(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 023 852 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
06.07.2022 Bulletin 2022/27

(21) Application number: **19943571.0**

(22) Date of filing: **30.08.2019**

(51) International Patent Classification (IPC):
E06B 9/52 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E06B 9/52

(86) International application number:
PCT/CN2019/103564

(87) International publication number:
WO 2021/035661 (04.03.2021 Gazette 2021/09)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Taroko Door & Window Technologies, Inc.**
Gaoxiong City, Taiwan 83160 (TW)

(72) Inventor: **WANG, Yimin**
Gaoxiong, Taiwan 83160 (CN)

(74) Representative: **Tahtadjiev, Konstantin**
J.k. Goce Delchev bl.233, et. 8, ap. 35
1404 Sofia (BG)

(54) **HIDDEN SCREEN WINDOW DEVICE**

(57) A hidden screen window device comprising: an outer frame (1), at least one first frame material (21), a second frame material (22) and a screen (23). The first frame material (21), the second frame material (22) and the screen (23) are accommodated in the outer frame (1), the first frame material (21) is adjacent to the outer frame (1), at least one frame material disassembly and assembly structure (3) is arranged between the first frame material (21) and the outer frame (1), the frame material disassembly and assembly structure (3) is at least provided with a driving device (4) and a fixing member (322), and when the frame material disassembly and assembly structure (3) is operated in one of a stirring mode, a rotating mode or a pressing mode, the driving device (4) can drive the fixing member (322), and then the first frame material (21) is combined with the outer frame (1).

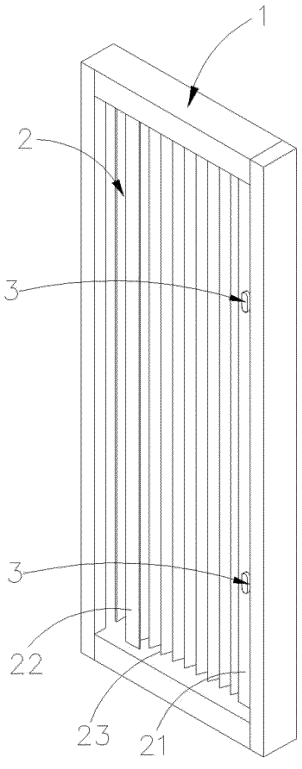

FIG. 1

EP 4 023 852 A1

Description

FIELD OF INVENTION

[0001] The present disclosure relates to a screen window device, and in particular, to a structure installed on a hidden screen window device.

BACKGROUND OF INVENTION

[0002] As far as we know, a present building has a door/window disposed on its opening, and a screen is disposed on the door/window to prevent outdoor flying dust or mosquitoes from entering inside of the building. In addition to the conventional flat screen window, present screen windows have been developed to a variety of hidden screen windows in recent years, for example, rolling screen windows and foldable screen windows. Because the hidden screen window has a feature of receiving and hiding the screen, when the screen is in a received state, the problem of narrowed visual field due to the installation of screen windows will not happen, meanwhile, it also provides benefits of enhancing the appearance of the door/window.

[0003] However, most of present hidden screen windows are fixed on the door/window by screwing, and such fixing manner not only requires technicians to operate, but it also requires technicians to detach when the hidden screen windows have been used for some time and needs to be maintained due to the breakdown or needs to be cleaned due to the accumulated dust. Therefore, the present hidden screen windows cannot be disassembled and assembled quickly.

[0004] Therefore, in order to improve the problem of inconvenient disassembly and assembly of hidden screen windows, Taiwan Patent No. M491079 provides a foldable screen window device which discloses that a plurality of connecting members are firstly installed on an inner edge of an outer frame of the door/window, and then the hooks preset on the connecting members are used to engage a frame of the foldable screen window to the connecting members by pressing the frame, thereby achieving the benefit of quickly installing the screen window. When the foldable screen window needs to be removed, the frame is pulled from the connecting members to be detached, thereby conveniently removing the foldable screen window.

[0005] However, although the above-mentioned conventional technique has the benefits of convenient disassembly and assembly, there are still disadvantages in the use of the foldable screen window. Disadvantages are listed below.

[0006] Firstly, since there is no preset reference for the connecting members to be installed and fixed on the inner edge of the outer frame of the present door/windows, the connecting members depend on either visual observation or experience to be installed and fixed. Therefore, after the frame of the foldable screen window is combined with the connecting members, skewness of the foldable screen window often occurs, which causes technicians to operate multiple times until the connecting members are correctly installed, thus resulting in inconvenience of installation and waste of man hour.

[0007] Secondly, the connecting members and the frame of the foldable screen window in the conventional techniques are respectively formed by a plastic injection and an aluminum extrusion molding. However, products produced by the above-mentioned processes often have a greater tolerance range due to the wear of the mold, thus not only resulting in a problem of installation difficulty but also resulting in a problem of removal difficulty because of the tight combination during the installation of the connecting members and the frame of the foldable screen window.

SUMMARY OF INVENTION

[0008] A technical mean adopted by the present invention is a hidden screen window device, which includes an outer frame, at least one first frame body, a second frame body, and a screen disposed between the first frame body and the second frame body. The first frame body, the second frame body and the screen are configured to be accommodated in the outer frame, and the first frame body is disposed adjacent to the outer frame. At least one frame disassembly and assembly structure is disposed between the first frame body and the outer frame, and the frame disassembly and assembly structure at least comprises a driving device and a fixing member. When the frame disassembly and assembly structure is operated by toggling, rotating, or pressing, the driving device drives the fixing member, thereby combining the first frame body to the outer frame.

[0009] A beneficial effect of the present invention is that: a main objective of the present invention is to provide a hidden screen window device, which omits the installation of the conventional connecting members and overcomes the problems of inconvenient installation and waste of man-hour caused by the conventional technique for installing the connecting members, so as to allow the screen window device to be more easily, fast, and conveniently disassembled and assembled.

[0010] Another main objective of the present invention is to provide a frame disassembly and assembly structure that can be toggled with one finger to rapidly disassemble and assemble the screen window device on the outer frame, thereby improving problems of installation difficulty and removal difficulty resulting from combing two frames by the conventional clipping technique.

DESCRIPTION OF DRAWINGS

[0011]

FIG. 1 is a schematic perspective view of a first preferred embodiment of the present invention.

FIG. 2A is a first one of three-dimensional exploded views of a screen window device and a frame disassembly and assembly structure in the first preferred embodiment of the present invention.

FIG. 2B is a second one of three-dimensional exploded views of the screen window device and the frame disassembly and assembly structure in the first preferred embodiment of the present invention.

FIG. 3 is a schematic cross-sectional view of the first preferred embodiment of the present invention.

FIG. 4A is a first one of schematic views showing a pushing block in the frame disassembly and assembly structure being moved upward according to the first preferred embodiment of the present invention.

FIG. 4B is a second one of schematic views showing the pushing block in the frame disassembly and assembly structure being moved upward according to the first preferred embodiment of the present invention.

FIG. 4C is a third one of schematic views showing the pushing block in the frame disassembly and assembly structure being moved upward according to the first preferred embodiment of the present invention.

FIG. 5A is a first one of schematic views showing the pushing block in the frame disassembly and assembly structure being moved downward according to the first preferred embodiment of the present invention.

FIG. 5B is a second one of schematic views showing the pushing block in the frame disassembly and assembly structure being moved downward according to the first preferred embodiment of the present invention.

FIG. 5C is a third one of schematic views showing the pushing block in the frame disassembly and assembly structure being moved downward according to the first preferred embodiment of the present invention.

FIG. 6 is a schematic cross-sectional view of a second preferred embodiment of the present invention.

FIG. 7A is a first one of schematic cross-sectional views of a third preferred embodiment of the present invention.

FIG. 7B is a second one of schematic cross-sectional views of the third preferred embodiment of the present invention.

FIG. 8A is a first one of schematic cross-sectional views of a fourth preferred embodiment of the present invention.

