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

(11) **EP 3 842 614 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.06.2021 Bulletin 2021/26

(21) Application number: **20199356.5**

(22) Date of filing: **30.09.2020**

(51) Int Cl.:
E06B 9/42 *(2006.01)* ***E06B 9/60*** *(2006.01)*
E06B 9/90 *(2006.01)*

(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
KH MA MD TN

(30) Priority: **26.12.2019 CN 201911368596**

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(54) ROLLING CURTAIN

(57) A rolling curtain is provided according to the present application, which includes a reel, a curtain body and a fixing frame. The curtain body is wound around the reel, and when the curtain body is in use, an outer end of the curtain body is hung vertically below the reel, and an inner end of the curtain body is connected with the reel. The reel is rotatable and has two rotation directions of winding and releasing. The fixing frame is connected with two ends of the reel. A control assembly is provided on at least one end of the reel. The control assembly includes at least one first elastic member. One end of the first elastic member is connected with the reel, and the other end of the first elastic member is connected with the fixing frame. The first elastic member is configured to drive the reel to rotate in the winding direction, and the force of the first elastic member for driving the rotation of the reel in the winding direction is balanced in real time with the force of the portion of the curtain body hung vertically below the reel for driving the rotation of the reel in the releasing direction. The curtain provided by the present embodiment can maintain balance with the help of gravity.

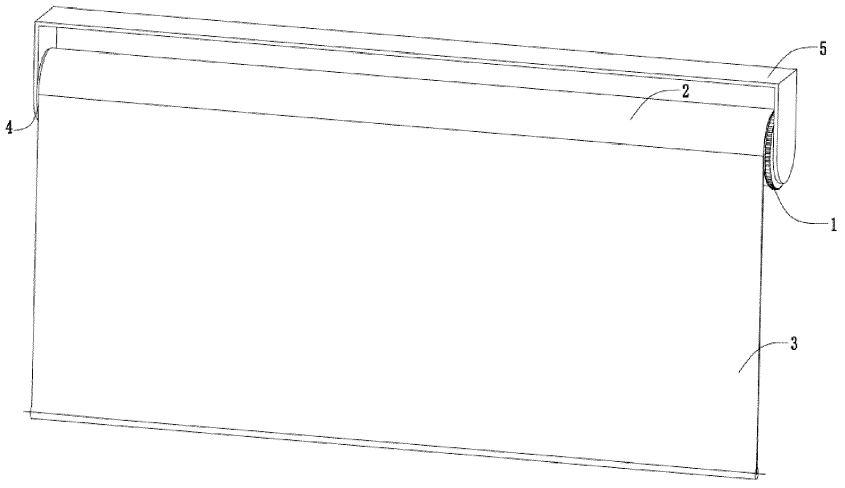

Figure 1

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Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the priority to Chinese Patent Application No. 201911368596.X, titled "ROLLING CURTAIN", filed with the China National Intellectual Property Administration on December 26, 2019.

FIELD

[0002] The present application relates to the technical field of curtain, and in particular to a rolling curtain.

BACKGROUND

[0003] With the improvement of living standards, consumers' requirements for curtains are also gradually improving. In addition to the original decoration and shading functions of the curtains, the curtains are further required to have the features of easy installation, smooth retraction and release, and low noise during the retraction and release.

[0004] At present, the curtains are mainly classified into electric curtains and manual curtains according to control methods. In the electric curtains, a motor is adopted to provide power to realize the retraction and release of the curtain. Because the motor is included, the installation of the curtain occupies a large space, and the motor generates noise when it is working. Manual curtains include pulling type curtains and bead curtains. The top of the pulling type curtain is arranged on a rail, and the opening and closing of the curtain are achieved by manually pulling the curtain left and right. This pulling type curtain makes a large noise when being opened or closed, and the curtain is not stored after being opened, but is only placed on two sides of the window, which is not beautiful for the office space. As for the bead curtains, the beads are pulled up and down to drive the reel to rotate, thus the curtain can be rolled up. The roll-up of this kind of curtain is not smooth, which is easy to get stuck. When the curtain is stuck, if the user recklessly continues to pull the beads, the curtain may be damaged. Besides, this kind of curtain makes a large noise when being rolled up.

