



(51) International Patent Classification:
E05D 15/06 (2006.01) *E05D 13/00* (2006.01)

(21) International Application Number:
PCT/KR2011/008069

(22) International Filing Date:
27 October 2011 (27.10.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10-2010-0105043 27 October 2010 (27.10.2010) KR

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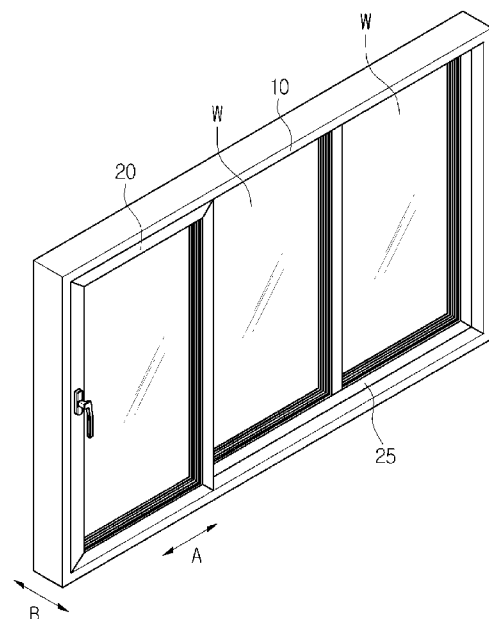
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: HORIZONTAL LOCKING WINDOW SYSTEM

[Fig. 1b]



(57) Abstract: Disclosed is a horizontal locking window system including a fixing window which is fixed to a window frame; a linear rail which is provided at a lower portion of a window frame; and a moving window which is reciprocated along the linear rail in a first direction and provided with window glass, wherein the moving window is moved in a second direction perpendicular to the window glass so as to be closely contacted with the window frame. According to the present invention, a sliding type window can be air-tightly contacted with a window frame by an operation of a handle, thereby providing excellent air-tightness, water-tightness and wind pressure resistance.



Published:

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

Description

Title of Invention: HORIZONTAL LOCKING WINDOW SYSTEM

Technical Field

- [1] The present invention relates to a horizontal locking window system, and more particularly to a horizontal locking window system in which a window reciprocated along a rail provided on a window frame is moved in a vertical direction to the reciprocating motion so as to be completely contacted with the window frame, thereby enhancing air-tightness.

Background Art

- [2] Generally, a window system is a generic term of a window frame disposed in a wall of a building or house, and a window mounted in the window frame. The window system has a lighting function for introducing external light, a ventilating function for ventilating the interior of a building or house, and an air-conditioning function for preventing heat transfer between the interior and exterior of the building or house.
- [3] The window system can be classified into a sliding type and a hinged type according to its opening and closing method. In the hinged type window system, a window coupled to a window frame via a hinge is pivoted around the hinge. The hinged type window system has excellent air-tightness, water-tightness and wind pressure resistance, and also has an advantage in facade division and structural stability of the window system. However, the sliding type has a more beautiful facade than the hinged type. Further, in case that a separate locking means is not provided at the hinged type window system, the window may be undesirably opened or closed by wind.
- [4] In the sliding type window system, the window is linearly reciprocated along a rail provided on the window frame so as to be opened or closed. The sliding type window system has an advantage in that it has a more beautiful facade than the hinged type, but also has some disadvantages in the air-tightness, water-tightness and wind pressure resistance.

Disclosure of Invention

Technical Problem

- [5] An object of the present invention is to provide a horizontal locking window system in which a sliding type window can be air-tightly contacted with a window frame by an operation of a handle, thereby providing excellent air-tightness, water-tightness and wind pressure resistance.
- [6] Another object of the present invention is to provide a horizontal locking window system having a hinged type function by which occupation of living space does not occur, unlike in a general hinged type window system in which the living space is

occupied by an inwardly hinged window.

Solution to Problem

- [7] To achieve the object of the present invention, the present invention provides a horizontal locking window system including a fixing window which is fixed to a window frame; a linear rail which is provided at a lower portion of a window frame; and a moving window which is reciprocated along the linear rail in a first direction and provided with window glass, wherein the moving window is moved in a second direction perpendicular to the window glass so as to be closely contacted with the window frame.
- [8] Preferably, the horizontal locking window system further includes a roller housing having a roller which is moved along the rail in the first direction; and a lower runner which is moved so as to be spaced away from the roller housing.
- [9] Preferably, the horizontal locking window system further includes an arm of which one end is rotatably coupled to the roller housing and the other end is rotatably coupled to the lower runner; a guide plate which is fixed to the arm and also formed with a guide hole; and a guide pin which is movably disposed in the guide hole.
- [10] Preferably, the guide pin is moved along the guide hole according to rotation of the moving window, and the arm is rotated around its one end so that the lower runner is spaced away from the roller housing.

Advantageous Effects of Invention

- [11] According to the present invention, since the sliding type window can be air-tightly contacted with a window frame by an operation of a handle, it is possible to provide the excellent air-tightness, water-tightness and wind pressure resistance.