FIG. 8B is a second one of schematic cross-sectional views of the fourth preferred embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0012] Referring to FIG. 1, showing a first preferred embodiment of a hidden screen window device of the present invention. A screen window device (2) includes at least one first frame body (21), a second frame body (22) and a screen (23). The screen window device (2) can be disposed in an outer frame (1). The outer frame(1) is a door outer frame or a window outer frame, and the outer frame(1) can be a rectangular frame or a ⊏-shaped frame.

[0013] Referring to FIG. 1 to FIG.4C, the number of the first frame bodies (21) is plural, but no matter how many first frame bodies (21) there are, the implementation of the first frame body (21) does not deviate from the application scope on disposing one first frame body (21). Therefore, to simplify the description, in the present embodiment, only one first frame body (21) is used for the description, and other aspects will not be repeated. The first frame body (21) and the second frame body (22) can be accommodated in the outer frame (1). The first frame body (21) is disposed adjacent to the outer frame (1) and at least has a first accommodating portion (211). As shown in FIG. 2A, FIG. 2B and FIG. 3, there is a first opening (212) disposed on the first accommodating portion (211). The outer frame (1) which is adjacent to the first frame body (21) is disposed with a second accommodating portion (11), and there is a second opening (12) disposed on the second accommodating portion (11), and the second opening (12) is communicated with the first opening (212) of the first frame body (21). As shown in FIG. 2A or FIG. 2B, at least one end of the first frame body (21) is provided with a turning member (24), and one end of the turning member (24) extends into the first accommodating portion (211) of the first frame body (21) and is connected to one of a fine adjustment base (25) or a frame disassembly and assembly structure (3). In FIG. 2A, one end of the turning member (24) extending into the first accommodating portion (211) of the first frame body (21) is connected to the fine adjustment base (25), and the fine adjustment base (25) is further connected to the frame disassembly and assembly structure (3). However, in FIG. 2B, one end of the turning member (24) extending into the first accommodating portion (211) of the first frame body (21) is connected to the frame disassembly and assembly structure (3), and the frame disassembly and assembly structure (3) is further connected to the fine adjustment base (25). The second

frame body (22) is slidable within the outer frame (1). The screen (23) is disposed between the first frame body (21) and the second frame body (22), so that while the second frame body (22) slides in the outer frame (1), the screen (23) can be folded and unfolded to open and close the opening of the outer frame (1). Moreover, as shown in FIG. 2A and FIG. 2B, at least one line (26) is passed through and disposed on the screen (23). After the line (26) is passed through the second frame body (22) and a transverse material (not shown in the figure) of the outer frame (1), the line (26) is further guided into the fine adjustment base (25) by the turning member (24) and is tied on a gear (251) of the fine adjustment base (25). The tightness of the line (26) can be regulated by the meshing of the gear (251).

[0014] Referring to FIGs. 2A, 2B and 3 again, the frame disassembly and assembly structure (3) is disposed between the outer frame (1) and the first frame body (21), and the frame disassembly and assembly structure (3) includes a carrier (31) and a sliding member (32). In the present embodiment, the carrier (31) is accommodated in the first accommodating portion (211) of the first frame body (21) and can be combined with the turning member (24). The carrier (31) also can be disposed between the turning member (24) or the fine adjustment base (25), or the carrier (31) can be directly fixed in the first accommodating portion (211). As shown in FIGs. 2A, 2B and 3, the carrier (31) at least has a hollow portion (311), and the sliding member (32) is slidably disposed in the hollow portion (311) of the carrier (31). There is a rotary portion (321) disposed on the sliding member (32), and one end of the rotary portion (321) protrudes out of the hollow portion (311) of the carrier (31) by a distance. The protruding end of the rotary portion (321) is disposed with at least one fixing member (322), and the fixing member (322) can pass through the first opening (212) of the first frame body (21) and the second opening (12) of the outer frame (1) so as to extend into the second accommodating portion (11) of outer frame (1), as shown in FIG. 3.

[0015] Referring to FIG. 2A, FIG. 2B, FIG. 3, FIG. 4A to FIG. 4C, a driving device (4) is disposed between the rotary portion (321) of the sliding member (32) and the hollow portion (311) of the carrier (31). The driving device (4) includes a plurality of teeth (41) disposed around the periphery of the rotary portion (321) and at least one driving protrusion (42) disposed on the carrier (31). The driving protrusion (42) is disposed on a rotating path of the rotary portion (321) of the sliding member (32), and a front edge of the driving protrusion (42) extends between two teeth (41) of the driving device (4). Therefore, while the sliding member (32) slides (as shown by the arrow in FIG. 4A), the driving protrusion (42) of the driving device (4) can drive the teeth (41), thereby driving the rotary portion (321) to rotate (as shown by the arrow on the rotary portion (321) in FIG. 4B), and synchronously rotate the fixing member (322) by an angle, so that the fixing member (322) can abut against and combine with wings (13) located on both sides of the second opening (12) of the outer frame (1), so as to fix the first frame body (21) on a side of the outer frame (1) (as shown in FIG. 3 and FIG. 4C). Referring to FIG. 2A or FIG. 2B again, in order to facilitate the driving of the sliding member (32) to slide, the hollow portion (311) of the carrier (31) is disposed with a first through hole (313) on a sliding path relative to the sliding member (32), and the first frame body (21) is disposed with a second through hole (213) opposite to the first through hole (313). A pin (216) of a pushing block (214) passes through the second through hole (213) of the first frame body (21) and the first through hole (313) of the carrier (31) and is then fixed to a fixing hole (323) of the sliding member (32). Therefore, while the pushing block (214) is pushed, the sliding member (32) can be driven to slide, such that the driving device (4) can rotate the rotary portion (321) by an angle.

[0016] Referring to FIG. 5A to FIG. 5C, when the first frame body (21) is desired to be detached from the outer frame (1), it is only needed to push the pushing block (214) downwardly. As shown by the arrows in the preceding figures, in the process of sliding the sliding member (32) downwardly, the fixing member (322) can be reversely driven by the driving device (4) to reverse and return to the original state, so that the fixing member (322) is no longer abutted against the wings (13) located on both sides of the second opening (12) of the outer frame (1). At this time, the first frame body (21) is no longer combined with the outer frame (1), which enables the first frame body (21) to be detached from the outer frame (1). In the detaching process, the fixing member (322) sequentially passes through the second opening (12) of the outer frame (1) and the first opening (212) of the first frame body (21), so that the first frame body (21) can be easily detached from the outer frame (1). Therefore, from the foregoing descriptions in the present embodiment, only one finger is used to toggle the pushing block (214) up and down, the first frame body (21) can be easily and quickly fixed to the outer frame (1) or detached from the outer frame (1), thereby solving the problems of installation inconvenience and waste of man-hour caused by the conventional technique for installing the connecting members. Moreover, there is no problems of installation difficulty and removal difficulty resulting from combing two frames by the conventional clipping technique.

[0017] Referring to FIG. 2A and FIG. 2B, a hole (217) is disposed on a sliding path of the first frame body (21) relative to the pushing block (214), and an indicator pillar (33) is disposed on the carrier (31) of the frame disassembly and assembly structure (3) relative to the hole (217). Therefore, when the carrier (31) of the frame disassembly and assembly structure (3) is installed in the first accommodating portion (211) of the first frame body (21), the indicating pillar (33) is just accommodated in the hole (217) of the first frame body (21). Furthermore, when the frame disassembly and assembly structure (3) is employed to combine the first frame body (21) with the outer frame (1), the pushing block (214) can just cover the hole (217) and the indicating pillar (33), so that con-

sumers can know that the first frame body (21) and the outer frame (1) are in a combination state. In addition, when the pushing block (214) slides to expose the hole (217) and the indicator pillar (33) therein, the consumers can further know that the first frame body (21) and the outer frame (1) are in a detachable state. In the present embodiments, what can be judged by the consumers is not limited to the configuration of the hole (217) and the indicating pillar (33), and any label with shallow concave, shallow convex or text which can be used as a structure or an object that indicates a combination state are all within the scope of application of the present embodiment.