SUMMARY

[0005] An object of the present application is to provide a rolling curtain to solve the problem of unsmooth opening and closing of the curtain and large noise in the opening and closing of the curtain in the conventional technology.

[0006] In view of this, a rolling curtain is provided according to the present application, which includes a reel, a curtain body and a fixing frame.

[0007] The curtain body is wound around the reel, and when the curtain body is in use, an outer end of the curtain body is hung vertically below the reel, and an inner end of the curtain body is connected with the reel.

[0008] The reel is rotatable, and has two rotation directions of winding and releasing. When the reel rotates in the releasing direction, the outer end of the curtain body moves downward, and the curtain body is gradually released from the reel. When the reel rotates in the winding direction, the outer end of the curtain body moves upward, and the curtain body is gradually wound around the reel.

[0009] The fixing frame is connected with two ends of the reel.

[0010] A control assembly is provided on at least one end of the reel. The control assembly includes at least one first elastic member. One end of the first elastic member is connected with the reel, and another end of the first elastic member is connected with the fixing frame. The first elastic member is configured to drive the reel to rotate in the winding direction, and the force of the first elastic member for driving the rotation of the reel in the winding direction is balanced in real time with the force of the portion of the curtain body hung vertically below the reel for driving the rotation of the reel in the releasing direction.

[0011] Preferably, the first elastic member is a clockwork spring, the clockwork spring is provided inside the reel, an outer end of the clockwork spring is connected with an inner wall of the reel, and an inner end of the clockwork spring is connected with the fixing frame.

[0012] Preferably, the control assembly further includes a rotating seat which is provided inside the reel. The rotating seat is interference-connected with the reel. The rotating seat has a hollow structure, and the clockwork spring is arranged in the rotating seat. The outer end of the clockwork spring is connected with an inner wall of the rotating seat.

[0013] Preferably, the control assembly further includes a force-adjusting member for adjusting an initial elastic force of the clockwork spring. The inner end of the clockwork spring is connected with the force-adjusting member, and the force-adjusting member is connected to the fixing frame.

[0014] Preferably, one end of the force-adjusting member is an adjustment shaft, and the other end is an adjustment disc. The adjustment shaft is threaded in the clockwork spring, and the inner end of the clockwork spring is connected with an outer wall of the adjustment shaft. The adjustment disc is connected with the fixing frame.

[0015] Preferably, a positioning pin is inserted in the force-adjusting member. The positioning pin is connected with the fixing frame, an end of the positioning pin close to the adjustment shaft is a cylindrical structure, and an end of the positioning pin away from the adjustment shaft is a non-cylindrical structure. The adjustment shaft has a hollow structure, the adjustment disc is provided with a non-cylindrical through hole matching the positioning pin, and a second elastic member is provided between the adjustment shaft and the rotating seat.

[0016] Preferably, the second elastic member is a compression spring.

[0017] Preferably, a fixing bolt is provided at one end of the fixing frame connected with the positioning pin. The fixing bolt has a non-cylindrical structure, and the positioning pin is provided with a non-cylindrical groove matching the fixing bolt.

[0018] Preferably, a speed reducer is provided at an end of the reel where no control assembly is provided. The speed reducer is provided inside the reel and is interference-connected with the reel. The speed reducer is connected to the fixing frame by a bolt.

[0019] Preferably, multiple ribs are provided on an outer wall of the rotating seat, and the multiple ribs are in interference fit with the inner wall of the reel.

[0020] Compared with the conventional technology, the present application has the following advantages.