Brief Description of Drawings

- [12] The above and other objects, features and advantages of the present invention will become apparent from the following description of preferred embodiments given in conjunction with the accompanying drawings, in which:
- [13] Figs. 1A and 1B are schematic perspective view for explaining an operation of a window system according to the present invention.
- [14] Figs. 2A and 2B are longitudinal cross-sectional views showing the operation of a window system according to the present invention.
- [15] Fig. 3 is a perspective view of a hardware which is provided at a window of the window system according to the present invention.
- [16] Fig. 4 is a partially exploded perspective view of an A portion of Fig. 3.
- [17] Fig. 5 is a lower perspective view of a lower runner and a roller housing of Fig. 4.
- [18] Fig. 6 is a lower perspective view when the lower runner and the roller housing of Fig. 5 are in a closing position.

- [19] Fig. 7 is a lower perspective view when the lower runner and the roller housing of Fig. 5 are in a locking position.

Best Mode for Carrying out the Invention

- [20] Hereinafter, the embodiments of the present invention will be described in detail.
- [21] The terms and words used in the description as described below are not limited to the typical or dictionary definition, and they can be interpreted as proper meanings and definitions consistent with the technical ideas.
- [22] Figs. 1A and 1B are schematical perspective view for explaining an operation of a window system according to the present invention, Figs. 2A and 2B are longitudinal cross-sectional views showing the operation of a window system according to the present invention, Fig. 3 is a perspective view of a hardware which is provided at a window of the window system according to the present invention, Fig. 4 is a partially exploded perspective view of an A portion of Fig. 3, Fig. 5 is a lower perspective view of a lower runner and a roller housing of Fig. 4, Fig. 6 is a lower perspective view when the lower runner and the roller housing of Fig. 5 are in a closing position, and Fig. 7 is a lower perspective view when the lower runner and the roller housing of Fig. 5 are in a locking position.
- [23] As shown in Fig. 1A, a window system includes a window frame 10 which is installed in a wall of a building and a window 20, 25 which is disposed in the window frame 10. The window includes a fixed window 25 which is fixed to the window frame 10 and a moving window 20 which is moved along a rail (not shown) provided at a lower portion of the window frame 10 so as to open and close the window system, which is provided with window glass w. The moving window 20 is disposed to be parallel with the window frame 10 and is reciprocated on the rail of the window frame 10 in a first direction (A direction of Figs. 1A and 1B) so as to open and close the window system. Further, while the moving window 20 is disposed to be parallel with the window frame 10, it is moved toward the window frame 10, i.e., in a second direction (B direction of Fig. 1B) vertical to a surface of the window glass w and thus is air-tightly contacted with the window frame 10 (hereinafter, the window system which is closely contacted with the window frame in this way is called as "horizontal locking window system").
- [24] In the horizontal locking window system according to the present invention, the moving window 20 is moved on the linear rail of the window frame in the first direction A so as to open and close the horizontal locking window system. Further, the moving window 20 is moved in the second direction (B direction) so as to tightly contacted with the window frame, thereby maintaining the locking state.
- [25] In the horizontal locking window system according to the present invention, since the

moving window 20 is moved 3-dimensionally, it is necessary to define a position of the moving window. Hereinafter, an "opening position" means a position that the window system is opened by sliding of the moving window 20, and a "closing position" means a position that the moving window 20 is slid in the first direction (A direction) from the opening position so as to close an opened portion of the window frame, and a "locking position" means a position that the moving window 20 is moved in the second direction (B direction) so as to be tightly contacted with the window frame 10.

- [26] Figs. 2A and 2B are longitudinal cross-sectional views of the horizontal locking window system when it is located in the opening and closing positions. That is, when the horizontal locking window system is in the opening position (Fig. 2A), the moving window 20 is not tightly contacted with the window frame 10, and thus there is a gap G between them. And external and internal air can be circulated through the gap G, and thus a ventiating function is performed. In other words, according to the horizontal locking window system of the present invention, even in the closed position that the moving window is not opened, there is the gap between the moving window and the window frame, and thus the ventiating function can be performed. At this time, although the ventilation is carried out, a locking function may be operated so that the window cannot be opened from the outside. And when the horizontal locking window system is in the closing position (Fig. 2B), the moving window 20 is tightly contacted with the window frame 10, and thus there is not the gap between them.
- [27] As shown in Fig. 3, the moving window 20 of the horizontal locking window system includes a hardware 30, a skin (not shown) coated on an outer surface of the hardware, and a handle H which is provided a longitudinal member of the hardware so as to allow a user to open and close the window. The hardware 30 is formed into a rectangular frame and disposed to enclose a side surface of the moving window. The hardware 30 functions to transmit power via a link by rotation of the handle H.
- [28] As shown in Fig. 4, a lower runner 60 and a roller housing 50 are disposed at a lower transverse member of the hardware 30. The roller housing 50 accommodates a roller 52 which rotates on the linear rail provided on the window frame 10, so that the moving window can be moved in the first direction, and the lower runner 60 is to allow the moving window to be moved in the second direction due to a principle to be described below.
- [29] The lower runner 60 includes a base plate 64, a rod bar 66 which is disposed at an outer surface of the base plate 64, a guide pin 68 which is fixed to the rod bar 66, and a corner drive connection pin 62 which is formed at the rod bar 66 so as to be inserted into a hole formed at a corner drive 40. If the handle H is rotated by a user, rotational force is transmitted to the corner drive 40 through the rod bar 66, and thus the guide

pin can be moved linearly. The lower runner 60 is moved in the B direction by the linear movement of the guide pin 68, thereby achieving the horizontal locking.