[0018] Referring to FIG. 6, showing a second preferred embodiment of the present invention, the second preferred embodiment is different from the first preferred embodiment in that: the carrier (31) is accommodated in the second accommodating portion (11) of the outer frame (1); the fixing member (322) of the sliding member (32) passes through the second opening (112) of the outer frame(1) and the first opening (212) of the first frame body (21), and then extends into the first accommodating portion (111) of the first frame body (21); the outer frame (1) is disposed with a third through hole (14) opposite to the first through hole (313) of the carrier (31); the pin (216) of the pushing block (214) passes through the third through hole (114) of the outer frame (1) and the first through hole (313) of the carrier (31), and is then fixed to the fixing hole (323) of the sliding member (32). Therefore, the operation of the present embodiment is the same as that of the above-mentioned first preferred embodiment. Similarly, when the pushing block (214) on the outer frame (1) is pushed upward, in addition to being rotated by an angle, the fixing member (322) on the rotary portion (321) also can be abutted against wings (215) located on both sides of the first opening (212) of the frame body (21), so as to clip the first frame body (21) on a side of the outer frame (1). Moreover, when pushing block (214) is pushed downward, the fixing member (322) is reversely rotated to the original state, so that the fixing member (322) is no longer abutted against the wings (215) located on both sides of the first opening (212) of the first frame body (21). At this time, the first frame body (21) is no longer combined with the outer frame (1), which enables the first frame body (21) to be detached from the outer frame (1). Therefore, from the foregoing descriptions in the present embodiment, only one finger is used to push the pushing block (214) up and down, the first frame body (21) can be easily and quickly fixed to the outer frame (1) or detached from the outer frame (1). Accordingly, in addition to the advantages of easy and convenient operation, which is the same as the first preferred embodiment, a sliding path of the outer frame (1) relative to the pushing block (214) is also disposed with a structure or an object with a marked label that indicates a combination state and/or a non-combination state, so that the present embodiment can be used practically and conveniently.

[0019] Referring to FIG.7A and 7B, showing a third preferred embodiment of the present invention, the third preferred embodiment is different from the first and the second preferred embodiments in that: frame disassembly and assembly structure (6) at least has a rotary member (61) and a fixing member (62); the rotary member (61) passes through a preset fourth through hole (27) of the first frame body (21), and one end of the rotary member (61) protruding out of the first frame body (21) is disposed with a knob (611), and the other end of the rotary member (61) extending into the first accommodating portion (211) of the first frame body (21) is disposed with a screw member (612); the screw member (612) has an external thread (613), and fixing member (62) has a threaded hole (621); the fixing member (62) is screwed on the external thread (613) of the screw member (612) through the threaded hole (621). Therefore, when the knob (611) of the rotary member (61) is rotated forward (as shown in FIG. 7A), the fixing member (62) can be extended into a predetermined first engaging groove (15) of the outer frame (1) so as to combine the first frame body (21) with the outer frame (1). In addition, when the knob (611) of the rotary member (61) is reversely rotated, the fixing member (62) moves out from the first engaging groove (15) of the outer frame (1), so that the first frame body (21) can be easily detached from the outer frame (1), as shown in FIG. 7B.

[0020] Referring to FIG.8A and 8B, showing a fourth preferred embodiment of the present invention, the fourth preferred embodiment is different from the first to the third preferred embodiments in that: frame disassembly and assembly structure (7) at least has a pressing portion (71), a sleeve (72) and a rotary disc (73); the pressing portion (71) protrudes out of the first frame body (21), and the pressing portion (71) has a rod body (711); the rod body (711) passes through a fifth through hole (28) preset in the first frame body (21), and then enters a preset chamber (218) in the first accommodating portion (211) of the first frame body (21), and the chamber (218) has an exit (219); the sleeve (72) is sleeved on the rod body (711) of the pressing member (71) which is accommodated in the chamber (218); at least one chute (721) is disposed on the periphery of the sleeve (72), and a plurality of unidirectional claws (722) are disposed on one end of the sleeve (72); the rotary disc (73) is disposed opposite to the end of the sleeve (72) where the claw (722) is disposed, and the rotary disc (73) is disposed with a plurality of engaging ribs (731), and the engaging ribs (731) can be slid into the chute (721) of the sleeve (72); one end of the rotary disc (73) is disposed with a shaft (733), and the shaft (733) extends out of the exit (219) of the chamber (218), and the end of the shaft (733) extending out of the exit (219) is disposed with a fixing member (734), and a spring component (735) is sleeved on the shaft (733). Accordingly, when the present embodiment is in use, the pressing member (71) can be pressed to move the rotary disc (73) downwardly so as to disengage the engaging ribs (731) on the rotary disc (73) from the chute (721) of the sleeve (72), an inclined surface of a top of the engaging rib (731) is in contact

with the claw (722) of the sleeve (72) to generate a radial force, so that the rotary disc (73) rotates at an angle, causing the engaging ribs (731) to abut against the claw (722) of the sleeve (72). At this time, the fixing member (734) is extended into the first engaging groove (15) of the outer frame (1), so as to combine the first frame body (21) with the outer frame (1). Referring to FIG. 8A, when the pressing member (71) is pressed again, the engaging ribs (731) on the rotary disc (73) will be moved back to the chute (721) of the sleeve (72) by an elastic recovery force of the spring component (735), so as to disengage the fixing member (734) on the rotary disc (73) from the first engaging groove (15) of the outer frame(1), so that the outer frame (1) is no longer in combined with the first frame body (21). At this time, as shown in FIG. 8B, the first frame body (21) can be the quickly and easily detached from the outer frame (1). Furthermore, the frame disassembly and assembly structures (6) and (7) in the above-mentioned third and fourth embodiments also can be disposed on the outer frame (1), so as to achieve the same operation and function as the present embodiment, thus will not repeated herein.

[0021] The above descriptions are only preferred embodiments of the present invention but are not used to limit the features of the present invention. As long as a reinvention uses technical means or creation principles related to the present invention, the reinvention still falls within the scope of the invention. One skilled in the art, without departing from the spirit and scope of the invention, can make various modifications and variations, so it is reasonable that the range of the scope of the invention is defined by the claims.

Claims

1. A hidden screen window device, **characterized in that** the hidden screen window device comprises: an outer frame, at least one first frame body, a second frame body and a screen disposed between the first frame body and the second frame body, wherein the first frame body, the second frame body and the screen are configured to be accommodated in the outer frame, and the first frame body is disposed adjacent to the outer frame, and at least one frame disassembly and assembly structure is disposed between the first frame body and the outer frame, and the frame disassembly and assembly structure at least comprises a driving device and a fixing member; and wherein when the frame disassembly and assembly structure is operated by toggling, rotating or pressing, the driving device drives the fixing member, thereby combining the first frame body to the outer frame.

2. The hidden screen window device according to claim 1, **characterized in that** the outer frame can be a window outer frame or a door outer frame, and the second frame body is slidable in the outer frame.

3. The hidden screen window device according to claim 1, **characterized in that** the first frame body is disposed with a first accommodating portion, and the first accommodating portion has a first opening; and the outer frame which is opposite to the first frame body is disposed with a second accommodating portion, and the second accommodating portion has a second opening, and the second opening is opposite to the first opening; the frame disassembly and assembly structure is disposed in the first accommodating portion of the first frame body, and the fixing member passes through the first opening of the first frame body and extends into the second accommodating portion of the outer frame.

4. The hidden screen window device according to claim 3, **characterized in that** the frame disassembly and assembly structure at least comprises a sliding member and a carrier, and the carrier is accommodated in the first accommodating portion of the first frame body, and the sliding member is slidable on the carrier, and the sliding member is disposed with a rotary portion, and the driving device is disposed between the rotary portion and the carrier, and the fixing member is disposed on the rotary portion, so that when the sliding member slides, the driving device can drive the fixing member to rotate an angle.

