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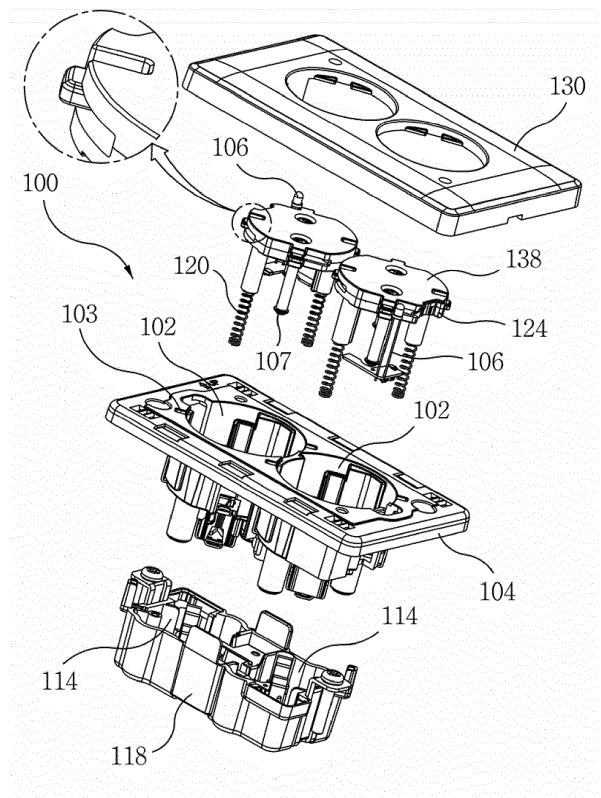
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(54) **ELECTRICAL SOCKET OUTLET**

(57) Provided is an electrical socket outlet that can prevent an accident from happening with a press plate locking device of the electrical socket outlet, since a safe plate does not fall down other than an insertion of an electrical cord, completely block foreign matters such as dust from being introduced into the electrical socket outlet, by blocking the respective holes of a safe plate, and make it easy to confirm a plug-in state with the naked eye in the daytime and at night.



[FIG. 1]

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an electrical socket outlet, and more particularly, to an electrical socket outlet that can prevent an accident from happening with a press plate locking device of the electrical socket outlet, completely block foreign matters such as dust from being introduced into the electrical socket outlet, make it easy to confirm a plug-in state with the naked eye in the daytime and at night, easily open and close the electrical socket outlet with one hand through a one-touch function, and standby the next operation with only half a plug inserted into the electrical socket outlet.

2. Description of the Related Art

[0002] In general, an electrical socket outlet is equipped with a socket. When using electrical appliances, a plug is inserted (or plugged) into an electrical socket outlet. Moreover, the electrical socket outlet has a press plate locking safety device for protecting a user from an accident.

[0003] The press plate locking safety device is disclosed in Korean Patent Application No. 10-2013-0120450 filed on 10 October 2013 by the applicant, entitled "a safe socket outlet" including: a power connection unit provided with an internal connecting terminal; a socket outlet body that is coupled on an upper portion of the power connection unit and that is provided with an internal plug receiving portion in which socket holes are perforated on a bottom surface of the plug receiving portion; a press plate that is positioned at an inner side of the plug receiving portion in the socket outlet body and that ascends and descends in the inner side of the plug receiving portion by an elasticity of a spring in which insertion holes are perforated in correspondence to the socket holes; a cover that is coupled on top of the socket outlet body and prevents the press plate from being completely separated from the plug receiving portion in the socket outlet body; and a rotary type locking body that is provided on top of the press plate to block the insertion holes of the press plate and that is rotated by a pressing operation of incoming plug terminals when a plug is inserted into the socket outlet, to thus open the insertion holes of the press plate and that returns to an original position when the plug terminals are released from the outlet, to thus block the insertion holes of the press plate, wherein a locking hole is further provided on the press plate, and wherein the locking body cover comprises: a fastening protrusion that is coupled with the locking hole of the press plate; a coupling pin that is fitted into a first coupling hole of the press plate and a second coupling hole of a cross-shaped locking unit when the coupling pin is located at a position corresponding to the second

coupling hole of the cross-shaped locking unit; a support piece in which the cross-shaped locking unit is positioned and with which one surface of the cross-shaped locking unit is supported in close contact; fitting holes corresponding to the insertion holes of the press plate; and spring support pieces with which one side of a return spring is supported in close contact in which the other side of the return spring is fitted with a spring coupling protrusion of the cross-shaped locking unit.

[0004] However, the conventional safe socket outlet has some defects in which an accident cannot be prevented from occurring due to insecure locking, and foreign matters such as dust cannot be completely blocked from being introduced into the safe socket outlet.

[0005] In addition, the conventional safe socket outlet has a problem that a plug-in state, that is, a state where a plug is properly plugged in the safe socket outlet, cannot be confirmed with the naked eye at night. Meanwhile, another socket outlet is provided with a lamp unit which is associated with a turn-on switch or a turn-off switch, to thus cause a problem of making a user have to operate the turn-on switch or the turn-off switch.