[30] When the moving window 20 is in the opening position, the lower runner 60 is spaced away in a distance of about 20mm from the roller housing 50, and when the moving window 20 is moved from the closing position to the locking position, the lower runner 60 is parallelly moved to be closely contacted with the roller housing 50.

[31] The locking and sliding of the horizontal locking window system of the present invention will be described with reference to Figs. 5 to 7. Fig. 5 is a lower perspective view of a lower runner and a roller housing of Fig. 4, which shows a ram 110 by which the lower runner and the roller housing are spaced away from each other.

[32] One end of the arm 110 is rotatably coupled to the roller housing 50 through a first shaft 112, and the other end thereof is rotatably coupled to the base plate 64 of the lower runner 60 through a second shaft. And the other end of the arm 110 is formed into a pointed end. A guide plate 70 is fixed to the arm 110, and the guide plate 70 is formed with a guide hole 75 in which the guide pin 68 is inserted. Therefore, if the handle H is rotated, the guide pin 68 connected to the road bar 66 is moved along the guide hole 75, and the arm 110 is rotated around the first shaft 112 so as to parallelly move the lower runner 60 toward the roller housing 50 or allow the lower runner 60 to be spaced away from the roller housing 50.

[33] That is, as shown in Fig. 5, when the handle disposed at the hardware 30 is rotated by a user in the opening position that the lower runner 60 is maximally spaced away from the roller housing 50, the arm 110 is rotated around the first shaft 112 and then seated in a groove formed in the roller housing 50, as shown in Fig. 5, and thus the moving window is in the closing position. Then, if the handle is further rotated, the moving window 20 is parallelly moved to the window frame and thus is in the locking position.

[34] And there is provided a returning means 130 for pressing a pointed portion 116 so as to rotate the arm 110 until the parallel movement of the lower runner 60 is finished, when it is started that the arm 110 is rotated around the first shaft 112. The returning means 130 may have various shapes using a spring.

[35] For example, assuming that an angle of the handle is 0 degree when the moving window 20 of the horizontal locking window system is opened (referring to Fig. 5), the guide pin 69 is located at one end of the guide hole 75, and the lower runner is maximally spaced away from the roller housing 50 by the rotation of the arm 110. And if the handle H is rotated at an angle of about 90 degrees, the guide pin 69 is located at about a center portion of the guide hole 75 (referring to Fig. 6), and the runner 60 is closely contacted with the roller housing 50. Then, if the handle H is further rotated at an angle of about 180 degrees, the guide pin 69 is located at the other end of the guide hole 75, and the window is completely contacted with the window frame (referring to

Fig. 7).

- [36] While the present invention has been described with respect to the specific embodiments, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the following claims.

Industrial Applicability

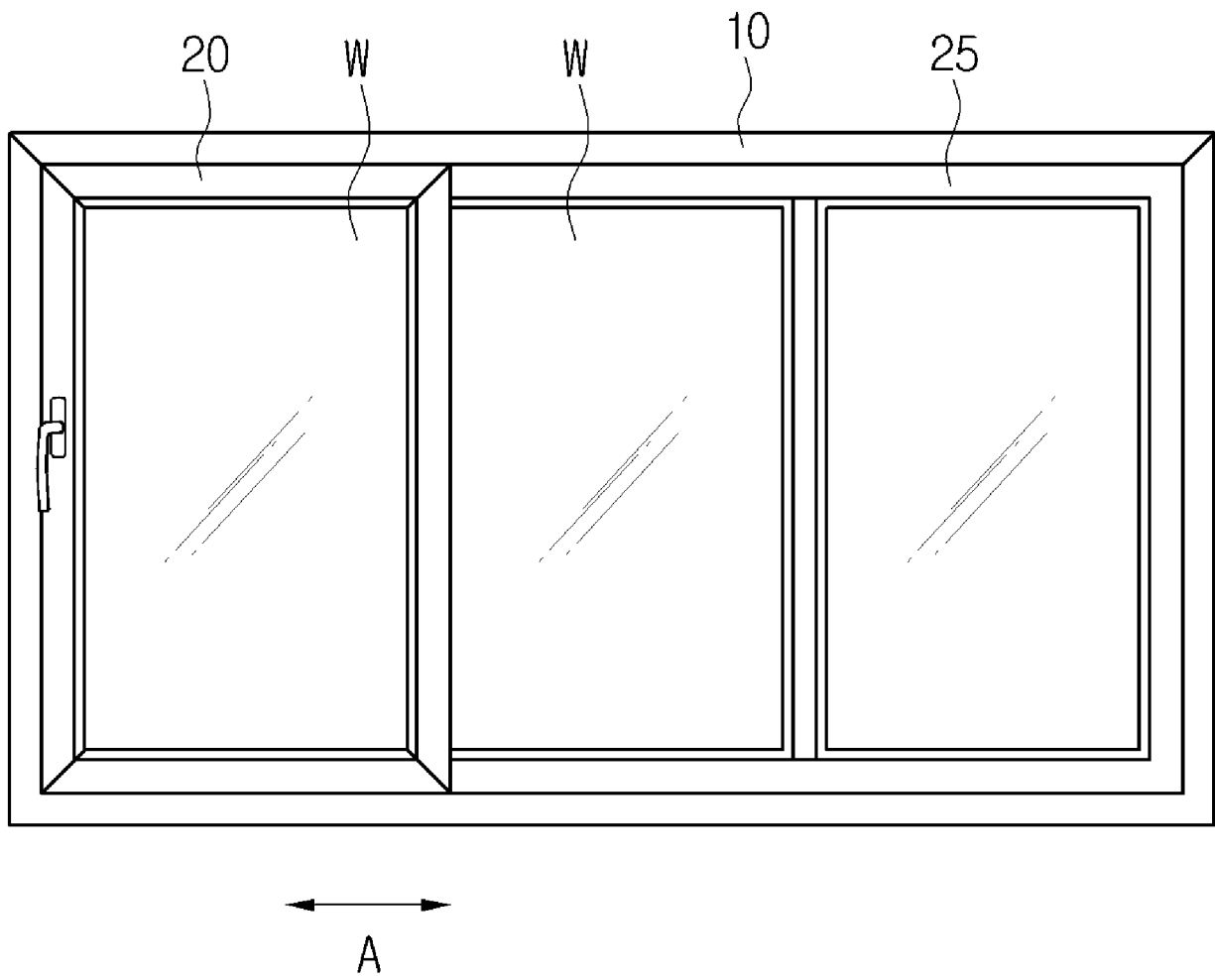
- [37] According to the present invention, since the moving window is moved on the rail provided at the window frame so as to open and close the window system and also allowed to be air-tightly contacted with the window frame, it is possible to provide the air-tight function which was a disadvantage in the sliding type window, and thus it is possible to prevent external air from being introduced into a room, and to prevent the heat transfer between the interior and exterior of a building, and also to completely shut out external noise.

