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(54) Adjusting device of a lamp

(57) An adjusting device of a lamp has two positioning members (10, 10A), two connecting arms (20) and an adjusting bolt (30). Each positioning member (10, 10A) has two engaging recesses (11, 11A, 12, 12A). Each connecting arm (20) has at least one ball-shaped end (21) rotatably mounted in the engaging recesses (11, 11A, 12, 12A). The adjusting bolt (30) is mounted through one positioning member (10) and is screwed on to the other positioning member (10A). A lighting device (44) is attached to an end of multiple adjusting devices that are sequentially connected to each other. By loosening or tightening the positioning members (10, 10A) and the adjusting bolts (30), the connecting arms (20) are able to pivot or are held in specific positions. Heights of the lighting device (44) and range that the lighting device (44) illuminates are diversely adjusted.

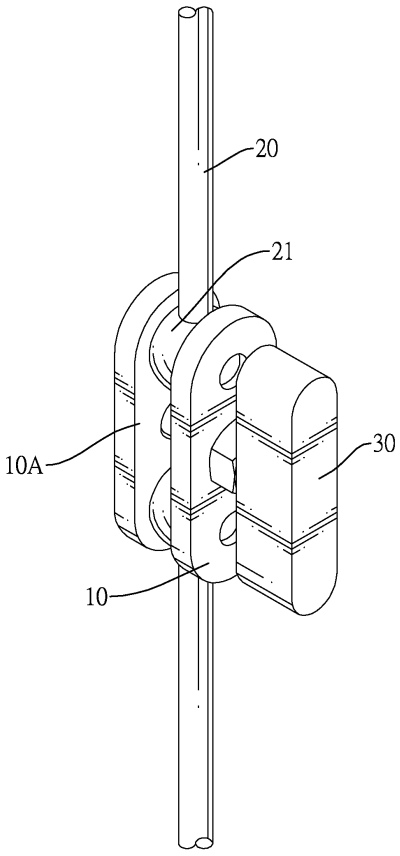

FIG.1

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Description

1. Field of the Invention

[0001] The present invention relates to an adjusting device of a lamp, especially to an adjusting device that is used to allow heights and positions of a light of the lamp being adjustable.

2. Description of the Prior Art(s)

[0002] A desk lamp is placed on a desk or other planes to provide illumination and is essential to daily lives. A conventional desk lamp has a base, a pole rotatably mounted on the base and a light pivotally connected to a top end of the pole. Thus, the pole as well as the light is rotatable relative to the base, and the light can be pivoted up and down relative to the pole and the base. Consequently, positions and directions that the light illuminates are adjustable.

[0003] However, although the pole allows the positions and the directions that the light illuminates to be adjustable, a length of the pole is fixed. Therefore, to adjust the illumination height and to extend the illumination range only relies on pivoting the light up and down so that the illumination height and range are limited. Consequently, manipulation of the conventional desk lamp is also limited.

[0004] The main objective of the present invention is to provide an adjusting device of a lamp. The adjusting device has two positioning members, two connecting arms and an adjusting bolt. Each positioning member has two engaging recesses. Each connecting arm has at least one ball-shaped end rotatably mounted in the engaging recesses. The adjusting bolt is mounted through one positioning member and is screwed on to the other positioning member.

[0005] A lighting device is attached to an end of multiple adjusting devices that are sequentially connected to each other. By loosening or tightening the positioning members and the adjusting bolts of the adjusting devices, pressures that the positioning members applied to the ball-shaped ends of the connecting arms and frictions between the positioning members and the ball-shaped ends of the connecting arms change. Thus, the connecting arms are able to pivot or are held in specific positions, and heights of the lighting device and range that the lighting device illuminates are diversely adjusted.

IN THE DRAWINGS:

[0006]

Fig. 1 is a perspective view of an adjusting device of a lamp in accordance with the present invention;
Fig. 2 is an exploded perspective view of the adjusting device in Fig. 1;
Fig. 3 is a side view in partial section of the adjusting device in Fig. 1;
Fig. 4 is an operational side view of the adjusting device in Fig. 1;
Fig. 5 is an exploded perspective view of another embodiment of an adjusting device of a lamp in accordance with the present invention; and
Fig. 6 is side view in partial section of the adjusting device in Fig. 5.