SUMMARY OF THE INVENTION

[0006] To solve the above problems, it is an object of the present invention to provide an electrical socket outlet that can prevent an accident from happening with a press plate locking device of the electrical socket outlet, completely block foreign matters such as dust from being introduced into the electrical socket outlet, and make it easy to confirm a plug-in state with the naked eye in the daytime and at night.

[0007] It is another object of the present invention to provide an electrical socket outlet that conveniently separate a plug from the electrical socket outlet through a one-touch function, and standby the next operation with only half a plug inserted into the electrical socket outlet.

[0008] However, the objects of the present invention are not limited to the above-mentioned object, and other objects that are not mentioned will be apparently understood from the following description to those skilled in the art.

[0009] According to an aspect of the present invention, there is provided an electrical socket outlet comprising: a main body in which a recess type socket is formed, and socket holes are formed so that a plug terminal can be inserted into the socket holes at a side on the bottom surface of the socket; a power supply unit that is detachably mounted on a lower surface of the main body, in which a power connection groove is formed at an inner side thereof so that a plug terminal can be inserted the power connection groove, to thus receive an electricity from an external power source and supply the electricity to the plug terminal; a press plate that is located inside the socket formed in the main body, that ascends and descends in the inner side of the socket by an elasticity of a spring in which insertion holes are perforated in cor-

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response to the socket holes of the socket, and engagement holes are formed therein at a predetermined distance from the insertion holes; a rotary type locking body that is provided on top of the press plate to block the insertion holes of the press plate in which the rotary type locking body is rotated by a pressing operation of incoming plug terminals when a plug is inserted into the socket outlet, to thus open the insertion holes of the press plate and make the rotary type locking body rotated to thus make a cross-shaped locking unit released from a locking jaw of the main body to then make the press plate descend, and returns to an original position when the plug terminals are automatically released from the socket outlet by a rotary cam that is located on the bottom-central surface of the main body once the plug terminals are pressed once more, to thus block the insertion holes and earth terminal holes of the press plate; a cover that is coupled to an upper portion of the main body to thus protect the main body from external impact and to make it easy to confirm a plug-in state with the naked eye in the daytime and at night; a light emitting portion that is fixed to the outer surface of the socket formed in the main body and that is positioned to protrude while passing through one side of an upper surface of the main body; an elastic material metal piece that is installed and fixed along one side of the bottom surface of the socket, in which an outer circumferential surface of one side thereof protrudes into the inside of each of the socket holes; and a resistor that is installed and fixed along one side of the bottom surface of the socket, and that is connected between one end of the light emitting portion and one end of the elastic material metal piece.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The above and other objects and advantages of the present invention will become more apparent by describing in detail exemplary embodiments thereof with reference to the attached drawings in which:

FIG. 1 is an exploded perspective view schematically showing an exploded electrical socket outlet according to an embodiment of the present invention;

FIG. 2 is an exploded perspective view showing details of an electrical socket outlet in accordance with an embodiment of the present invention.

FIG. 3A is an exploded perspective view schematically showing an essential portion of the inside of the main body shown in FIG. 1;

FIG. 3B is a perspective view schematically showing a state where a locking body cover is provided in the inside of a cover of FIG. 1.

FIG. 4A is an enlarged perspective view schematically showing an enlarged light emitting portion of

FIG. 1;

FIG. 4B is an enlarged bottom perspective view schematically showing a resistor provided on the bottom surface of the light-emitting portion of FIG. 1;

FIG. 5A is a perspective view schematically showing the main body of FIG. 1;

FIG. 5B is a schematic bottom perspective view of the bottom surface of the main body of FIG. 1;

FIG. 6A is a perspective view schematically showing a pressure plate of FIG. 1;

FIG. 6B is a perspective view schematically illustrating the bottom surface of the pressure plate of FIG. 1;

FIG. 7A is a perspective view schematically illustrating a locking body cover in FIG. 1;

FIG. 7B is a perspective view schematically illustrating the bottom surface of the locking body cover of FIG. 1;

FIG. 8A is an enlarged perspective view schematically illustrating a cross-shaped locking unit of FIG. 1;

FIG. 8B is an enlarged perspective view schematically illustrating the bottom surface of the cross-shaped locking unit of FIG. 1;

FIG. 9A is an enlarged perspective view schematically illustrating, a power supply unit of FIG. 1; and

FIG. 9B is an enlarged perspective view schematically illustrating a bottom surface of a power supply unit of FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

[0011] The other objects and features in addition to the above objects of the present invention will be clearly revealed through description of preferred embodiments of the present invention with reference to the accompanying drawings.