[38]

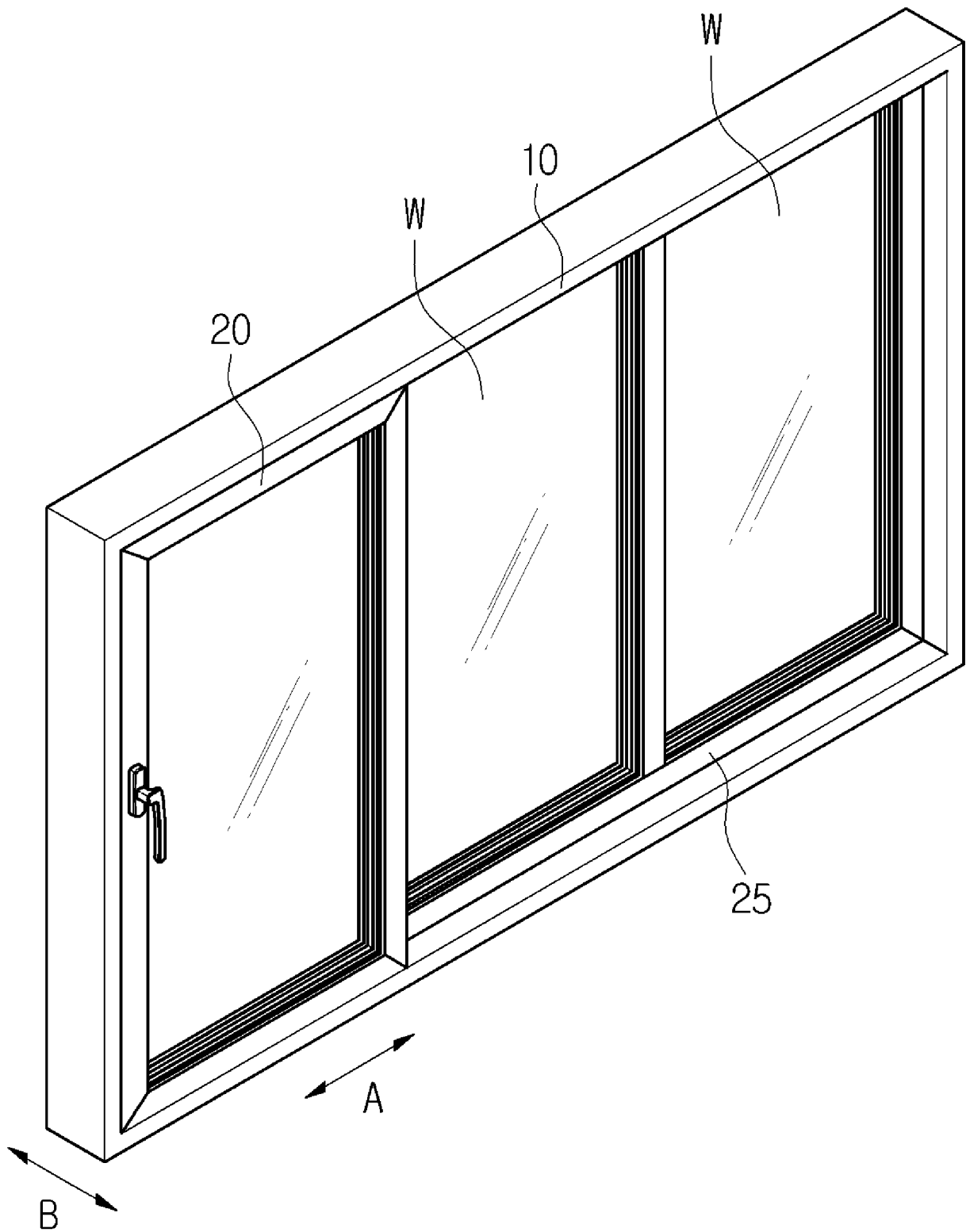
Claims

- [Claim 1] A horizontal locking window system comprising:
a fixing window which is fixed to a window frame;
a linear rail which is provided at a lower portion of a window frame;
and
a moving window which is reciprocated along the linear rail in a first direction and provided with window glass,
wherein the moving window is moved in a second direction perpendicular to the window glass so as to be closely contacted with the window frame.
- [Claim 2] The horizontal locking window system according to claim 1, further comprising:
a roller housing having a roller which is moved along the rail in the first direction; and
a lower runner which is moved so as to be spaced away from the roller housing.