[0021] The curtain provided by the present application keeps balance with the help of gravity, and the force provided by the clockwork spring is balanced with the gravity of the hanging part of the curtain in real time. The curtain can be pulled down by a gentle pull (the balance is broken, and the downward force is greater than the elastic force of the clockwork spring), and the curtain remains in balance after releasing the hand (the balance is maintained, and the downward force is substantially equal to the elastic force of the clockwork spring); and the curtain can be wound around the reel by lifting it by hand (the balance is broken, and the downward force is less than the elastic force of the clockwork spring), and the curtain again remains in balance after releasing the hand (the balance is maintained, and the downward force is substantially equal to the elastic force of the clockwork spring). The rolling curtain provided by the present application can be rolled up smoothly without noise. According to the present application, an adjustment member for adjusting the initial elastic force of the clockwork spring is provided. By reasonably designing the mechanism of the positioning pin and the adjustment member, the adjustment member can be rotated once the adjustment disc is pressed inward, so as to adjust the initial elastic force of the clockwork spring, and the compression spring can bounce the adjustment member back to position by releasing the adjustment disc. According to the present application, a rotating seat is further provided between the clockwork spring and the reel, the rotating seat is provided with multiple ribs, and the multiple ribs are in interference fit with the inner wall of the reel, so that the rotating seat can transmit the force between the clockwork spring and the reel. According to the present application, the control assembly can be installed as a whole, which is convenient for installation and subsequent replacement.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The drawings to be used in the description of the embodiments or the conventional technology will be described briefly as follows, so that the technical solutions according to the embodiments of the present application or according to the conventional technology will become clearer. It is apparent that the drawings in the following description only illustrate some embodiments of the present application. For those skilled in the art, other drawings may be obtained according to these drawings without any creative work.

Figure 1 is a schematic structural view of a rolling curtain according to the present application;

Figure 2 is a schematic view showing the assembly of the rolling curtain according to the present application;

Figure 3 is a schematic sectional view of the rolling curtain according to the present application; and

Figure 4 is a schematic view showing the assembly of a control assembly of the rolling curtain according to the present application.

[0023] Reference numerals are listed as follows:

1	control assembly;	2	reel;
3	curtain body;	4	speed reducer;
5	fixing frame;	11	positioning pin;
12	force-adjusting member;	13	rotating seat;
14	pressing sheet;	15	first elastic member;
16	second elastic member;	121	adjustment disc;

(continued)

122 adjustment shaft.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0024] The technical solutions according to the embodiments of the present application will be described clearly and completely as follows in conjunction with the drawings. It is apparent that the described embodiments are only a part of the embodiments according to the present application, rather than all the embodiments. Based on the embodiments in the present application, all of other embodiments, made by the person skilled in the art without any creative efforts, fall into the scope of the present application.

[0025] In the description of the present application, it should be noted that the orientation or positional relationships indicated by terms such as "center", "up", "down", "left", "right", "vertical", "horizontal", "inner", "outer", and the like are based on the orientation or positional relationships shown in the drawings, and are merely for the convenience of describing the present application and the simplification of the description, and do not indicate or imply that the device or element referred to must have a particular orientation, or be configured and operated in a particular orientation, and therefore should not be construed as a limitation to the scope of the present application. In addition, terms such as "first", "second", "third" and the like are merely for description, and should not be construed as indicating or implying relative importance.

[0026] Otherwise clear specification and definition are provided, terms such as "installation", "joint" and "connection" should be understood in a broad sense, such as a fixed connection, a detachable connection or an integral connection; a mechanical connection or an electrical connection; a direct connection or an indirect connection through an intermediate media, or an internal connection inside two components. For those skilled in the art, the specific meaning of the above terms in the present application may be understood in the light of specific circumstances.

First embodiment

[0027] Referring to Figures 1 to 4, a rolling curtain is provided according to the present embodiment, which includes a reel 2, a curtain body 3 and a fixing frame 5. The curtain body 3 is wound around the reel 2, and the fixing frame 5 is connected with two ends of the reel 2.

[0028] When the curtain body 3 is in use, an outer end of the curtain body 3 is hung vertically below the reel 2, and an inner end of the curtain body 3 is connected with the reel 2. The reel 2 is rotatable, and has two rotation directions of winding and releasing. When the reel 2 rotates in the releasing direction, the outer end of the curtain body 3 moves downward, and the curtain body 3 is gradually released from the reel 2. When the reel 2 rotates in the winding direction, the outer end of the curtain body 3 moves upward, and the curtain body 3 is gradually wound around the reel 2.