[0012] The terms used in this application have been used for the purpose of describing particular embodiments only and are not intended to limit the present invention. Unless otherwise defined, all terms used herein, including technical or scientific terms, have the same meanings as those commonly understood by those of ordinary skill in the art to which the invention belongs. It should be interpreted that such terms as those defined in commonly used dictionaries have the meanings consistent with the sense to the context of the related art, but shall not be interpreted to have ideal or excessively formal meanings unless clearly defined in the present

application.

[0013] Hereinbelow, an electrical socket outlet according to respective embodiments of the present invention will be described in more detail with reference to the accompanying drawings. However, the present invention may be implemented in various modifications or variations, but is not limited thereto. In addition, portions that are not involved directly with the present invention are omitted to make the present invention clearer. Like reference numerals indicate like elements throughout the description of the figures.

[0014] In the following description, well-known functions or specific description of the configuration is determined to unnecessarily obscure the subject matter of the present invention, a detailed description thereof will be omitted.

[0015] A main body 104 in an electrical socket outlet 100 in accordance with an embodiment of the present invention includes two sockets 102 that are identical, in which like elements are denoted by like reference numerals. Thus, only one socket 102 of FIG. 1 will be described below.

[0016] As shown in FIGS. 1 through 9B, an electrical socket outlet according to an embodiment of the present invention includes: a main body 104; a power supply unit 118; a press plate 124; a rotary type locking body 128; a cover 130; a light emitting portion 106; an elastic material metal piece 108; and a resistor 110.

[0017] The main body 104 is configured so that a recess type socket 102 is formed therein, in which socket holes are formed therein so that a plug terminal can be inserted into the socket holes at a side on the bottom surface of the socket 102.

[0018] The power supply unit 118 is detachably mounted on a lower surface of the main body (104), in which a power connection groove 114 is formed at an inner side thereof so that a plug terminal can be inserted the power connection groove 114, to thus receive an electricity from an external power source and supply the electricity to the plug terminal.

[0019] The press plate 124 is located inside the socket 102 formed in the main body 104, to ascend and descend in the inner side of the socket 102 by an elasticity of a spring 120 in which insertion holes 122 are perforated in correspondence to the socket holes of the socket 102, and engagement holes are formed therein at a predetermined distance from the insertion holes 122.

[0020] The rotary type locking body 128 is provided on top of the press plate 124 to block the insertion holes 122 of the press plate 124 in which the rotary type locking body 128 is rotated by a pressing operation of incoming plug terminals when a plug is inserted into the socket outlet, to thus open the insertion holes 122 of the press plate 124 and make the rotary type locking body 128 rotated to thus make a cross-shaped locking unit released from a locking jaw 103 of the main body 104 to then make the press plate 124 descend, and the rotary type locking body returns to an original position when the

plug terminals are automatically released from the socket outlet by a rotary cam 204 that is located on the bottom-central surface of the main body 104 once the plug terminals are pressed once more, to thus block the insertion holes 122 and earth terminal holes 126 of the press plate 124.

[0021] The cover 130 is coupled to an upper portion of the main body 104 to thus protect the main body 104 from external impact and to make it easy to confirm a plug-in state with the naked eye in the daytime and at night;

[0022] The light emitting portion 106 that is fixed to the outer surface of the socket 102 formed in the main body 104 and that is positioned to protrude while passing through one side of an upper surface of the main body 104.

[0023] The elastic material metal piece 108 is installed and fixed along one side of the bottom surface of the socket 102, in which an outer circumferential surface of one side thereof protrudes into the inside of each of the socket holes.

[0024] The resistor 110 is installed and fixed along one side of the bottom surface of the socket 102, and that is connected between one end of the light emitting portion 106 and one end of the elastic material metal piece 108.

[0025] In this case, the socket 102 is provided with an insertion tube 200 that is formed so that the spring 120 can be inserted into the insertion tube 200. The insertion tube 200 is clogged so that the spring 120 is not separated outside through the insertion tube 200. A press plate leaving preventing piece 107 is prevented from being detached from the main body 104.

[0026] The rotary type locking member 128 includes: a cross-shaped locking unit 134 in which a coupling hole 130 is formed in correspondence to a coupling pin and spring coupling projections 132 are protrudingly formed in entire surfaces thereof; an opening and closing portion 136 that is extended from both sides of the cross-shaped locking unit 134 and is forms at a position corresponding to the insertion holes 122 of the press plate 124; and a locking body cover 138 from which the cross-shaped locking unit 134 is extended and a protruding portion is positioned on an upper surface of the locking groove of the socket 102 to thus prevent departure of the cross-shaped locking unit 134.

[0027] In this case, the opening and closing portion 136 is inclined toward one end thereof, and includes an elongated protrusion.

[0028] The assembly and the use state of the electrical socket outlet according to the embodiment of the present invention configured as described above are as follows.

[0029] Here, the assembly of the electrical socket outlet according to the embodiment of the present invention can be changed depending on tastes of assemblers.