- [Claim 3] The horizontal locking window system according to claim 2, further comprising:
an arm of which one end is rotatably coupled to the roller housing and the other end is rotatably coupled to the lower runner;
a guide plate which is fixed to the arm and also formed with a guide hole; and
a guide pin which is movably disposed in the guide hole.
- [Claim 4] The horizontal locking window system according to claim 3, wherein the guide pin is moved along the guide hole according to rotation of the handle of the moving window, and the arm is rotated around its one end so that the lower runner is spaced away from the roller housing.

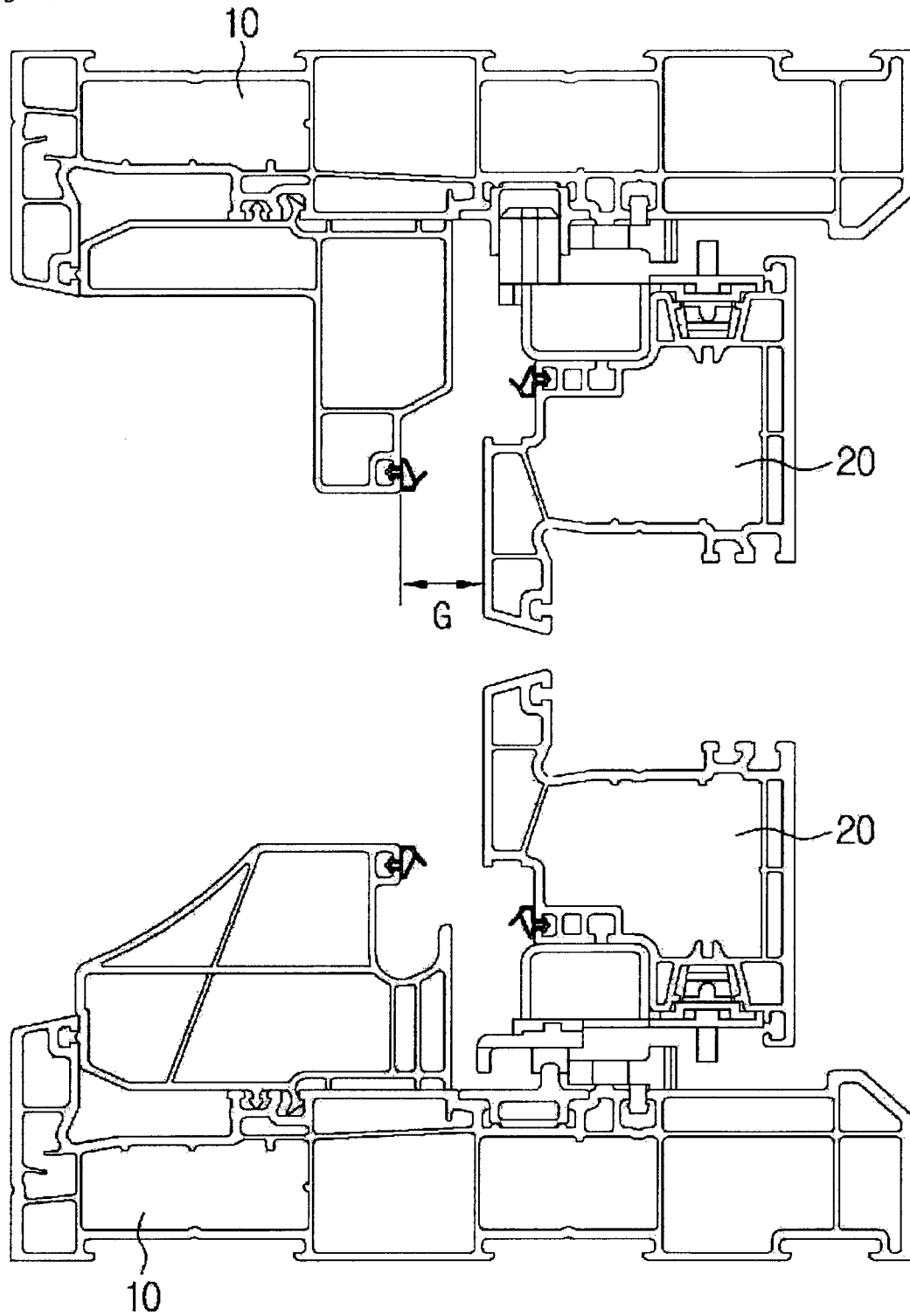
[Fig. 1a]



