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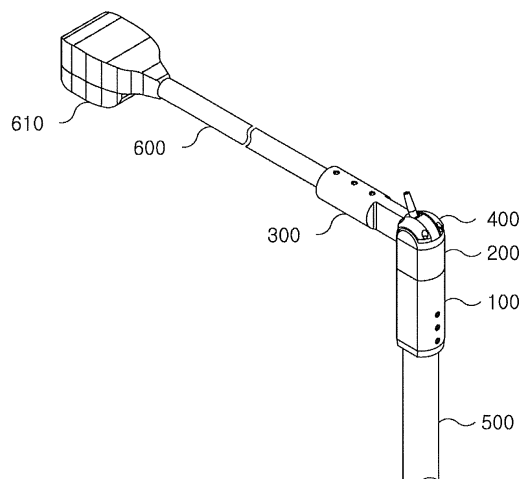
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(54) **MULTIFUNCTION SMART ADAPTOR FOR LED LUMINAIRE**

(57) Provided is a multifunction adaptor comprising an adaptor base 100 which is connected to a standard pole 500 and includes an electronic equipment for a LED luminaire 610; an adaptor middle part 200 which is connected to the adaptor base 100 and prevents the heat interference between the LED luminaire 610 and the

electronic equipment; and an adaptor bracket 300 of which one side is connected to an arm part 600 connected to the LED luminaire 610, and the other side is connected to the adaptor middle part 200 in order to control the angle of the LED luminaire 610.

Fig. 2



Description**BACKGROUND OF THE INVENTION****Field of the Invention**

[0001] The present invention relates to a multifunction adaptor, and more particularly to the multifunction adaptor which can be connected to any street lamp apparatus, adjust the angle of the direction of a LED light in a state it is not disassembled, and separate the heat generation sources and therefore implement the ventilation of them efficiently.

Description of Related Art

[0002] In general, a street lamp apparatus is comprised of a LED luminaire, an arm part and a pole. The basic function of the street lamp apparatus is to provide the visibility in the dark. That is, the street lamp apparatus has to be installed to direct properly a beam at a spot, which is needed to have the visibility.

[0003] However, the coupling structure with the LED luminaire, the arm part and the pole is predetermined as are manufactured in a factory. Thereby, the direction of the beam of the LED luminaire cannot be adjusted accordingly to several installation conditions.

[0004] Fig. 1 is an exploded perspective view of the lighting apparatus having a conventional angle adjustment function, which is included in Korean Utility Model No.20-0448832 Y1 published on 27 May 2010.

[0005] As is examined, a LED luminaire 1 is connected to a Y frame 6 by two screws 11, in a state of having set up the location of the LED luminaire 1.

[0006] That is, the LED luminaire 1 must be separated so as to adjust the angle of the beam of it, and after adjusting it, the two screws 11 have to be again inserted.

[0007] Moreover, the shapes of the LED luminaire 1 and the Y frame 6 are confined in order to implement the lighting apparatus according to the prior art described in Fig. 1.

[0008] Meanwhile, the street lamp apparatus may contain an electronic equipment such as a speaker, a monitoring device, or a controlling device.

[0009] However, normally the LED luminaire and the electronic equipment are configured in the same place. Thereby, the heat generation of them may influence to each other in the aspect of malfunction or disorder.

SUMMARY OF THE INVENTION

[0010] An embodiment of the present invention is directed to providing a multifunction adaptor which can be connected to any street lamp apparatus.

[0011] An embodiment of the present invention is directed to providing a multifunction adaptor, which can adjust the angle of the direction of a LED light in a state the multifunction adaptor is not disassembled.

[0012] An embodiment of the present invention is directed to providing a multifunction adaptor, which can separate the heat generation sources and therefore implement the ventilation of them efficiently.