[0030] First of all, the main body 104 having the recess type socket 102 is positioned, and a light emitting portion 106 provided with a resistor 110 is positioned on the outer surface of the socket 102 formed in the main body 104.

[0031] The metal piece 108 of the elastic material is installed along one side of the bottom surface of the socket 102. At this time, the elastic material metal piece 108 is projected in the inside of each of the socket holes formed in the socket 102 to thus connect the metal piece 118 of the elastic material to the resistor 110.

[0032] After the press plate 124 having the spring 120 is positioned, the rotary type locking member 128 blocking the connecting hole 122 and the ground terminal hole 126 is installed on an upper surface of the press plate 124.

[0033] The rotary type locking member 128 includes: a cross-shaped locking unit 134 in which a coupling hole 130 is formed in correspondence to a coupling pin (not shown) and spring coupling projections 132 are protrudingly formed in entire surfaces thereof; an opening and closing portion 136 that is extended from both sides of the cross-shaped locking unit 134 and is forms at a position corresponding to the insertion holes 122 of the press plate 124; and a locking body cover 138 from which the cross-shaped locking unit 134 is extended and a protruding portion is positioned on an upper surface of the locking groove of the socket 102 to thus prevent departure of the cross-shaped locking unit 134.

[0034] The press plate 124 and the rotary type locking body 128 are inserted into the inside of the socket 102 formed in the main body 104.

[0035] As described above, when the press plate 124 and the rotary type locking body 128 are inserted into the inside of the socket 102, the lower surface of the main body 104 is pushed into the power connection groove 114 of the power supply unit 118.

[0036] When the main body 104 and the power supply unit 118 are coupled with a coupler (not shown), and the cover 130 is coupled on an upper portion of the main body 104, the light emitting portion 106 is inserted into the inner hole of the cover 130. The light emitting portion 106 can make a user easily determine a plug-in state with the user's naked eye during the day or night.

[0037] When the assembly of the electrical socket outlet according to the embodiment of the present invention as described above is completed, the electrical socket outlet 100 is installed on the wall and an external electric wire is connected to the power supply unit 118, and the external electric wire is supplied with the electricity through the power supply unit 118.

[0038] Then, after positioning the plug (not illustrated) having the plug terminal, the plug is pushed into the socket 102.

[0039] The plug terminal of the plug as described above is inserted through the locking body cover 138, and is in contact with the opening and closing portion 136 of the cross-shaped locking unit 134, to then move the opening and closing portion 136.

[0040] When the cross-shaped locking unit 134 is rotated to thus release the locking jaw 103 and make the press plate 124 descend, the opening and closing portion 136 moves, and the plug terminal is inserted into each of the socket holes of the socket 102 through the insertion

holes of the press plate 124.

[0041] As described above, when the plug terminal is inserted into the socket holes of the socket 102, the plug terminal is in contact with the outer circumferential surface of the metal piece 108 of the elastic material and in contact with the power supply unit 109, to thereby enable the light emitting portion 106 to emit light by means of the plug terminal.

[0042] Looking a little more for the reason that the light emitting portion 106 emits light, when the plug terminal is inserted into the socket holes formed in the socket 102, one side of the plug terminal is contact with the power supply terminal on the outer circumferential surface of the elastic material metal piece 108 that is positioned to protrude to the inside of each of the socket holes. Then, when the plug is made to descend to thus be in contact with the power supply terminal 109, and electric power is applied to the elastic material metal piece 108, the light emitting unit 106 emits light to thereby make a user easily identify a plug-in state with the user's naked eye during the day or night.

[0043] The electrical socket outlet according to the present invention as described above, exhibits an effect that an accident can be prevented with a press plate locking device.

[0044] In addition, the present invention exhibits an effect that foreign matters such as dust can be completely blocked from being introduced into the electrical socket outlet, and an effect that a plug-in state can be easily confirmed with the naked eye in the daytime and at night.

[0045] In addition, the present invention exhibits an effect that a light emitting portion is turned on once a plug terminal is inserted is inserted into an electrical socket outlet, to thus prevent a failure due to a conventional on or off switch and to reduce manufacturing costs.

[0046] In addition, the present invention exhibits an effect that the electrical socket outlet can be easily opened and closed with one hand through a one-touch function

[0047] While the present invention has been particularly shown and described with reference to exemplary embodiments thereof, it will be understood by those of ordinary skill in the art that various changes in form and details may be made therein without departing from the spirit and scope of the present invention as defined by the following claims.