5. The hidden screen window device according to claim 4, **characterized in that** a through hole is provided on a sliding path of the first frame body relative to the sliding member, and the through hole allows a pin of a pushing block to pass therethrough and then be fixed to the sliding member.

6. The hidden screen window device according to claim 1, **characterized in that** the first frame body is disposed with a first accommodating portion, and the first accommodating portion has a first opening; and the outer frame which is opposite to the first frame body is disposed with a second accommodating portion, and the second accommodating portion has a second opening, and the second opening is opposite to the first opening; and the frame disassembly and assembly structure is disposed in the second accommodating portion of the outer frame, and the fixing member passes through the second accommodating portion of the outer frame and extends into the first accommodating portion of the first frame body.

7. The hidden screen window device according to claim 6, **characterized in that** the frame disassembly and assembly structure at least comprises a sliding member and a carrier, and the carrier is accommodated in the second accommodating portion of the outer frame, and the sliding member is slidable on the car-

rier, and the sliding member is disposed with a rotary portion, and the driving device is disposed between the rotary portion and the carrier, and the fixing member is disposed on the rotary portion, so that when the sliding member slides, the driving device can drive the fixing member to rotate an angle.

8. The hidden screen window device according to claim 7, **characterized in that** a through hole is provided on a sliding path of the outer frame relative to the sliding member, and the through hole allows a pin of a pushing block to pass therethrough and then be fixed to the sliding member.

9. The hidden screen window device according to claims 4 or 7, **characterized in that** the driving device comprises a plurality of teeth arranged around the rotary portion and at least one driving protrusion disposed on the carrier, and the driving protrusion is disposed on a rotating path of the rotary portion of the sliding member, and the driving protrusion extends between two teeth of the rotary portion.

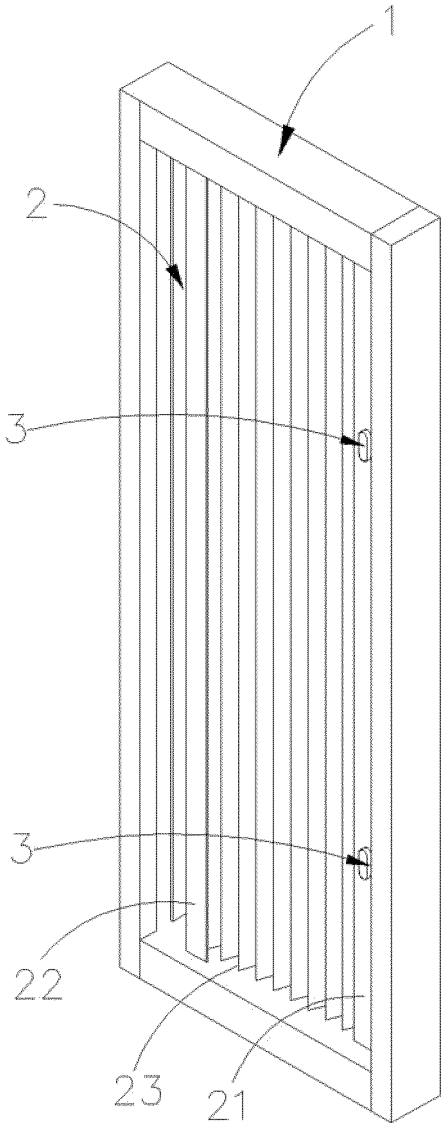

FIG. 1

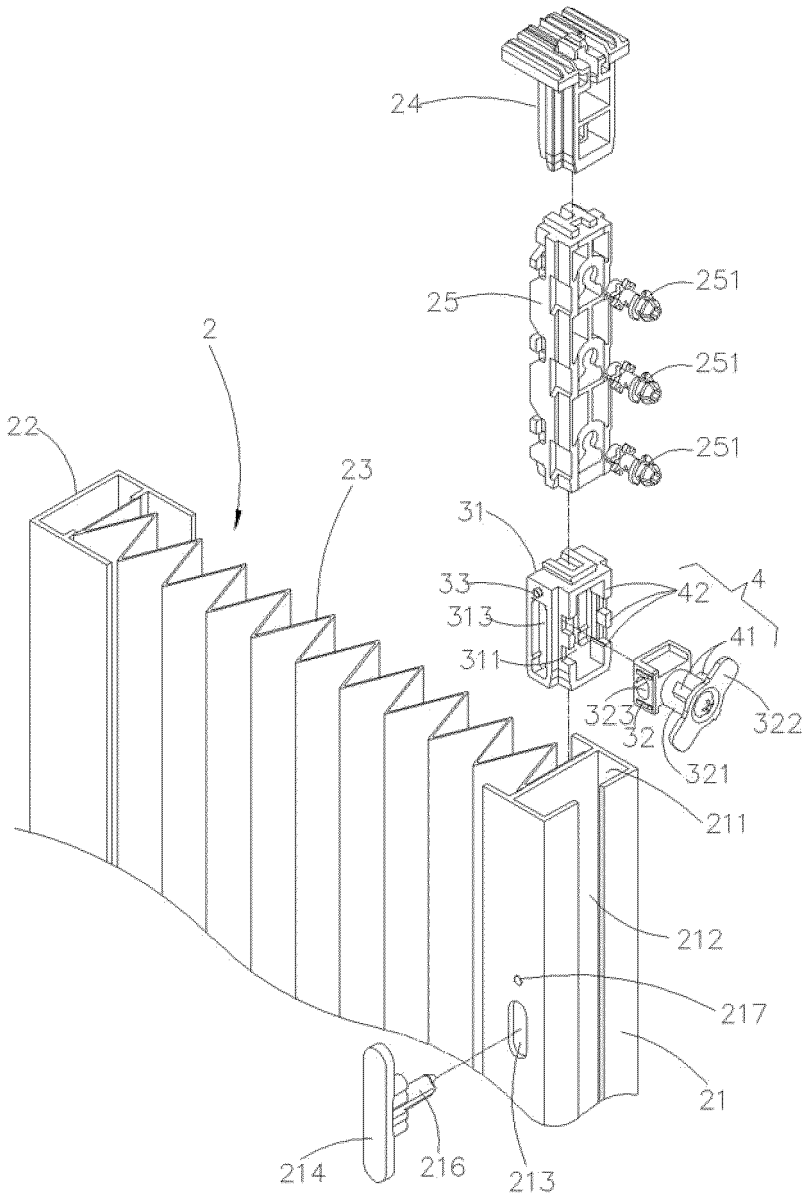
24
25
251
251
251
2
22
23
31
33
313
311
42
4
41
323
322
32
321
211
212
217
21
214
216
213

