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(54) **ROLL-UP WINDOW SCREEN AND CONNECTING DEVICE THEREOF**

(57) A roll-up window screen and a connecting device thereof. The roll-up window screen comprises two side frames, a movable frame, a curtain mesh, a rolling mechanism, and a connecting device connected to the side frames. The rolling mechanism comprises a housing seat and a fixing seat connected to the housing seat. The housing seat is provided with an inner space, the inner space is provided with a roller, the roller is connected to one end of the curtain mesh and the other end of the curtain mesh is connected to the movable frame. The connecting device is arranged at two ends of the fixing seat and comprises a body and a first insertion part connected to the body. One side of the body extends to form a first blocking part, one end of the first blocking part extends to form at least one blocking piece part, and the blocking piece part and the first blocking part are arranged in parallel at intervals to form a track, so that the curtain mesh is guided to enter the side frame to prevent wrinkling.

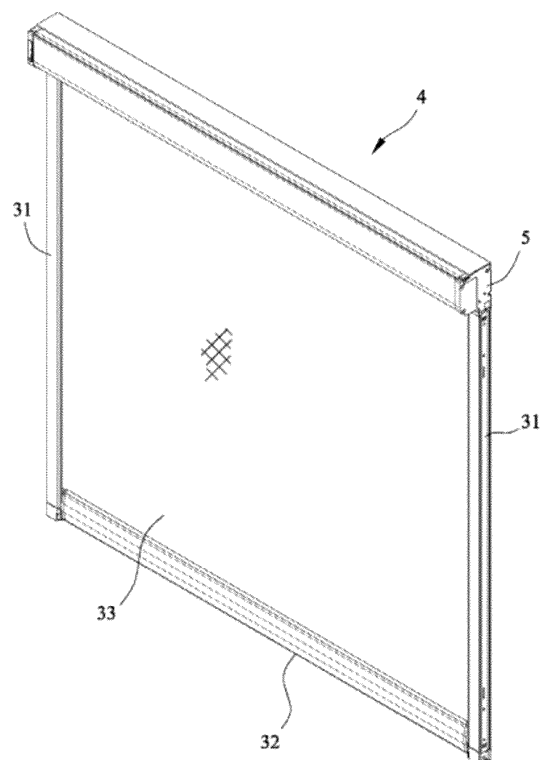


FIG. 3

EP 4 571 035 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to the field of a roller device for a door and window screen shielding curtain, in particular to a roll-up window screen and connecting device thereof.

BACKGROUND ART

[0002] Referring to FIG. 1, a conventional roller screen 1 comprises a housing 10 that surrounds and defines a configuration space 100, a shaft 11 arranged within the configuration space 100, a curtain mesh 12 retractably roll-up on the shaft 11, an operation member 13 connected to the distal end of the curtain mesh 12 away from the housing 10 for pulling, and two side frames 14 respectively connected to opposite ends of the housing 10, and together with the housing 10, surround and define a shielding area Z that is covered when the curtain mesh 12 is extended. Wherein, each of the side frame 14 surrounds and defines an inner space 140, the inner space 140 is provided with an anti-lift track. The curtain mesh 12 comprises a mesh body 121 and two film strips 122 attached to the left and right sides of the mesh body 121 to stabilize the overall retraction and extension of the curtain mesh 12 and prevent the curtain mesh 12 from being lifted out of the side frame 14. When the curtain mesh 12 is extended away from the housing 10 by pulling the operating member 13, the mesh body 121 moves within the inner spaces 140, and the film strips 122 attached to the mesh body 121 can slide within the anti-lift tracks in the inner spaces 140, preventing the curtain mesh 12 from detaching from the inner space 140 of the side frame 14 due to external impact or strong winds.

[0003] Furthermore, considering that the curtain mesh 12 may accumulate foreign objects such as dust and sand outside the configuration space 100 during prolonged use, a cleaning brush strip 19, which generates relative movement during the retraction and extension of the curtain mesh 12 to remove foreign objects, is typically provided at the outlet of the configuration space 100, as shown in FIG. 2, thereby preventing the curtain mesh 12 from bringing in accumulated particles during retraction.

[0004] However, although the cleaning brush strip 19 achieves the purpose of removing foreign objects, the height of the cleaning brush strip 19 is configured to be sufficient for achieving a cleaning effect on the mesh body 121. Therefore, the film strips 122 additionally attached to the mesh body 121 will be pushed by the cleaning brush strip 19, and when the mesh body 121 is relatively uneven, the mesh body 121 near the film strips 122 is prone to wrinkling. If the retraction and extension of the curtain mesh 12 are continuously operated while the mesh body 121 is wrinkled, it is easy to cause uneven extension or retraction of the curtain mesh 12. At the same time,

irreversible creases may occur on the mesh body 121, affecting the appearance and quality, and may even cause subsequent operations to be unsmooth. This definitely needs to be improved, especially when used in a roller screen window with a hinged cover, where the mesh body 121 is more prone to wrinkling near the film strips 122 when entering the side frame 14.

SUMMARY OF INVENTION

[0005] The objective of the present invention is to provide a roll-up window screen and connecting device thereof that effectively prevents wrinkling

[0006] The connecting device of the roll-up window screen according to the present invention comprises a body and a first insertion part connected to the body. One side of the body extends to form a first blocking part, and one end of the first blocking part extends to form at least one blocking piece. The blocking piece and the first blocking part are arranged in parallel at intervals to form a track.

