



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

(43) Date of publication:  
**07.12.2022 Bulletin 2022/49**

(51) International Patent Classification (IPC):  
**E06B 9/52 (2006.01) E06B 9/24 (2006.01)**  
**E06B 7/24 (2006.01)**

(21) Application number: **20919546.0**

(52) Cooperative Patent Classification (CPC):  
**E06B 7/24; E06B 9/24; E06B 9/52**

(22) Date of filing: **18.02.2020**

(86) International application number:  
**PCT/CN2020/075712**

(87) International publication number:  
**WO 2021/163883 (26.08.2021 Gazette 2021/34)**

(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**

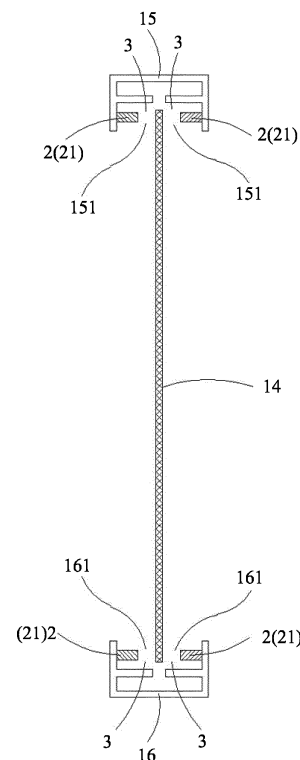
(71) Applicant: **Taroko Door & Window Technologies, Inc.**  
**Gaoxiong City, Taiwan 83160 (TW)**

(72) Inventor: **LIN, Dinghui**  
**Gaoxiong City, Taiwan 83160 (CN)**

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

(54) **DOOR AND WINDOW SHIELDING STRUCTURE WITH MOSQUITO EXPELLING FUNCTION**

(57) Disclosed is a door and window shielding structure with a mosquito expelling function, the structure comprising a frame body (1), wherein the frame body (1) is a screen window frame or a door and window outer frame; the frame body (1) is provided with at least an opening (11); at least one movable frame material (12) is provided in the opening (11) and can slide in the opening; a gauze screen (14) is provided between the movable frame material (12) and the frame body (1); the gauze screen (14) can be unfolded when the movable frame material (12) slides in the opening (11); at least one mosquito expelling device (2) is provided between the unfolded gauze screen (14) and the frame body (1); and a mosquito blocking area (3) is provided between the mosquito expelling device (2) and the frame body (1) and/or the unfolded gauze screen (14). The structure can prevent mosquitoes in the open air from entering a room through gaps, thereby improving the mosquito prevention and expelling effects thereof.



**FIG. 2A**

**Description****DESCRIPTION OF DRAWINGS****FIELD OF INVENTION****[0005]**

**[0001]** The present disclosure relates to a shielding structure, and in particular, to a door and window shielding structure with mosquito expelling function.

5

FIG. 1A is a schematic diagram of a preferred embodiment of the present invention implemented in a rolling screen window.

**BACKGROUND OF INVENTION**

10

FIG. 1B is a schematic diagram of a preferred embodiment of the present invention implemented in a foldable screen window.

**[0002]** Current door and window shielding structures, such as screen windows, are installed on the doors and windows to prevent outdoor mosquitoes from entering the room. Current door and window shielding structures are divided into two types: flat screen windows and hidden screen windows. Although the flat screen windows can block the mosquitoes outdoors, when the flat screen windows are in use, the flat screen windows will block people from enjoying the outdoor scenery. Although the hidden screen windows can be stored or rolled up when not in use without hindering people from enjoying the outdoor scenery, when the hidden screen windows are unfolded, there are gaps between the screen and the screen frame or door and window frame, thus causing outdoor mosquitoes to easily enter the room through the aforementioned gaps, and the effect of the hidden screens to block mosquitoes from outdoors will be greatly reduced.

15

FIG. 2A is a first one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a rolling screen window and the insect repellent device is an insect repellent brush strip.

20

FIG. 2B is a second one of the schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a foldable screen window and the insect repellent device is an insect repellent brush strip.

25

FIG. 2C is a third one of the schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a rolling screen window and the insect repellent device is an insect repellent brush strip.

**SUMMARY OF INVENTION**

30

**[0003]** The technical solution of the present invention is to provide a door and window shielding structure with mosquito expelling function, which comprises a frame body, at least one movable frame material, a gauze screen and at least one insect repellent device. The at least one movable frame material can be slid in the frame body. The gauze screen is disposed between the movable frame material and the frame body, and the gauze screen can be unfolded by the sliding of the movable frame material. The at least one insect repellent device is disposed between the unfolded gauze screen and the frame body, and a mosquito blocking area is formed between the insect repellent device and the frame body and/or the unfolded gauze screen.

35

FIG. 2D is a fourth one of the schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a foldable screen window and the insect repellent device is an insect repellent brush strip.

40

FIG. 3A is a first one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a rolling screen window and the insect repellent device is an insect repellent lamp installed in the mosquito blocking area.

45

FIG. 3B is a second one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a foldable screen window and the insect repellent device is an insect repellent lamp installed in the mosquito blocking area.

50

FIG. 3C is a third one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a rolling screen window and the insect repellent device is an insect repellent lamp installed in the mosquito blocking area.

55

FIG. 3D is a fourth one of schematic diagrams show-

**[0004]** The beneficial effects of the present invention are as follows: the main purpose of the present invention is to provide a door and window shielding structure with insect (mosquito) repellent function, which mainly includes at least one insect repellent device disposed between a screen window and the frame body on which the screen window is installed. A mosquito blocking area is formed between the insect repellent device and the frame body and/or between the insect repellent device and the gauze screen of the screen window. With the setting of the mosquito blocking area, outdoor mosquitoes can be prevented from entering the room through the aforementioned gaps.

ing a preferred embodiment of the present invention where the gauze screen belongs to a foldable screen window and the insect repellent device is an insect repellent lamp installed in the mosquito blocking area.

FIG. 4A is a first one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a rolling screen window and the insect repellent device is a sonic insect repellent unit installed in the mosquito blocking area.

FIG. 4B is a second one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a foldable screen window and the insect repellent device is a sonic insect repellent unit installed in the mosquito blocking area.

FIG. 4C is a third one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a rolling screen window and the insect repellent device is a sonic insect repellent unit installed in the mosquito blocking area.

FIG. 4D is a fourth one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a foldable screen window and the insect repellent device is a sonic insect repellent unit installed in the mosquito blocking area.

FIG. 5A is a first one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a rolling screen window and the insect repellent device is an insect repellent conductive strip installed in the mosquito blocking area.