[0007] With reference to Figs. 1, 2 and 5, an adjusting device of a lamp in accordance with the present invention comprises two positioning members 10, 10A, two connecting arms 20, an adjusting bolt 30 and four washers 16.

[0008] With further reference to Fig. 3, the positioning members 10, 10A are separated from each other. Each positioning member 10, 10A is an elongated panel and has two end surfaces, an inner surface, a first engaging recess 11, 11A, a second engaging recess 12, 12A, two recess bottoms and two through holes 15, 15A.

[0009] The end surfaces of the positioning member 10, 10A are convex. The inner surface of the positioning member 10, 10A corresponds to the inner surface of the other positioning member 10A, 10.

[0010] The first engaging recess 11, 11A is convex, is formed in the inner surface of the positioning member 10, 10A and is disposed adjacent to one end surface of the positioning member 10, 10A. The second engaging recess 12, 12A is convex, is formed in the inner surface of the positioning member 10, 10A, is separated from the first engaging recess 11, 11A and is disposed adjacent to the other end surface of the positioning member 10, 10A.

[0011] The recess bottoms are respectively defined in the first engaging recess 11, 11A and the second engaging recess 12, 12A. The through holes 15, 15A are respectively formed through the recess bottoms of the positioning member 10, 10A.

[0012] One positioning member 10 further has a mounting hole 13 formed through the positioning member 10 and disposed between the first engaging recess 11 and the second engaging recess 12. The other positioning member 10A further has a threaded hole 14A formed through the positioning member 10A and disposed between the first engaging recess 11A and the second engaging recess 12A.

[0013] The connecting arms 20 are pivotally mounted between the positioning members 10, 10A. Each connecting arm 20 has at least one ball-shaped end 21. One of the at least one ball-shaped end 21 of one connecting arm 20 is rotatably mounted in the first engaging recesses 11, 11A of the positioning members 10, 10A. One of the at least one ball-shaped end 21 of the other connecting arm 20 is rotatably mounted in the second engaging recess 12, 12A of the positioning members 10, 10A.

[0014] The adjusting bolt 30 is T-shaped, is mounted through the positioning members 10, 10A and has a gripping head 31, a bolt body 32 and a separator 33. The

gripping head 31 is elongated, is disposed beside the positioning member 10 having the mounting hole 13 and has an inner surface corresponding to the positioning member 10 having the mounting hole 13. The bolt body 32 is formed on and protrudes from the gripping head 31, is mounted through the mounting hole 13 and the threaded hole 14A and adjustably engages the positioning member 10A having the threaded hole 14A. The separator 33 is formed on and around the bolt body 32, is disposed adjacent to the gripping head 31 and abuts the positioning member 10 having the mounting hole 13.

[0015] With further reference to Figs. 5 and 6, the washers 16 are respectively mounted in the first engaging recesses 11, 11A and the second engaging recesses 12, 12A of the positioning members 10, 10A and are respectively held between the positioning members 10, 10A and the ball-shaped ends 21 of the connecting arms 20. Each washer 16 has a convex surface and a concave surface. The convex surface of the washer 16 corresponds to the recess bottom of the positioning member 10, 10A. The concave surface of the washer 16 is grained and corresponds to the ball-shaped end 21 of the connecting arm 20.

[0016] When the adjusting bolt 30 is tightened with the positioning member 10A having the threaded hole 14A, the separator 33 and the gripping head 31 of the adjusting bolt 30 push the positioning member 10 having the mounting hole 13. Pressure that the positioning members 10, 10A applied to the ball-shaped end 21 of the connecting arms 20 and friction between the positioning member 10, 10A, the ball-shaped end 21 of the connecting arms 20 and the washers 16 increase. Thus, the connecting arms 20 are unable to pivot relative to the positioning members 10, 10A and are held in a specification.

