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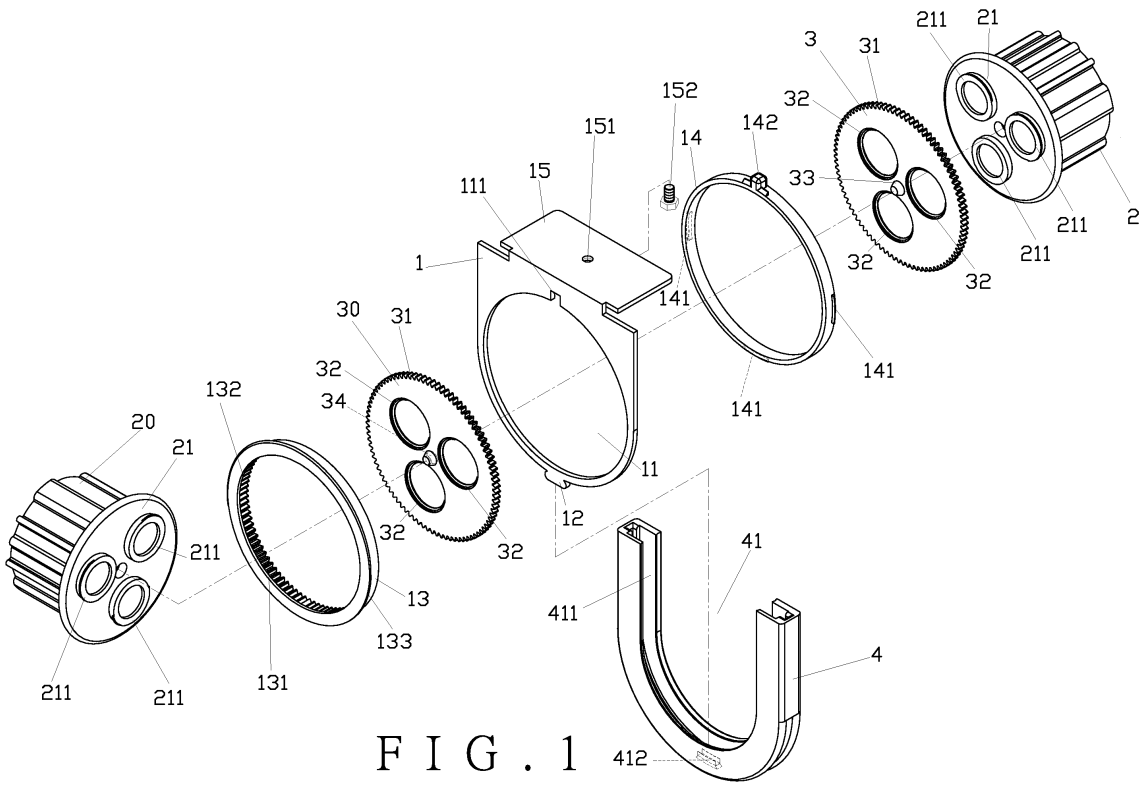
(71) Applicant: **Tao, Yi-Chin**
Kaohsiung City (TW)

(72) Inventor: **Tao, Yi-Chin**
Kaohsiung City (TW)

(74) Representative: **Viering, Jentschura & Partner**
Patent- und Rechtsanwälte
Kennedydamm 55 / Roßstrasse
40476 Düsseldorf (DE)

(54) **Driving assembly for curtain**

(57) A curtain driving assembly includes a support (1), two connectors (2, 20) and multiple transmitting disks (3, 30). The support (1) has an installation hole (11), and a connection ring (13) is pivotably connected to the installation hole (11). The connection ring (13) has multiple first engaging portions (131) on the inside thereof. Each of the two connectors (2, 20) has a driving portion (21) located corresponding to the support (1). The transmitting disks (3, 30) are connected to the driving portions (21) respectively, and are connected to the connection ring (13). Each of the transmitting disks (3, 30) has multiple second engaging portions (31) which are engaged with the first engaging portions (131) of the connection ring (13). The driving assembly controls multiple sets of curtains.



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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a curtain driving assembly, and more particularly, to a curtain driving assembly which is easily assembled and adjusted. The driving assembly drives multiple sets of curtains.

BACKGROUND OF THE INVENTION

[0002] A conventional curtain/roller blind generally includes two supports on two ends thereof and the driving assembly is connected to one of the two supports so as to control the operations of the curtain. When a wall has multiple windows, it is not suitable to install individual curtain driving assemblies for the individual curtains. The users have to operate the curtains one by one, and a gap will be formed between the adjacent curtains and the feature for shading is reduced.

[0003] Taiwan Patent No. M304304 discloses a curtain driving assembly comprising at least two sets of driving members and a support. Each driving member has a passive member integrally connected with a connection member. The two respective connection members relative to the adjacent driving members are configured in pair and coupled to each other. One of the connection members has an inner gear portion, and the other has an outer gear portion which engaged with the inner gear portion. The support has a hole to be pivotably connected with one of the passive members.

[0004] However, when the two sides of the curtain cannot be synchronically lowered, the curtain, the support and the driving members have to be disassembled and then adjusted. This is inconvenient for the users.

[0005] Because the driving members are connected to each other in pair, the two driving members have to be precisely and co-axially connected to each other. This requires more assembly techniques and time to assemble the whole curtain driving assembly.

[0006] The present invention intends to provide a curtain driving assembly to improve the shortcomings above mentioned.

SUMMARY OF THE INVENTION

[0007] The present invention relates to a curtain driving assembly and comprises a support having an installation hole defined therethrough, and a connection ring is pivotably connected to the installation hole. The connection ring has multiple first engaging portions on the inside thereof. Two connectors each have a driving portion which is located corresponding to the support. Multiple transmitting disks are connected to the driving portions of the two connectors respectively. The transmitting disks are connected to the connection ring. Each of the transmitting disks has multiple second engaging portions which are engaged with the first engaging portions of the connection ring.

[0008] Preferably, a bushing is located between the connection ring and the support.

[0009] Preferably, the bushing has multiple ridges on outside thereof, and the ridges are located corresponding to the periphery of the installation hole of the support.

[0010] Preferably, the support has a recess defined in the inside of the installation hole. The bushing has a insertion on the outside thereof, and the insertion is inserted into the recess.

[0011] Preferably, a cover has a notch and the support is engaged with the notch. A slot is located in the inside of the cover and communicates with the notch, and the transmitting disks and the support are engaged with the slot.

[0012] Preferably, the support has a rib, and a fixing hole is defined through the cover and communicates with the slot. The rib is engaged with the fixing hole.

[0013] Preferably, the connection ring has a contact portion around the inner periphery thereof, and the driving portions of the connectors each have multiple first connection portions. The transmitting disks each have multiple second connection portions which are located corresponding to the first connection portions of the driving portion. The transmitting disks contact to the contact portion.

[0014] Preferably, the first connection portions are protrusions, and the second connection portions are holes which are configured for the first connection portions to engage with.

[0015] Preferably, the first engaging portion of the connection ring is inner teeth, and the second engaging portions of the transmitting disks are outer teeth.

[0016] Preferably, one of the transmitting disks has a pivot, and the other transmitting disk has a central hole with which the pivot is pivotably engaged.

[0017] Preferably, the support has a board which is slidably connected with a base.

[0018] Preferably, the board has a threaded hole, and an urging member is threadedly connected to the threaded hole and contacts the base.

[0019] One aspect of the present invention is to provide a curtain driving assembly for controlling multiple sets of curtains. When the scrolled lengths of the curtains are not balanced, the cover can be removed and the support is moved toward a lateral side of the base to separate the first engaging portions of one of the transmitting disks from the second engaging portions. The pivot on one of the transmitting disks is still engaged with the other transmitting disk. Under this arrangement, when the connector is rotated, the curtain is adjusted.