[0013] To achieve the object of the present invention, the present invention provides a multifunction adaptor comprising an adaptor base 100 which is connected to a standard pole 500 and includes an electronic equipment for a LED luminaire 610; an adaptor middle part 200 which is connected to the adaptor base 100 and prevents the heat interference between the LED luminaire 610 and the electronic equipment; and an adaptor bracket 300 of which one side is connected to an arm part 600 connected to the LED luminaire 610, and the other side is connected to the adaptor middle part 200 in order to control the angle of the LED luminaire 610.

BRIEF DESCRIPTION OF THE DRAWINGS**[0014]**

Fig. 1 is an exploded perspective view of the lighting apparatus having a conventional angle adjustment function. Fig. 2 is a view showing the configuration of a multifunction adaptor according to an embodiment of the present invention.

Fig. 3 is an exploded perspective view of the adaptor base 100 of the multifunction adaptor according to the embodiment of the present invention.

Fig. 4 is an exploded perspective view of the adaptor middle part 200 of the multifunction adaptor according to the embodiment of the present invention.

Fig. 5 is an exploded perspective view of the adaptor bracket 300 of the multifunction adaptor according to the

embodiment of the present invention.

Fig. 6 is an exploded perspective view of the multifunction adaptor according to the embodiment of the present invention.

Fig. 7 is a view showing the configuration of a multifunction adaptor according to the other embodiment of the present invention.

[Detailed Description of Main Elements]

[0015]

100: adaptor base	200: adaptor middle part
300: adaptor bracket	310: communication antenna
320: tooth wheel	400: fixing bar
410: tooth bar	110, 210, 330, 420: screw
500: standard pole	600: arm part
610: LED luminaire	700: tube

DESCRIPTION OF SPECIFIC EMBODIMENTS

[0016] The advantages, features and aspects of the present invention will become apparent from the following description of the embodiments with reference to the accompanying drawings, which is set forth hereinafter.

[0017] Fig. 2 is a view showing the configuration of a multifunction adaptor according to an embodiment of the present invention.

[0018] The multifunction adaptor is comprised of an adaptor base 100, an adaptor middle part 200 and an adaptor bracket 300. Further, the adaptor bracket 300 includes a fixing and angle-adjusting means. Herein, the fixing and angle-adjusting means is inserted between the adaptor middle part 200 and the adaptor bracket 300. And the fixing and angle-adjusting means includes two fixing bars 400, four tooth bars 410 and four screws 420.(see Fig.5)

[0019] Herein, the adaptor base 100 is configured to be connected to a standard pole 500 used in a conventional LED lighting apparatus, especially a street lamp apparatus. Further, the adaptor bracket 300 is configured to be connected to an arm part 600 coupled to a conventional LED luminaire 610.

[0020] That is, the conventional lighting apparatus is easily coupled with the multifunction adaptor, and it does work properly and have several new functions.

[0021] Herein, the multifunction adaptor may be made from aluminum alloy, and the screws 420 may be made from stainless steel so as to have durability.

[0022] Fig. 3 is an exploded perspective view of the adaptor base 100 of the multifunction adaptor according to the embodiment of the present invention.

[0023] The adaptor base 100 is connected to the standard pole 500. The screws 110 are inserted through several screw holes on the side of the adaptor base 100 into the preformed tapped holes on the side of the standard pole 500. Herein, the tapped holes may be formed under installation work. At this time, the screws 110 may be headless so as not to stick out outside the adaptor base 100. Herein, the screws 110 may be made from stainless steel so as to have durability.

[0024] Desirably, in order to safely install the adaptor base 100 to the standard pole 500, they may be configured to be overlapped at least 100mm in a longitudinal direction. Further, the two tapped holes are configured on the top of the adaptor base 100 in order to assemble the adaptor base 100 to the adaptor middle part 200.

[0025] That is, by configuring the adaptor base 100 so as to be easily installed on the standard pole 500, the multifunction adaptor can facilitate setting up a new lighting apparatus and adjusting an existing lighting apparatus easily in this way.

[0026] The adaptor base 100 performs the function of an enclosure for an electronic equipment. The electronic equipment may include power supply, relay, dimming converter, ballast stabilizer, communication means, photo sensor, control means or audio means selectively.