FIG. 5B is a second one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a foldable screen window and the insect repellent device is an insect repellent conductive strip installed in the mosquito blocking area.

FIG. 5C is a third one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a rolling screen window and the insect repellent device is an insect repellent conductive strip installed in the mosquito blocking area.

FIG. 5D is a fourth one of schematic diagrams showing a preferred embodiment of the present invention where the gauze screen belongs to a foldable screen

window and the insect repellent device is an insect repellent conductive strip installed in the mosquito blocking area.

## 5 DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

**[0006]** Referring to FIG. 1A to FIG. 2D, which show a preferred embodiment of a door and window shielding structure with mosquito expelling function of the present invention. The door and window shielding structure comprises: a frame body (1), at least one movable frame material (12), a gauze screen (14) and at least one insect repellent device (2). The frame body (1) is a window screen frame or an outer frame of a door and window. The frame body (1) has at least one opening (11), and the at least one movable frame material (12) can slide in the opening (11). The gauze screen (14) is disposed between the movable frame material (12) and the frame body (1), and when sliding in the opening (11), the movable frame material (12) unfolds the gauze screen (14). The at least one insect repellent device (2) is disposed between the unfolded gauze screen (14) and the frame (1), and a mosquito blocking area (3) is formed between the insect repellent device (2) and the frame (1) and/or the unfolded gauze screen (14).

**[0007]** In the present embodiment, the gauze screen (14) is a gauze screen of a foldable screen window or a rolling screen window. As shown in FIG. 1A, when the gauze screen (14) is a screen of the rolling screen window, a reel (18) is disposed on one of frame materials of the frame body (1), so that the reel (18) can be used to roll up the gauze screen (14), so as to store the gauze screen (14). As shown in FIG. 1B, when the gauze screen (14) is a screen of the foldable screen window, the gauze screen (14) can be unfolded or stored in the opening (11) by the sliding of the movable frame (12).

**[0008]** Referring to FIG. 1A to FIG. 2D, the frame body (1) at least has an upper frame material (15), a lower frame material (16), and at least one connecting frame material (17) disposed between the upper frame material (15) and the lower frame material (16). The opening (11) is framed by the upper frame material (15), the lower frame material (16) and the connecting frame material (17). In addition, the upper frame material (15) and the lower frame material (16) are respectively provided with an upper rail (151) and a lower rail (161) at the positions relative to the opening (11). The upper rail (151) and the lower rail (161) are respectively used for two ends of the gauze screen (14) to slide thereon. However, because only two ends of the gauze screen (14) slide on the upper track (151) and the lower track (161), there are gaps between the two ends of the gauze screen (14) and the upper rail (151) as well as the lower rail (161) which are not tightly combined. The insect repellent device (2) is disposed between the upper track (151) and one end of the gauze screen (14) and/or between the lower track (161) and the other end of the gauze screen (14). The

mosquito blocking area (3) is formed by the insect repellent device (2), the upper rail (151) and one end of the gauze screen (14) and/or by the lower rail (161) and the other end of the gauze screen (14), so as to prevent outdoor mosquitoes from entering the room through any gaps between the gauze screen (14) and the upper track (151) or between the gauze screen (14) and the lower track (161). More specifically, besides the insect repellent device (2) can be fixed on any position of the upper rail (151) and the lower rail (161) (as shown in FIG. 2A and FIG. 2B), the insect repellent device (2) can also be installed on the gauze screen (14) near the mosquito blocking area (3) (as shown in FIG. 2C and FIG. 2D).

**[0009]** Referring to FIG. 2A to FIG. 6B, the insect repellent device (2) can be an insect repellent brush strip (21), an insect repellent lamp (22), a sonic insect repellent unit (23), or an insect repellent conductive strip (24), but not limited thereto. All structures or devices that can achieve insect repellent effect are all within the scope of application of the present invention. As shown in FIG. 2A and FIG. 2D As shown, a plurality of pyrethrum nanocapsules are embedded in the insect repellent brush strip (21), so that the pyrethrum component can be slowly released from the insect repellent brush strip (21) and further be filled in the mosquito blocking area (3), and therefore outdoor mosquitoes cannot pass through the mosquito blocking area (3).

**[0010]** It can be known that light with wavelength greater than 800um has an obvious insect repellent effect. Therefore, in the present embodiment, the insect repellent lamp (22) can emit light with a wavelength greater than 800um, such as infrared light, etc., so that the light emitted by the insect repellent lamp (22) can be irradiated on the mosquito blocking area (3), so as to prevent outdoor mosquitoes from entering the mosquito blocking area (3). As shown in FIG. 3A to FIG. 3D, in the present embodiment, the insect repellent lamp (22) can be a SMD LED, but it is not limited to this. Any lamps that can emit wavelengths greater than 800um are within the scope of application of the present invention.

**[0011]** As shown in FIG. 4A to FIG. 4D, the sonic insect repellent unit (23) can emit a high-frequency sound wave to the mosquito blocking area (3), so that outdoor mosquitoes do not dare to enter the mosquito blocking area (3). In the present embodiment, the sonic insect repellent unit (23) is an electronic insect repellent, but not limited thereto. As shown in FIG. 5A to FIG. 5D, the insect conductive strip (24) is fixed in the mosquito blocking area (3), and the insect repellent conductive strip (24) is provided with at least two conductors

**[0012]** (241). The two conductors (241) are respectively connected to a positive power source and a negative power source, so that when the mosquitoes enter the mosquito blocking area (3), and the mosquitoes will be repelled if they touch the two conductors (241). Moreover, the insect repellent conductive strip (24) is further provided with a filter capacitor (242) with a specific capacitance value which is used to calculate the charging

and discharging time, so as to make the discharging time of the two conductors (241) to the human body be shorter than the human nerve conduction time. Therefore, when the human body touches the insect repellent conductive strip (24), the voltage can be dropped to a safe range by using the voltage divider rule, so that the human body does not get electric shock, but the effect of repelling mosquitoes can be achieved.

**[0013]** It should be noted that, above-mentioned illustrations and descriptions are only preferred embodiments of the present invention and should not limit the scope of the present invention. Any equivalent changes and modifications may be possible without departing from the design scope of the present invention.