[0020] Another aspect of the present invention is that the connectors are indirectly rotated by the engagement and transmitting of the inner teeth of the connection ring and the outer teeth of the first engaging portions of the transmitting disks, so that the connectors do not need to be precisely aligned with each other. This reduces the assembling time.

[0021] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

Fig. 1 is an exploded view to show the curtain driving assembly of the present invention;
Fig. 2 is a perspective view to show the combination of the support, the bushing and the connection ring of the present invention;
Fig. 3 shows that the two connectors are to be indirectly connected to the connection ring;
Fig. 4 shows that the cover is to be connected to the support and the transmitting disks;
Fig. 5 shows a perspective view of curtain driving assembly of the present invention;
Fig. 6 shows a side cross sectional view of the curtain driving assembly of the present invention;
Fig. 7 shows the curtain driving assembly of the present invention is cooperated with multiple sets of curtains, and the scrolled lengths of the curtains are not aligned in the same level;
Fig. 8 shows that the cover is separated from to the support and the transmitting disks;
Fig. 9 is a cross sectional view showing that one of the transmitting disks is disengaged from the connection ring so as to make the adjustment of the driving assembly of the present invention;
Fig. 10 is a perspective view to show the adjustment of the driving assembly of the present invention, and
Fig. 11 shows that the scrolled lengths of the curtains are evenly lowered in the same level.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] Referring to Fig. 1, the curtain driving assembly of the present invention comprises a support 1 having an installation hole 11 and a rib 12. A recess 111 is defined in the inside of the support 1 and communicates with the installation hole 11. A connection ring 13 is pivotably connected to the installation hole 11 and has multiple first engaging portions 131 on the inside thereof and a contact portion 132. The first engaging portions 131 are inner teeth. A flange 133 extends from the outside of the connection ring 13 which contacts an end of a bushing 14. The bushing 14 is located between the connection ring 13 and the support 1 so as to reduce wearing of the connection ring 13. The bushing 14 has multiple ridges 141 on outside thereof, and the ridges 141 are located corresponding to the periphery of the installation hole 11 of the support 1 to form a stop. The bushing 14 has an insertion 142 which located on the outside of the bushing 14 and is inserted into the slot 111 to prevent the bushing 14 from rotating. The support 1 has a board 15. The board 15 has a threaded hole 151, and an urging member 152 is threadedly connected to the threaded hole 151.

[0024] Two connectors 2, 20 each have a driving portion 21 which is located corresponding to the support 1. The driving portions 21 of the connectors 2, 20 each have multiple first connection portions 211 which are protrusions.

[0025] Multiple transmitting disks 3, 30 are connected to the driving portions 21 of the two connectors 2, 20 respectively. The transmitting disks 3, 30 connected to the connection ring 13. Each of the transmitting disks 3, 30 has multiple second engaging portions 31 which are outer teeth and engaged with the inner teeth of the first engaging portions 131 of the connection ring 13. The transmitting disks 3, 30 each have multiple second connection portions 32 which are holes and located corresponding to the protrusions of the first connection portions 211 of the driving portion 21. One of the transmitting disks 3, 30 contacts to the contact portion 132. The transmitting disks 3 has a pivot 33, and the transmitting disk 30 has a central hole 34 with which the pivot 33 is pivotably engaged.

[0026] A cover 4 has a notch 41 and a slot 411 which is located in the inside of the cover 4 and communicates with the notch 41. The notch 41 and the slot 411 are configured to accommodate the support 1 and the transmitting disks 3, 30. That is to say, the transmitting disks 3, 30 and the support 1 are installed in the slot 411. A fixing hole 412 is defined through the cover 4 and communicates with the slot 411, so that the support 1 is engaged with the cover 4 by engaging the rib 12 with the fixing hole 412.

[0027] Referring to Figs. 1 and 2, when initially assembling, the bushing 14 is firstly installed to the installation hole 11 of the support 1, and the ridges 141 contacts the support 1 and adjacent to the installation hole 111. The insertion 142 is located corresponding to and engaged with the recess 111 of the support 1. The connection ring 13 is then installed into the bushing 14 to let the flange 133 of the connection ring 13 to contact the bushing 14. Consequently, the initial assembly of the curtain driving assembly is completed by combining the support 1, the connection ring 13 and the bushing 14 together, as shown in Fig. 2. Wherein, the connection ring 13 is rotatable relative to the support 1. The first connection portions 211 of the connectors 2, 20 are engaged with the second connection portions 32 of the transmitting disks 3, 30 respectively.

[0028] Referring to Figs. 3 to 7, to complete the overall installation of the curtain driving assembly, the board 15 is slidably connected to a base 16 which is fixed to the wall, and the urging 152 is rotated toward and contacts to the base 16 so as to fastenly position the support 1 to the base 16. The curtain "A" has a scrolling member "B" on one side thereof, and the other side of the curtain "A" is connected to the connector 20 whose transmitting disk

30 is connected to the connection ring 13 to engage the second engaging portions 31 of the transmitting disk 30 with the first engaging portions 131 of the connection ring 13, and the transmitting disk 30 contacts the contact portion 132 (as shown in Fig. 3). The other connector 2 is connected with the other curtain "A" and the other transmitting disk 3, and the second engaging portions 31 of the transmitting disk 3 are engaged with the first engaging portions 131 of the connection ring 13 (as shown in Figs. 3 and 4). Then, the cover 4 is installed to accommodate the combination of the support 1, the connection ring 13, the bushing 14 and the transmitting disks 3, 30 within the notch 41 and the slot 411, and the rib 12 of the support 1 is engaged with the fixing hole 412 of the cover 4 (as shown in Figs. 4 to 6). Under the above-mentioned arrangement, the curtain driving assembly configured for controlling multiple sets of curtains "A" are assembled. The connectors 2, 20 each are respectively cooperated with the transmitting disks 3, 30 whose outer teeth are connected to the inner teeth of the connection ring 13 to form an indirect transmitting relationship. Therefore, the connectors 2, 20 do not need to precisely and co-axially connected to each other.

[0029] When in use, referring to Figs. 3, 6 and 7, the user pulls the bead chain of one of the scrolling member "B", and the corresponding curtain "A" and the corresponding connector 2 or 20 are activated, such that the other curtain "A" is also adjusted concurrently. More specifically, for example, when the connector 2 is activated to rotate, the rotation of the connector 2 drives the transmitting disk 3 to rotate as an integral part of the connector 2 by the connection of the first connection portions 211 and the second connection portion 32. Because the transmitting disk 3 is engaged with the connection ring 13 by the engagement of the first and second engaging portions 131, 31, the connection ring 13 is driven to rotate by the rotation of the transmitting disk 3. Based on the same arrangement, the other transmitting disk 30 which is driven by the rotation of the connection ring 30, the other connector 20 which is rotated with the transmitting disk 30, and the other curtain "A" which is rotated with the connector 20 are rotating simultaneously.

[0030] Referring to Figs. 8 and 9, when the scrolled lengths of the curtains "A" are not evenly lowered or lifted (as shown in Fig. 7), the cover 4 is removed and the urging member 152 is loosened, so that the support 1 is moved toward the lateral side of the base 16 to separate the first engaging portions 131 of the transmitting disk 3 from the second engaging portion 31. The pivot 33 on the transmitting disk 3 is still engaged with the central hole 34 of the transmitting disk 30. When the connector 2 is rotated as shown in Figs. 9 and 10, the scrolled length of the curtain "A" is adjusted to be the same as the scrolled length of the other curtain "A" as shown in Fig. 11. After the adjustment is completed, the support 1 is returned to its initial position to be fastenly position to the base 16, and the cover 4 is connected to the support 1. The curtain "A" is adjusted without disassembling the curtain "A" and the whole curtain driving assembly, such that the cost time for the adjustment of the uneven scrolled lengths of the curtains is greatly reduced.

