the invention. Accordingly, those skilled in the art will appreciate

that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. A sliding window comprising:

a window frame fixed in a wall and provided with at least one rail therein; and
a sash that is provided with a window wheel unit being in contact with the rail of the window frame, and is provided with a diverting unit for diverting the window wheel unit,
wherein the window wheel unit brings the sash into close contact with the window frame and releases the sash from the window frame by an operation of the diverting unit.

2. The sliding window of claim 1, further comprising: a handle connected to the diverting unit.

3. The sliding window of claim 2, wherein the window wheel unit comprises:

an outer housing installed in the sash;
an inner housing placed in the outer housing and connected to the outer housing by an adjusting pin;
a wheel housing placed in the inner housing and connected to both the inner housing and the outer housing by a locking pin; and
a bracket placed in the wheel housing and holding a wheel,
wherein the wheel housing is movable in leftward and rightward directions along the adjusting pin while being connected to both the inner housing and the outer housing by the adjusting pin inserted into the bracket by passing through the bracket.

4. The sliding window of claim 3, further comprising:

an adjusting screw connected to an end of the inner housing after passing through the outer housing, so when the adjusting screw is rotated, the adjusting pin moves upward and downward so as to adjust a gap between the sash and the window wheel unit.

5. The sliding window of claim 4, wherein the diverting unit is set in an upper part of the window wheel unit and comprises:

a connector that extends along a side surface and a lower surface of the sash from the handle

manipulated by a user and transmits power;
a cam installed in the window wheel unit and
connected to the connector; a slot hole formed
in both the outer housing and the inner housing;
and
a guide hole formed in the wheel housing.

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6. The sliding window of claim 5, wherein the diverting unit is set in a looking slot formed in the lower surface of the sash.

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7. The sliding window of claim 3, wherein the outer housing has a width of 30mm to 50mm.

8. The sliding window of claim 3, further comprising:

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a wheel guide provided at each side of the wheel of the window wheel unit by protruding downward in parallel with the wheel.