[0007] Additionally, the roll-up window screen of the present invention includes two side frames, a movable frame, a curtain mesh, a rolling mechanism, and a connecting device connected to the side frames. Wherein, the two side frames are arranged in parallel at intervals. The movable frame can move between the two side frames. The rolling mechanism is fixed between the two side frames and comprises a housing seat with an inner space and a fixing seat connected to the housing seat. The inner space is provided with a roller, and the roller is connected to one end of the curtain mesh. The other end of the curtain mesh is connected to the movable frame, allowing the curtain mesh to extend or retract between the two side frames as the movable frame moves. The connecting device is respectively disposed at both ends of the fixing seat. Furthermore, at least one end of the roller is also provided with an extension piece, and the extension piece is provided with a groove. The movable frame is also provided with at least one counterweight.

[0008] The beneficial effect of the present invention is that, even if the curtain mesh is attached with blocking pieces to stabilize the overall pulling and prevent the curtain mesh from lifting off the side frames, the track formed by the blocking piece and the first blocking part of each connecting device can accommodate the blocking pieces of the curtain mesh, thereby guiding the curtain mesh into the side frames and preventing wrinkling.

[0009] Another effect of the present invention is that the extension piece on the roller is provided with a groove. The design of the groove not only increases the capacity to accommodate the blocking pieces on the curtain mesh, thereby increasing the length of the curtain mesh, but also guides the blocking pieces of the curtain mesh within the space of the groove, making the extension and retraction of the curtain mesh smoother.

[0010] A further effect of the present invention is that

the movable frame is provided with at least one counterweight, which increases the weight of the movable frame. Therefore, when the present invention is applied to an electric roll-up window screen, the counterweight can provide stable lifting and lowering of the movable frame when extending the curtain mesh.

[0011] Another objective of the present invention is to provide a .

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is a perspective view illustrating a conventional roller device.

FIG. 2 is a partial schematic view, illustrating the installation of a cleaning brush strip on the roller device in conjunction with FIG. 1.

FIG. 3 is a perspective view illustrating an embodiment of the roll-up window screen of the present invention.

FIG. 4 is a schematic view illustrating the arrangement of pull cords provided in the side frames of the embodiment and the setup of the pull cords.

FIG. 5 is an exploded perspective view illustrating the rolling mechanism of the embodiment.

FIG. 6 is a partial cross-sectional view illustrating the roller of the rolling mechanism.

FIG. 7 is a partially enlarged perspective view illustrating an embodiment of the connecting device of the roll-up window screen of the present invention.

FIG. 8 is a schematic view illustrating the relative position between the connecting device of the embodiment and the curtain mesh.

FIG. 9 is a cross-sectional view illustrating one of the blocking pieces of the curtain mesh within the track.

FIG. 10 is a schematic view illustrating one of the blocking pieces of the curtain mesh within one of the side frames.

DETAILED DESCRIPTION OF EMBODIMENT

[0013] Referring to FIG. 3, an embodiment of the roll-up window screen of the present invention is shown. The embodiment has two side frames 31 arranged in parallel at intervals, a movable frame 32 movably arranged between the side frames 31, a curtain mesh 33 with one end connected to the movable frame 32, a fixed frame 34 with opposite ends respectively connected to the side frames

31 (see FIG. 5), a rolling mechanism 4 for rolling the curtain mesh 33, and two connecting devices 5 of the roll-up window screen according to the present invention, each connected to the side frames 31 (only one is visible in FIG. 3 due to the viewing angle).

[0014] Referring to FIG. 3 and FIG. 4 at the same time, each side frame 31 is provided with an adjustment member 311 at the end opposite to the connecting device 5, and a pull cord 312 with one end connected to the adjustment member 311. As shown in FIG. 4, the other end of each pull cord 312, opposite to the adjustment member 311, first passes through the side frame 31, loops around the movable frame 32, and then passes through the side frame 31 again to connect and fix to the rolling mechanism 4. The tension of the pull cords 312 can be adjusted at any time using the adjustment members 311. At the same time, the tension adjustment of the pull cords 312 through the adjustment members 311 ensures that the movable frame 32 remains stable and does not tilt.

[0015] It should be noted that in this embodiment, the curtain mesh 33 comprises a mesh body 331 for providing a shielding effect and two blocking pieces 332 arranged in parallel on one side of the mesh body 331. Wherein, the blocking pieces 332 are positioned correspond to the side frames 31 respectively, and the blocking pieces 332 can be flexible sheets, such as film strips, thin metal sheets, etc.

[0016] Referring to FIG. 5 and in conjunction with FIGS. 3 and 4, the rolling mechanism 4 comprises a housing seat 41 with an inner space 410, a fixing seat 42 connected to the housing seat 41, and a roller 49 arranged in the inner space 410 and connected to one end of the curtain mesh 33. As shown in FIG. 6, in this embodiment, the roller 49 is provided with extension pieces 491 at both ends respectively (only one end is shown in FIG. 6). Each extension piece 491 is provided with a groove 499. When the curtain mesh 33 is rolled up onto the roller 49, the grooves 499 allow the blocking pieces 332 of the curtain mesh 33 to be respectively rolled and accommodated, thereby allowing the curtain mesh 33 to be relatively rolled more smoothly onto the roller 49. Additionally, the design of the groove 499 in the extension piece 491 not only guides the blocking pieces 332 of the curtain mesh 33 within the space of the groove 499, making the extension and retraction of the curtain mesh 33 smoother, but also increases the capacity to accommodate the blocking pieces 332 on the curtain mesh 33, thereby increasing the usable length of the curtain mesh 33 and providing users with a longer curtain mesh 33.