[0031] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

Claims

1. A curtain driving assembly comprising: a support (1) and two connectors (2, 20); **characterized in that** the support (1) having an installation hole (11) defined therethrough, a connection ring (13) pivotably connected to the installation hole (11), the connection ring (13) having multiple first engaging portions (131) on an inside thereof; the two connectors (2, 20) each having a driving portion (21) which is located corresponding to the support (1), multiple transmitting disks (3, 30) connected to the driving portions (21) of the two connectors (2, 20) respectively, the transmitting disks (3, 30) installed in the connection ring (13), each of the transmitting disks (3, 30) having multiple second engaging portions (31) which are engaged with the first engaging portions (131) of the connection ring (13).

2. The driving assembly as claimed in claim 1, wherein a bushing (14) is located between the connection ring (13) and the support (1).

3. The driving assembly as claimed in claim 2, wherein the bushing (14) has multiple ridges (141) on outside thereof, and the ridges (141) are located corresponding to a periphery of the installation hole (11) of the support (1).

4. The driving assembly as claimed in claim 1, wherein a cover (4) has a notch (41), the support (1) is engaged with the notch (41), a slot (411) is located in an inside of the cover (4) and communicates with the notch (41), and the transmitting disks (3, 30) and the support (1) are installed in the slot (411).

5. The driving assembly as claimed in claim 4, wherein the support (1) has a rib (12), a fixing hole (412) is defined through the cover (4) and communicates with the slot (411), the rib (12) is engaged with the fixing hole (412).

6. The driving assembly as claimed in claim 1, wherein the connection ring (13) has a contact portion (132), the driving portions (21) of the connectors (2, 20) each have multiple first connection portions (211), the transmitting disks (3, 30) each have multiple second connection portions (32) which are located cor-

responding to the first connection portions (211) of the driving portion (21), one of the transmitting disks (3, 30) contact to the contact portion (132).

7. The driving assembly as claimed in claim 1, wherein the first engaging portions (131) of the connection ring (13) are inner teeth, and the second engaging portions (31) of the transmitting disks (3, 30) are outer teeth.

8. The driving assembly as claimed in claim 1, wherein one of the transmitting disks (3) has a pivot (33), and the other transmitting disk (30) has a central hole (34) with which the pivot (33) is pivotably engaged.

9. The driving assembly as claimed in claim 1, wherein the support (1) has a board (15) which is slidably connected with a base (16).

10. The driving assembly as claimed in claim 9, wherein the board (15) has a threaded hole (151), and an urging member (152) is threadedly connected to the threaded hole (151) and contacts the base (16).

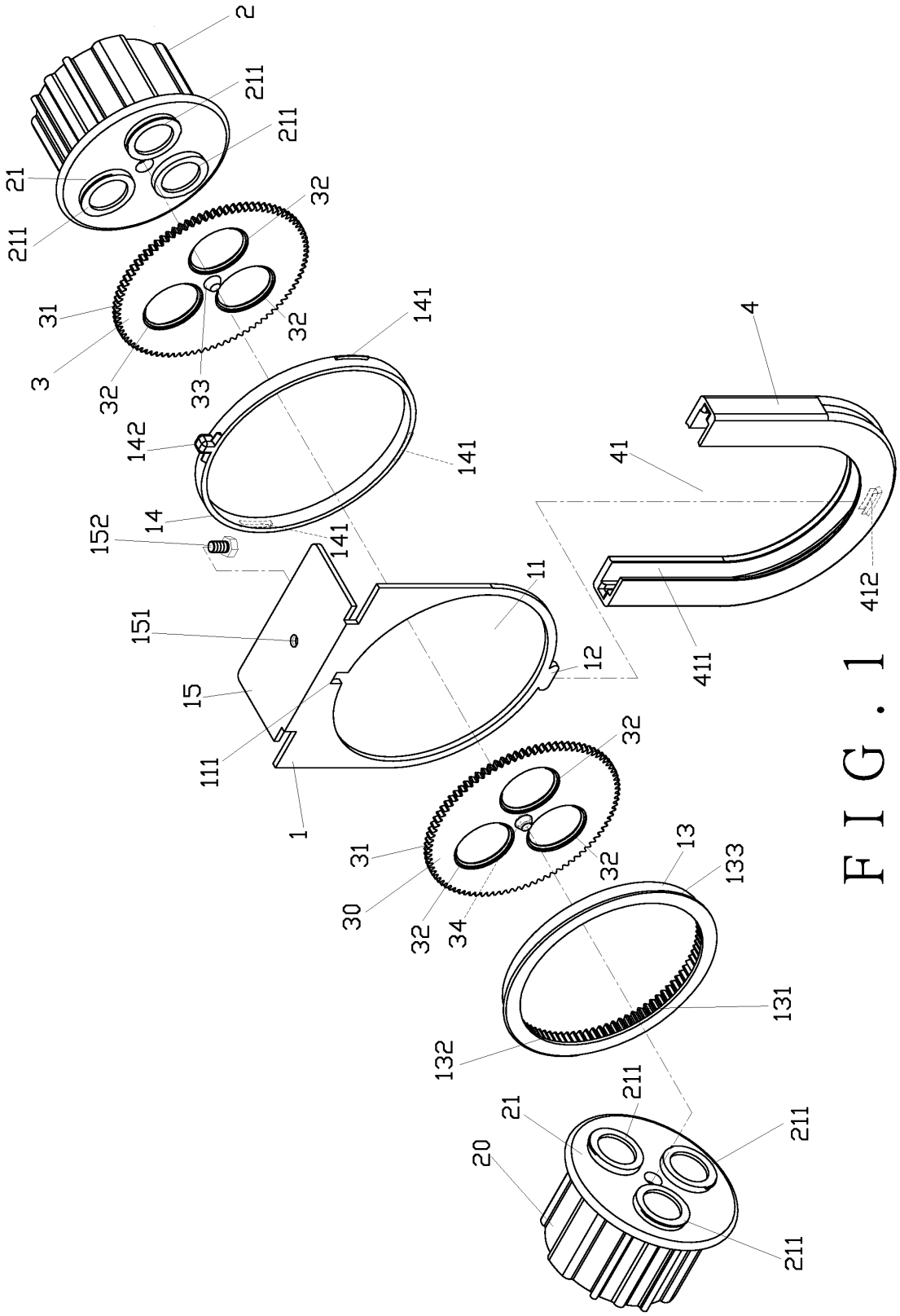
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FIG. 1