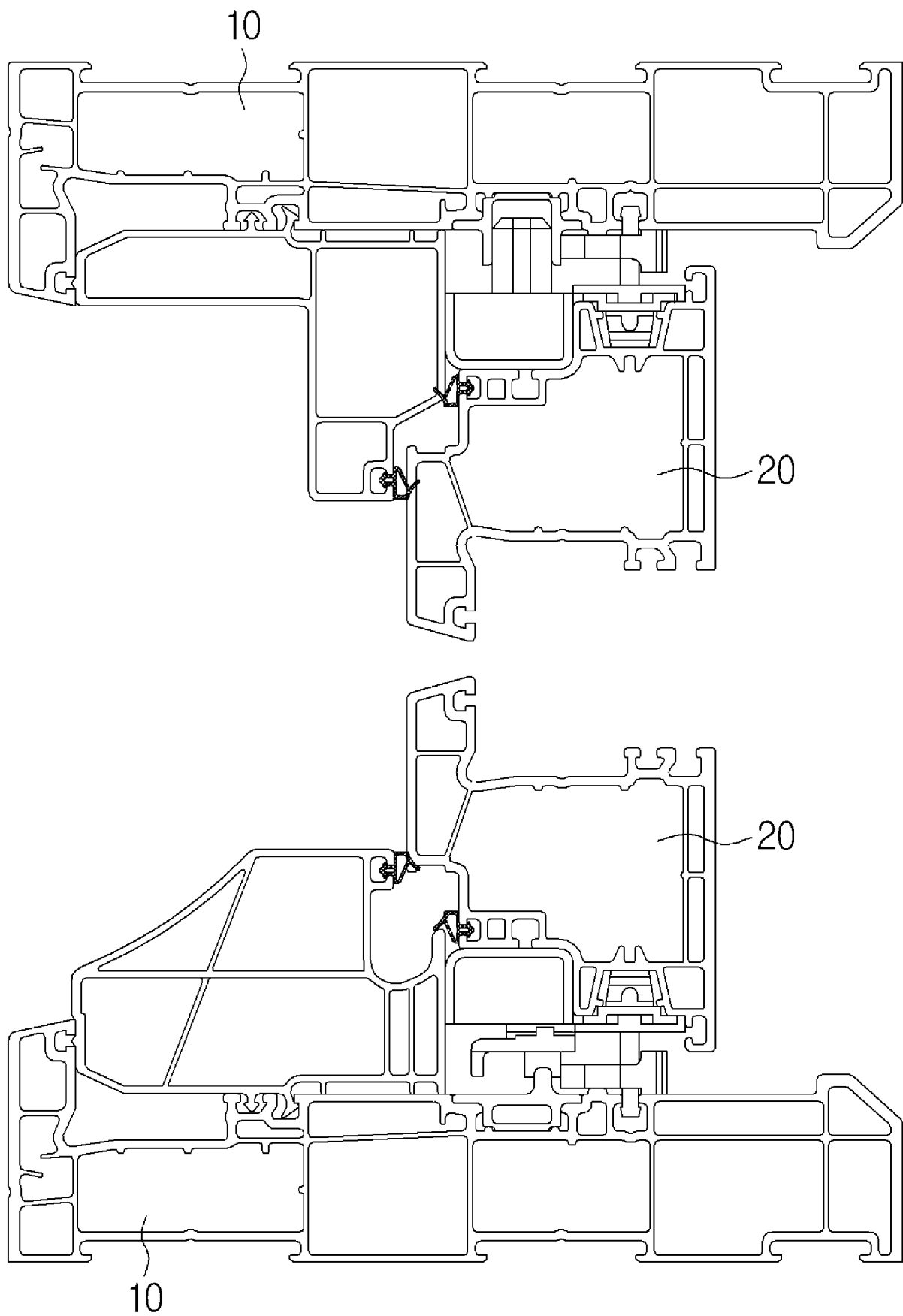
[Fig. 1b]