FIG. 2A

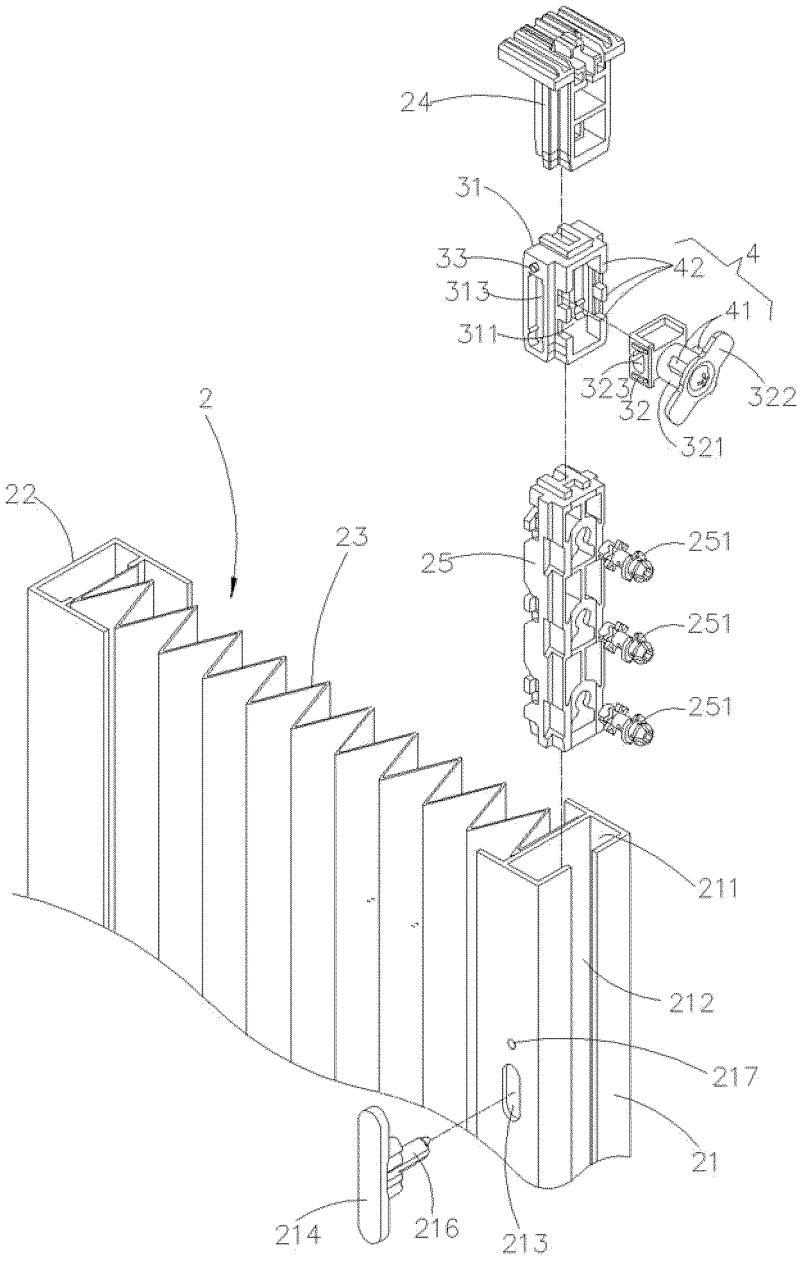
24
31
33
313
311
42
4
41
323
32
322
321
2
22
23
25
251
251
251
211
212
217
21
214
216
213