[0027] Further, the adaptor base 100 may include DALI(Digital Addressable Lighting Interface) means so as to reduce energy consumption by controlling dimming of the LED luminaire 610.

[0028] Fig. 7 is a view showing the configuration of a multifunction adaptor according to the other embodiment of the present invention.

[0029] A tube 700 may be inserted between the adaptor base 100 and the standard pole 500. The tube 700 performs the function of an extension for the adaptor base 100. The tube 700 may be coupled in various forms to the standard pole 500. The tube 700 may be coupled inside or outside of the standard pole 500. A coupling means may be a screw coupling, or another connector may be used additionally in order to be assembled accordingly to several forms of the

standard pole 500.

[0030] In the case of insertion of the tube 700, the tube 700 may include power supply, relay, dimming converter, ballast stabilizer, communication means, photo sensor, control means, audio means or DALI means selectively.

[0031] Fig. 4 is an exploded perspective view of the adaptor middle part 200 of the multifunction adaptor according to the embodiment of the present invention.

[0032] The adaptor middle part 200 is connected to the adaptor base 100. The screws 210 are inserted through the screw holes on the top of the adaptor middle part 200 into the tapped holes on the top of the adaptor base 100. Herein, the screws 210 may be made from stainless steel so as to have durability.

[0033] The adaptor middle part 200 performs the function of a cable channeling. That is, the cables between the LED luminaire 610 and the electronic equipment in the adaptor base 100 or the tube 700 pass through the adaptor middle part 200. The adaptor middle part 200 may be formed as a kind of a hub connector, into which the ends of the cables can be inserted and coupled easily into several preformed connecting holes.

[0034] Further, the adaptor middle part 200 performs the function of the prevention of heat interference between the LED luminaire 610 and the electronic equipment. That is, the radiation of heat from the LED luminaire 610 can be implemented more effectively. Moreover, the ventilation of the electronic equipment as well as the LED luminaire 610 can be easily and effectively performed.

[0035] Fig. 5 is an exploded perspective view of the adaptor bracket 300 of the multifunction adaptor according to the embodiment of the present invention.

[0036] With the fixing and angle-adjusting means, the adaptor bracket 300 performs the function of adjusting the angle of the direction of LED light by rotating the arm part 600 precisely and minutely. Herein, the fixing and angle-adjusting means includes two fixing bars 400, four tooth bars 410 and four screws 420.

[0037] The two tooth wheels 320 are formed on the both sides of the adaptor bracket 300, and the edge of each wheel is saw-toothed so as to adjust the angle precisely and minutely. The two lower tooth bars 410 are located below the two tooth wheels 320, and perform the function of the bearings which help the adapter bracket 300 to rotate minutely.

[0038] The two lower tooth bars 410 are inserted into the preformed holes on top of the adaptor middle part 200. And the two upper tooth bars 410 are put on the two tooth wheels 320. At this time, the flat part of each upper tooth bar 410 needs to be located in parallel to the adaptor middle part 200. And the two fixing bars 400 are put on the two upper tooth bars 410, and thereby the two upper tooth bars 410 are precisely located in the preformed holes of the two fixing bars 400. As a result, the two fixing bars 400 are located in parallel to the adaptor middle part 200, and therefore the coupling of the adaptor middle part 200 and the adaptor bracket 300 is strong.

[0039] Herein, the two upper tooth bars 410 perform the function of the bearings which help the adapter bracket 300 to rotate minutely.

[0040] After putting the two fixing bars 400 on the two upper tooth bars 410, the four screws 420 are inserted through the screw holes on the top of the two fixing bars 400 into the tapped holes on the top of the adaptor middle part 200. Herein, the screws 420 may be made from stainless steel so as to have durability.

[0041] Thereby, when the multifunction adaptor is installed or although it was installed, the adaptor bracket 300 can be rotated in a state the multifunction adaptor is not disassembled, and so the angle of the LED light of the LED luminaire 610 can be adjusted easily.