Claims

1. An electrical socket outlet comprising:

a main body (104) in which a recess type socket (102) is formed, and socket holes are formed so that a plug terminal can be inserted into the socket holes at a side on the bottom surface of the socket (102);

a power supply unit (118) that is detachably mounted on a lower surface of the main body

(104), in which a power connection groove (114) is formed at an inner side thereof so that a plug terminal can be inserted the power connection groove (114), to thus receive an electricity from an external power source and supply the electricity to the plug terminal;

a press plate (124) that is located inside the socket (102) formed in the main body (104), that ascends and descends in the inner side of the socket (102) by an elasticity of a spring (120) in which insertion holes (122) are perforated in correspondence to the socket holes of the socket (102), and engagement holes are formed therein at a predetermined distance from the insertion holes (122);

a rotary type locking body (128) that is provided on top of the press plate (124) to block the insertion holes (122) of the press plate (124) in which the rotary type locking body (128) is rotated by a pressing operation of incoming plug terminals when a plug is inserted into the socket outlet, to thus open the insertion holes (122) of the press plate (124) and make the rotary type locking body (128) rotated to thus make a cross-shaped locking unit released from a locking jaw (103) of the main body (104) to then make the press plate (124) descend, and the rotary type locking body returns to an original position when the plug terminals are automatically released from the socket outlet by a rotary cam (204) that is located on the bottom-central surface of the main body (104) once the plug terminals are pressed once more, to thus block the insertion holes (122) and earth terminal holes (126) of the press plate (124);

a cover (130) that is coupled to an upper portion of the main body (104) to thus protect the main body (104) from external impact and to make it easy to confirm a plug-in state with the naked eye in the daytime and at night;

a light emitting portion (106) that is fixed to the outer surface of the socket (102) formed in the main body (104) and that is positioned to protrude while passing through one side of an upper surface of the main body (104);

an elastic material metal piece (108) that is installed and fixed along one side of the bottom surface of the socket (102), in which an outer circumferential surface of one side thereof protrudes into the inside of the socket hole; and

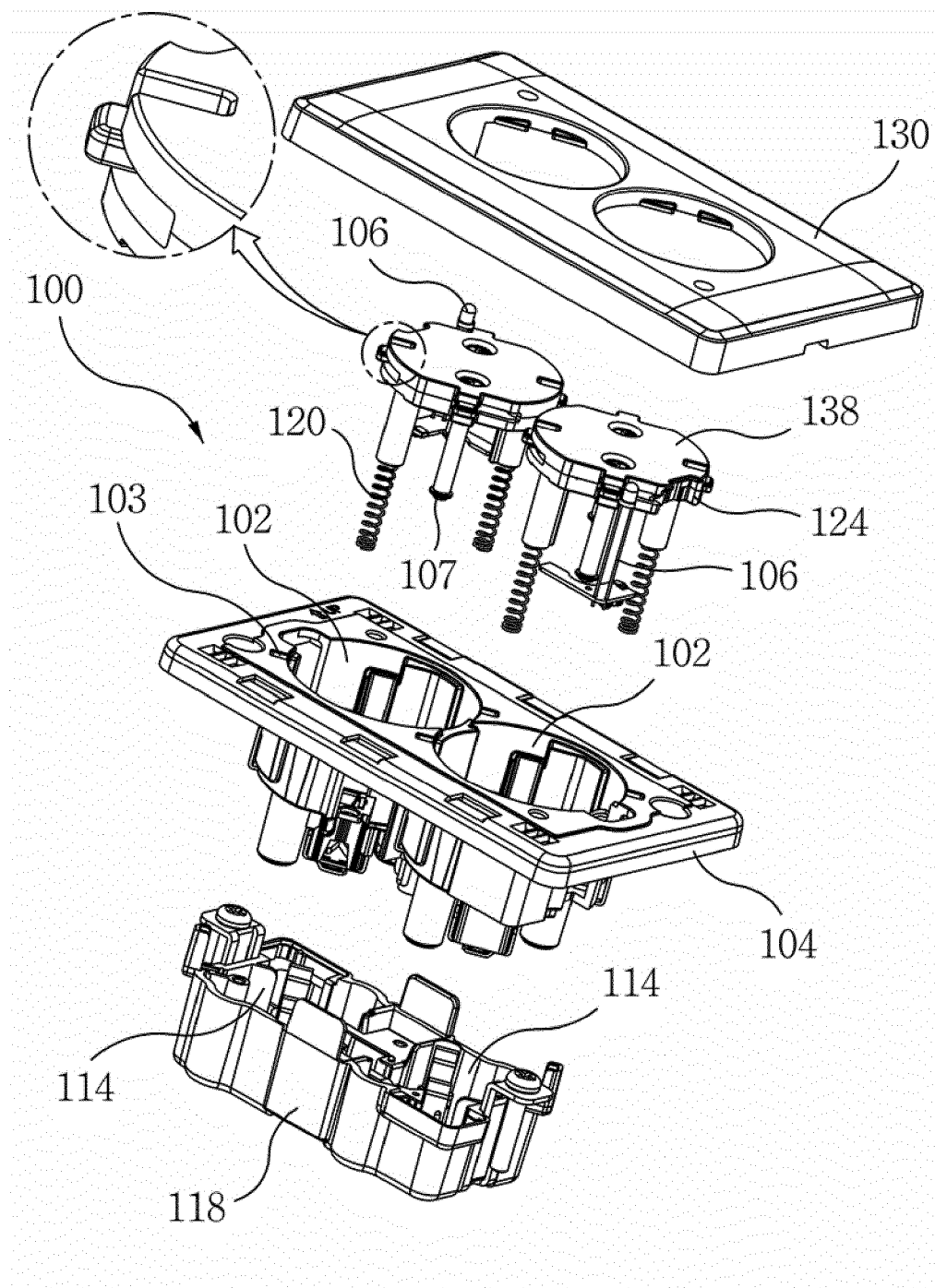
a resistor (110) that is installed and fixed along one side of the bottom surface of the socket (102), and that is connected between one end of the light emitting portion (106) and one end of the elastic material metal piece (108).