[0017] When the adjusting bolt 30 is loosened from the positioning member 10A having the threaded hole 14A, the pressure that the positioning members 10, 10A applied to the ball-shaped end 21 of the connecting arms 20 and the friction between the positioning member 10, 10A, the ball-shaped end 21 of the connecting arms 20 and the washers 16 decrease. Thus, the connecting arms 20 are able to pivot relative to the positioning members 10, 10A. Consequently, relative angles of the two connecting arms 20 are adjusted.

[0018] With reference to Fig. 4, a lamp has a base 40, three adjusting devices of the present invention and a lighting device 44. The base 40 is placed on a plane.

[0019] The three adjusting devices are defined as a first adjusting device 41, a second adjusting device 42 and a third adjusting device 43. The first adjusting device 41 has a first connecting arm 410 and an upper rod. The first connecting arm 410 is attached to the base 40. The second adjusting device 42 has a lower rod and an upper rod. The lower rod of the second adjusting device 42 and the upper rod of the first adjusting device 42 are integrated into a second connecting arm 411. The third adjusting device 43 has a lower rod and a fourth connecting arm 430. The lower rod of the third adjusting device 42 and the upper rod of the second adjusting device 42 are integrated into a third connecting arm 420.

[0020] The lighting device 44 is attached to the fourth connecting arm 430 of the third adjusting device 43 and has at least one light emitting element 440 mounted on the lighting device 44.

[0021] By pivoting or holding the connecting arms 410, 411, 420, 430 of the adjusting device 41, 42, 43, or changing the number of the adjusting device 41, 42, 43, heights of the lighting device 44 and range that the lighting device 44 illuminates are diversely adjusted.

Claims

1. An adjusting device of a lamp **characterized by** comprising:

   two positioning members (10, 10A), each positioning member (10, 10A) having an inner surface corresponding to the inner surface of the other positioning member (10A, 10), a first engaging recess (11, 11A) being convex and formed in the inner surface of the positioning member (10, 10A), a second engaging recess (12, 12A) being convex, formed in the inner surface of the positioning member (10, 10A) and separated from the first engaging recess (11, 11A), and one positioning member (10) further having a mounting hole (13) formed through the positioning member (10) and disposed between the first engaging recess (11) and the second engaging recess (12) and the other positioning member (10A) further having a threaded hole (14A) formed through the positioning member (10A) and disposed between the first engaging recess (11A) and the second engaging recess (12A);

   two connecting arms (20) pivotally mounted between the positioning members (10, 10A), each connecting arm (20) having at least one ball-shaped end (21), one of the at least one ball-shaped end (21) of one connecting arm (20) rotatably mounted in the first engaging recesses (11, 11A) of the positioning members (10, 10A), and one of the at least one ball-shaped end (21) of the other connecting arm (20) rotatably mounted in the second engaging recess (12, 12A) of the positioning members (10, 10A); and

   an adjusting bolt (30) having a bolt body (32) mounted through the mounting hole (13) and the threaded hole (14A) and adjustably engaging the positioning member (10A) having the threaded hole (14A).

2. The adjusting device as claimed in claim 1 further comprising four washers (16) respectively mounted in the first engaging recesses (11, 11A) and the sec-

ond engaging recesses (12, 12A) of the positioning members (10, 10A) and respectively held between the positioning members (10, 10A) and the ball-shaped ends (21) of the connecting arms (20), and each washer (16) having a concave surface being grained and corresponding to the ball-shaped end (21) of the connecting arm (20).

3. The adjusting device as claimed in claim 1 or 2, wherein
the adjusting bolt (30) further has a gripping head (31) being elongated; and the bolt body (32) of the adjusting bolt (30) is formed on and protrudes from the gripping head (31).

4. The adjusting device as claimed in claim 3, wherein each positioning member (10, 10A) is an elongated panel and has two end surfaces;
the first engaging recess (11, 11A) of each positioning member (10, 10A) is disposed adjacent to one end surface of the positioning member (10, 10A); and the second engaging recess (12, 12A) of each positioning member (10, 10A) is disposed adjacent to the other end surface of the positioning member (10, 10A).