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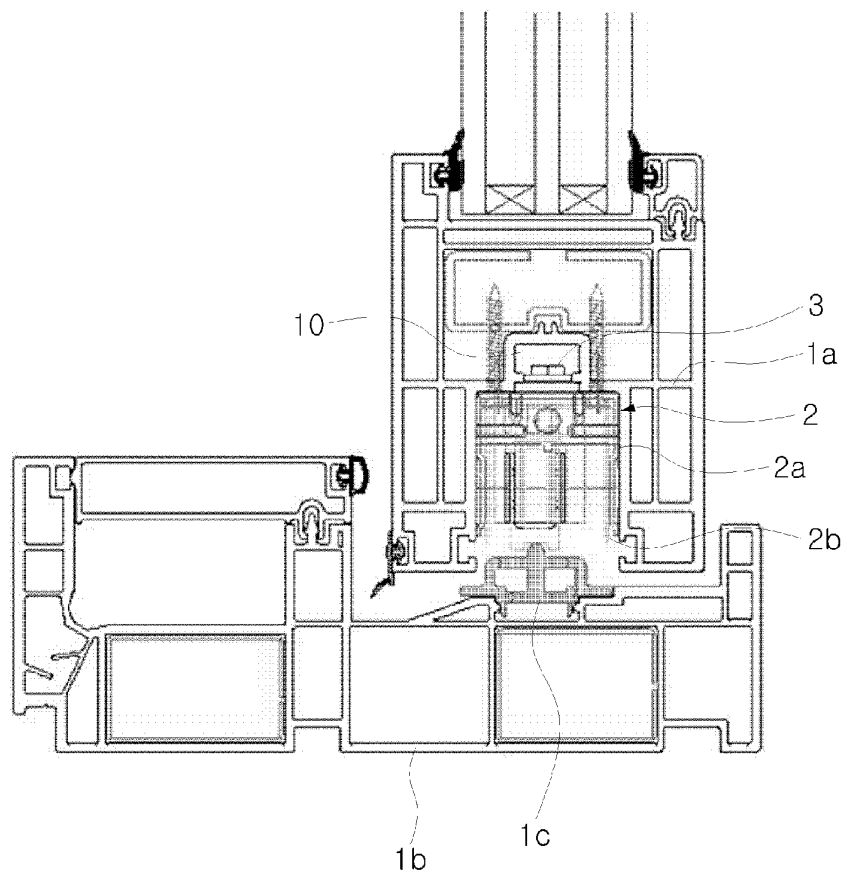
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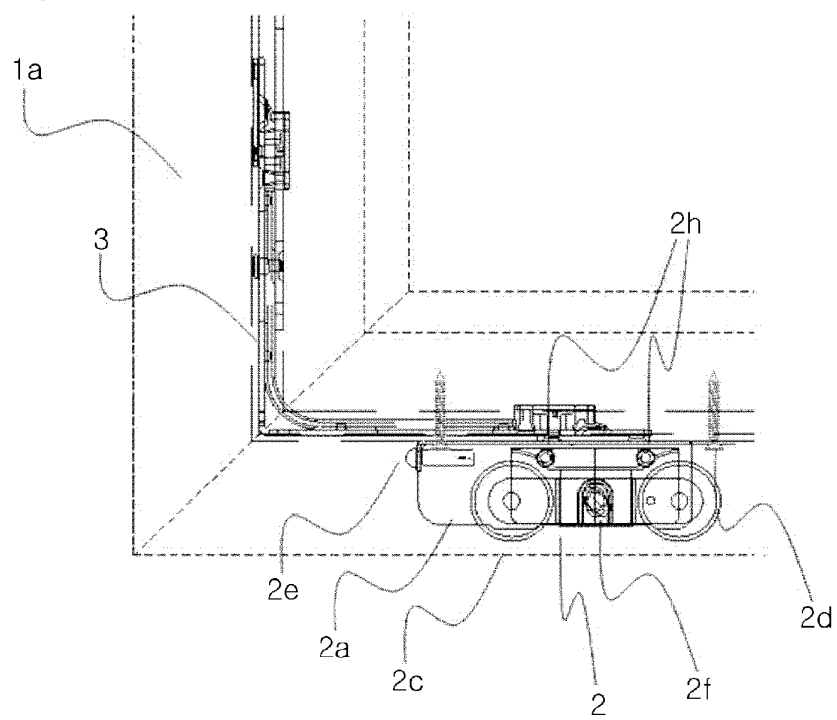
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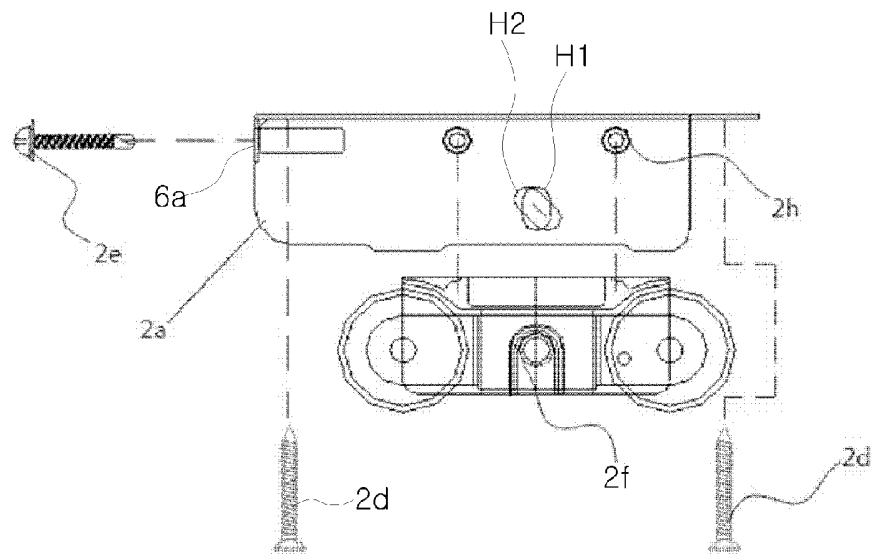
[Fig. 1]