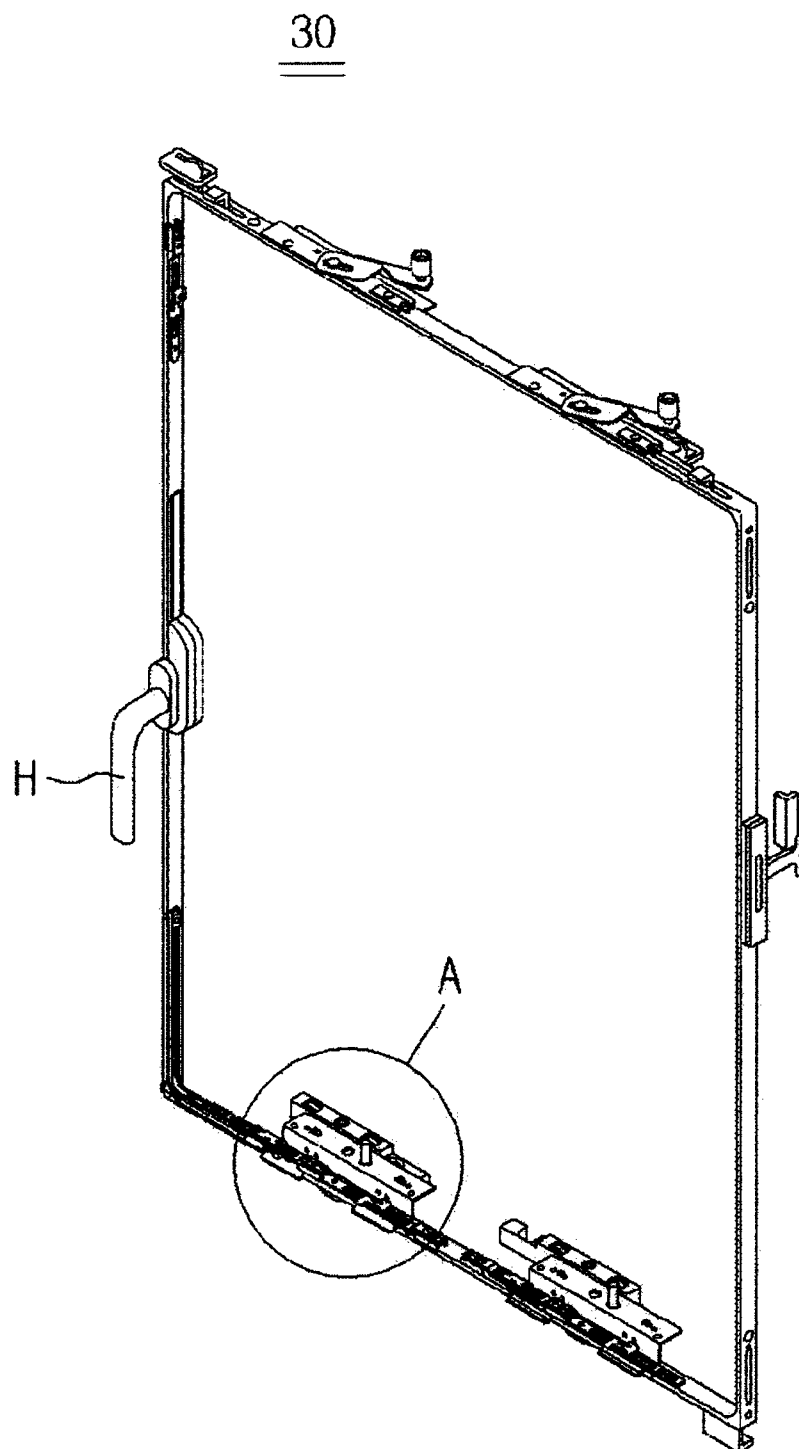
[Fig. 2a]



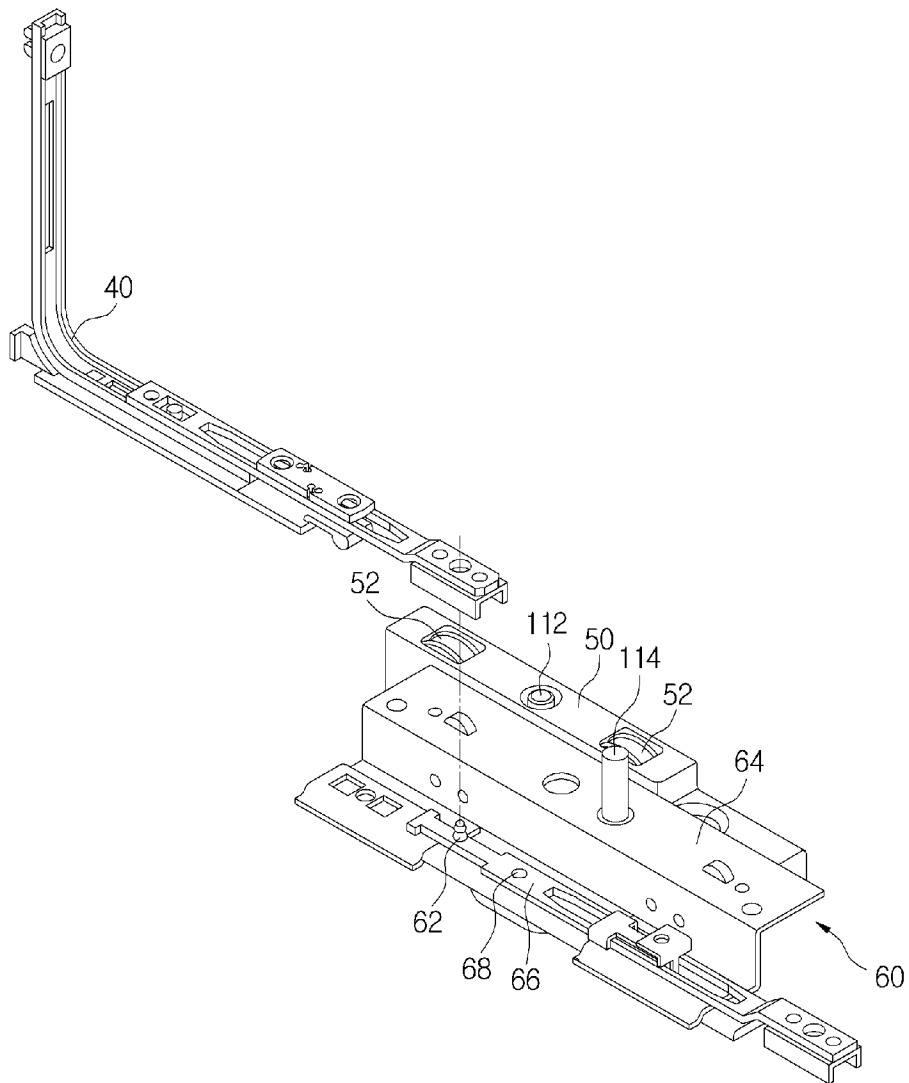
[Fig. 2b]