[0017] When operating the roll-up window screen of this embodiment, the pull cords 312 can be adjusted to maintain appropriate tension through the adjustment members 311, so that the movable frame 32 can remain stable during manual operation, and the curtain mesh 33 can be pulled in coordination with the operation of the rolling mechanism 4, making the extension and retraction

of the curtain mesh 33 smoother. Additionally, when the roll-up window screen is applied to an electric function, the roller 49 of the rolling mechanism 4 is equipped with a motor (not shown) to provide the power for pulling the curtain mesh 33. The motor drives the roller 49 to roll the curtain mesh 33, allowing users to extend or retract the curtain mesh 33 without manually operating the movable frame 32. Furthermore, the movable frame 32 of the roll-up window screen can be equipped with at least one counterweight (not shown). The weight of the counterweight assists in maintaining the stability of the movable frame 32 during movement, especially when the roll-up window screen is applied to an electric function. The counterweight ensures that the movable frame 32 remains stable during lifting and lowering when extending the curtain mesh 33.

[0018] Referring to FIG. 7 and in conjunction with FIG. 5, the connecting device 5 of the roll-up window screen of this embodiment is shown. Specifically, in this embodiment, the connecting device 5 is respectively arranged at both ends of the fixing seat 42 of the rolling mechanism 4, and each connecting device 5 comprises a body 50 and a first insertion part 51 connected to the body 50, and one side of the body 50 extends to form a first blocking part 501, and one end of the first blocking part 501 extends to form a blocking piece part 509. The blocking piece part 509 and the first blocking part 501 are arranged in parallel at intervals to form a track 500. Additionally, one side of the first blocking part 501 extends toward the first insertion part 51 to form a second insertion part 52, and one side of the body 50 further extends to form a second blocking part 502. The second blocking part 502 and the first blocking part 501 are arranged in parallel at intervals to form a channel 505. One side of the second blocking part 502 extends toward the second insertion part 52 to form a third insertion part 53. The third insertion part 53 and the second insertion part 52 are arranged in parallel at intervals.

[0019] Referring to FIGS. 8 and 9 and in conjunction with FIG. 7, in this embodiment, the connection between the connecting device 5 and the side frame 31 is achieved by inserting the first insertion part 51, the second insertion part 52, and the third insertion part 53 into the inner space 310 of the side frame 31, but this is not limiting. Even if the connecting device 5 only has the first insertion part 51, it can still be inserted into the inner space 310 of the side frame 31 to connect with the side frame 31. Subsequently, the diameter of the entrance end of the inner space 310 of the side frame 31 matches the channel opening of the channel 505 of the connecting device 5. Therefore, when the curtain mesh 33 is operated to retract by the rolling mechanism 4, the curtain mesh 33 can enter and move within the inner space 310 of the side frame 31 through the channel 505 of the connecting device 5.

[0020] Referring further to FIGS. 8 to 10, the track 500 of the connecting device 5 is in communication with the anti-lift track 319 provided in the inner space 310 of the

side frame 31, and the spacing between the anti-lift track 319 and the connection point of the track 500 matches with each other. Therefore, the individual blocking pieces 332 of the curtain mesh 33 corresponding to each side frame 31, can be accommodated within the respective track 500 of the connecting device 5, enter and move within the anti-lift track 319 of the side frame 31 through the track 500. When the blocking pieces 332 are properly accommodated within the track 500 of the connecting device 5 and the anti-lift track 319 of the side frame 31, even if a cleaning brush strip 39 is arranged as shown in FIG. 8, the blocking piece part 509 of the connecting device 5 can limit the deformation space of the blocking pieces 332 without causing wrinkles, so that the curtain mesh 33 always maintains in a relatively flat state. Therefore, when retracting the curtain mesh 33, the curtain mesh 331 is less prone to wrinkling due to the movement of the blocking pieces 332, which not only makes the operation smoother, but also avoids creases on the curtain mesh 331 and even affects the service life. Even when the curtain mesh 331 is subjected to external impact or strong winds, the curtain mesh 33 will not be lifted out of the inner space 310 of the side frame 31.

[0021] In summary, the roll-up window screen and the connecting device 5 of the present invention, in the embodiment where the connecting device 5 of the roll-up window screen of the present invention is installed, when operating the embodiment of the roll-up window screen of the present invention, the blocking pieces 332 of the curtain mesh 33 can be properly accommodated and smoothly guided, thereby avoiding movement that causes wrinkling of the curtain mesh 331. Therefore, even considering the cleaning of the curtain mesh 331 and installing the cleaning brush strip 39, the smooth operation of the curtain mesh 33 can still be ensured, and the service life of the curtain mesh 33 can be extended. When the curtain mesh 331 is subjected to external impact or strong winds, the curtain mesh 33 will not be lifted out of the internal space 310 of the side frame 31. Therefore, the objectives of the present invention are indeed achieved.

[0022] As described above, this is only an embodiment of the present invention and should not be used to limit the scope of the invention. Any simple equivalent changes or modifications made based on the content of the patent claims and the patent specification of the present invention shall still fall within the scope of the patent of the present invention.