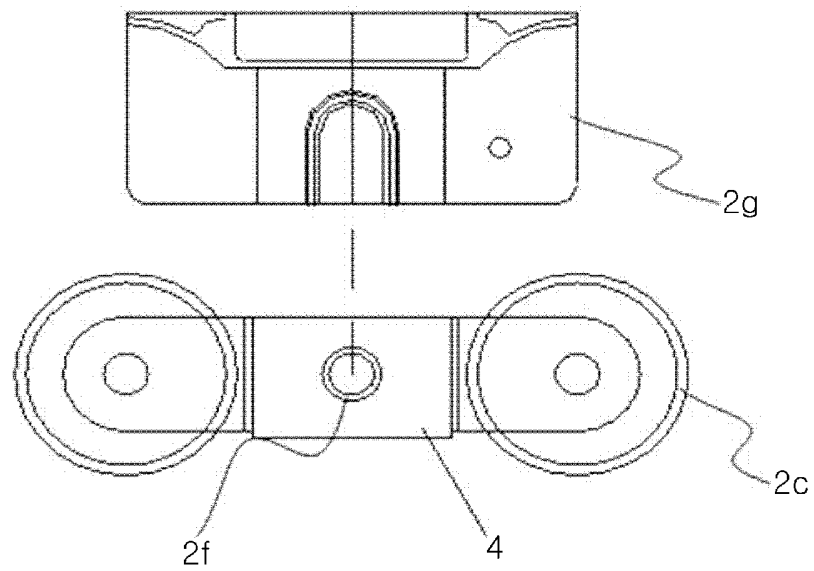
[Fig. 2]



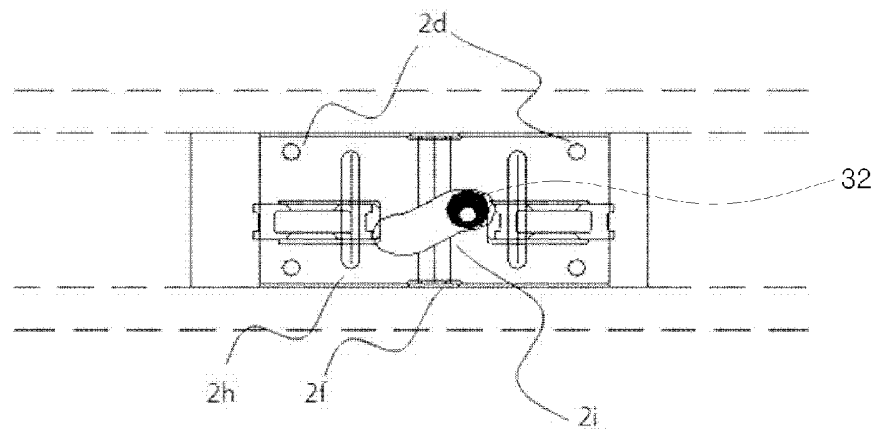
[Fig. 3]



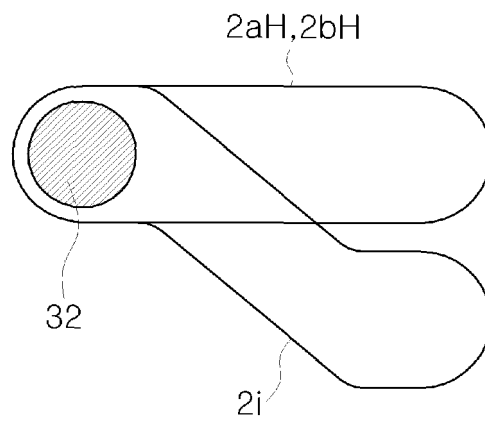
[Fig. 4]



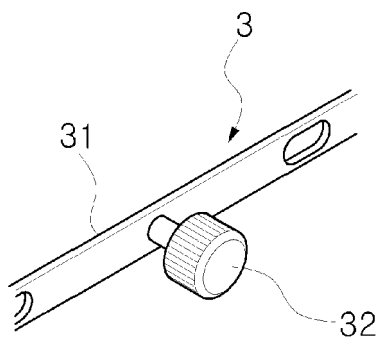
[Fig. 5a]