a cross-shaped locking unit (134) in which a coupling hole (130) is formed in correspondence to a coupling pin and spring coupling projections (132) are protrudingly formed in entire surfaces thereof;

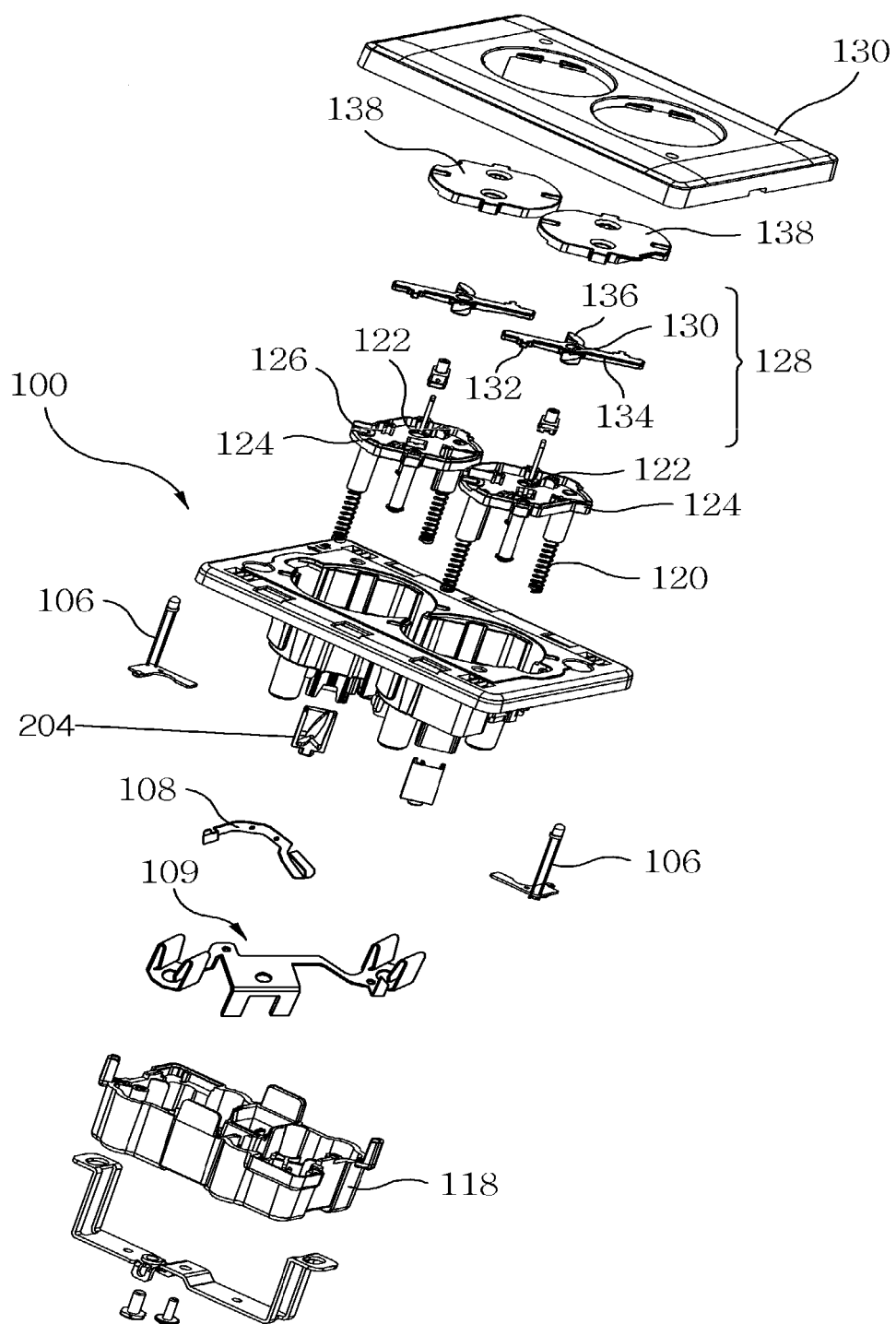
an opening and closing portion (136) that is extended from both sides of the cross-shaped locking unit (134) and is forms at a position corresponding to the insertion holes (122) of the press plate (124); and

a locking body cover (138) from which the cross-shaped locking unit (134) is extended and a protruding portion is positioned on an upper surface of the locking groove of the socket (102) to thus prevent departure of the cross-shaped locking unit (134).