## Claims

1. A door and window shielding structure with mosquito expelling function, **characterized in that** it comprises a frame body, at least one movable frame material, a gauze screen and at least one insect repellent device, wherein the at least one movable frame material is slidably disposed in the frame body, the gauze screen is disposed between the at least one movable frame material and the frame body, and the gauze screen can be unfolded by the sliding of the movable frame material, and the at least one insect repellent device is disposed between the unfolded gauze screen and the frame body, and a mosquito blocking area is formed between the insect repellent device and the frame body and/or the unfolded gauze screen.
2. The door and window shielding structure with mosquito expelling function according to claim 1, **characterized in that** the frame body at least has an upper frame material, a lower frame material, and a connecting frame material disposed between the upper frame material and the lower frame material.
3. The door and window shielding structure with mosquito expelling function according to claim 2, **characterized in that** an opening is formed by the upper frame material, the lower frame material and the connecting frame material, and an upper rail and a lower rail are respectively provided at the positions of the upper frame material and the lower frame material facing the opening, and the insect repellent device is disposed between the upper rail and one end of the gauze screen and/or between the lower rail and the other end of the gauze screen.
4. The door and window shielding structure with mosquito expelling function according to claim 3, **characterized in that** the insect repellent device is fixed on the upper rail and/or the lower rail.

5. The door and window shielding structure with mosquito expelling function according to claim 3, **characterized in that** the insect repellent device is disposed on a position of the gauze screen near the mosquito blocking area. 5
6. The door and window shielding structure with mosquito expelling function according to claim 1, **characterized in that** the insect repellent device is an insect repellent brush strip. 10
7. The door and window shielding structure with mosquito expelling function according to claim 6, **characterized in that** a plurality of pyrethrum nanocapsules are embedded in the insect repellent brush strip. 15
8. The door and window shielding structure with mosquito expelling function according to claim 1, **characterized in that** the insect repellent device is an insect repellent lamp, and the insect repellent lamp can emit a light with a wavelength greater than 800um. 20
9. The door and window shielding structure with mosquito expelling function according to claim 1, **characterized in that** the insect repellent device is a sonic insect repellent unit, and the sonic insect repellent unit can emit a high-frequency sound wave. 25
10. The door and window shielding structure with mosquito expelling function according to claim 1, **characterized in that** the insect repellent device is an insect repellent conductive strip. 30
- 35