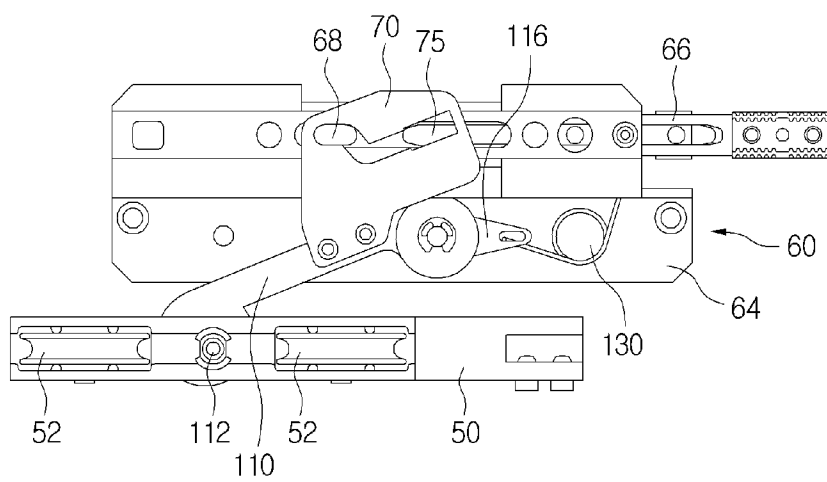
[Fig. 3]



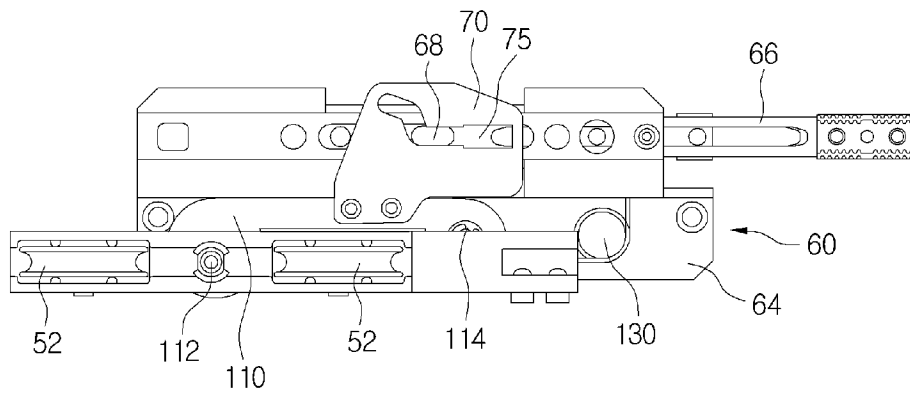
[Fig. 4]



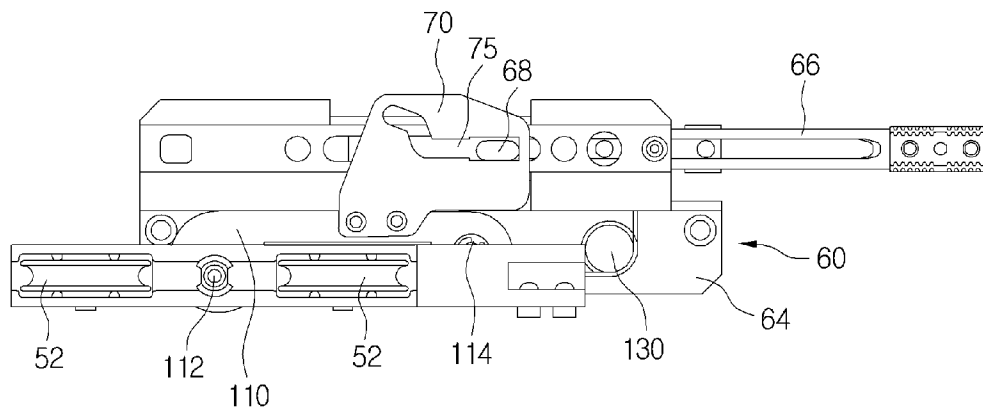
[Fig. 5]



[Fig. 6]



[Fig. 7]



A. CLASSIFICATION OF SUBJECT MATTER***E05D 15/06(2006.01)i, E05D 13/00(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; E05F 11/10; E05C 1/10; E05C 9/00; E05D 15/48; E06B 3/50

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

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: window, seal, guide, pin

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2006-0126864 A (KIM, YOUNG ROK) 11 December 2006 See abstract and Fig.1	1-4
A	KR 10-2007-0066830 A (LG CHEM. LTD.) 27 June 2007 See claims 1-4 and Fig.5	1-4
A	JP 2008-180046 A (YKK AP INC) 07 August 2008 See claims 1-5 and Fig.1	1-4



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

28 FEBRUARY 2012 (28.02.2012)

Date of mailing of the international search report

29 FEBRUARY 2012 (29.02.2012)

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Government Complex-Daejeon, 189 Cheongsa-ro,
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2011/008069Patent document
cited in search reportPublication
datePatent family
member(s)Publication
date

KR 10-2006-0126864 A

11.12.2006

None

KR 10-2007-0066830 A

27.06.2007

None

JP 2008-180046 A

07.08.2008

None