[0029] A control assembly 1 is provided on at least one end of the reel 2. The control assembly 1 includes at least one first elastic member 15. One end of the first elastic member 15 is connected with the reel 2, and another end of the first elastic member 15 is connected with the fixing frame 5. The first elastic member 15 is configured to drive the reel 2 to rotate in the winding direction, and the force of the first elastic member 15 for driving the rotation of the reel 2 in the winding direction is balanced in real time with the force of the portion of the curtain body 3 hung vertically below the reel 2 for driving the rotation of the reel 2 in the releasing direction.

[0030] The curtain provided by the present embodiment keeps balance with the help of gravity, and the force provided by the first elastic member 15 is balanced with the gravity of the hanging part of the curtain body 3 in real time. The curtain can be pulled down by a gentle pull, and the curtain remains in balance after releasing the hand; and the curtain can be wound around the reel by lifting it by hand, and the curtain again remains in balance after releasing the hand. The rolling curtain provided by the present embodiment can be rolled up smoothly without noise.

[0031] Specifically, the reel 2 of this embodiment has a hollow structure, and the fixing frame 5 has a U-shaped structure. Bolts facing inward are provided on two arms of the fixing frame 5. The bolts of the fixing frame 5 are inserted at two ends of the reel 2. The control assembly 1 is arranged in one end of the reel 2. The control assembly 1 includes the first elastic member 15. The first elastic member 15 is a clockwork spring, an outer end of the clockwork spring is connected with an inner wall of the reel 2, and the outer end of the clockwork spring is connected with the bolt of the fixing frame 5. In practical production, the control assembly 1 and the first elastic member 15, namely the clockwork spring, in the control assembly 1 of this embodiment are not limited to one. If the mass of the curtain body 3 is large, the number of the control assembly 1 or the clockwork spring can be increased correspondingly, so that the force of the control assembly 1 is balanced with that of the curtain body 3 in real time. If the elastic force of the clockwork spring is larger, the force of the control assembly 1 can be balanced with that of the curtain body 3 in real time by increasing the density of the curtain body 3. The curtain of this embodiment can keep balance with the help of gravity.

[0032] In an improved embodiment, the control assembly 1 further includes a rotating seat 13 which is provided inside

the reel 2. The rotating seat 13 is interference-connected with the reel 2. The rotating seat 13 has a hollow tubular structure with two open ends. A pressing sheet 14 is provided at an inner end of the rotating seat 13 and is clamped with the rotating seat 13 to seal the opening of the inner end of the rotating seat 13. The first elastic member 15, namely the clockwork spring, is arranged in the rotating seat 13, and the outer end of the clockwork spring is connected with an inner wall of the rotating seat 13. Specifically, multiple ribs are provided on an outer wall of the rotating seat 13, and the multiple ribs are in interference fit with the inner wall of the reel 2, so that the rotating seat 13 can transmit the force between the clockwork spring and the reel 2.

[0033] In an improved embodiment, the control assembly 1 further includes a force-adjusting member 12 for adjusting the first elastic member 15, that is, for adjusting an initial elastic force of the clockwork spring. An inner end of the clockwork spring is connected with the force-adjusting member 12, and the force-adjusting member 12 is connected to the fixing frame 5.

[0034] Specifically, one end of the force-adjusting member 12 is an adjustment shaft 122, and the other end is an adjustment disc 121. The adjustment shaft 122 is threaded in the clockwork spring, and the inner end of the clockwork spring is connected with an outer wall of the adjustment shaft 122. The adjustment disc 121 seals the opening of the outer end of the rotating seat 13 and is connected to the fixing frame 5. The diameter of the adjustment disc 121 is greater than the inner diameter of the reel 2. During installation, the adjustment disc 121 is arranged outside the end portion of the reel 2. A side wall of the adjustment disc 121 has a gear-like structure, and the user can adjust the initial elastic force of the clockwork spring by rotating the adjustment disc 121.