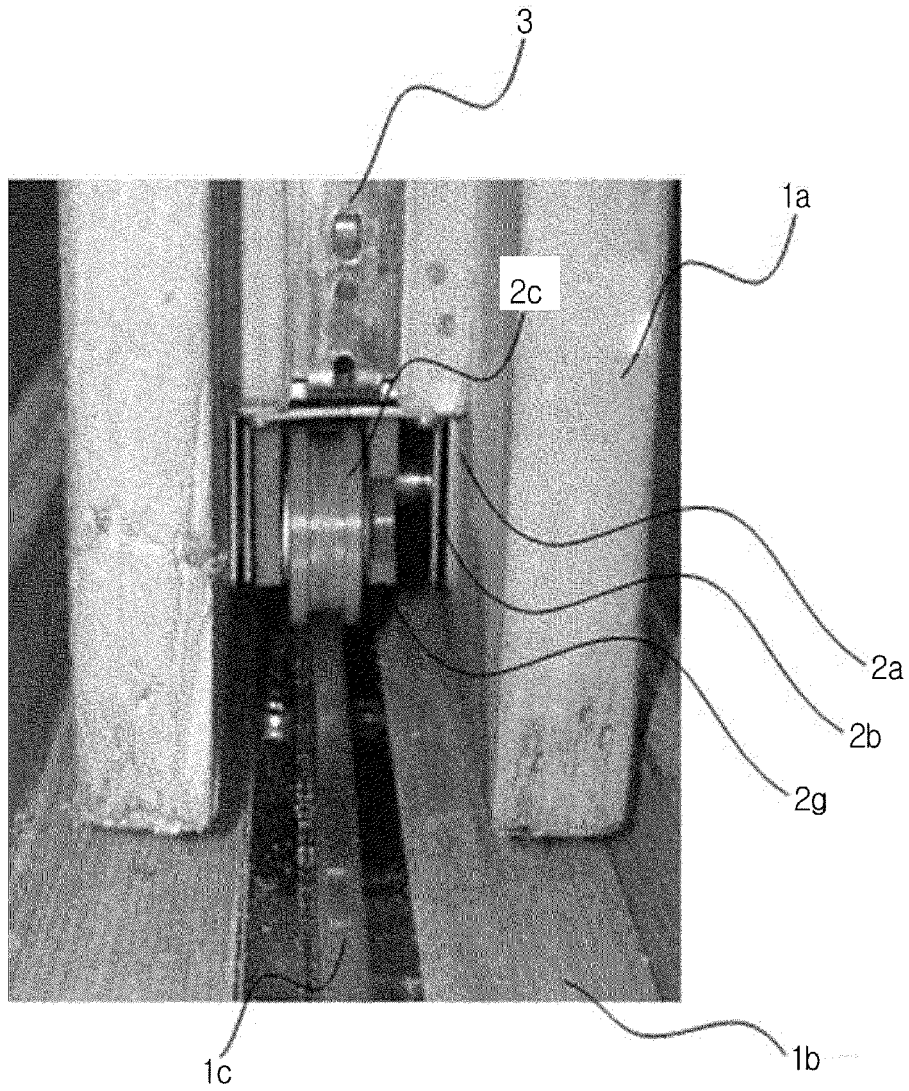
[Fig. 5b]



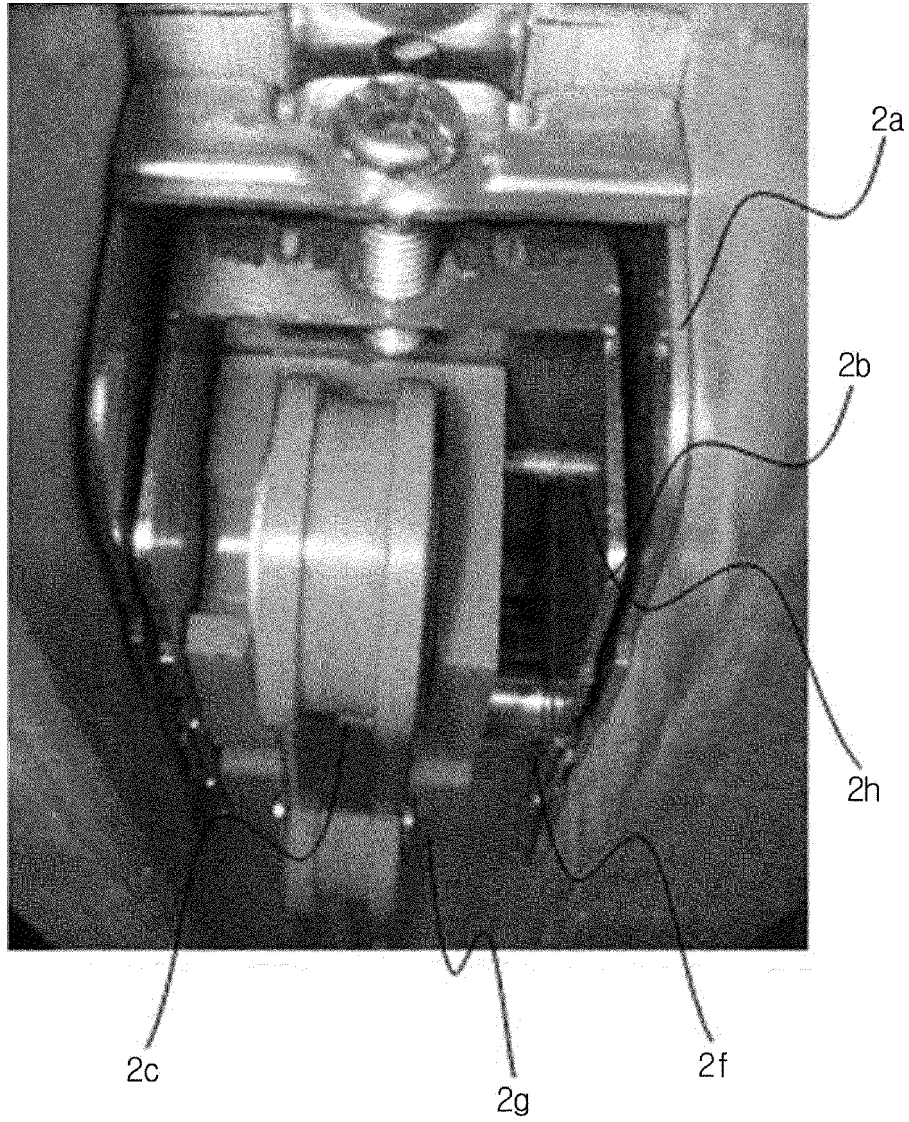
[Fig. 5c]