[0042] A communication antenna 310 may be added on the adaptor bracket so as to have the fast connection with the other communication systems.

[0043] Fig. 6 is an exploded perspective view of the multifunction adaptor according to the embodiment of the present invention.

[0044] The adaptor bracket 300 is connected to the arm part 600. The screws 330 are inserted through several screw holes on the side of the adaptor bracket 300 into the preformed tapped holes on the side of the arm part 600. Herein, the tapped holes may be formed under installation work. At this time, the screws 330 may be headless so as not to stick out outside the adaptor bracket 300. Herein, the screws 330 may be made from stainless steel so as to have durability.

[0045] Desirably, in order to safely install the adaptor bracket 300 to the arm part 600, they may be configured to be overlapped at least 100mm in a coupling direction.

[0046] While the present invention has been described with respect to the specific embodiments, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the following claims.

Claims

1. A multifunction adaptor comprising:

an adaptor base 100 which is connected to a standard pole 500 and includes an electronic equipment for a

LED luminaire 610;

an adaptor middle part 200 which is connected to the adaptor base 100 and prevents the heat interference between the LED luminaire 610 and the electronic equipment; and

an adaptor bracket 300 of which one side is connected to an arm part 600 connected to the LED luminaire 610, and the other side is connected to the adaptor middle part 200 in order to control the angle of the LED luminaire 610.

2. A multifunction adaptor comprising:

a tube 700 which is connected to a standard pole 500 and includes an electronic equipment for a LED luminaire 610;

an adaptor base 100 which is connected to the tube 700;

an adaptor middle part 200 which is connected to the adaptor base 100 and prevents the heat interference between the LED luminaire 610 and the electronic equipment; and

an adaptor bracket 300 of which one side is connected to an arm part 600 connected to the LED luminaire 610, and the other side is connected to the adaptor middle part 200 in order to control the angle of the LED luminaire 610.

3. The multifunction adaptor of claim 1 or claim 2, wherein the adaptor bracket 300 comprises

the two tooth wheels 320 which are formed on the both sides of the adaptor bracket 300;

a fixing and angle-adjusting means, which is interlocked with the two tooth wheels 320 for controlling the angle of the LED luminaire 610, and includes two fixing bars 400, four tooth bars 410 and four screws 420.

4. The multifunction adaptor of claim 1 or claim 2, wherein the electronic equipment includes power supply, relay, dimming converter, ballast stabilizer, communication means, photo sensor, control means, audio means or DALI means selectively.

5. The multifunction adaptor of claim 3,

wherein in order to connect the adaptor bracket 300 to the adaptor middle part 200, the four tooth bars 410 are located above and below the two tooth wheels 320, the two fixing bars 400 are put on the two upper tooth bars 410 of the four tooth bars 410, and the four screws 420 are inserted through the screw holes on the top of the two fixing bars 400 into the tapped holes on the top of the adaptor middle part 200.

6. The multifunction adaptor of claim 1 or claim 2, wherein in order to connect the adaptor bracket 300 to the arm part 600, the screws 330 are inserted through several screw holes on the side of the adaptor bracket 300 into the preformed tapped holes on the side of the arm part 600.

7. The multifunction adaptor of claim 1 or claim 2, wherein in order to connect the adaptor middle part 200 to the adaptor base 100, the screws 210 are inserted through several screw holes on the top of the adaptor middle part 200 into the preformed tapped holes on the top of the adaptor base 100.

8. The multifunction adaptor of claim 1,

wherein in order to connect the adaptor base 100 to the standard pole 500, the screws 110 are inserted through several screw holes on the side of the adaptor base 100 into the preformed tapped holes on the side of the standard pole 500, and the adaptor base 100 and the standard pole 500 are configured to be overlapped at least 100mm in a longitudinal direction.