Claims

1. A connecting device for a roll-up window screen, **characterized in that:** comprises a body and a first insertion part connected to said body, and one side of said body extends to form a first blocking part, and one end of said first blocking part extends to form at least one blocking piece part, said blocking piece

- part and said first blocking part are arranged in parallel at intervals to form a track.
2. The connecting device, as recited in claim 1, **characterized in that:** wherein one side of said first blocking part extends toward said first insertion part to form a second insertion part.
 3. The connecting device, as recited in claim 2, **characterized in that:** wherein one side of said body further extends to form a second blocking part, and said second blocking part is arranged in parallel with said first blocking part at intervals to form a channel.
 4. The connecting device, as recited in claim 3, **characterized in that:** wherein one side of said second blocking part extends toward said second insertion part to form a third insertion part, and said third insertion part is arranged in parallel with said second insertion part at intervals.
 5. A roll-up window screen having the connecting device according to any one of claims 1 to 4, **characterized in that:** has two side frames, a movable frame, a curtain mesh, a rolling mechanism, and said connecting device connected to said side frames, wherein said rolling mechanism comprises:
 - a housing seat, said housing seat has an inner space, wherein said inner space is provided with a roller, and said roller is connected to one end of said curtain mesh, while the other end of said curtain mesh is connected to said movable frame; and
 - a fixing seat, said fixing seat is connected to said housing seat, wherein said connecting device is respectively arranged at both ends of said fixing seat.
 6. The roll-up window screen, as recited in claim 5, **characterized in that:** wherein a fixed frame is further provided, wherein both ends of said fixed frame are respectively connected to one end of said side frames.
 7. The roll-up window screen, as recited in claim 5 or 6, **characterized in that:** wherein at least one end of said roller is provided with an extension piece, and said extension piece is provided with a groove.
 8. The roll-up window screen, as recited in claim 6, **characterized in that:** wherein each of said side frames is provided with an adjustment member at the end opposite to said connecting device.
 9. The roll-up window screen, as recited in claim 7, **characterized in that:** wherein at least one side of said curtain mesh is provided with a blocking piece.
 10. The roll-up window screen, as recited in claim 8, **characterized in that:** wherein each of said side frames is provided with a pull cord, one end of said pull cord is connected to said adjustment member, and the other end passes through said side frame, loops around said movable frame, and then passes through said side frame again to connect and fix to said rolling mechanism.
 11. The roll-up window screen, as recited in claim 10, **characterized in that:** wherein said movable frame is provided with at least one counterweight.
 12. The roll-up window screen, as recited in claim 11, **characterized in that:** wherein said roller is provided with a motor that provide the power for pulling said curtain mesh.