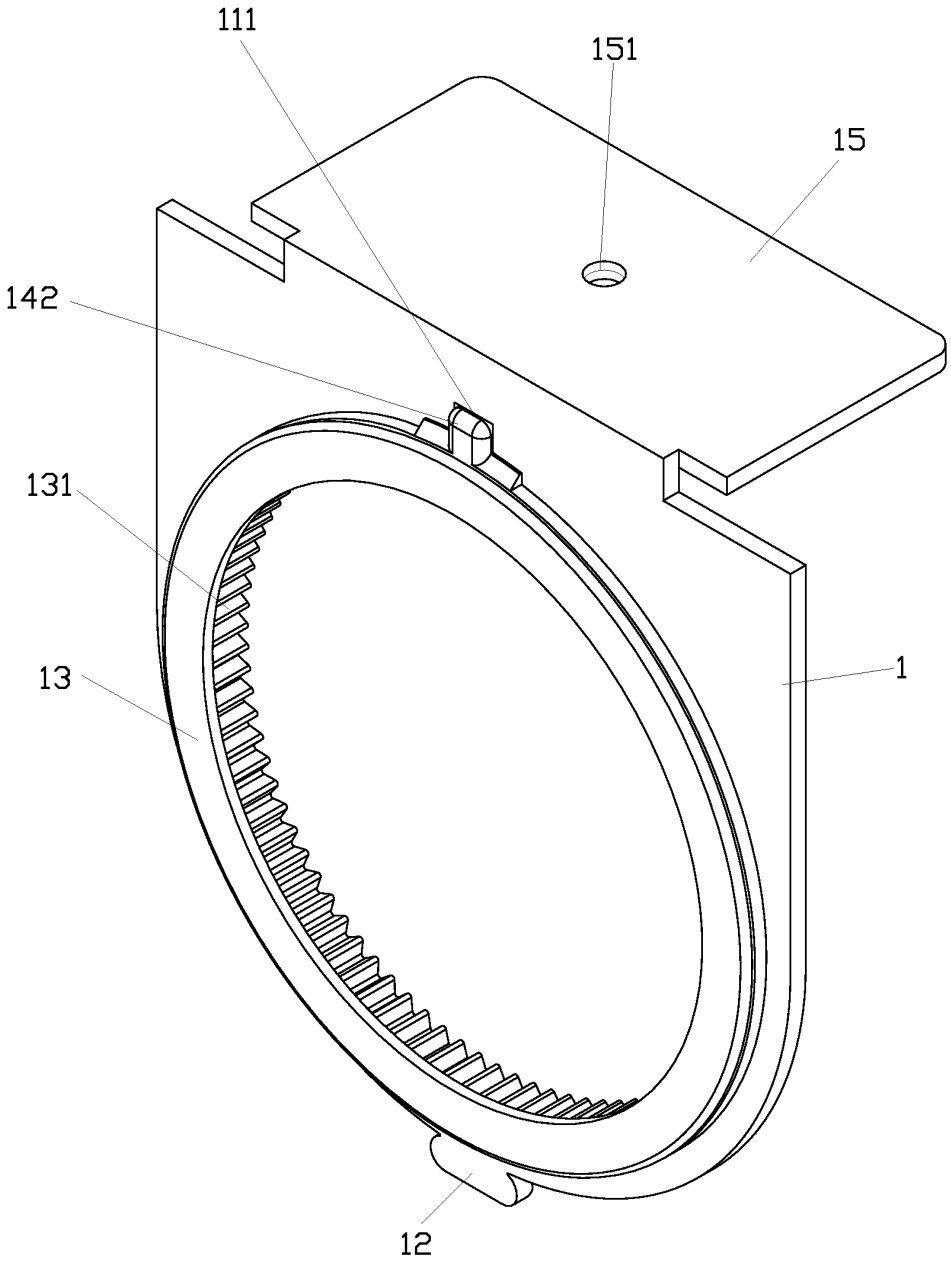


FIG. 2

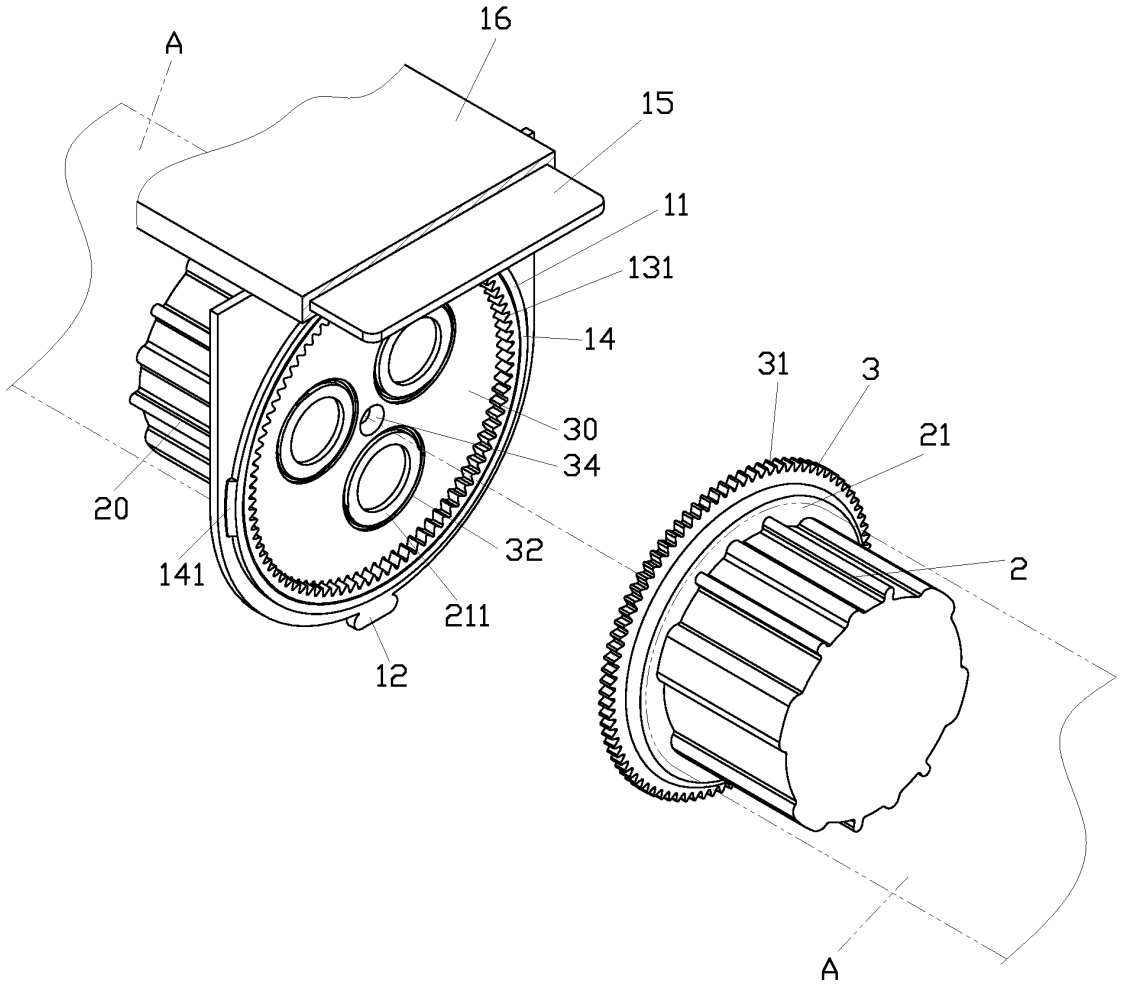
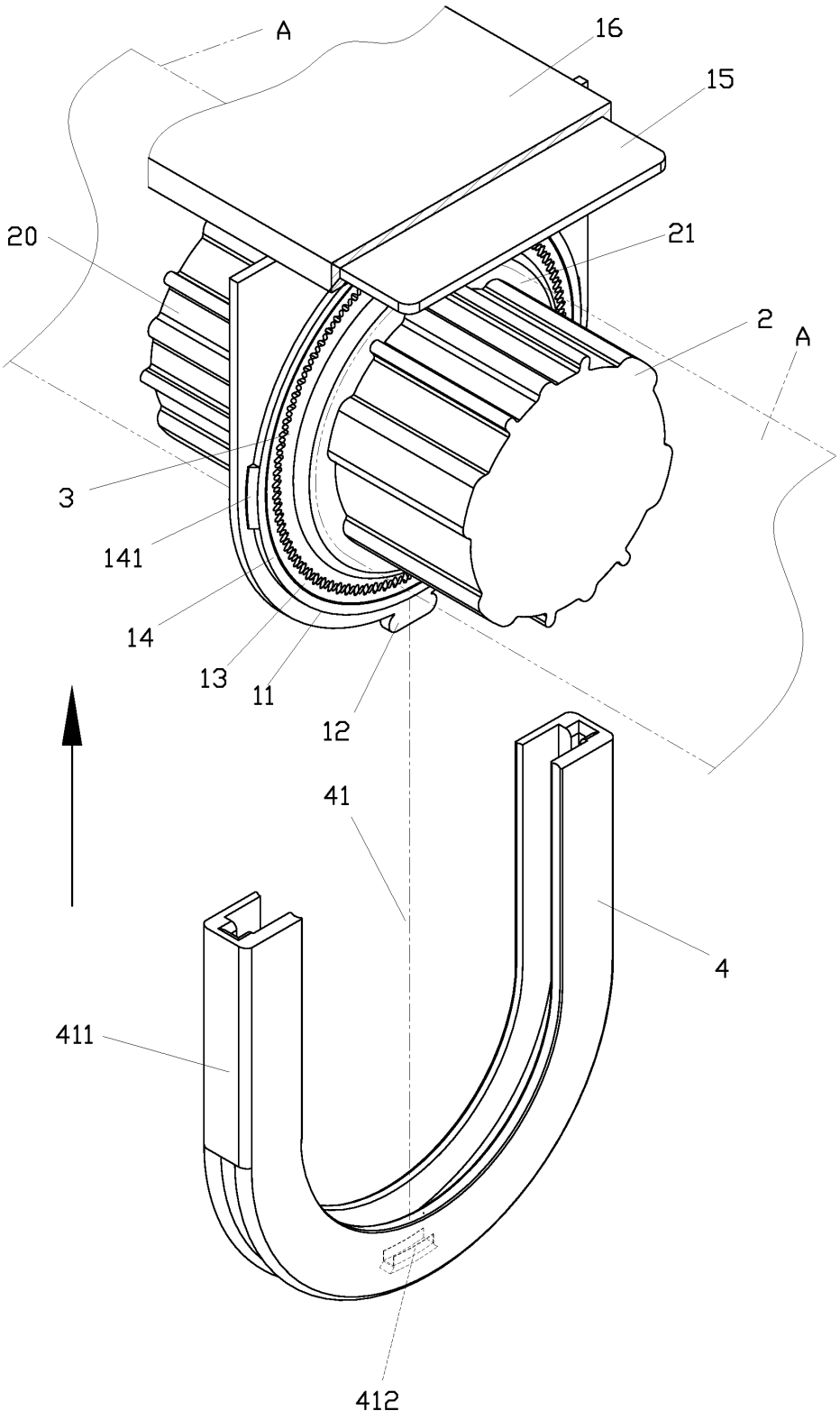