Fig. 1

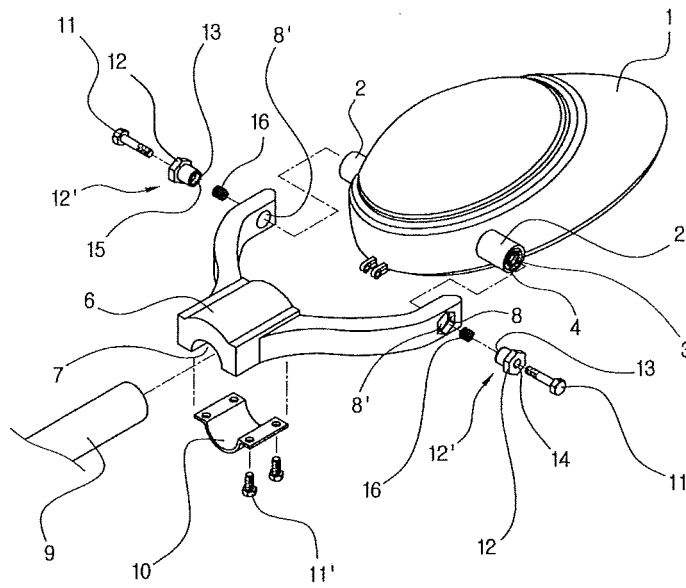


Fig. 2

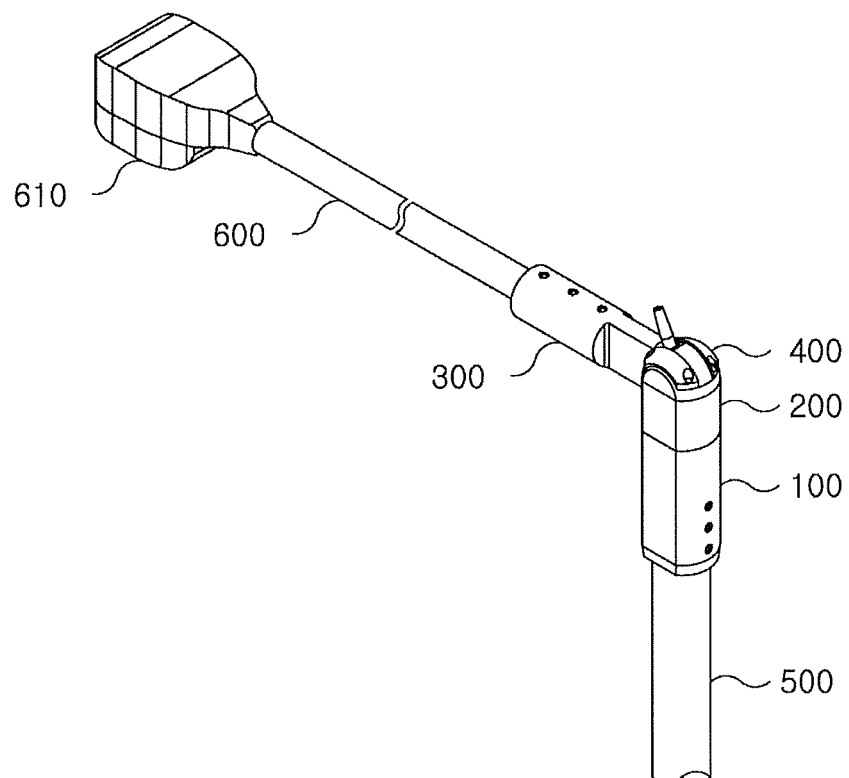
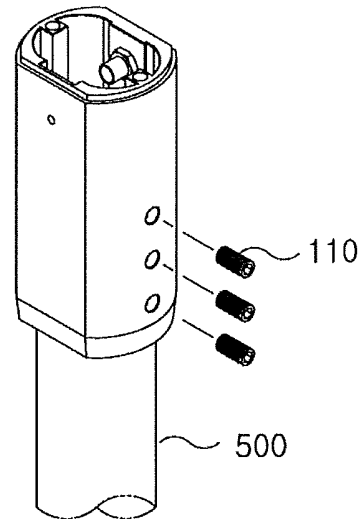