[0035] In an improved embodiment, a positioning pin is 11 inserted in the force-adjusting member 12. The positioning pin 11 is connected with the fixing frame 5, an end of the positioning pin 11 close to the adjustment shaft 122 is a cylindrical structure, and an end of the positioning pin 11 away from the adjustment shaft 122 is a non-cylindrical structure. The adjustment shaft 122 has a hollow structure, the adjustment disc 121 is provided with a non-cylindrical through hole matching the positioning pin 11, and a second elastic member 16 is provided between the adjustment shaft 122 and the pressing sheet 14 of the rotating seat 13.

[0036] Specifically, the second elastic member 16 is a compression spring. One end of the compression spring abuts against the pressing sheet 14 of the rotating seat 13, and the other end is threaded in the adjustment shaft 122 and abuts against the adjustment disc 121. Under normal conditions, the second elastic member 16, namely the compression spring, squeezes the force-adjusting member 12 outwards, so that the non-cylindrical through hole of the adjustment disc 121 cooperates with the non-cylindrical end of the positioning pin 11 to ensure that the force-adjusting member 12 does not rotate with the first elastic member 15, namely the clockwork spring. When it is required to adjust the initial elastic force of the first elastic member 15, namely the clockwork spring, the adjustment disc 121 is pressed inward, so that the non-cylindrical through hole of the adjustment disc 121 is at the cylindrical end of the positioning pin 11, and at this time, the adjustment disc 121 can be rotated to adjust the initial elastic force of the first elastic member 15. After the adjustment is completed, the adjustment disc 121 is released, and the compression spring 16 bounces the force-adjusting member 12 back to position. A fixing bolt is provided at one end of the fixing frame 5 connected with the positioning pin 11. The fixing bolt has a non-cylindrical structure, and the positioning pin 11 is provided with a non-cylindrical groove matching the fixing bolt. The fixing bolt is inserted into the groove of the positioning pin 11 during installation, finishing the connection between the positioning pin 11 and the fixing frame 5 and keeping the positioning pin 11 from rotating with the force-adjusting member 12.

[0037] In an improved embodiment, a speed reducer 4 is provided at another end of the reel 2 where no control assembly 1 is provided. The speed reducer 4 is provided inside the reel 2 and is interference-connected with the reel 2. The speed reducer 4 is connected to the fixing frame 5 by the bolt.

[0038] In summary, the curtain provided by the present embodiment keeps balance with the help of gravity, and the force provided by the clockwork spring is balanced with the gravity of the hanging part of the curtain in real time. The curtain can be pulled down by a gentle pull, and the curtain remains in balance after releasing the hand; and the curtain can be wound around the reel by lifting it by hand, and the curtain again remains in balance after releasing the hand. The rolling curtain provided by the present embodiment can be rolled up smoothly without noise. In the present embodiment, the adjustment member for adjusting the initial elastic force of the clockwork spring is provided. By reasonably designing the mechanism of the positioning pin and the adjustment member, the adjustment member can be rotated once the adjustment disc is pressed inward, so as to adjust the initial elastic force of the clockwork spring, and the compression spring can bounce the adjustment member back to position by releasing the adjustment disc. In the present embodiment, the rotating seat is further provided between the clockwork spring and the reel, the rotating seat is provided with multiple ribs, and the multiple ribs are in interference fit with the inner wall of the reel, so that the rotating seat can transmit the force between the clockwork spring and the reel. The control assembly of the present embodiment can be installed as a whole, which is convenient for installation and subsequent replacement.

[0039] Finally, it should be stated that: the above embodiments are only intended for illustrating the technical solutions of the present application rather than limiting the present application. Although the present application is illustrated in detail with reference to the embodiments described above, it should be understood by those skilled in the art that,

modifications can still be made to the technical solutions recited in the embodiments described above, or equivalent substitutions can be made onto a part or all of the technical features of the technical solution. While such modifications or substitutions will not cause the essence of corresponding technical solutions to depart from the scope of the technical solutions of the embodiments of the present application.