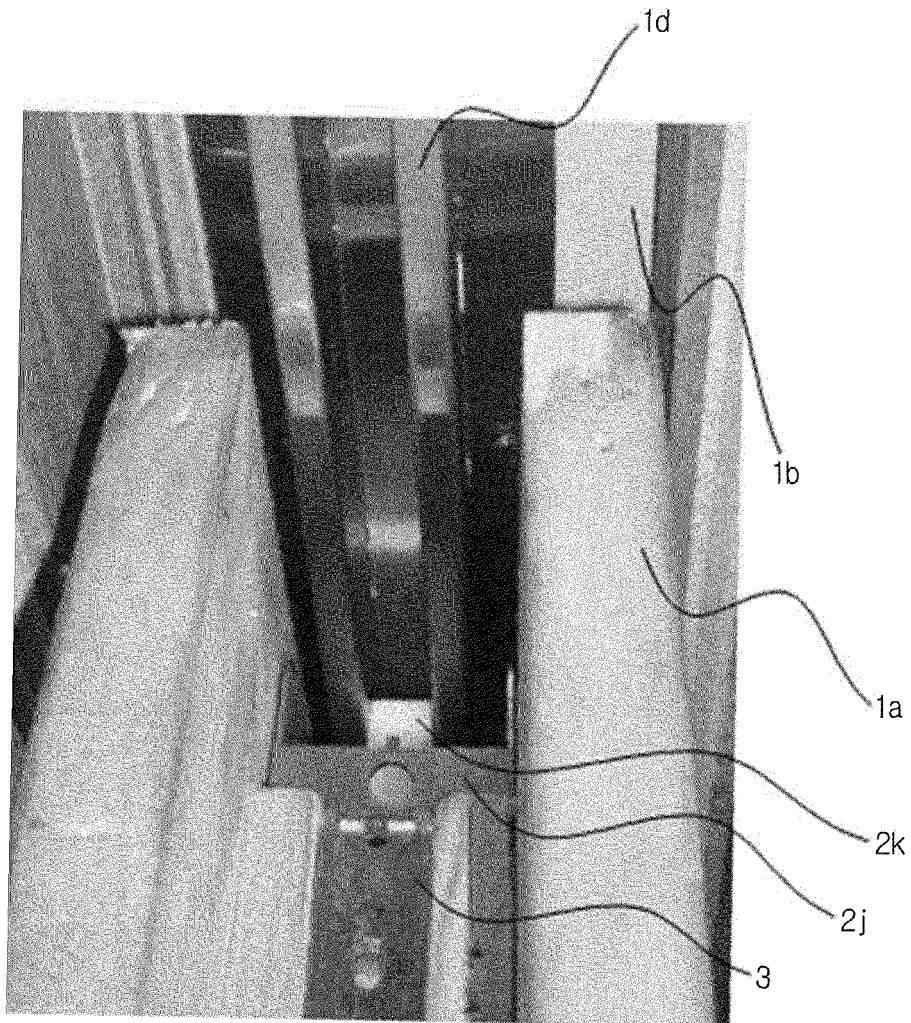
[Fig. 6]