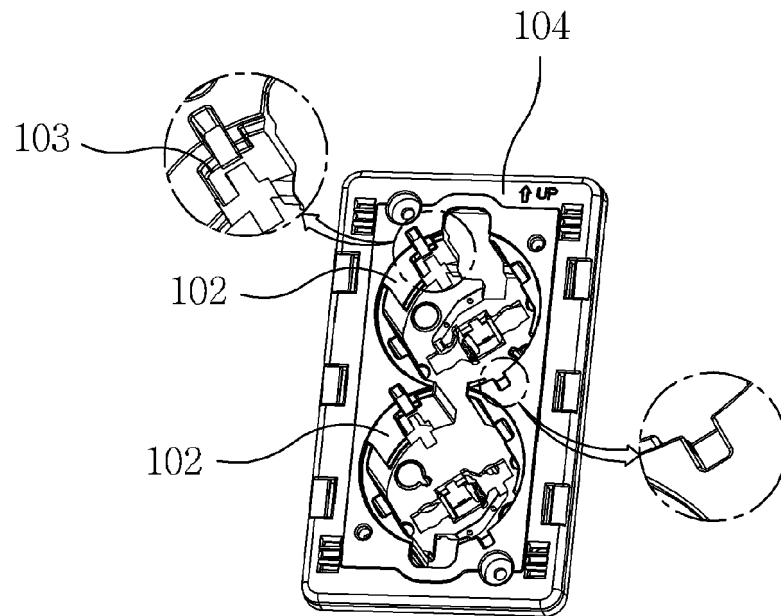
2. The electrical socket outlet of claim 1, wherein the rotary type locking member (128) comprises:



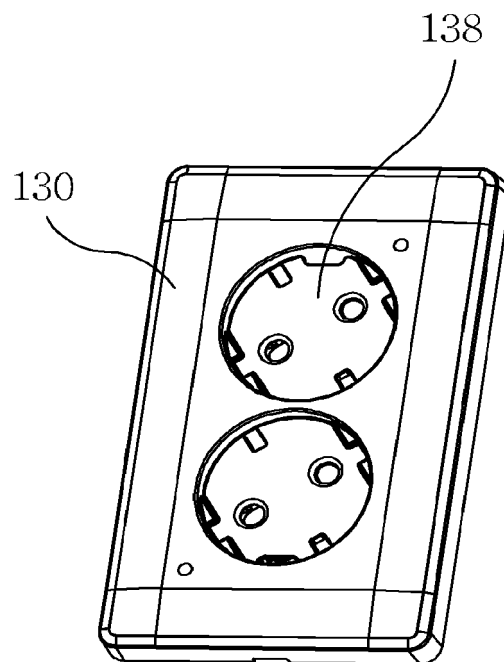
[FIG. 1]



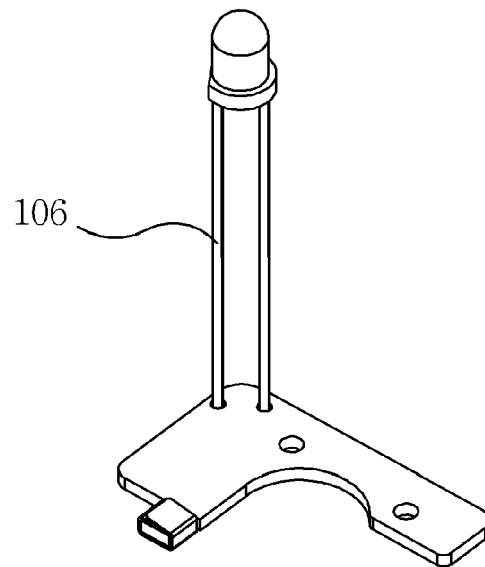
[FIG. 2]



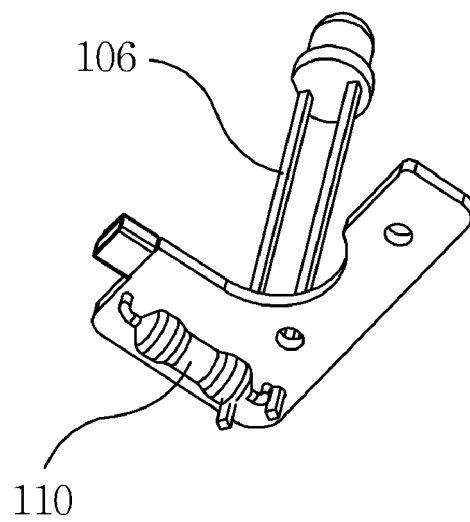
[FIG. 3A]