40

45

50

55

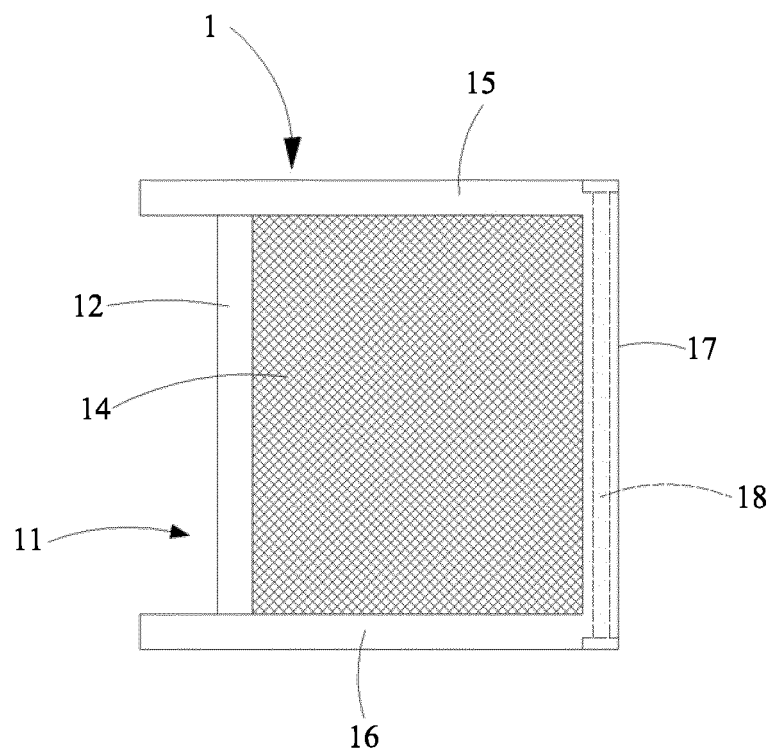


FIG. 1A

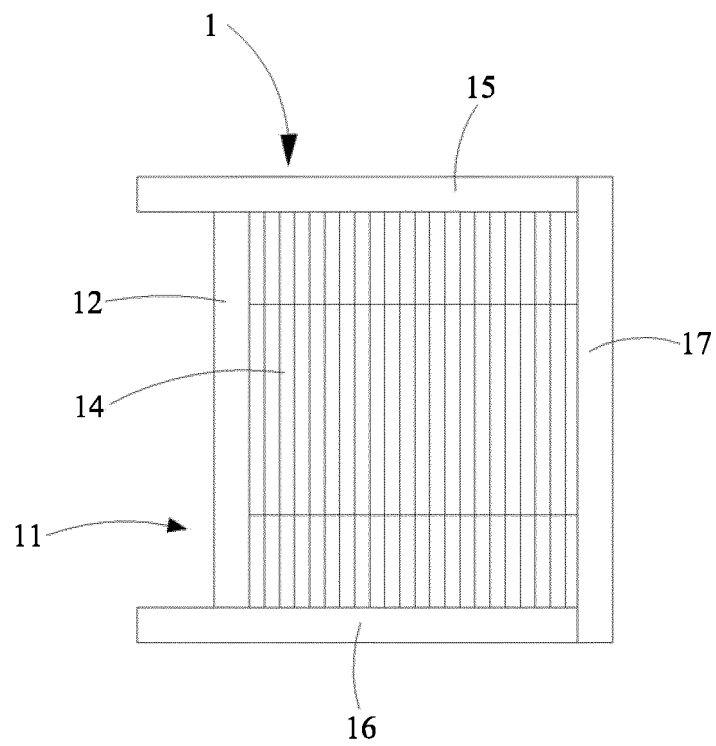


FIG. 1B

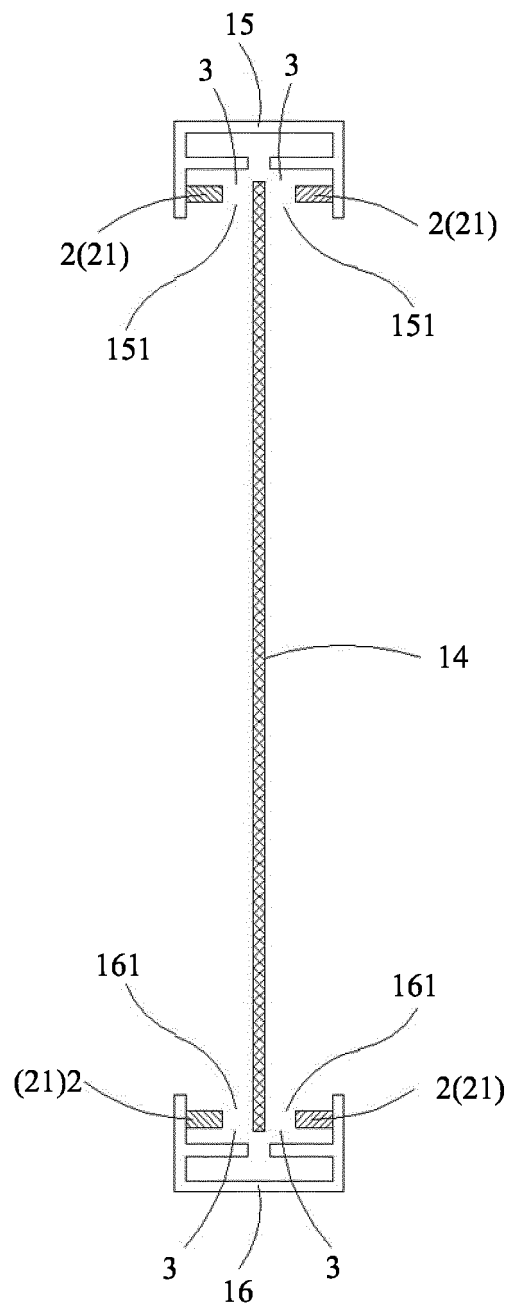


FIG. 2A



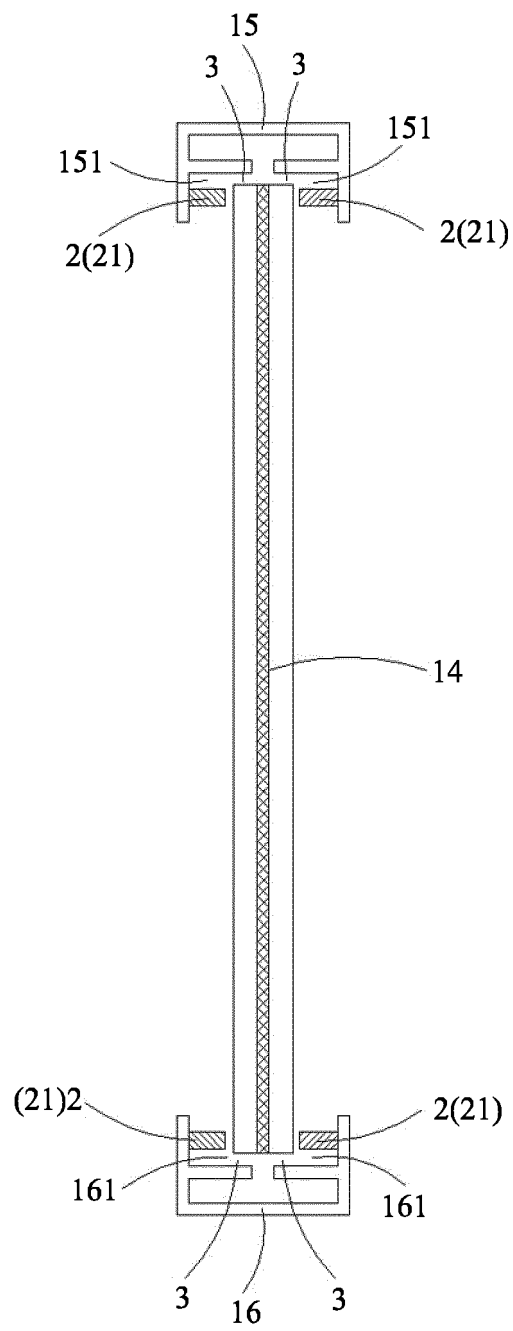


FIG. 2B

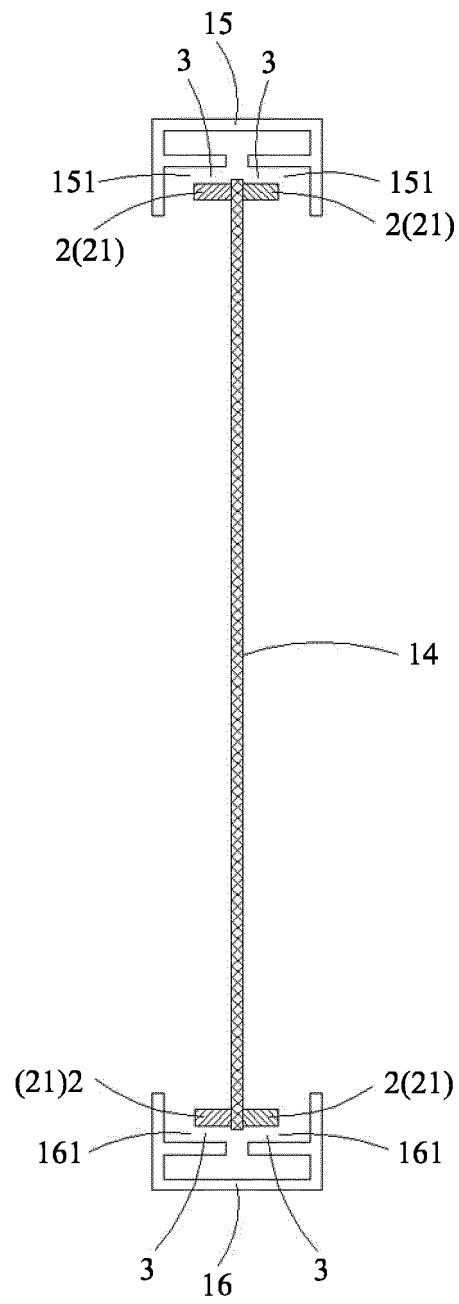


FIG. 2C

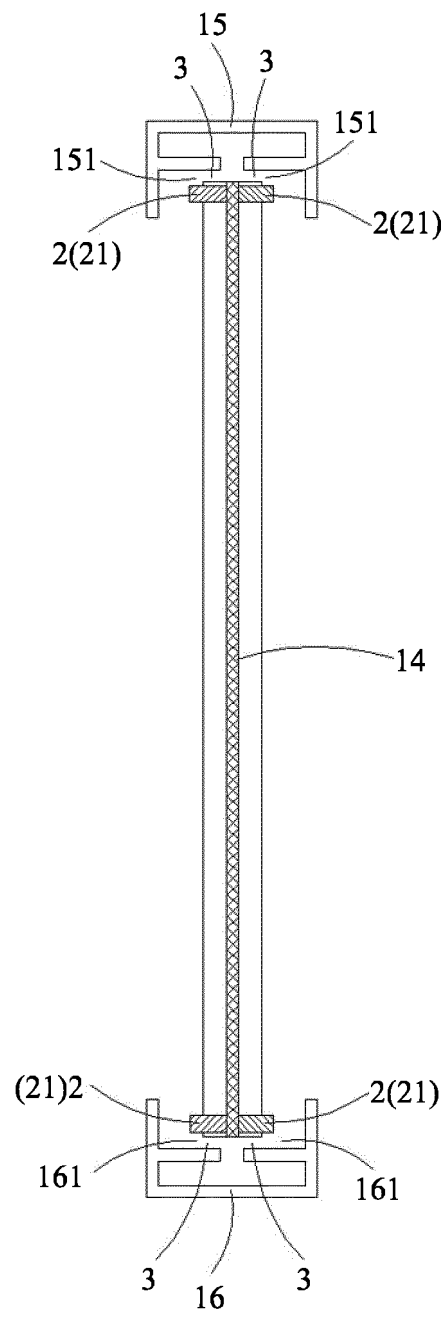


FIG. 2D

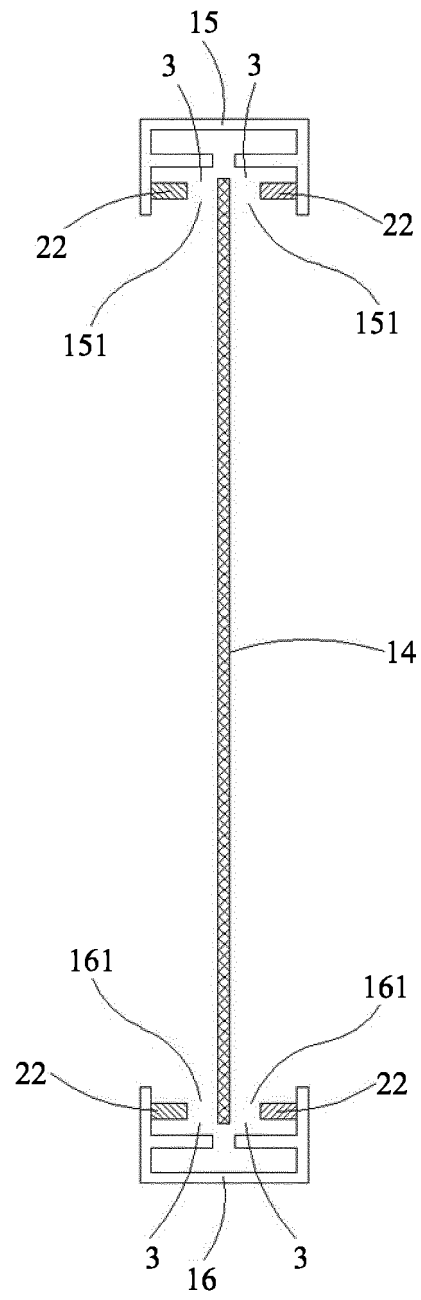


FIG. 3A

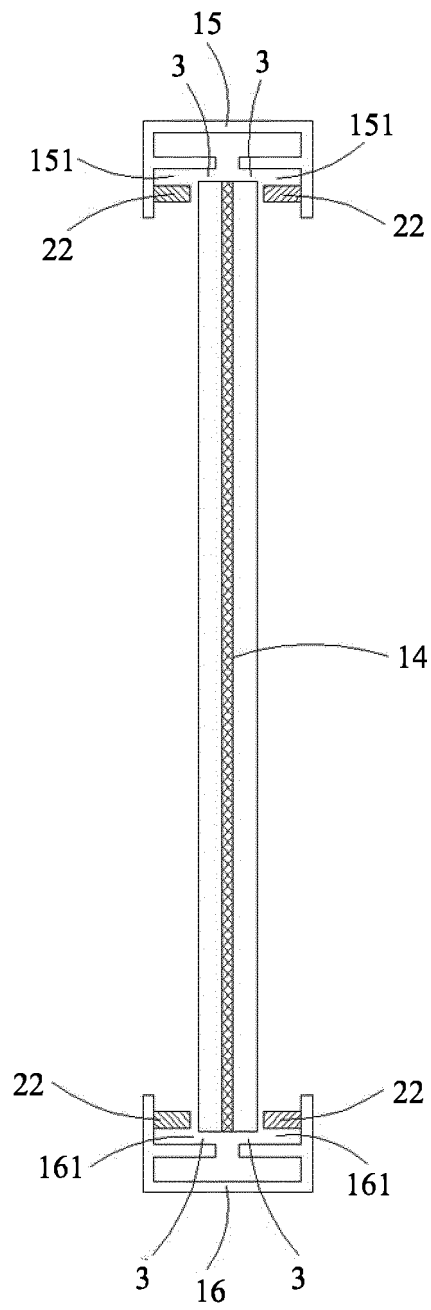


FIG. 3B

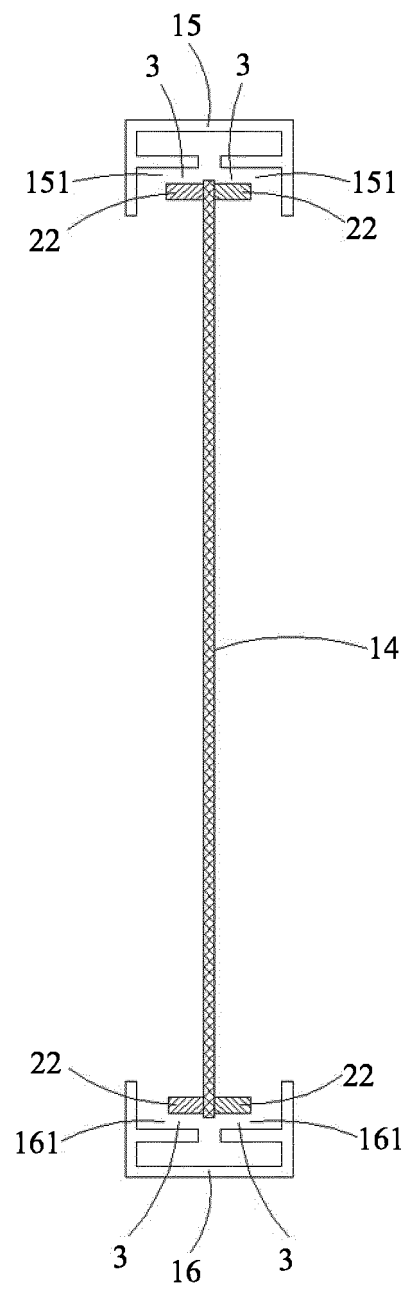


FIG. 3C

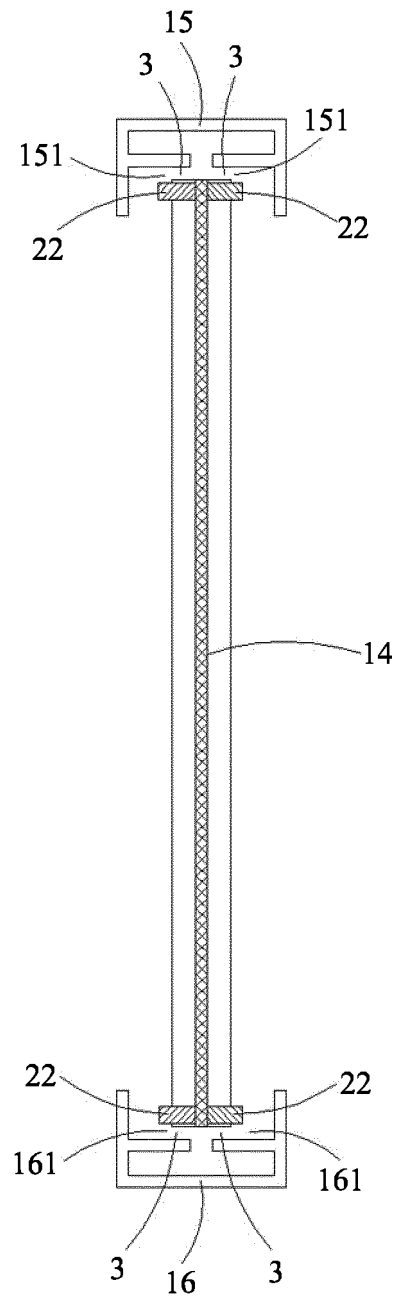


FIG. 3D

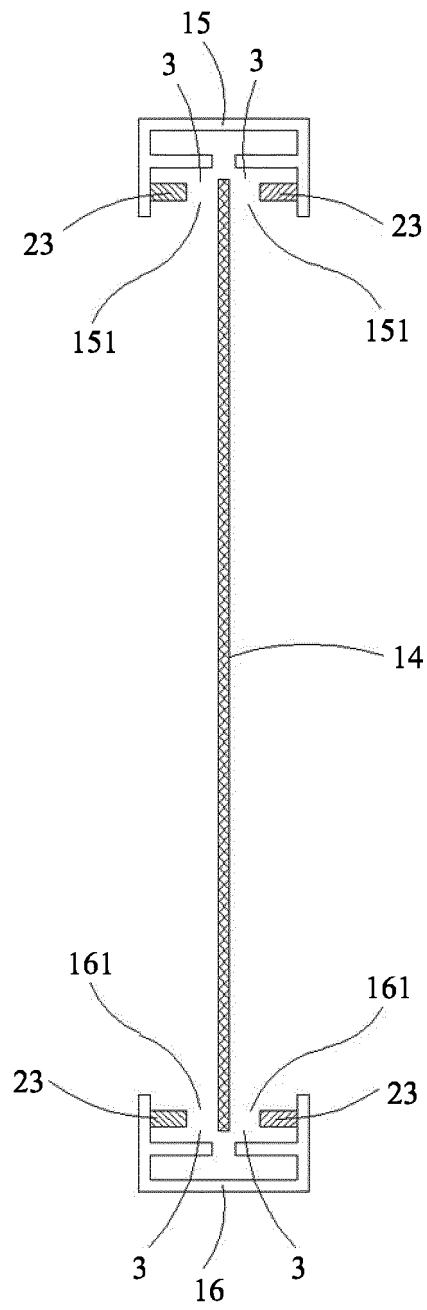


FIG. 4A



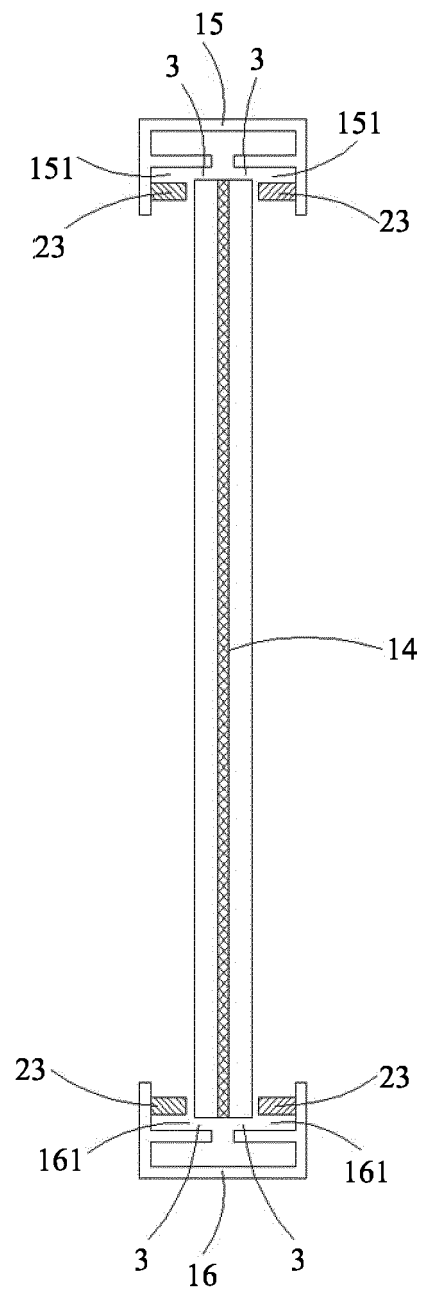


FIG. 4B

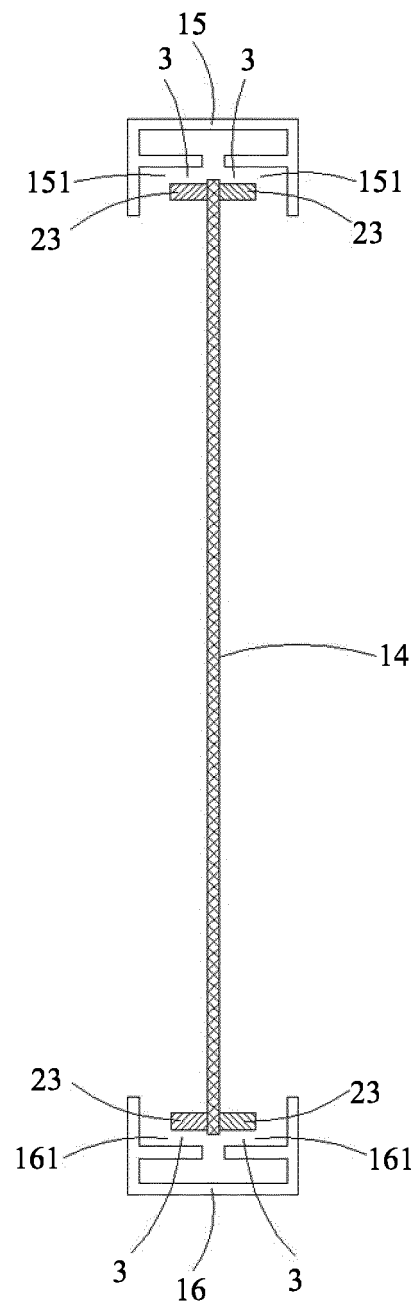


FIG. 4C

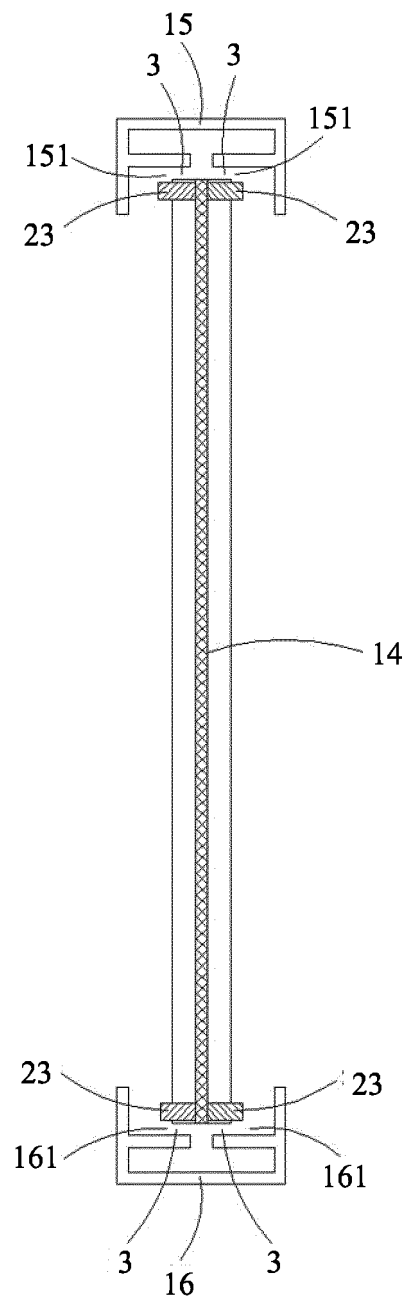


FIG. 4D

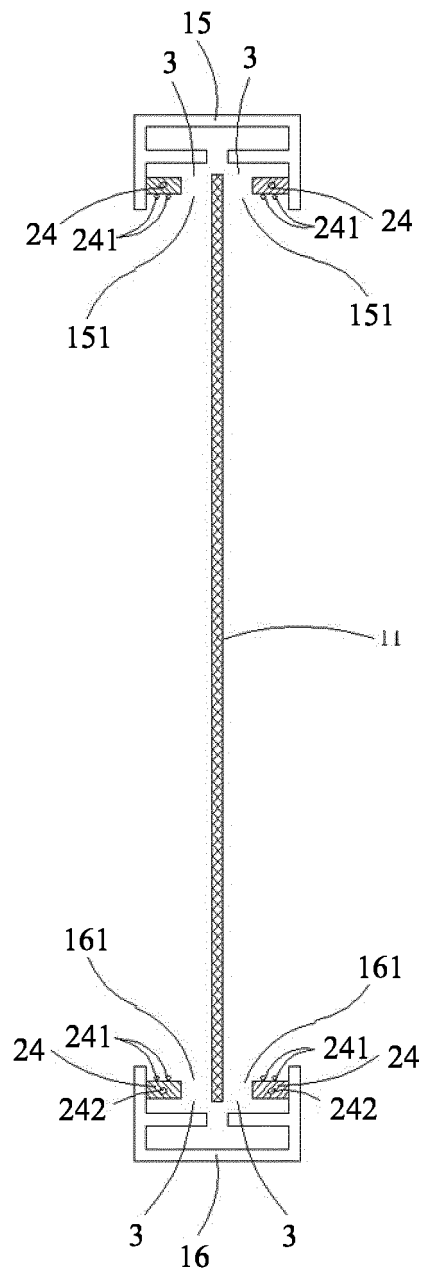


FIG. 5A

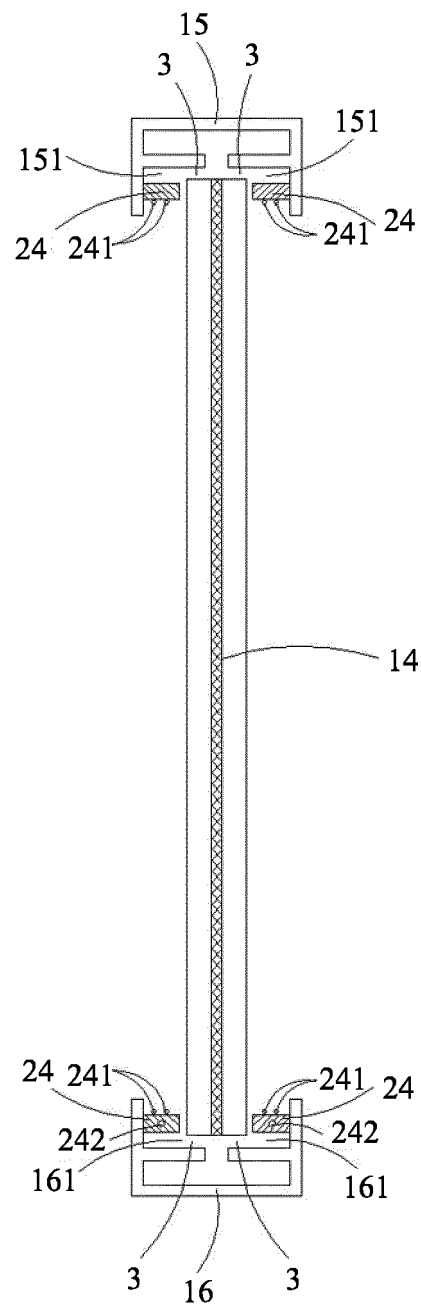


FIG. 5B

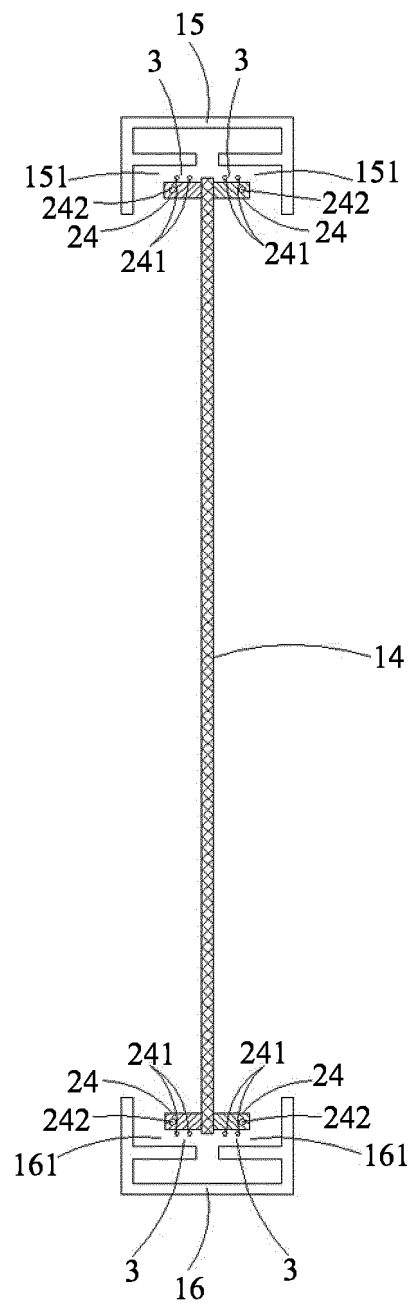


FIG. 5C

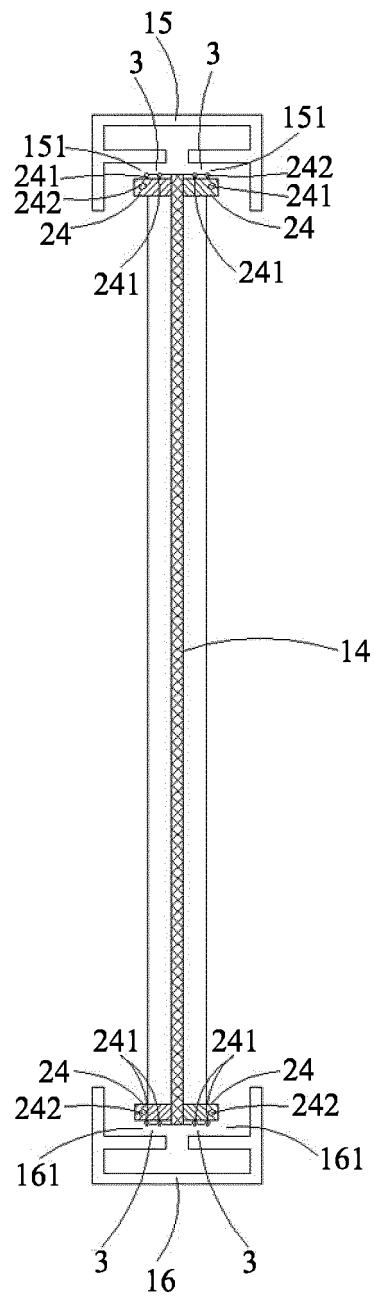


FIG. 5D

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/075712

**A. CLASSIFICATION OF SUBJECT MATTER**

E06B 9/52(2006.01)i; E06B 9/24(2006.01)i; E06B 7/24(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

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)