Claims

1. A rolling curtain, comprising a reel, a curtain body and a fixing frame; wherein,
the curtain body is wound around the reel, and while the curtain body is in use, an outer end of the curtain body is hung vertically below the reel, and an inner end of the curtain body is connected with the reel;
the reel is rotatable, and has two rotation directions of winding and releasing, and

when the reel rotates in the releasing direction, the outer end of the curtain body moves downward, and the curtain body is gradually released from the reel; and
when the reel rotates in the winding direction, the outer end of the curtain body moves upward, and the curtain body is gradually wound around the reel;

the fixing frame is connected with two ends of the reel; and
a control assembly is provided on at least one end of the reel, which comprises at least one first elastic member, wherein one end of the first elastic member is connected with the reel, and another end of the first elastic member is connected with the fixing frame, the first elastic member is configured to drive the reel to rotate in the winding direction, and a force of the first elastic member for driving the rotation of the reel in the winding direction is balanced in real time with the force of a portion of the curtain body hung vertically below the reel for driving the rotation of the reel in the releasing direction.

2. The rolling curtain according to claim 1, wherein the first elastic member is a clockwork spring, the clockwork spring is provided inside the reel, an outer end of the clockwork spring is connected with an inner wall of the reel, and an inner end of the clockwork spring is connected with the fixing frame.

3. The rolling curtain according to claim 2, wherein the control assembly further comprises a rotating seat which is provided inside the reel, the rotating seat is interference-connected with the reel, the rotating seat has a hollow structure, the clockwork spring is arranged in the rotating seat, and the outer end of the clockwork spring is connected with an inner wall of the rotating seat.

4. The rolling curtain according to claim 3, wherein a plurality of ribs are provided on an outer wall of the rotating seat, and the plurality of ribs are in interference fit with the inner wall of the reel.

5. The rolling curtain according to claim 2, wherein the control assembly further comprises a force-adjusting member configured to adjust an initial elastic force of the clockwork spring, the inner end of the clockwork spring is connected with the force-adjusting member, and the force-adjusting member is connected with the fixing frame.

6. The rolling curtain according to claim 5, wherein one end of the force-adjusting member is an adjustment shaft and another end of the force-adjusting member is an adjustment disc, the adjustment shaft is threaded in the clockwork spring, the inner end of the clockwork spring is connected with an outer wall of the adjustment shaft, and the adjustment disc is connected with the fixing frame.

7. The rolling curtain according to claim 6, wherein a positioning pin is inserted in the force-adjusting member, the positioning pin is connected with the fixing frame, an end of the positioning pin close to the adjustment shaft is a cylindrical structure, another end of the positioning pin away from the adjustment shaft is a non-cylindrical structure, the adjustment shaft has a hollow structure, the adjustment disc is provided with a non-cylindrical through hole matching the positioning pin, and a second elastic member is provided between the adjustment shaft and the rotating seat.

8. The rolling curtain according to claim 7, wherein the second elastic member is a compression spring.

9. The rolling curtain according to claim 7, wherein a fixing bolt is provided at one end of the fixing frame connected with the positioning pin, the fixing bolt has a non-cylindrical structure, and the positioning pin is provided with a non-

cylindrical groove matching the fixing bolt.

10. The rolling curtain according to claim 1, wherein a speed reducer is provided at an end of the reel where no control assembly is provided, the speed reducer is provided inside the reel and is interference-connected with the reel, and the speed reducer is connected to the fixing frame by a bolt.