FIG. 3



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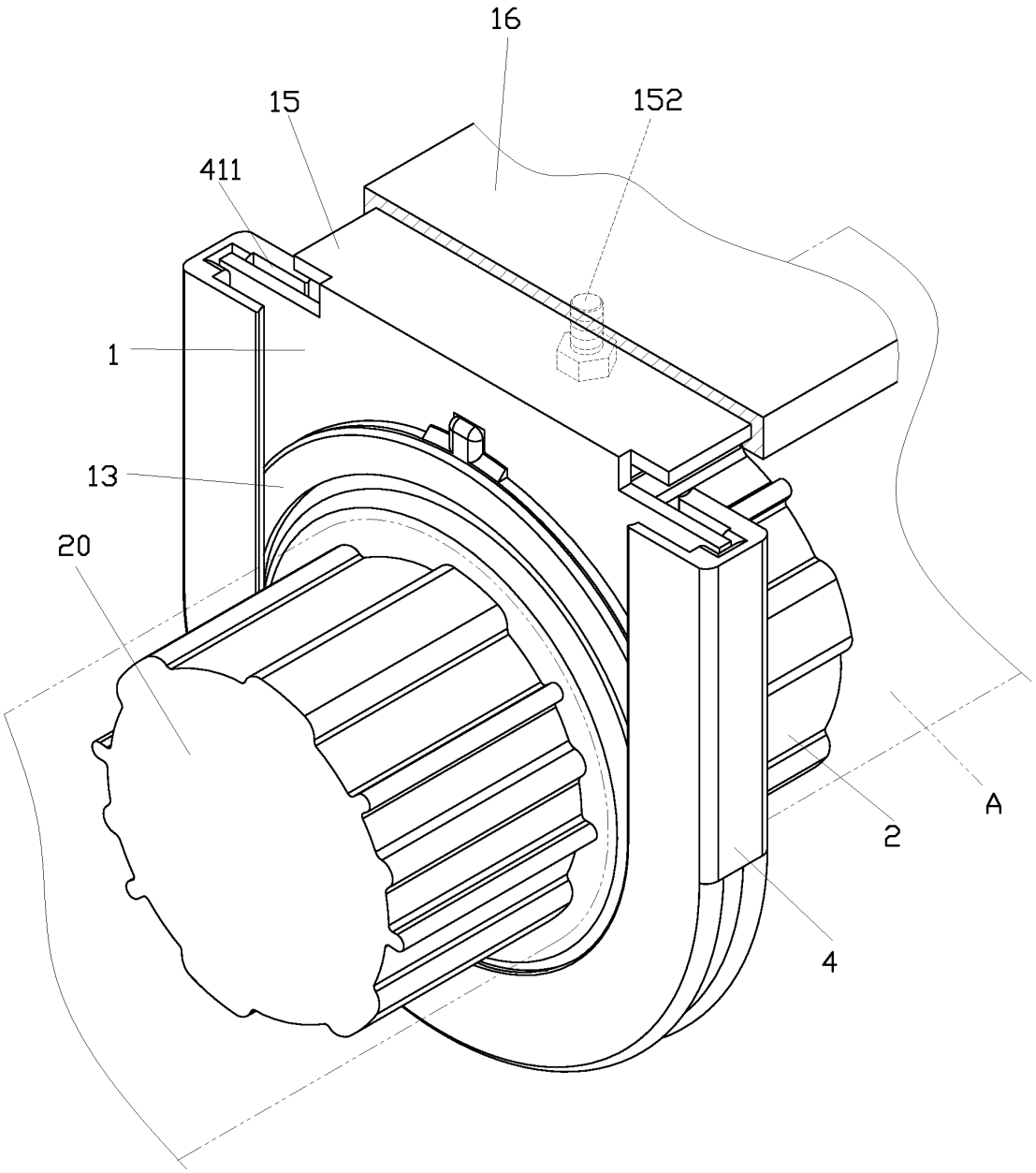