Fig. 3

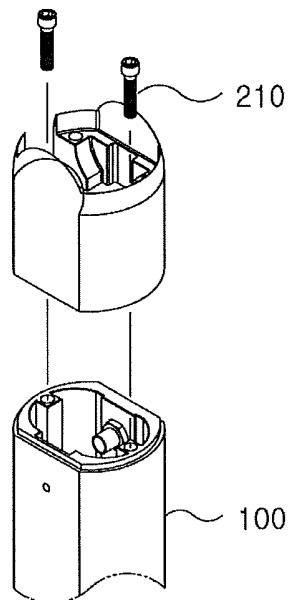
100



L

Fig. 4

200



L

Fig. 5

300 & 400

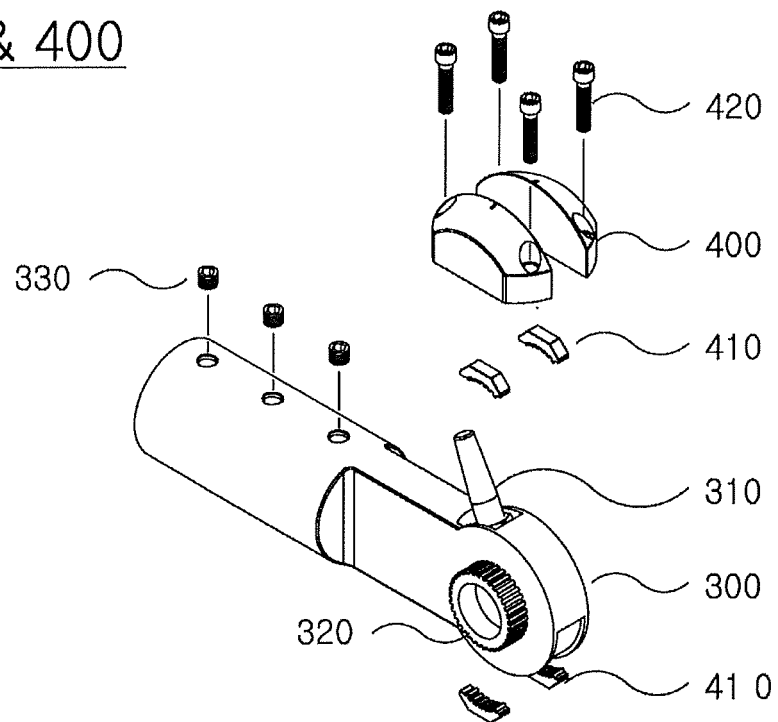


Fig. 6

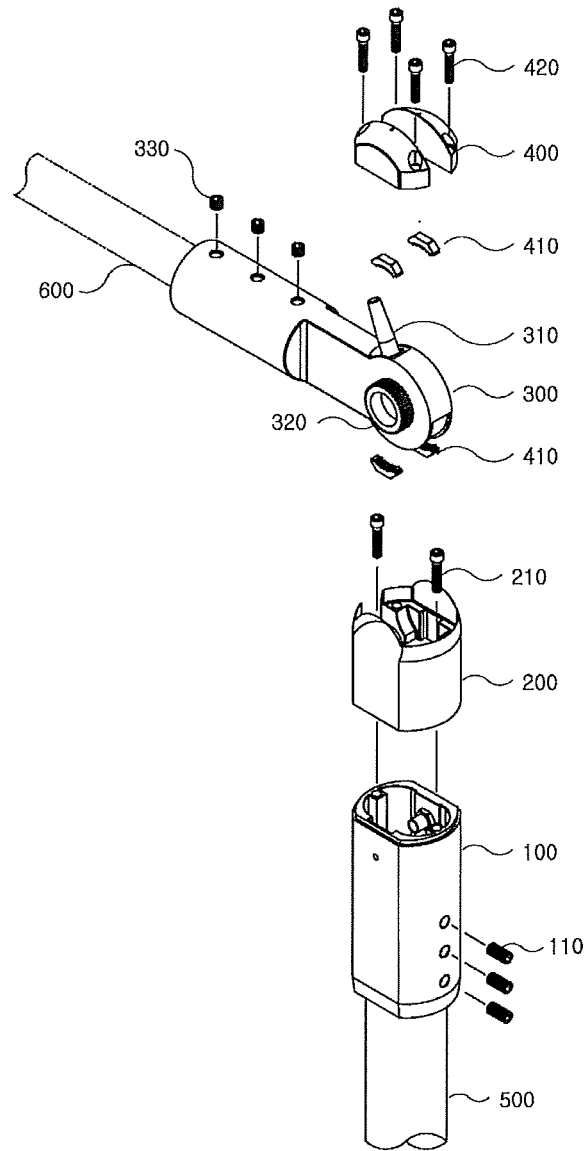
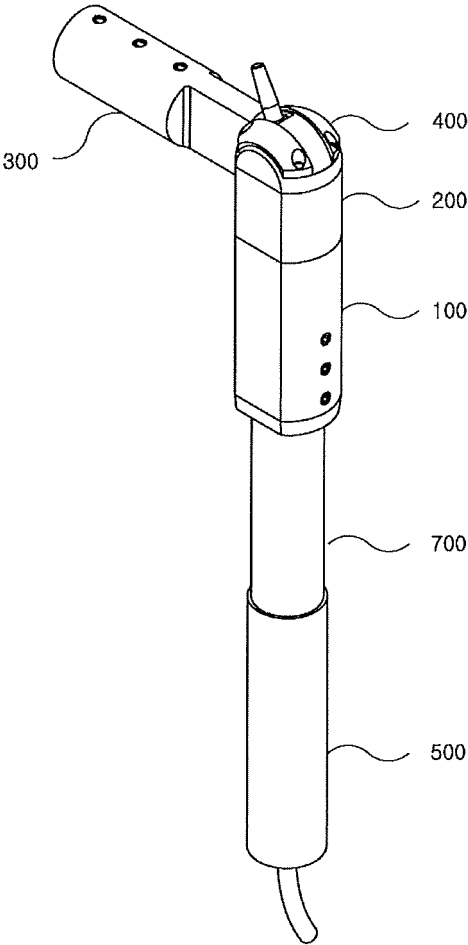


Fig. 7



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2012/011391

A. CLASSIFICATION OF SUBJECT MATTER

F21V 21/14(2006.01)i, F21V 17/00(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)

F21V 21/14; F21S 8/08; F21V 3/00; F21V 21/30; F21V 14/02; F21V 17/02; F21W 111/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models: IPC as above

Japanese Utility models and applications for Utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & Keywords: street light, luminaires, angle, adjustment, control means, sawtooth.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2009-032468 A (TOSHIBA LIGHTING & TECHNOLOGY CORP) 12 February 2009 See abstract, claims 1-3, figures 1-2, 4-6	1-8
A	KR 10-0994448 B1 (PARK, Young Min) 15 November 2010 See abstract, claims 1-10, figures 1-9	1-8
A	KR 10-1044261 B1 (AMOLUXE CO., LTD.) 28 June 2011 See abstract, claims 1-17, figures 4-8	1-8
A	KR 10-2011-0081655 A (LUTIMA CO. LTD.) 14 July 2011 See abstract, claims 1-6, figures 1-4	1-8

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

* Special categories of cited documents:

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Date of the actual completion of the international search

18 MARCH 2013 (18.03.2013)

Date of mailing of the international search report

19 MARCH 2013 (19.03.2013)

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2012/011391

Patent document cited in search report	Publication date	Patent family member	Publication date
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KR 10-0994448 B1	15.11.2010	NONE	
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		WO 2011-078515 A3	30.06.2011
KR 10-2011-0081655 A	14.07.2011	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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