5. The adjusting device as claimed in claim 4, wherein the end surfaces of each positioning member (10, 10A) are convex.

6. The adjusting device as claimed in claim 5, wherein each positioning member (10, 10A) further has
two recess bottoms respectively defined in the first engaging recess (11, 11A) and the second engaging recess (12, 12A); and
two through holes (15, 15A) respectively formed through the recess bottoms of the positioning member (10, 10A).

7. The adjusting device as claimed in claim 6, wherein the adjusting bolt (30) further has a separator (33) formed on and around the bolt body (32), disposed adjacent to the gripping head (31) and abutting the positioning member (10) having the mounting hole (13).

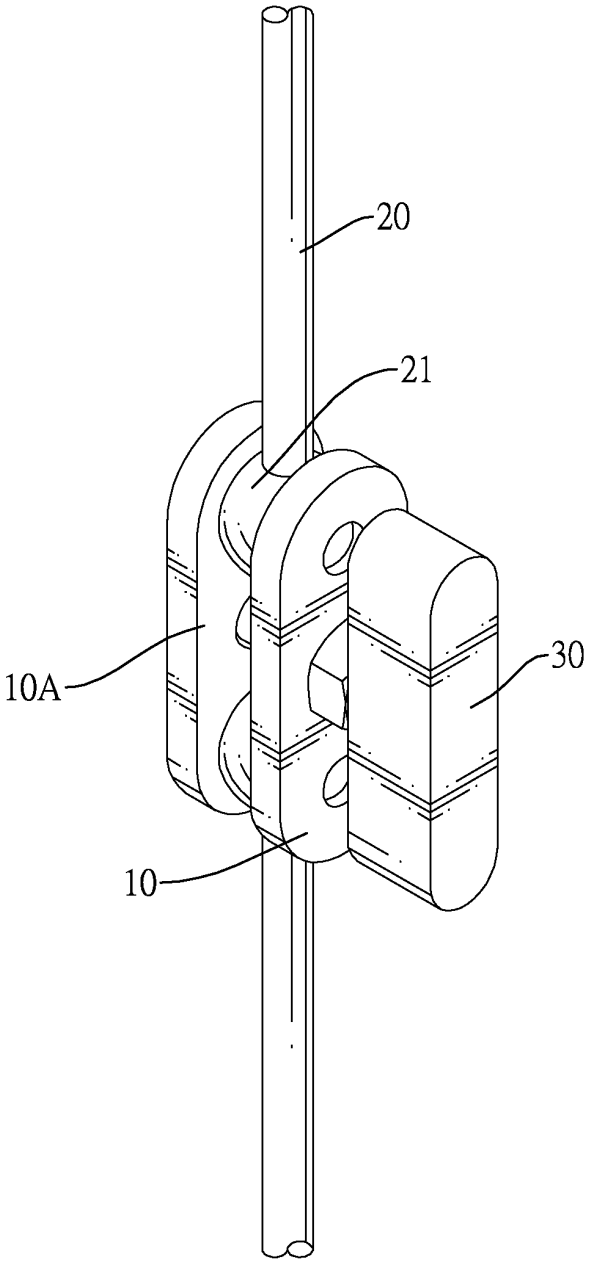

FIG.1

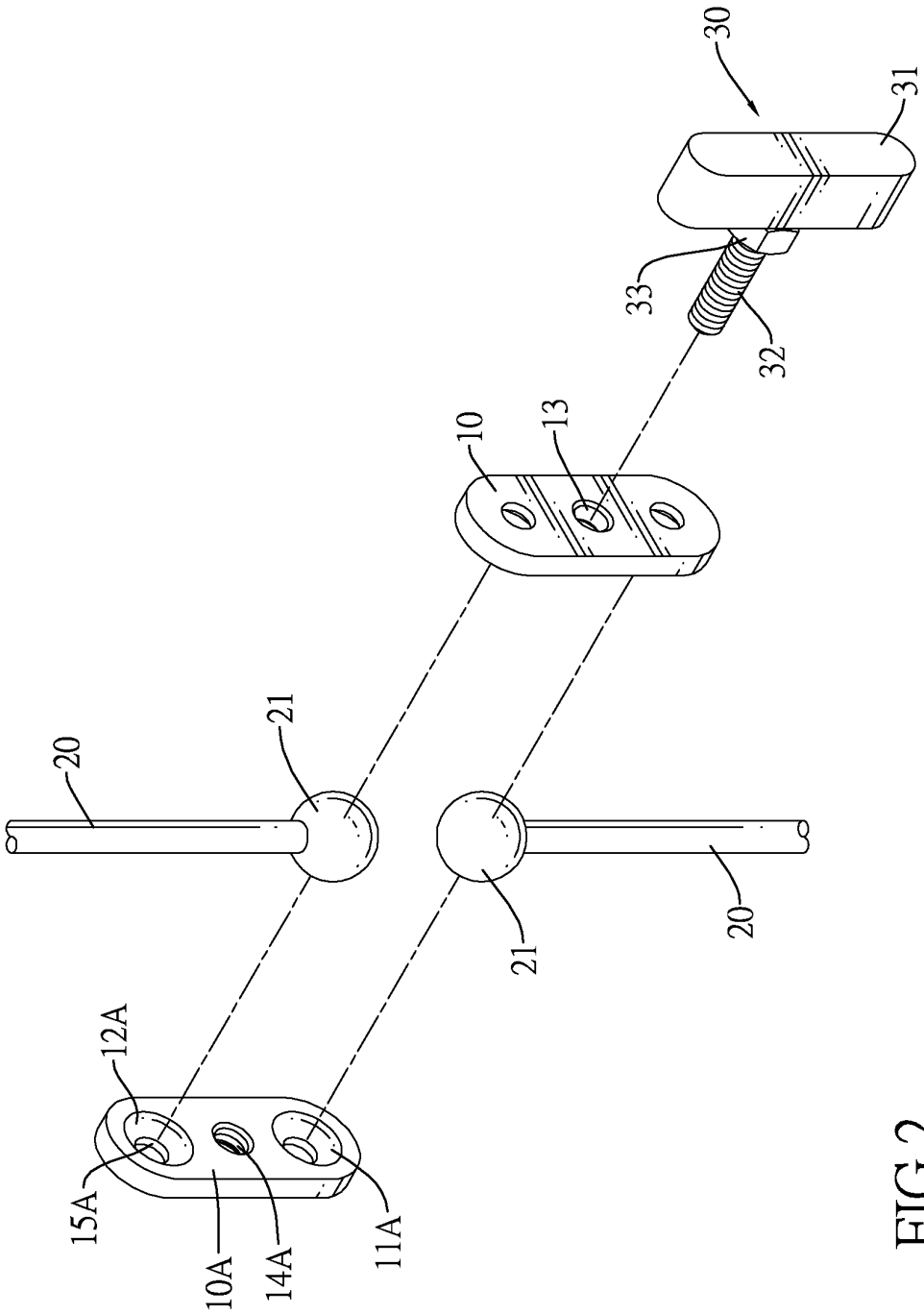

FIG.2

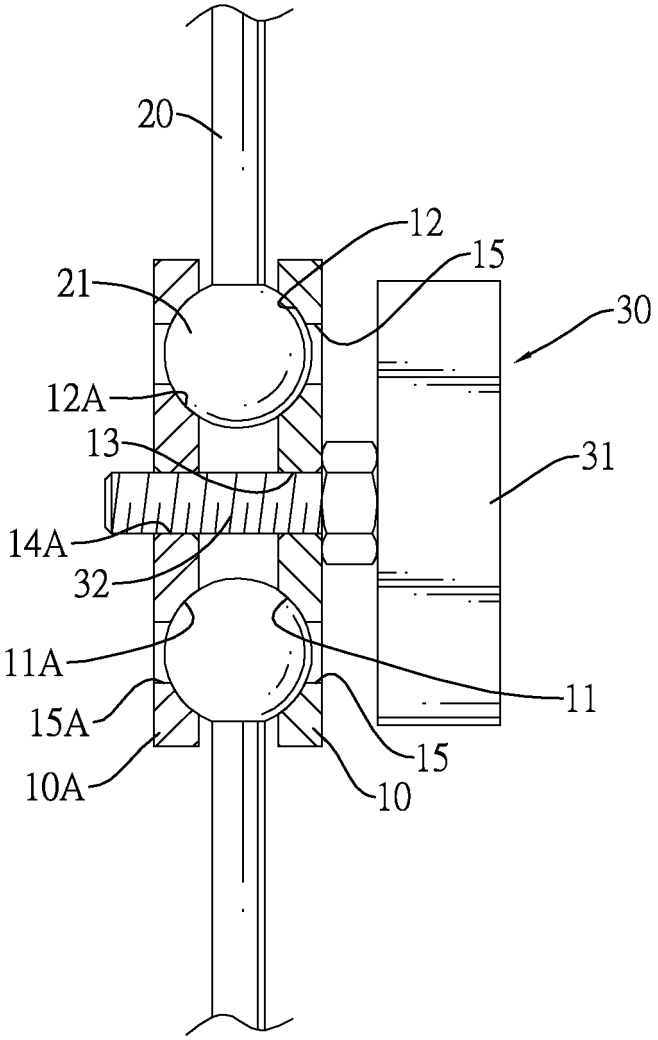

FIG.3

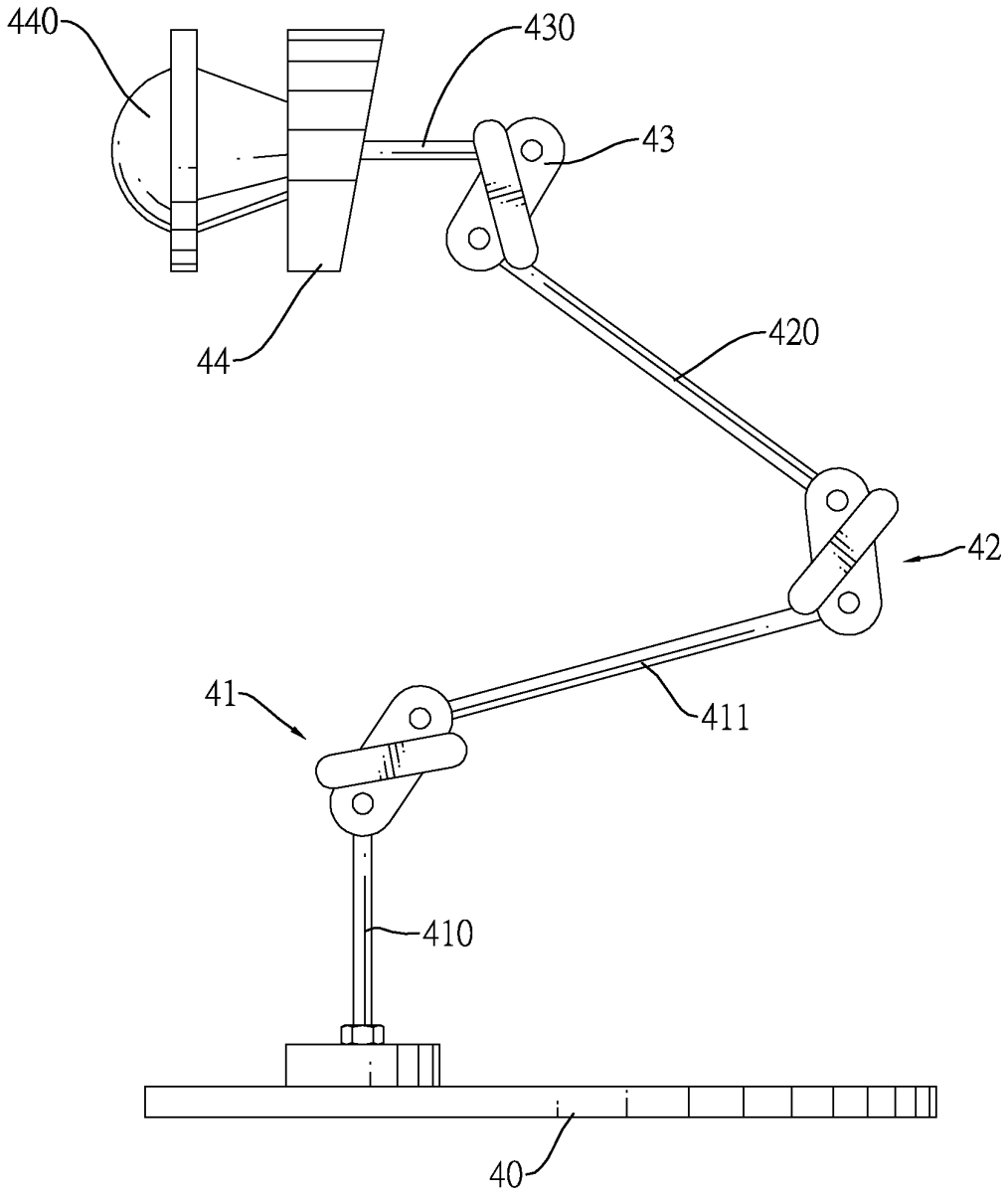

FIG.4