FIG. 5

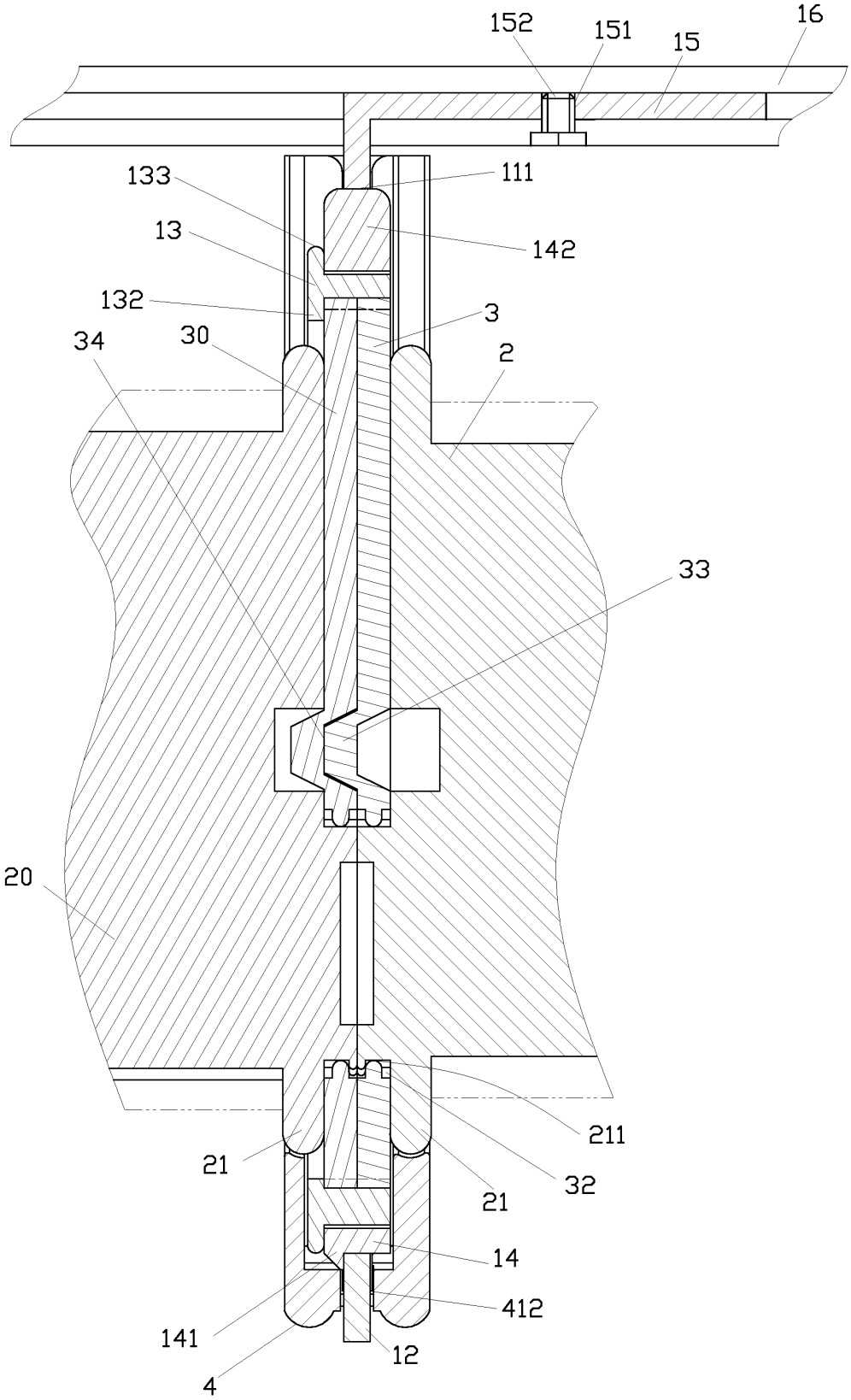
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FIG. 6