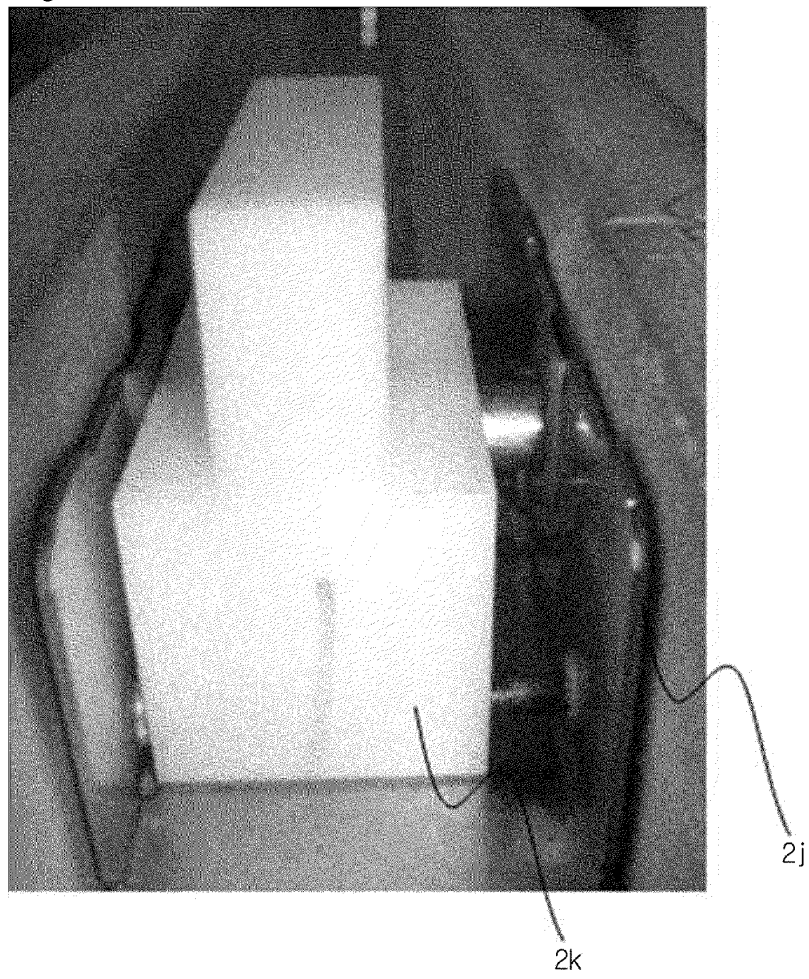
[Fig. 7]



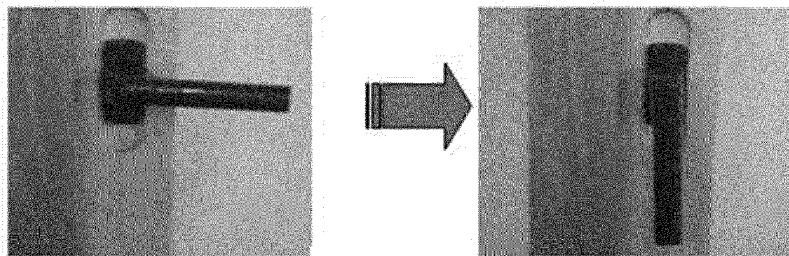
[Fig. 8]



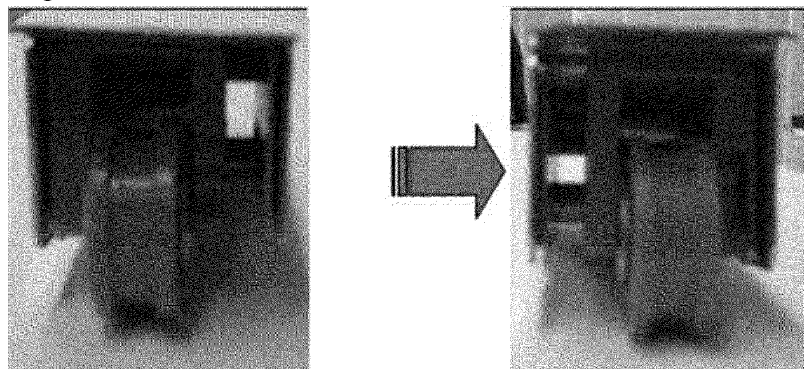
[Fig. 9]