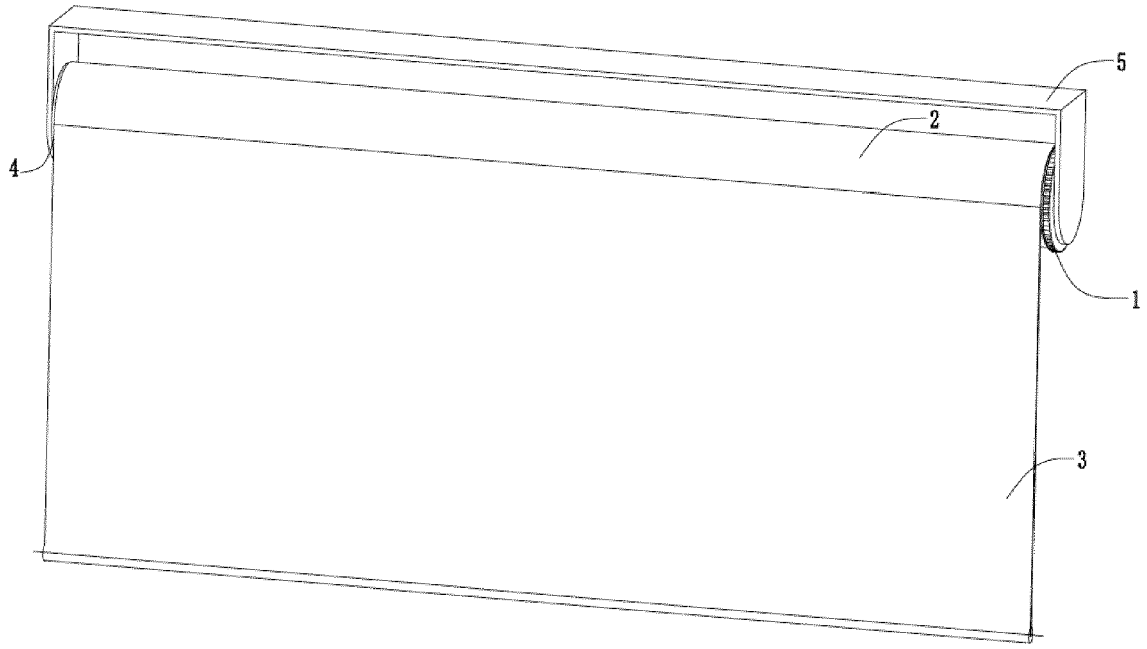

Figure 1

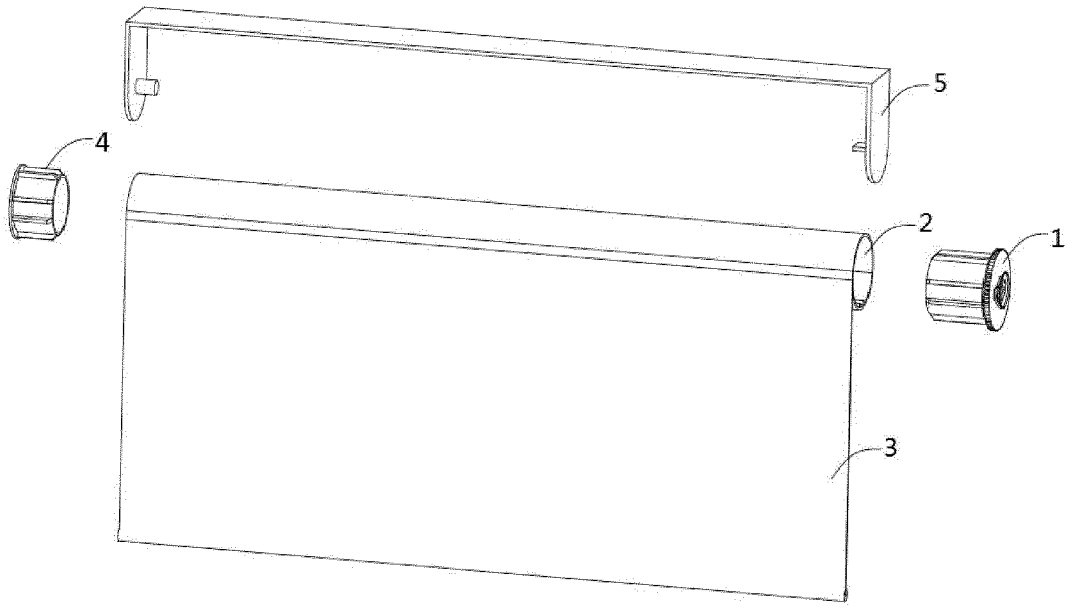

Figure 2

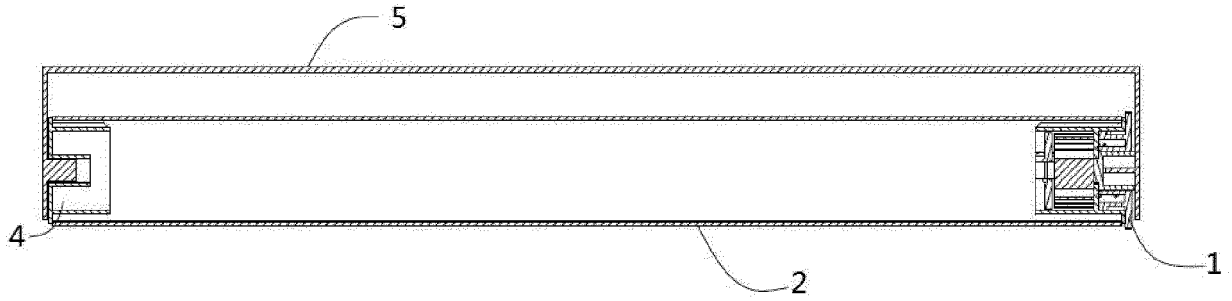

Figure 3

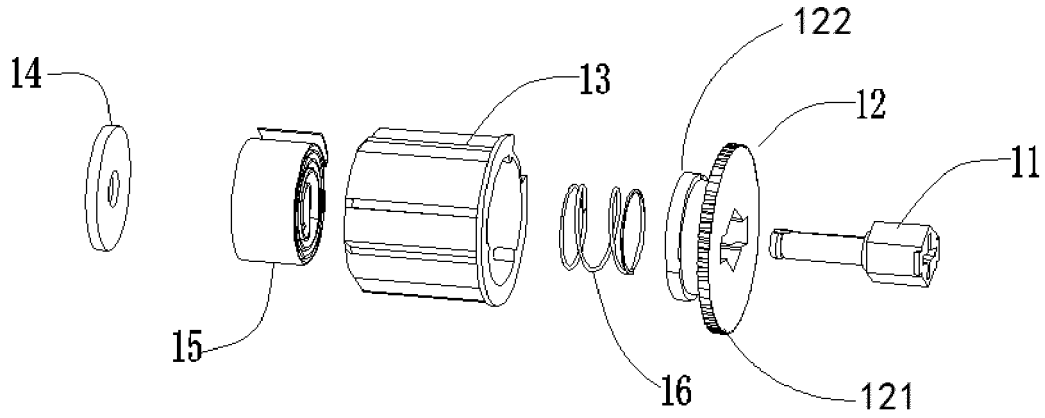

Figure 4

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EUROPEAN SEARCH REPORT

Application Number
EP 20 19 9356

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,P	CN 110 984 825 A (GUANGZHOU JIALUN RUBBER AND PLASTIC CO LTD) 10 April 2020 (2020-04-10) * the whole document *	1-10	INV. E06B9/42 E06B9/60 E06B9/90
X	US 2019/323285 A1 (WONG MING LU [TW]) 24 October 2019 (2019-10-24)	1-5	
A	* figures 1,5,6 * * column 5, line 21 - line 32 *	6-10	
A	US 9 816 317 B2 (CHEN I-MING [TW]; CHEN YAO-TSUNG [TW]) 14 November 2017 (2017-11-14) * paragraphs [0030], [0035]; figure 3 *	6	

TECHNICAL FIELDS SEARCHED (IPC)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	24 March 2021	Cornu, Olivier

CATEGORY OF CITED DOCUMENTS

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24-03-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 110984825 A	10-04-2020	NONE	
US 2019323285 A1	24-10-2019	TW M573197 U	21-01-2019
		US 2019323285 A1	24-10-2019
US 9816317 B2	14-11-2017	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 201911368596X **[0001]**