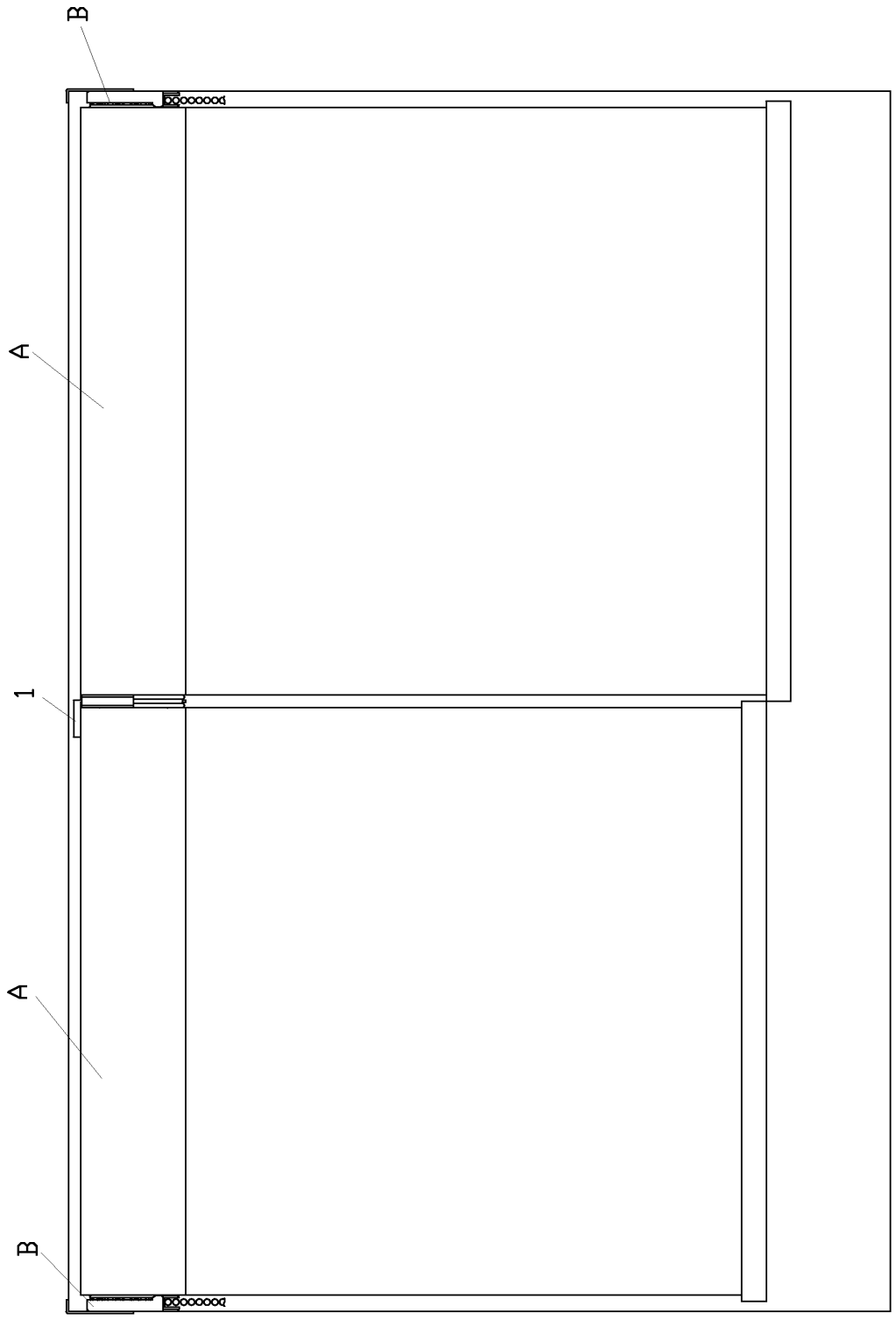

FIG. 7

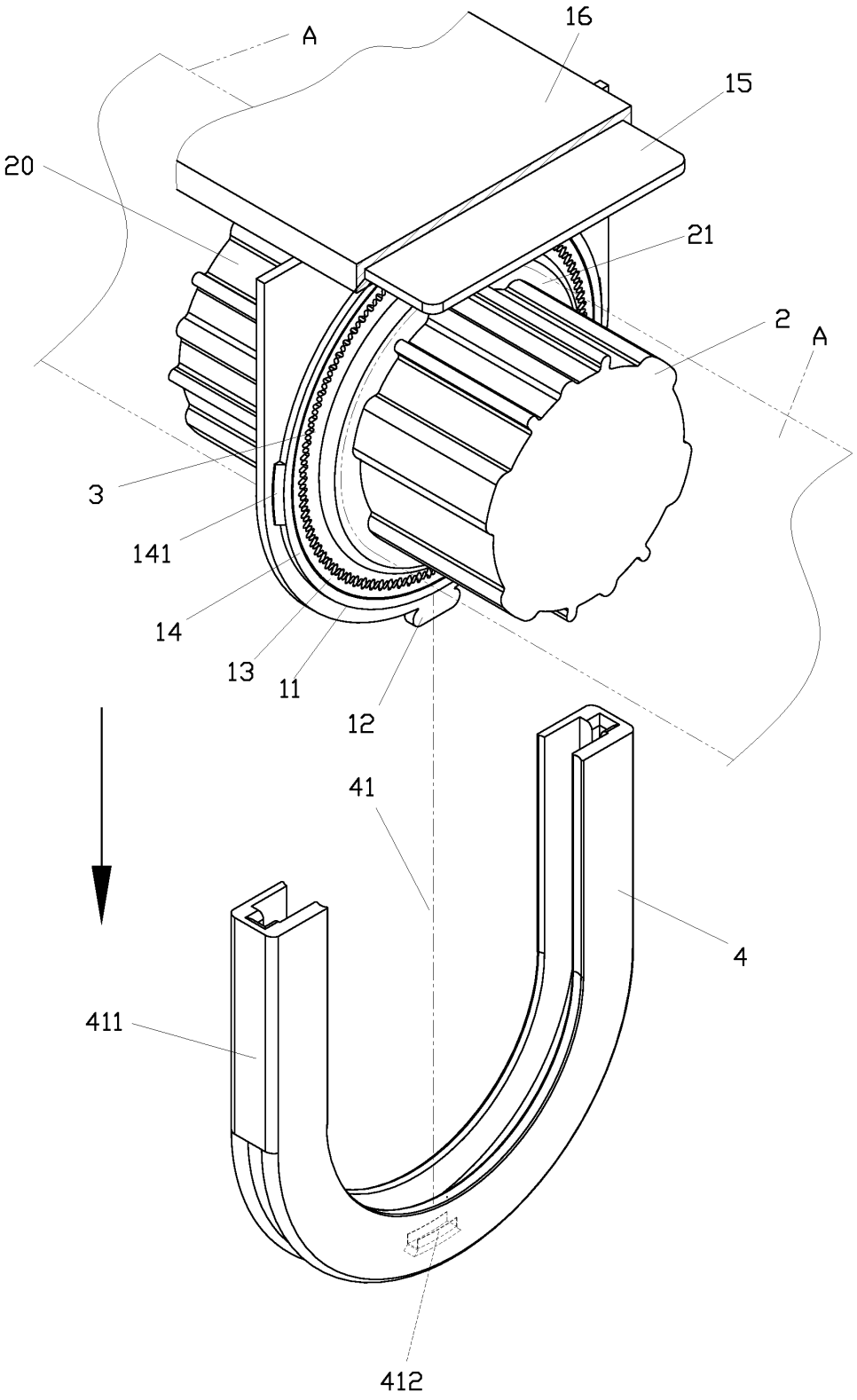

FIG. 8

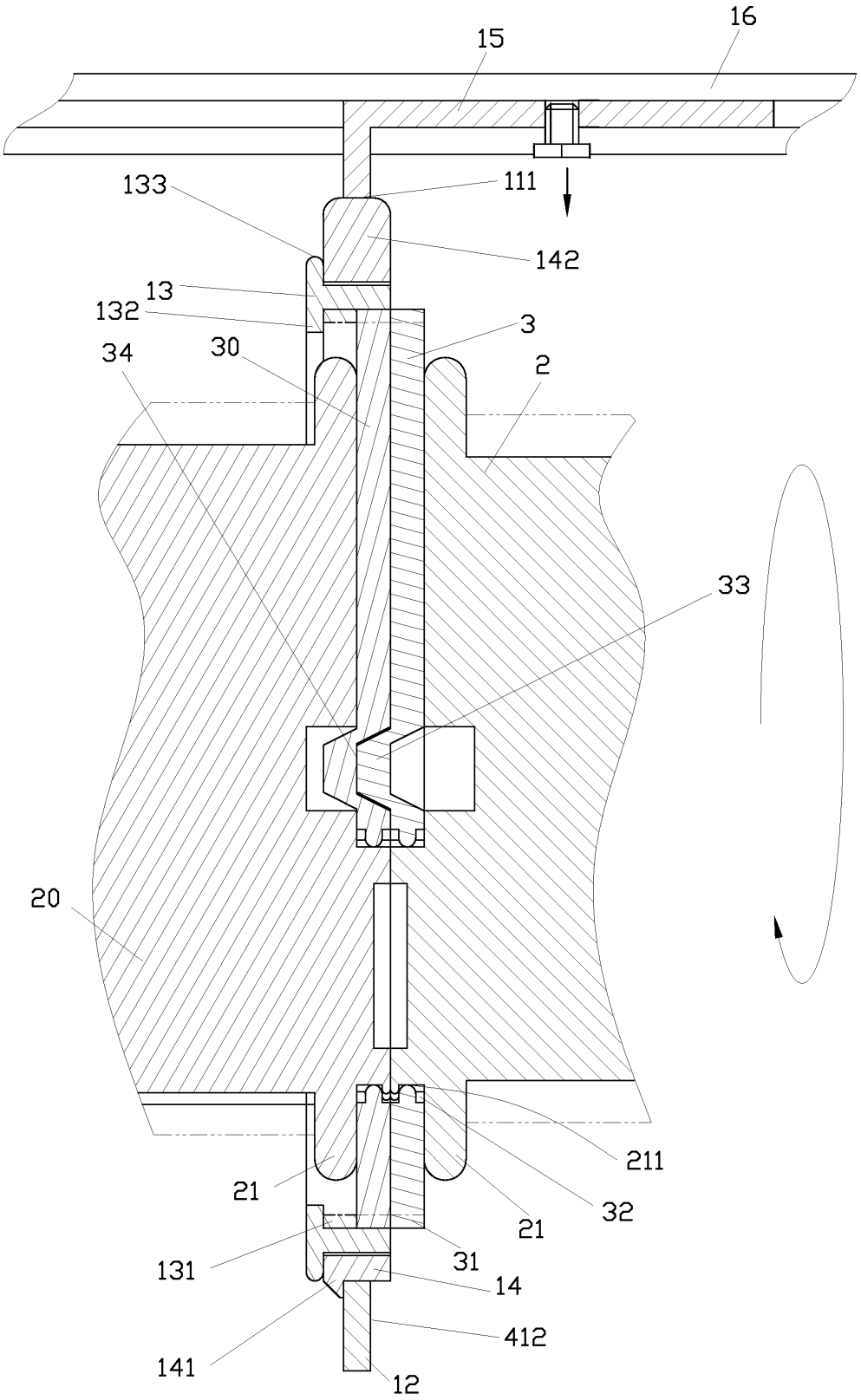
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FIG. 9