CNABS, CNTXT, VEN, SIPOABS, CNKI, 门, 窗, 纱网, 蚊虫, 框, 滑动, 滑移, 轨道, door, window, screen, gauze, mosquito, frame, glide, orbit

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                     | Relevant to claim No. |
|-----------|------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Y         | CN 202187693 U (CHEN, Shuangxi) 11 April 2012 (2012-04-11)<br>description, paragraph [0008], and figure 1              | 1-10                  |
| Y         | CN 201024874 Y (LIU, Jisheng) 20 February 2008 (2008-02-20)<br>description page 4 line 20 to page 5 line 15, figure 12 | 1-10                  |
| A         | CN 209228260 U (NANJING MAIHAO CURTAIN WALL ENGINEERING CO., LTD.) 09<br>August 2019 (2019-08-09)<br>entire document   | 1-10                  |
| A         | CN 102561927 A (TAROKO DOOR & WINDOW TECHNOLOGIES, INC.) 11 July 2012<br>(2012-07-11)<br>entire document               | 1-10                  |
| A         | CN 207194788 U (GUANGZHOU HAOHAN ALUMINIUM INDUSTRY CO., LTD.) 06<br>April 2018 (2018-04-06)<br>entire document        | 1-10                  |
| A         | JP 10184246 A (OTSUKA HIDEAKI) 14 July 1998 (1998-07-14)<br>entire document                                            | 1-10                  |