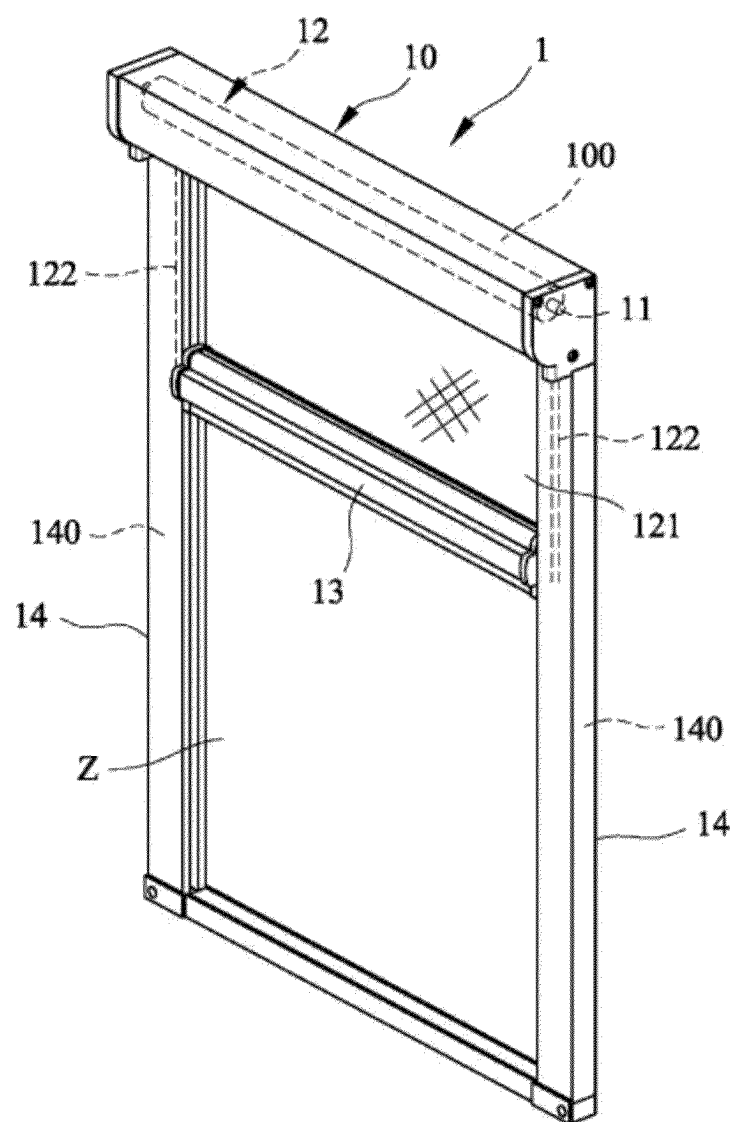


FIG. 1

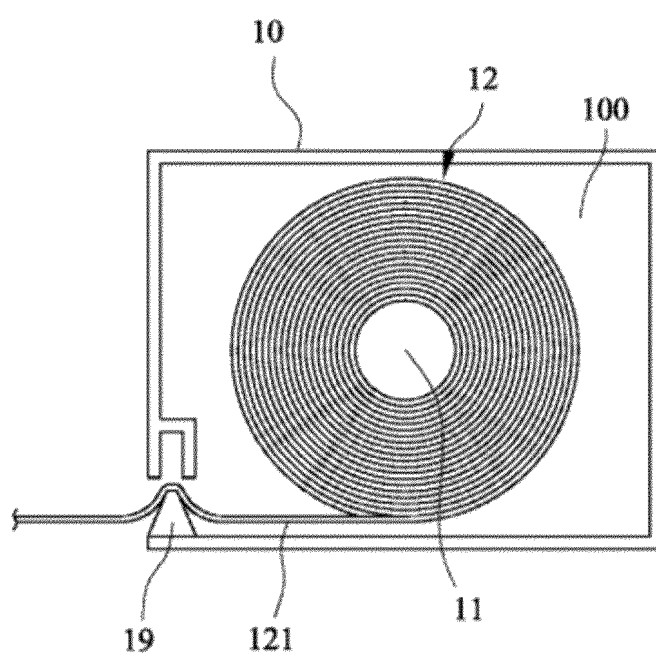


FIG. 2

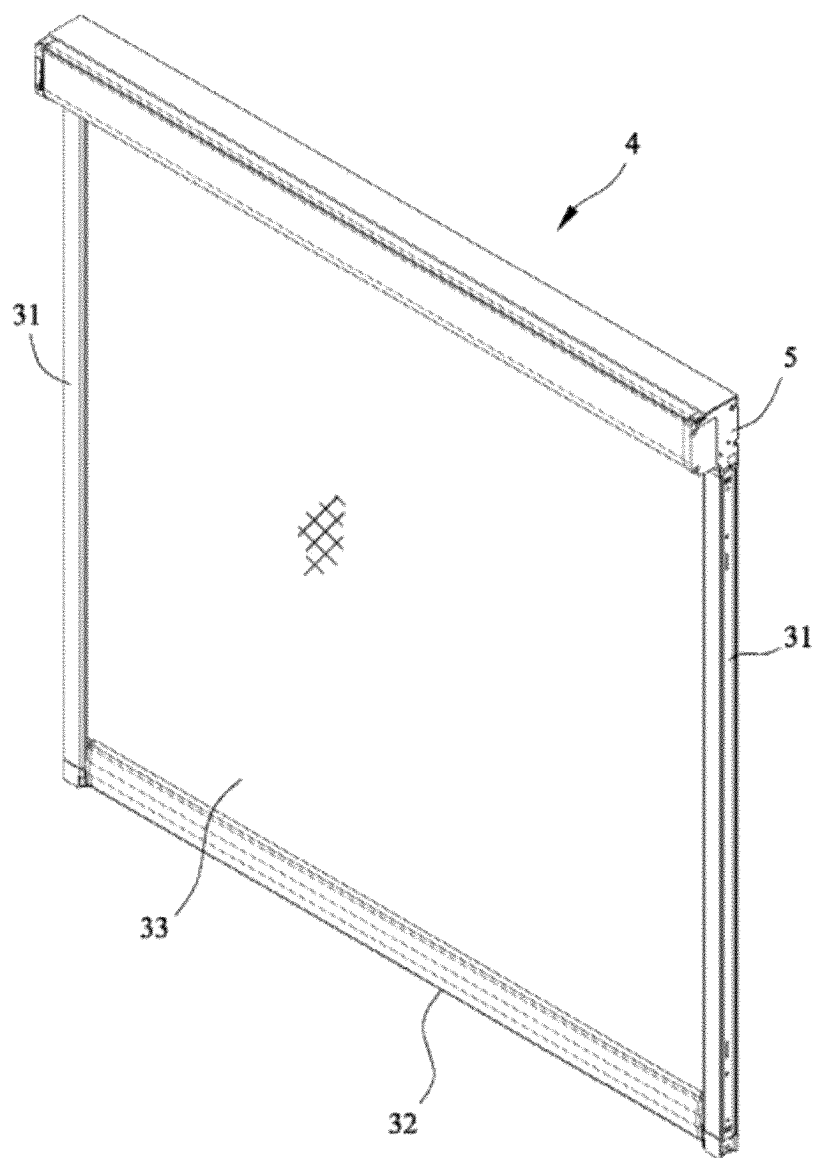


FIG. 3

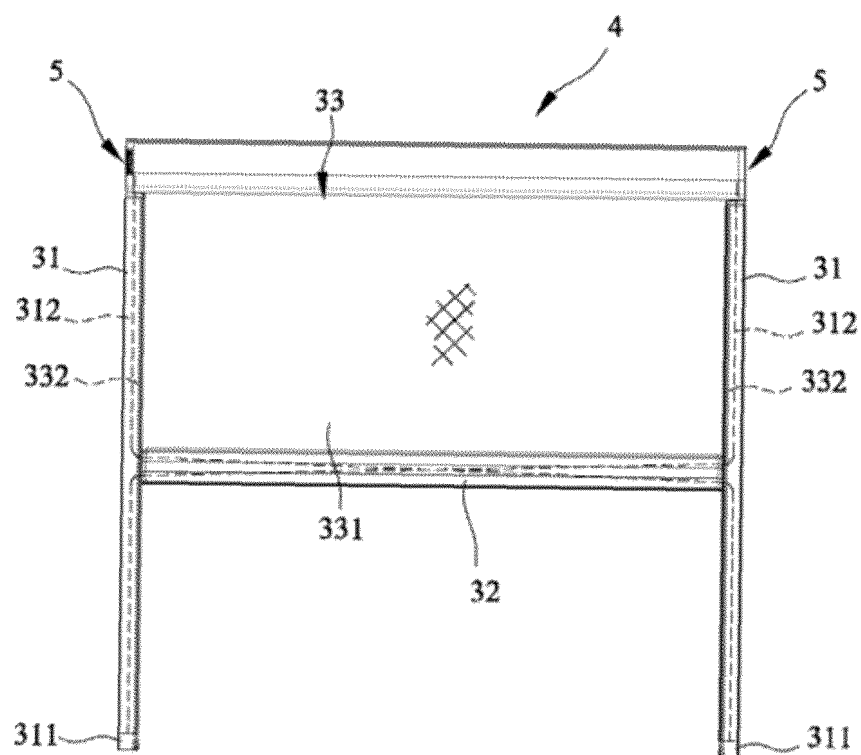


FIG. 4

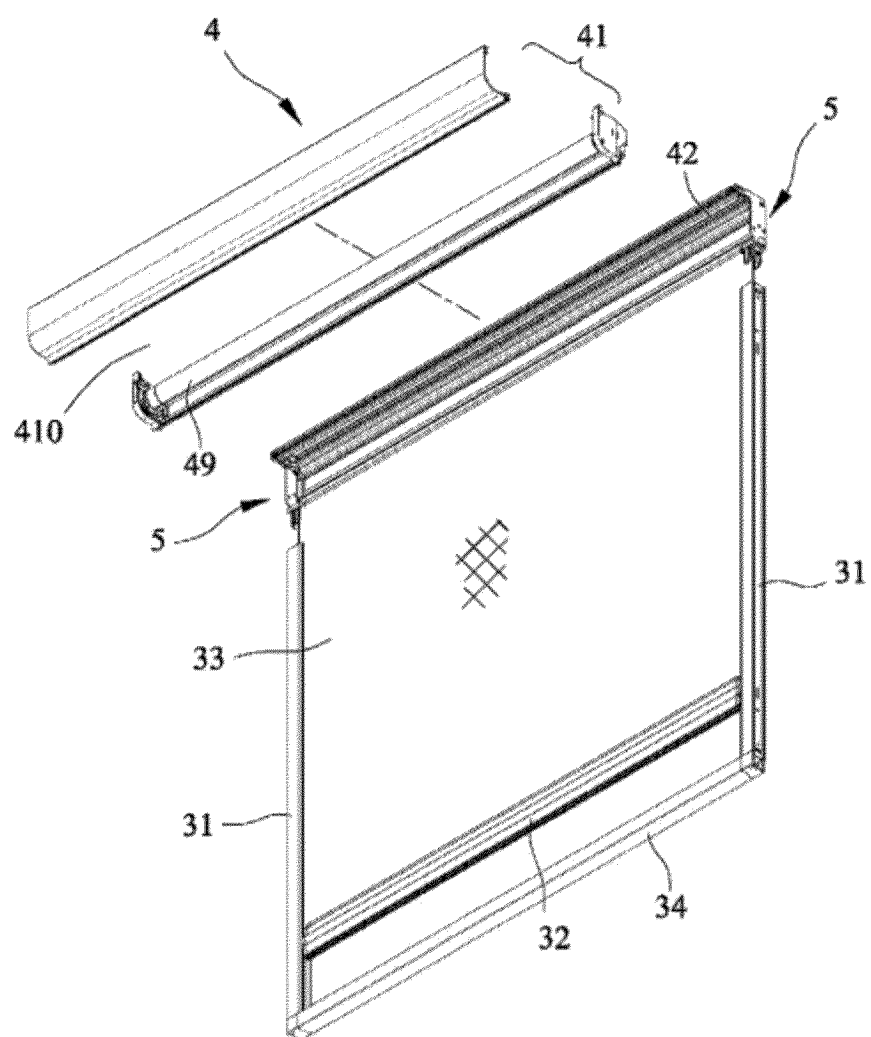


FIG. 5

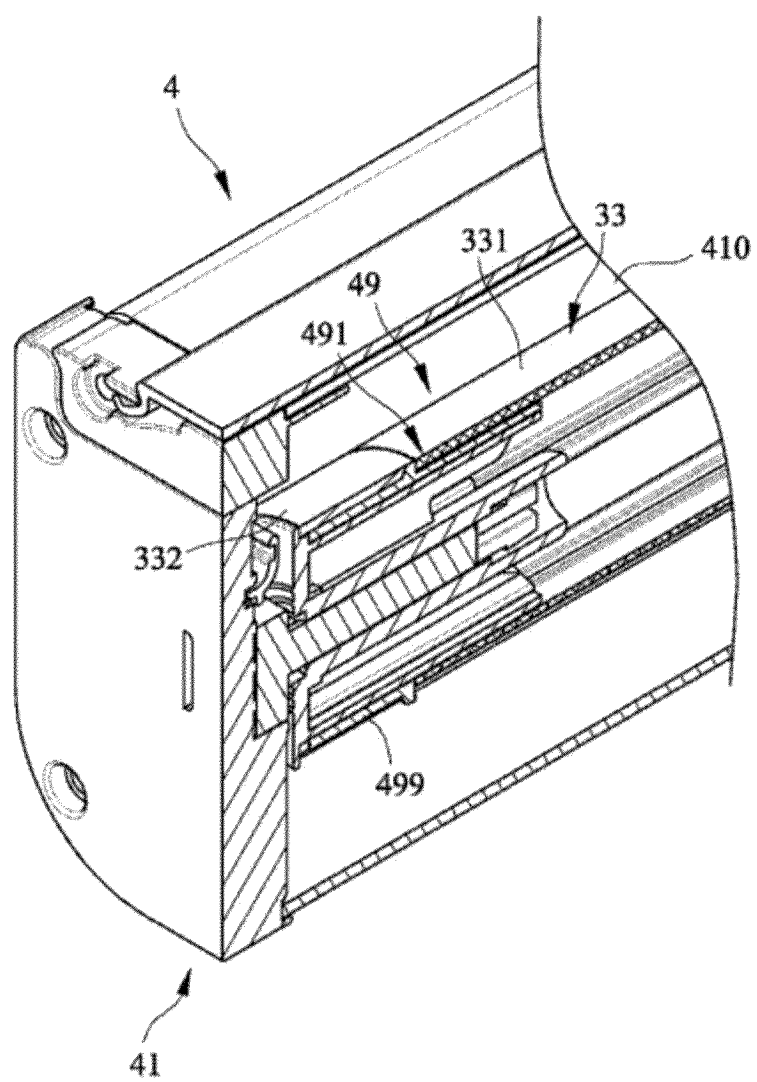


FIG. 6

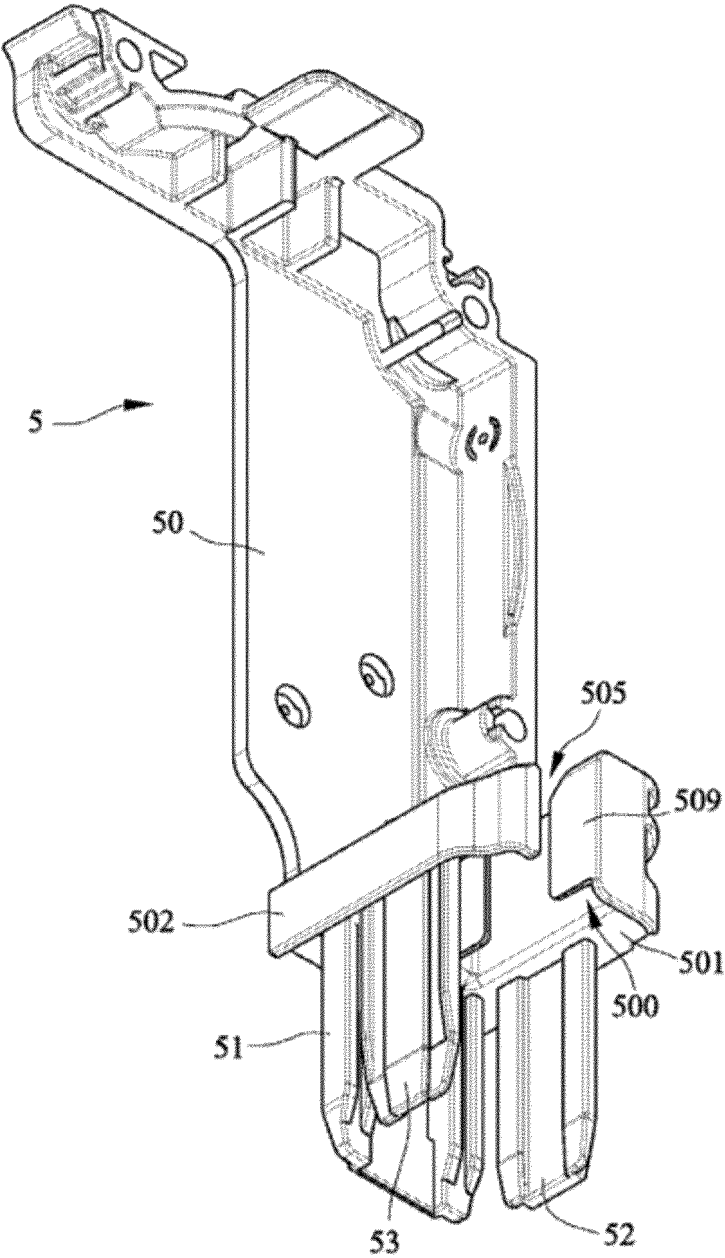


FIG. 7

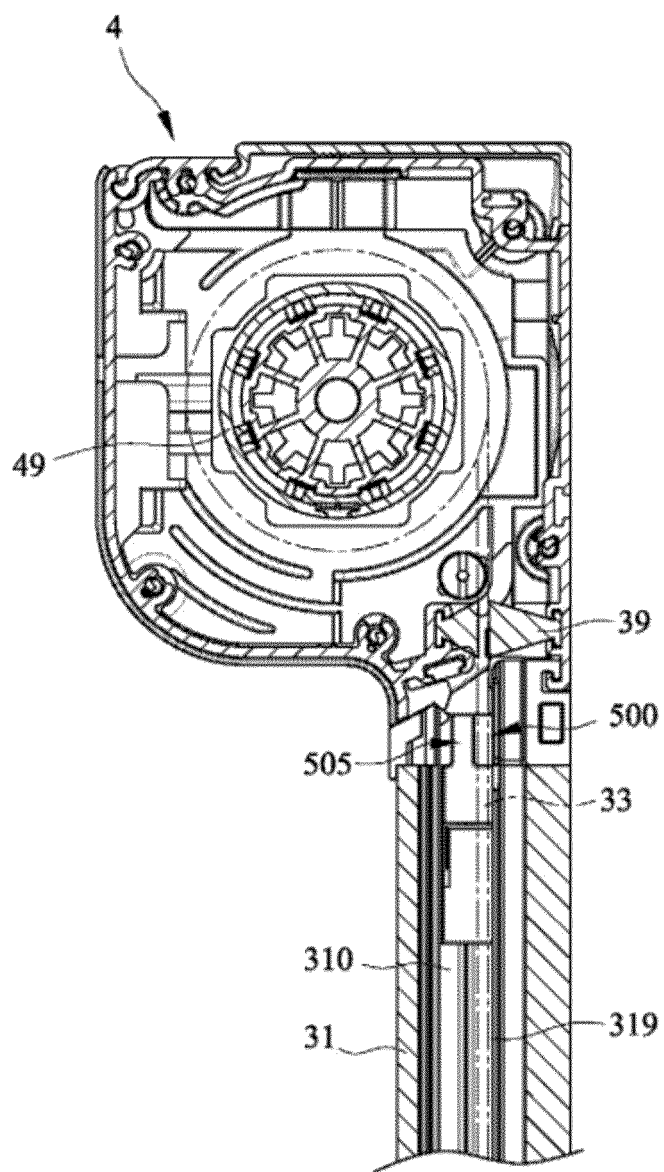