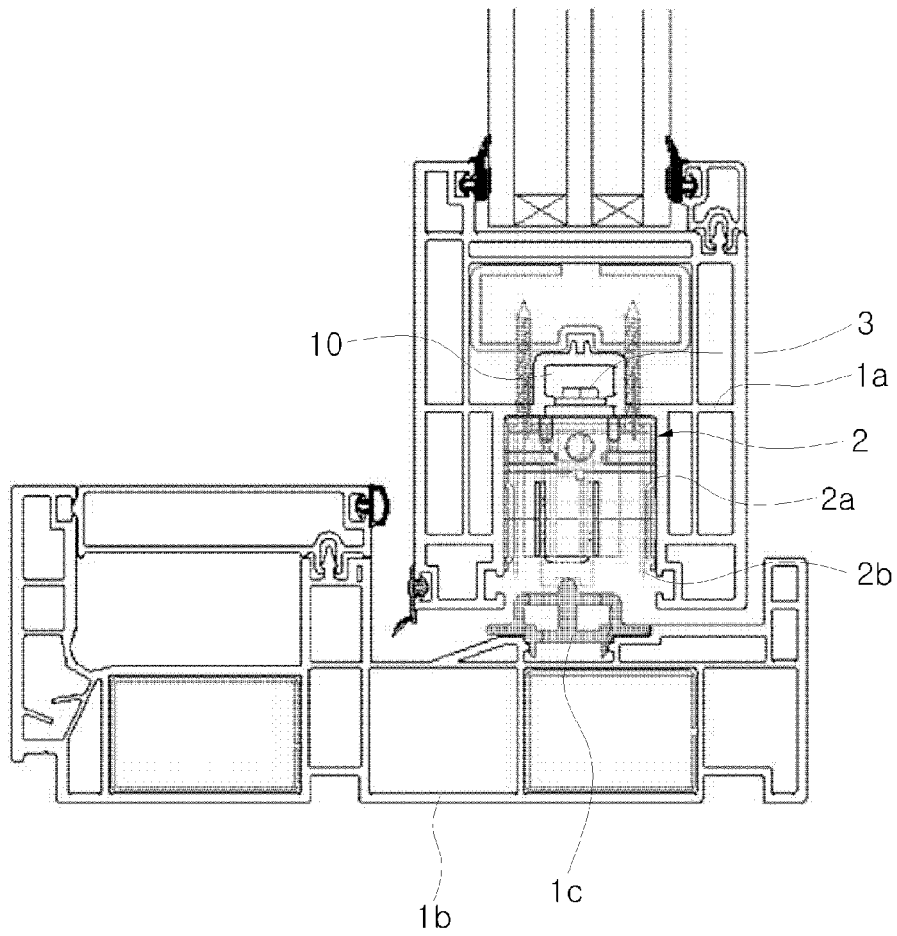
[Fig. 10]



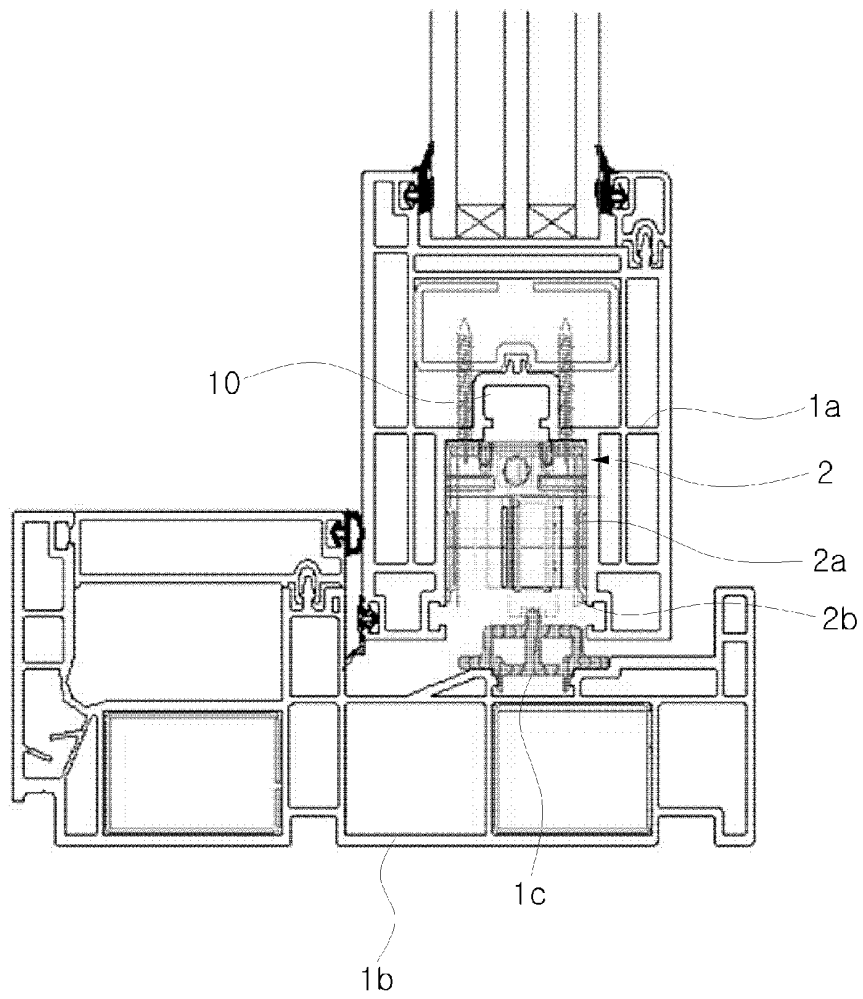
[Fig. 11]