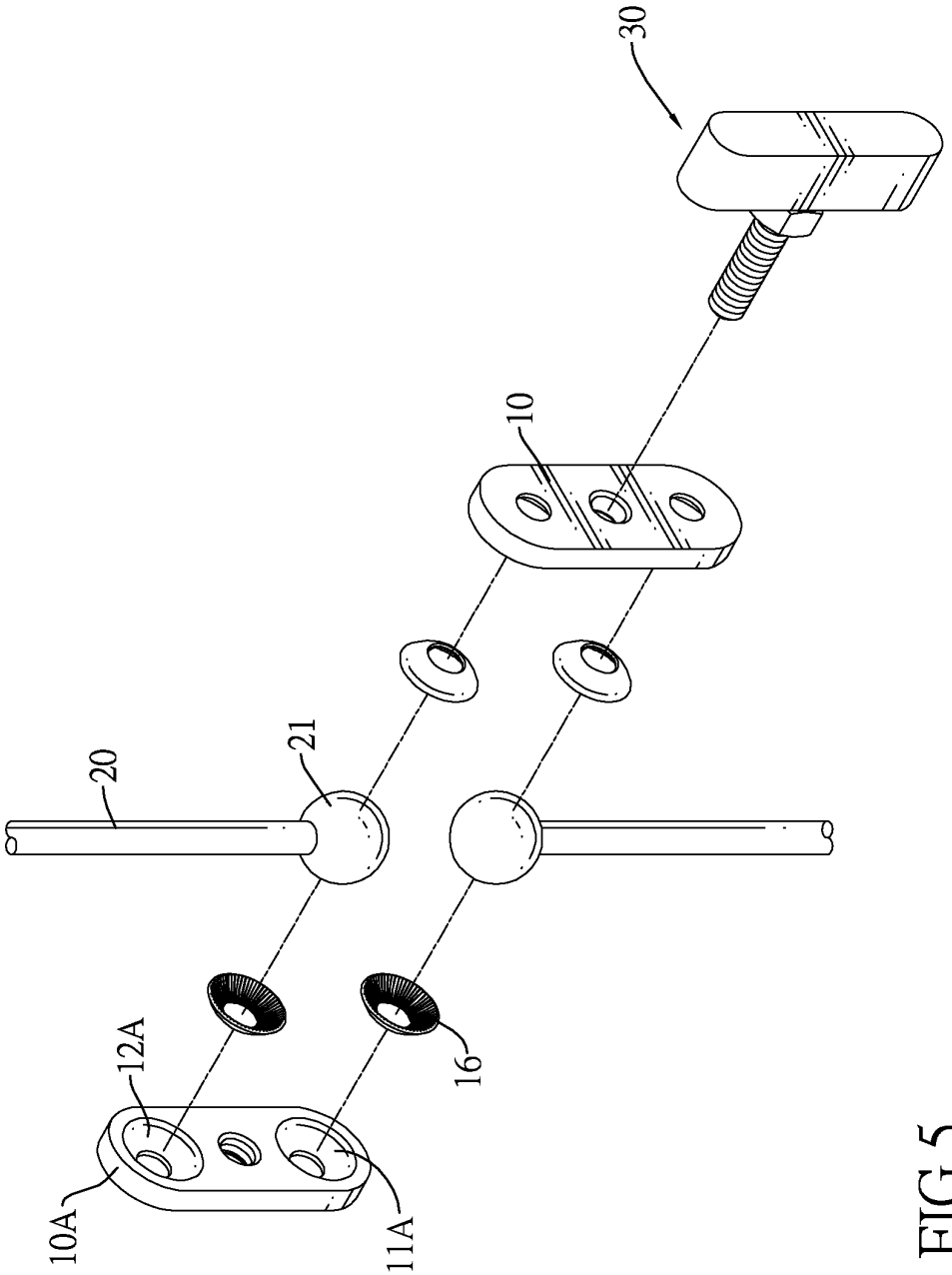

FIG.5

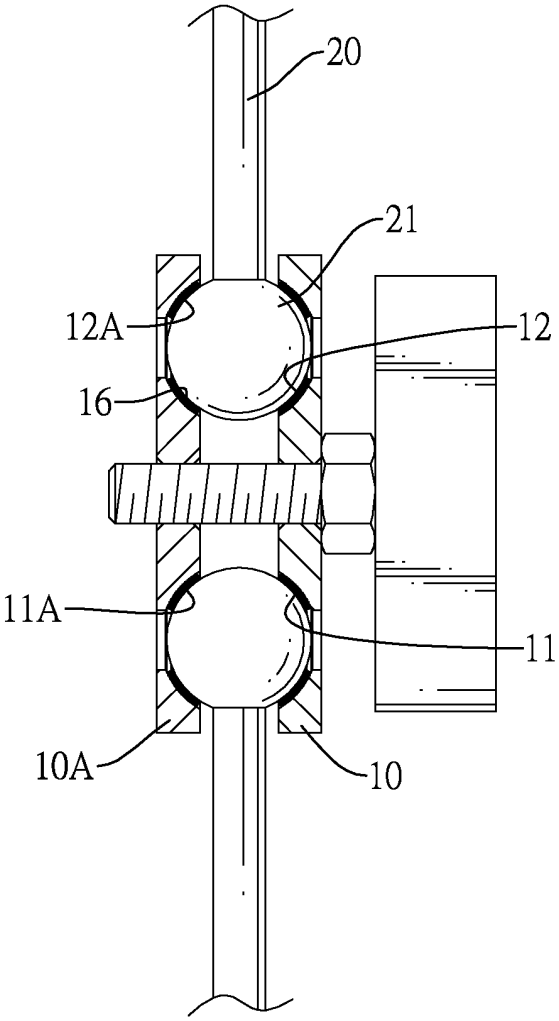

FIG.6

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EUROPEAN SEARCH REPORT

Application Number
EP 12 17 6917

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 A	GB 2 075 589 A (ANDERSON GEORGE HENRY) 18 November 1981 (1981-11-18) * page 2, line 15 - page 3, line 19; figures 1-3 *	1 5	INV. F21V21/26 F21V21/28
Y	US 2 440 873 A (RUDOLF POPP ET AL) 4 May 1948 (1948-05-04) * column 2, line 35 - column 5, line 11; figures 1-9 *	1-7	
Y	US 6 220 556 B1 (SOHRT THOMAS M [US] ET AL) 24 April 2001 (2001-04-24) * column 1, line 65 - column 3, line 18; figure 3 *	1,3-7	
Y A	US 2005/095058 A1 (BIBA SCOTT I [US] ET AL BIBA SCOTT IGNATIUS [US] ET AL) 5 May 2005 (2005-05-05) * paragraph [0022] - paragraph [0048]; figure 4 *	2 1	
			TECHNICAL FIELDS SEARCHED (IPC) F21V

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	21 January 2013	Arboreanu, Antoniu

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 17 6917

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21-01-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2075589 A	18-11-1981	NONE	
US 2440873 A	04-05-1948	NONE	
US 6220556 B1	24-04-2001	NONE	
US 2005095058 A1	05-05-2005	CA 2507652 A1	19-05-2005
		US 2005095058 A1	05-05-2005
		WO 2005045260 A2	19-05-2005

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