FIG. 8

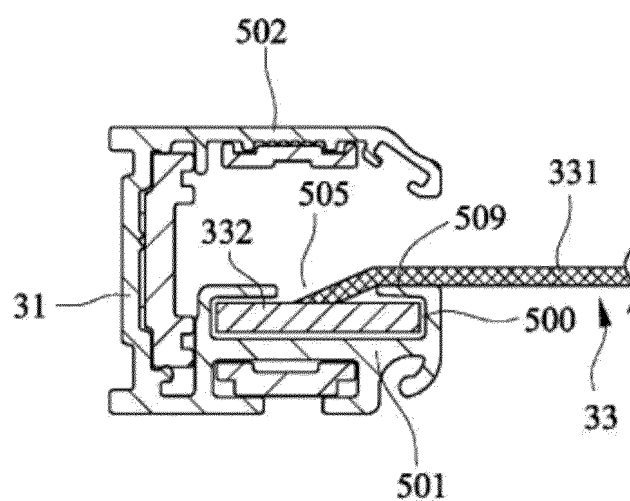


FIG. 9

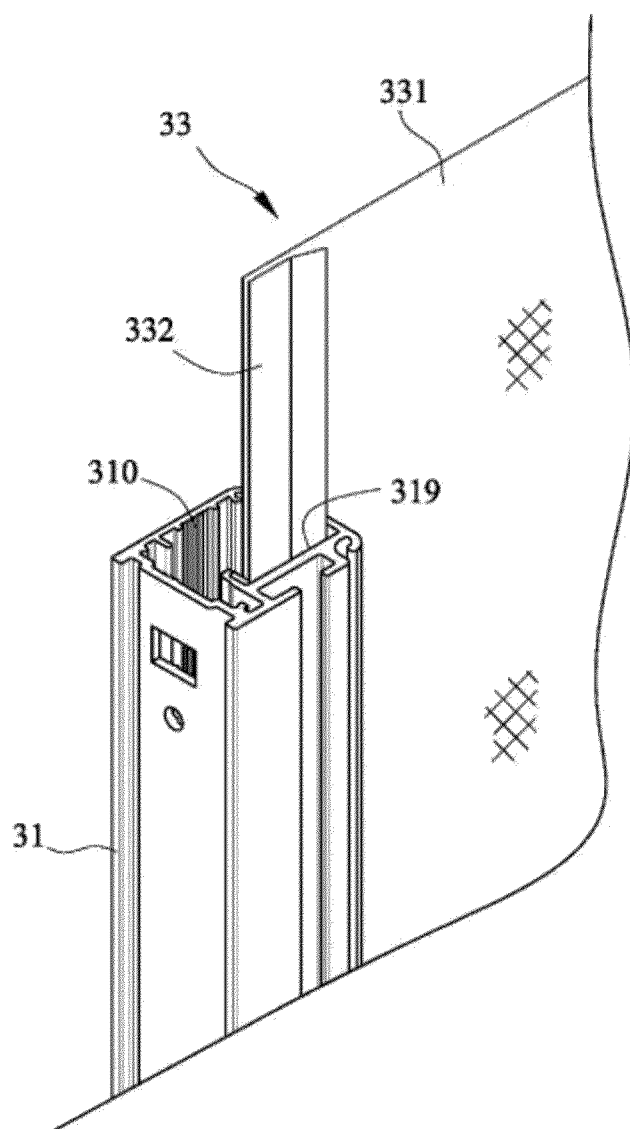


FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/131074

A. CLASSIFICATION OF SUBJECT MATTER

E06B9/54(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)

IPC: 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)

CNXTX, CNKI, ENTXTC, VEN: 卷轴, 卷绕, 卷帘, 卷辊, 连接装置, 连接器, 连接件, 角码, 组角, 拐角, 插接, 卡接, 卡合, 轨, 轨道, 线, 绳, 索, 交叉, 交错, 斜交, 对角, roll+, scroll+, connect+, plug+, corner, rail, track, rope?, cord, string, cable, cross +, intersect+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ 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
"D" document cited by the applicant in the international application	"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
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 24 February 2023	Date of mailing of the international search report 28 March 2023
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088 Facsimile No. (86-10)62019451	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT

International application No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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