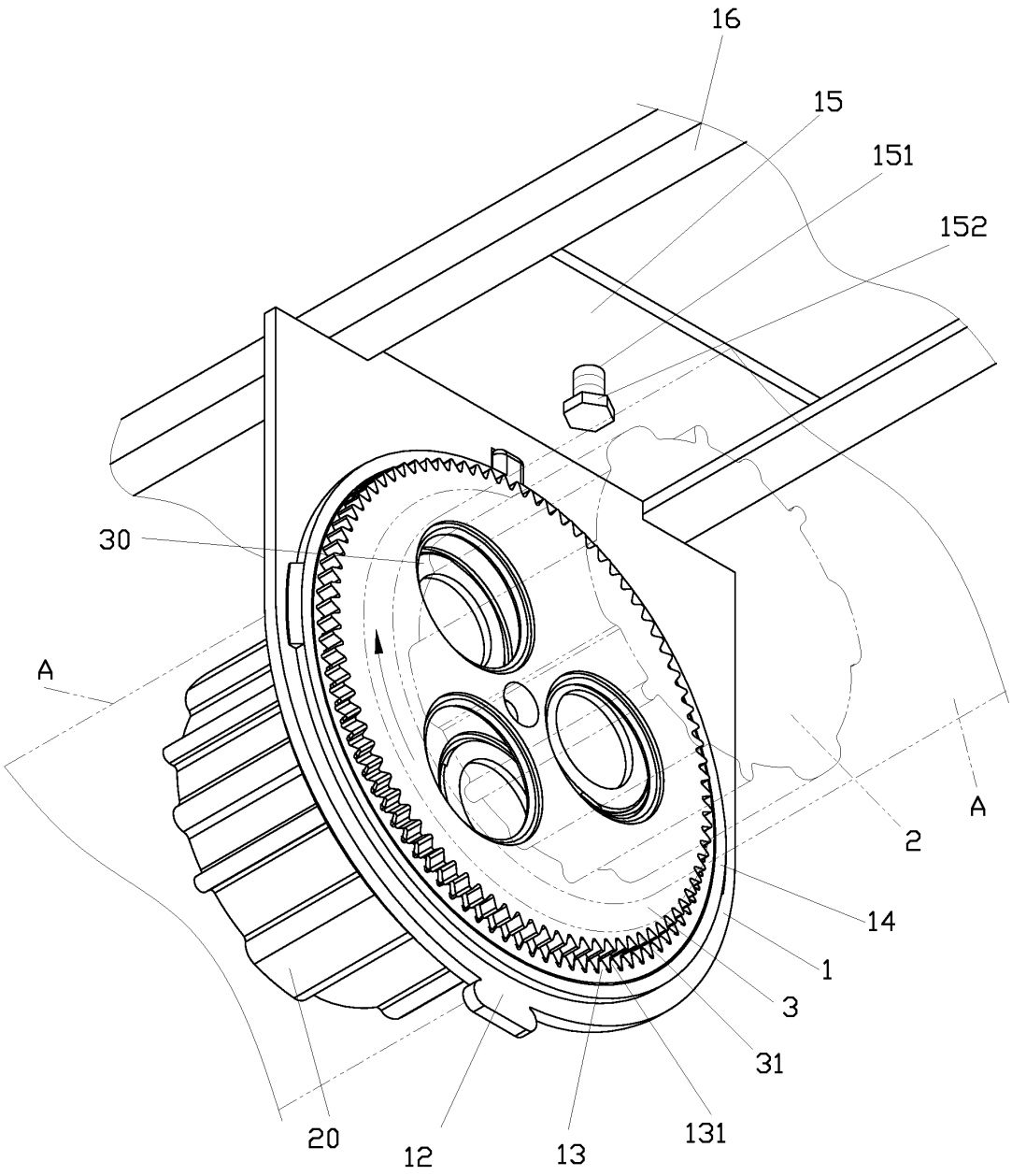

FIG. 10

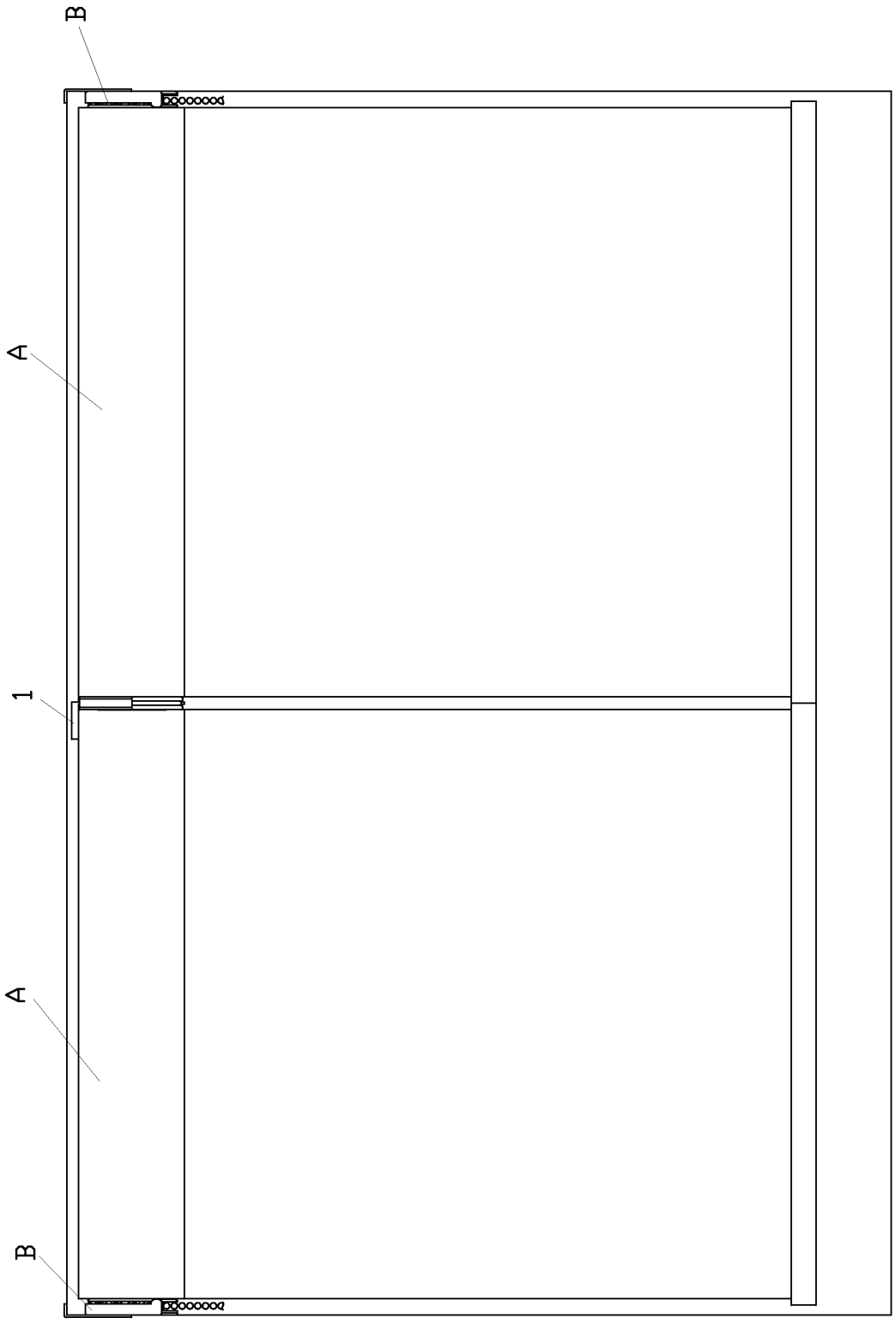

FIG. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 13 15 9384

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	TW M 304 304 U (STEFANO CARMELO JOSEPH LICCIAR [AU]) 11 January 2007 (2007-01-11) * figures 1,4 *	1-10	INV. A47H5/14 E06B9/50
A	US 2008/153606 A1 (KOOP LARS [DE] ET AL) 26 June 2008 (2008-06-26) * paragraphs [0021] - [0026]; figures 1-3, 4 *	1-10	
A	WO 2006/025681 A1 (YOUN SHIN-YOUNG [KR]) 9 March 2006 (2006-03-09) * abstract; figures 1-3, 6b, 14 *	1-10	
A	WO 2011/117575 A1 (LOUVER LITE LTD [GB]; BARNES ANTONY [GB]; GREENING ANDREW [GB]) 29 September 2011 (2011-09-29) * abstract; figure 1 *	1-10	

TECHNICAL FIELDS SEARCHED (IPC)
A47H
E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 August 2013	Weißbach, Mark

CATEGORY OF CITED DOCUMENTS

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19-08-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
TW M304304 U	11-01-2007	NONE	
US 2008153606 A1	26-06-2008	AR 064607 A1	15-04-2009
		AU 2007240243 A1	10-07-2008
		BR PI0704663 A	19-08-2008
		CA 2612828 A1	21-06-2008
		CL 37902007 A1	29-08-2008
		CN 101205795 A	25-06-2008
		CO 5990184 A1	31-12-2008
		KR 20080058237 A	25-06-2008
		SG 144104 A1	29-07-2008
		SG 177908 A1	28-02-2012
		TW 200833938 A	16-08-2008
		US 2008153606 A1	26-06-2008
WO 2006025681 A1	09-03-2006	CN 101010480 A	01-08-2007
		WO 2006025681 A1	09-03-2006
WO 2011117575 A1	29-09-2011	AU 2011231412 A1	15-11-2012
		US 2013133841 A1	30-05-2013
		WO 2011117575 A1	29-09-2011

EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- TW M304304 **[0003]**