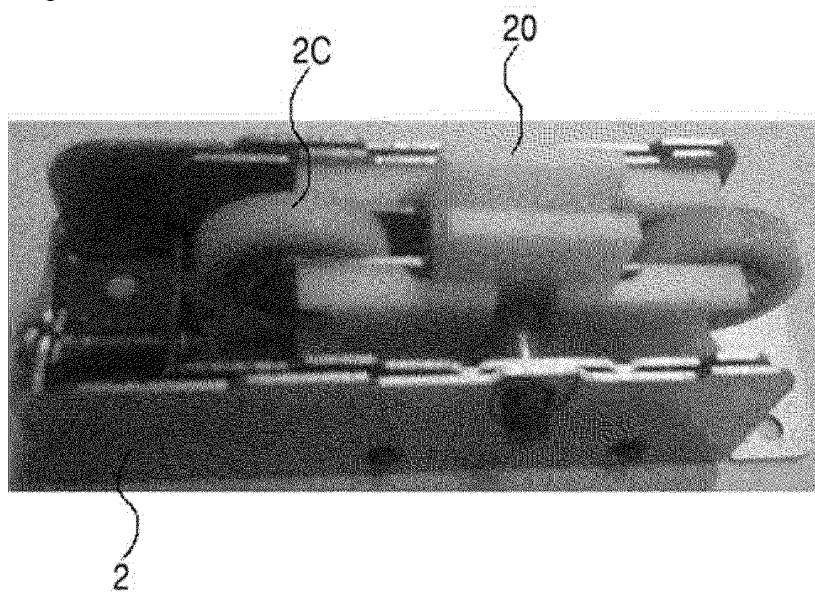
[Fig. 12a]



[Fig. 12b]



[Fig. 13]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2013/006790

A. CLASSIFICATION OF SUBJECT MATTER

E05D 15/06(2006.01)i, E05D 13/00(2006.01)i, E06B 3/46(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)

E05D 15/06; E05D 13/00; E05D 15/00; E05D 15/10; E06B 3/46

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

Korean Utility models and applications for Utility models: IPC as above

Japanese Utility models and applications for Utility models: IPC as above

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

eKOMPASS (KIPO internal) & Keywords: close adhesion, sealing, horizontality, moving, roller, door roller, rail, soundproofing

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2008-0062789 A (LEE, Kwang-Seok) 03 July 2008	1-2
A	See page 13, lines 29-44, page 14, lines 1-9 and figures 5a, 5b, 11a, 11b and 14.	3-8
A	KR 10-2012-0043822 A (LG HAUSYS, LTD.) 07 May 2012 See claims 1-4 and figures 3-4.	1-8
A	KR 10-1142795 B1 (SIAN CO., LTD.) 08 May 2012 See claims 1-4 and figures 1-4.	1-8
A	KR 10-0785706 B1 (KIM, Young Rok) 17 December 2007 See page 4, lines 16-40, page 15, lines 1-15 and figures 2-3.	1-8

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

* Special categories of cited documents:

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Date of the actual completion of the international search

29 NOVEMBER 2013 (29.11.2013)

Date of mailing of the international search report

02 DECEMBER 2013 (02.12.2013)

Name and mailing address of the ISA/KR


 Korean Intellectual Property Office
 Government Complex-Daejeon, 189 Seonsa-ro, Daejeon 302-701,
 Republic of Korea

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2013/006790

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KR 10-0785706 B1	17/12/2007	NONE	

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