FIG. 2B

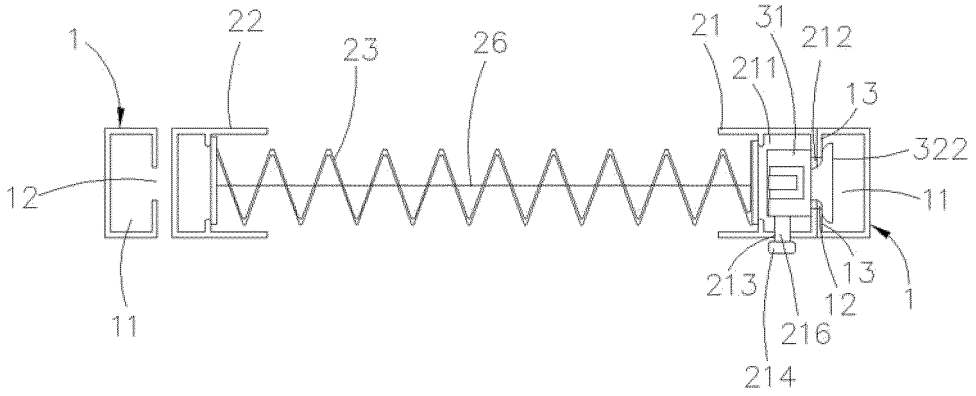

FIG. 3

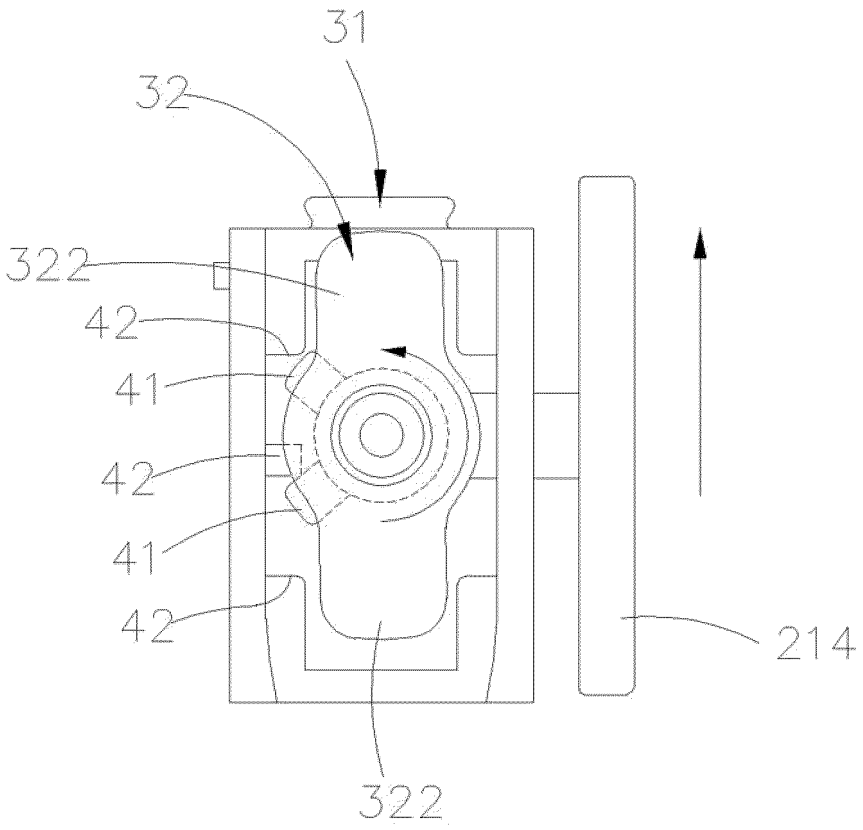

FIG. 4A

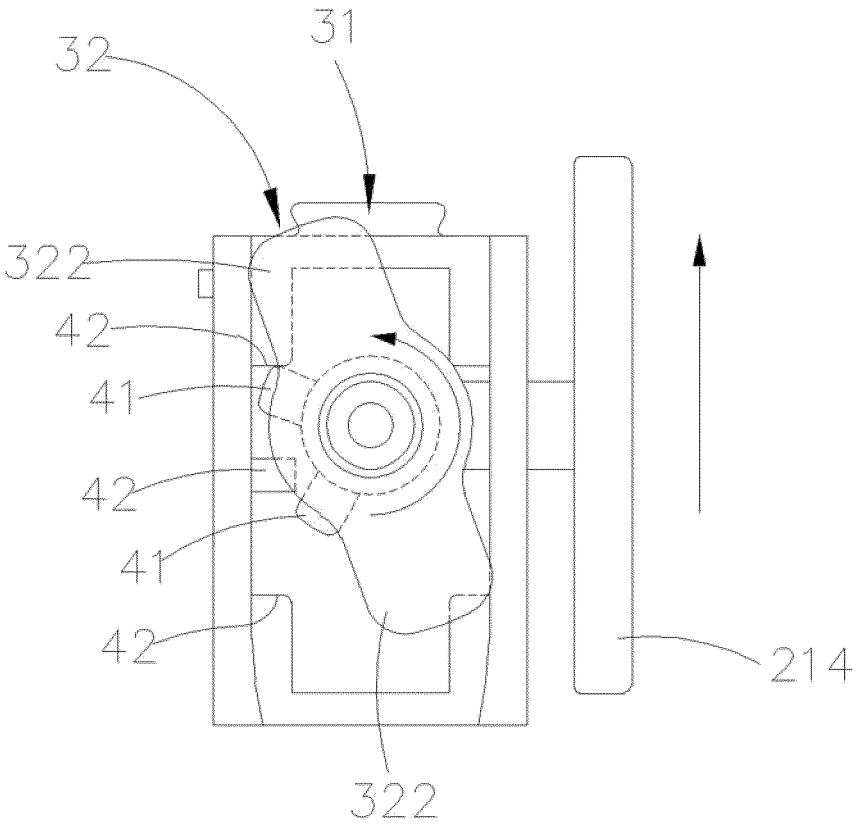

FIG. 4B

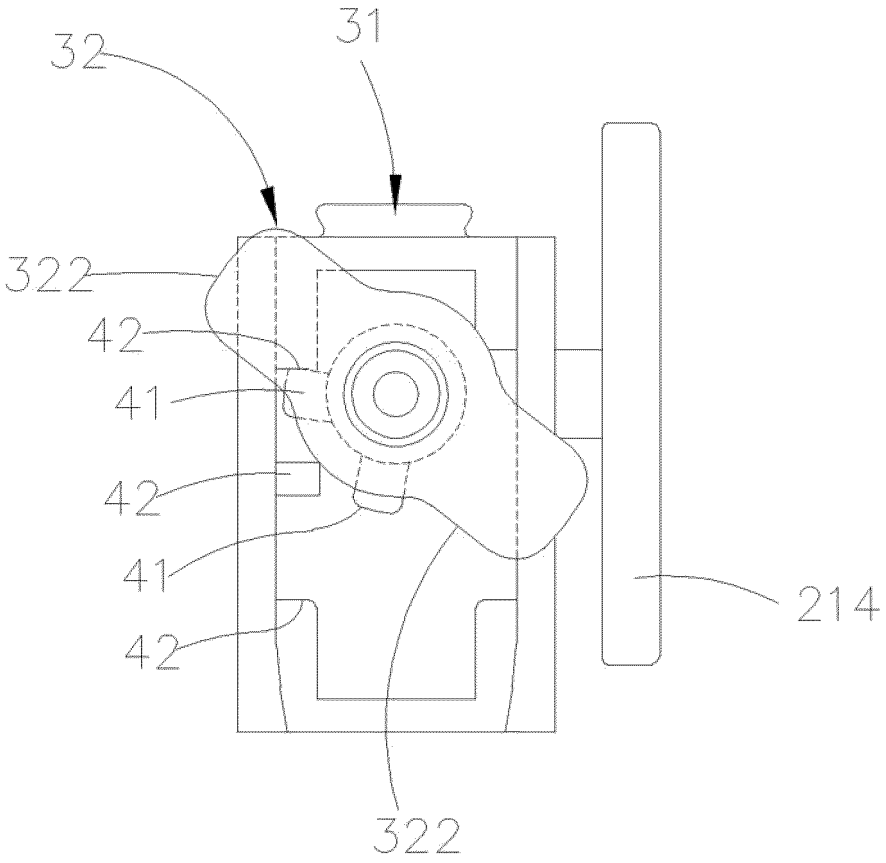

FIG. 4C

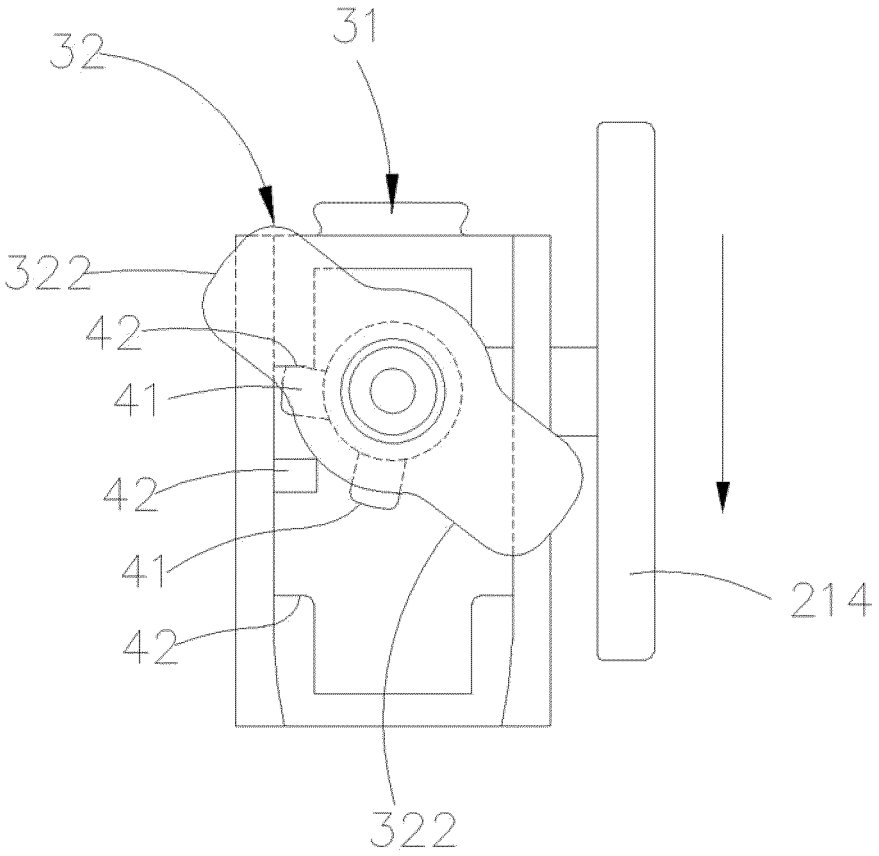

FIG. 5A

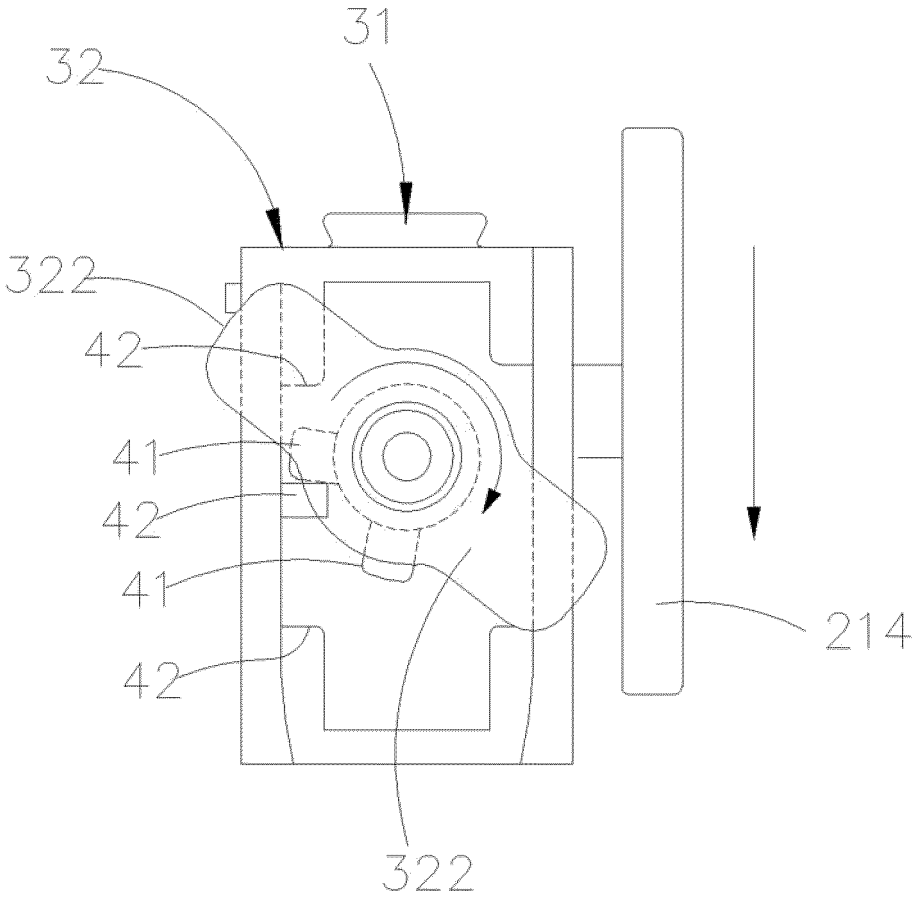

FIG. 5B

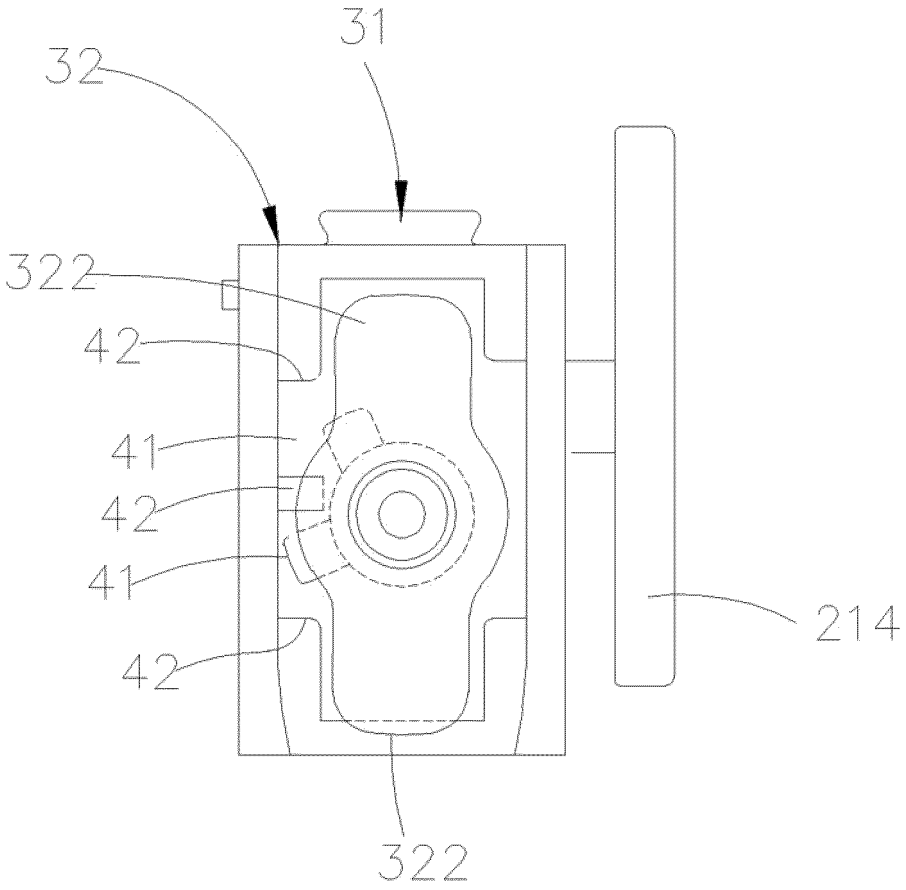

FIG. 5C

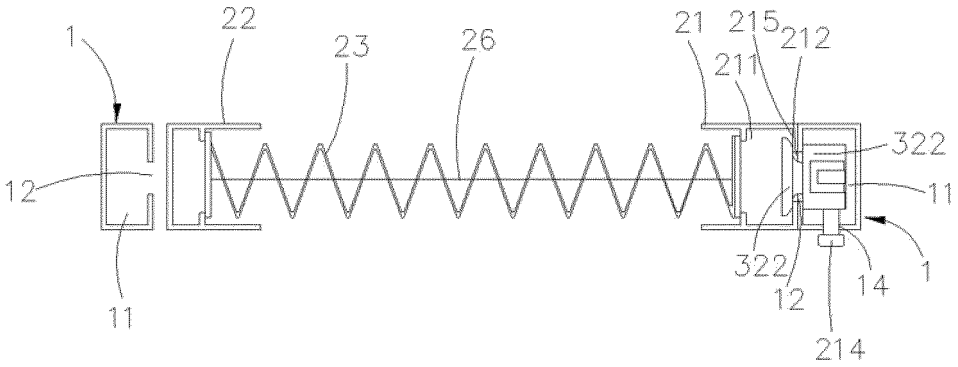

FIG. 6

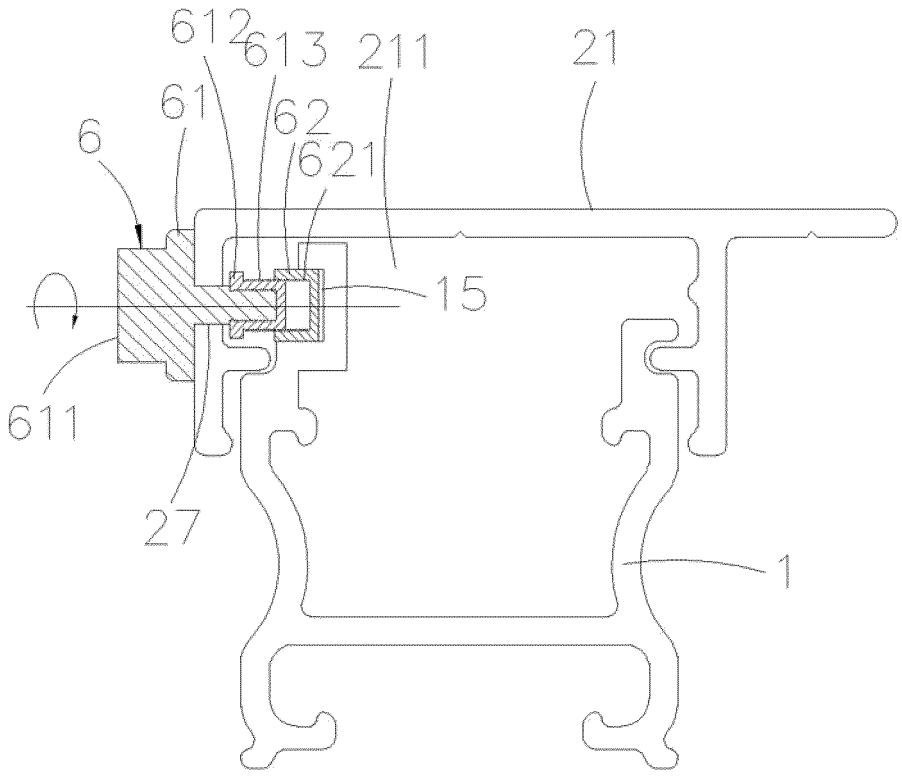

FIG. 7A

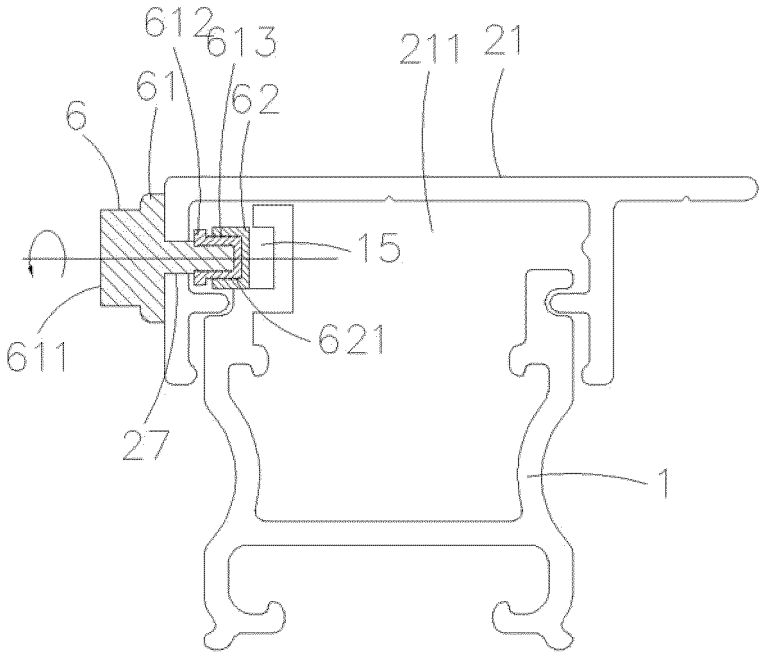

FIG. 7B

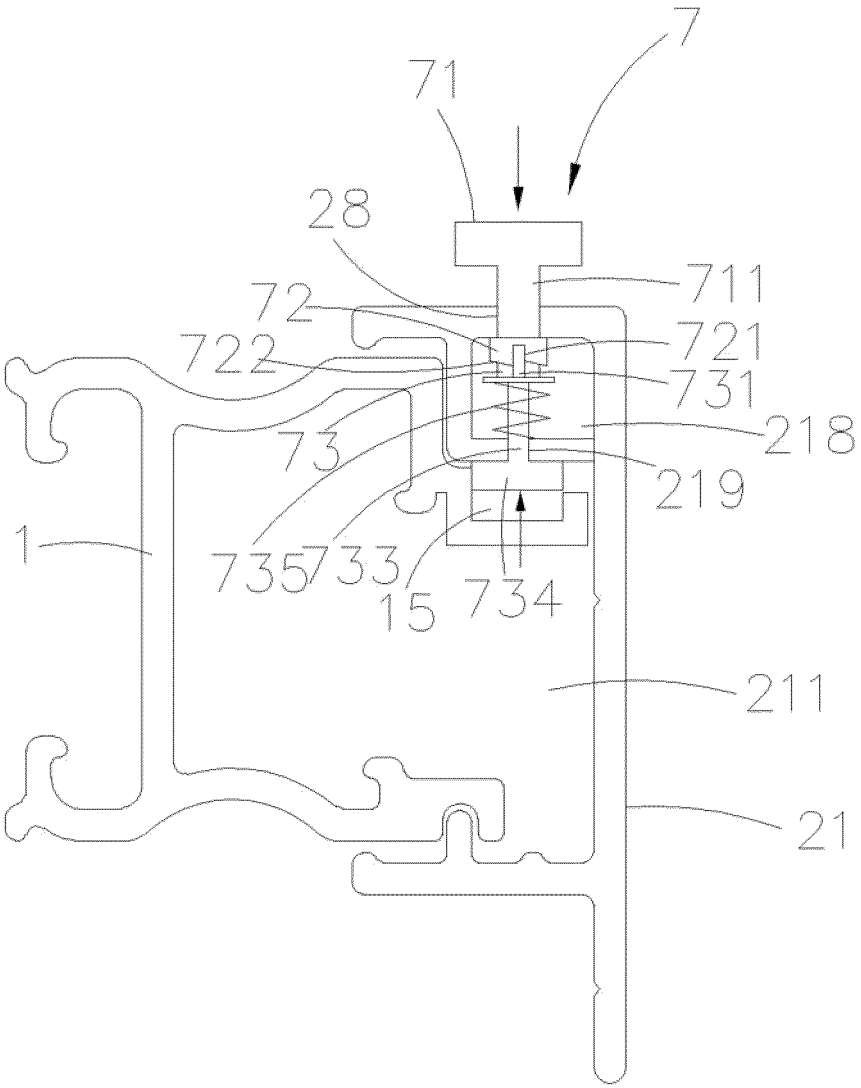

FIG. 8A

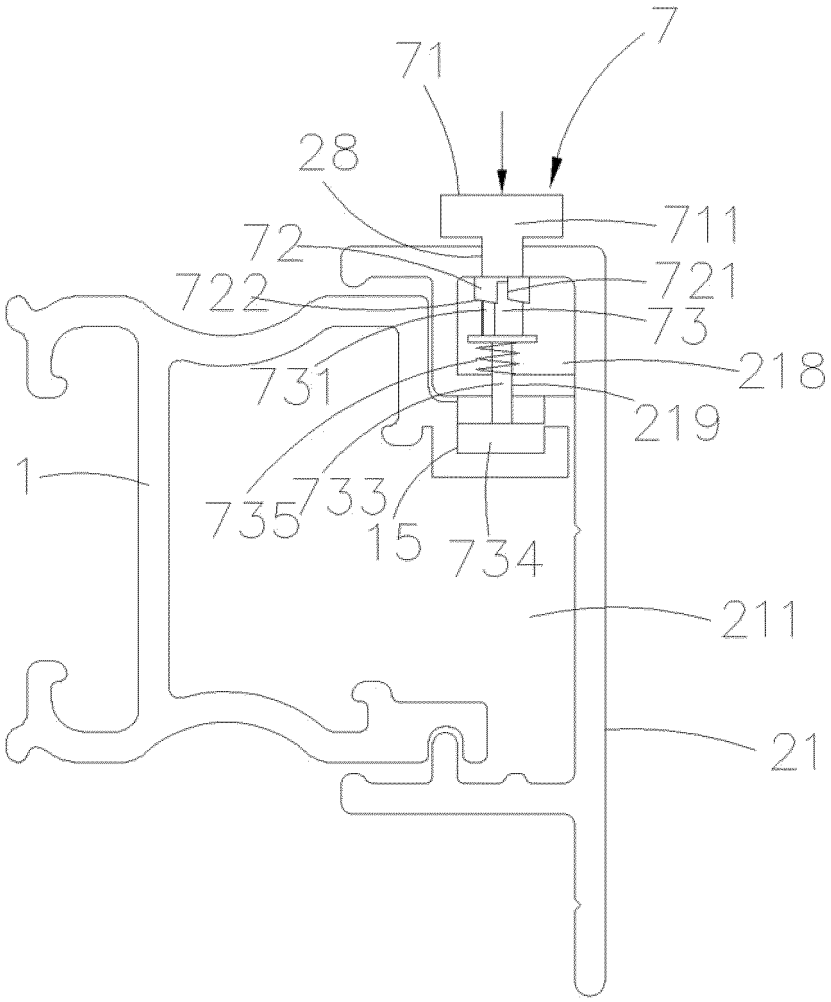

FIG. 8B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/103564

A. CLASSIFICATION OF SUBJECT MATTER

E06B 9/52(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)

E06B 9，E05C 3

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