| A         | US 8656979 B2 (TIERNEY BRUCE DONALD) 25 February 2014 (2014-02-25)<br>entire document                                  | 1-10                  |

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

|                                                                                                                                                                         |                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| * Special categories of cited documents:                                                                                                                                | "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                                              |
| "A" document defining the general state of the art which is not considered to be of particular relevance                                                                | "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                                                                     |
| "E" earlier application or patent but published on or after the international filing date                                                                               | "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 |
| "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) | "&" document member of the same patent family                                                                                                                                                                                                    |
| "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                                                                  |                                                                                                                                                                                                                                                  |

Date of the actual completion of the international search

16 October 2020

Date of mailing of the international search report

27 October 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

Authorized officer

Facsimile No. (86-10)62019451

Telephone No.

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



INTERNATIONAL SEARCH REPORT  
Information on patent family members

International application No.

PCT/CN2020/075712

| Patent document<br>cited in search report | Publication date<br>(day/month/year) | Patent family member(s) | Publication date<br>(day/month/year) |
|-------------------------------------------|--------------------------------------|-------------------------|--------------------------------------|
| CN 202187693 U                            | 11 April 2012                        | None                    |                                      |
| CN 201024874 Y                            | 20 February 2008                     | None                    |                                      |
| CN 209228260 U                            | 09 August 2019                       | None                    |                                      |
| CN 102561927 A                            | 11 July 2012                         | None                    |                                      |
| CN 207194788 U                            | 06 April 2018                        | None                    |                                      |
| JP 10184246 A                             | 14 July 1998                         | JP H10184246 A          | 14 July 1998                         |
| US 8656979 B2                             | 25 February 2014                     | US 2011225892 A1        | 22 September 2011                    |

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