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

CNKI, CNABS, CNTXT, VEN: 隐藏, 隐蔽, 隐形, 不可见, 收纳, 容纳, 折叠, 纱窗, 幕, 纱网, 框, 拆装, 拆卸, 组装, 可拆, 组装, 更换, 替换, 分离, 安装, 固定, 夹掣, 夹持, hidden, hiding, invision, invisible, hold, cavity, receipt, fold+, screen, mash, frame, removable, detachable, disasembly, dismantle, assemb+, fixed, fix

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 109057683 A (TAROKO DOOR & WINDOW TECHNOLOGIES, INC.) 21 December 2018 (2018-12-21) claims 9-17, figures 1-8B	1-9
Y	CN 204002491 U (WANG, Tao) 10 December 2014 (2014-12-10) description, specific embodiments, and figures 1-8	1-9
Y	JP 2004197368 A (YKK AP INC et al.) 15 July 2004 (2004-07-15) description, paragraphs [0018]-[0022], and figures 1-9	1-9
Y	CN 2916734 Y (YINGYEDA CO., LTD.) 27 June 2007 (2007-06-27) description, specific embodiments, and figures 1-5B	1-9
A	CN 202325185 U (XIE, Nanping) 11 July 2012 (2012-07-11) entire document	1-9

☐ 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
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"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
"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
"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
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 May 2020	**29 May 2020**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/103564

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 109057683 A	21 December 2018	None	
CN 204002491 U	10 December 2014	None	
JP 2004197368 A	15 July 2004	JP 4007906 B2	14 November 2007
CN 2916734 Y	27 June 2007	None	
CN 202325185 U	11 July 2012	None	

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- TW M491079 **[0004]**