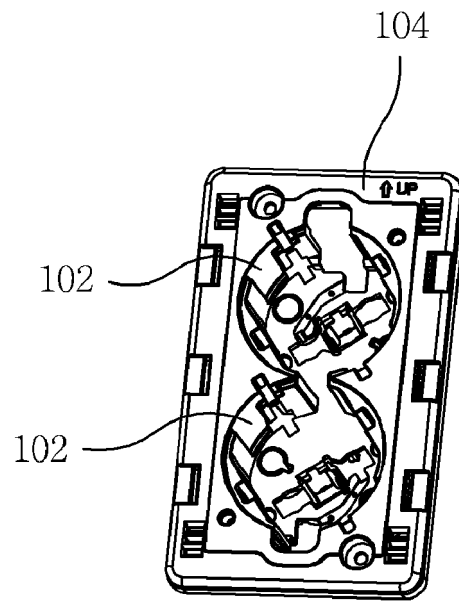
[FIG. 3B]



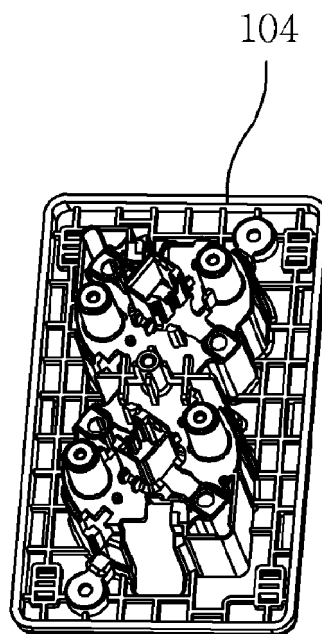
[FIG. 4A]



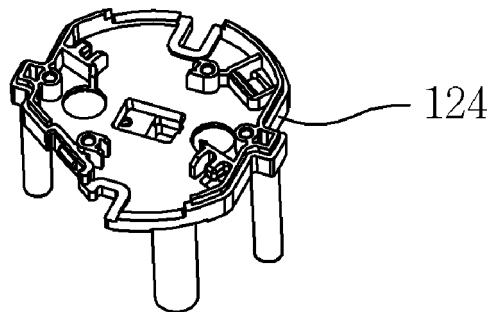
[FIG. 4B]



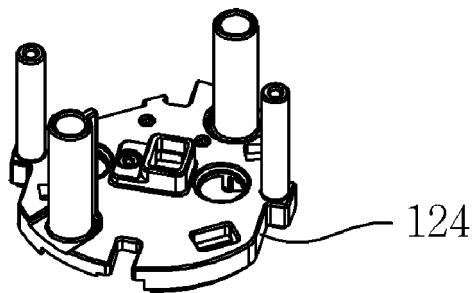
[FIG. 5A]



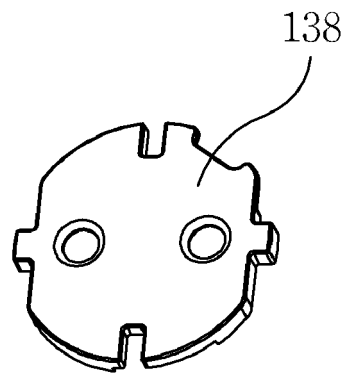
[FIG. 5B]



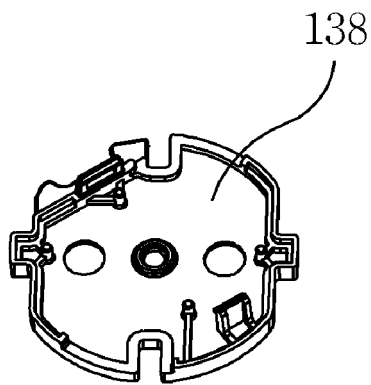
[FIG. 6A]



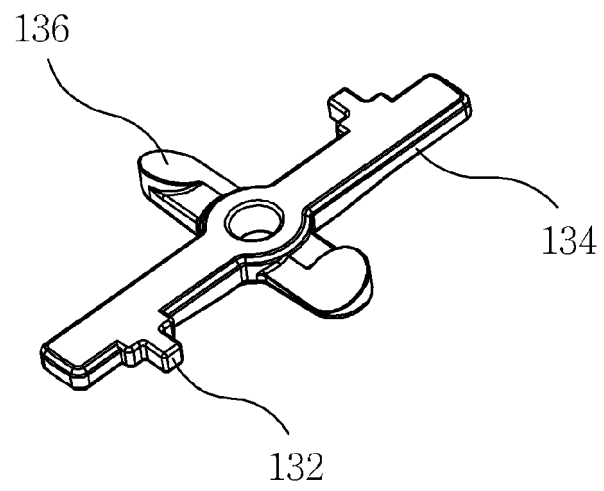
[FIG. 6B]



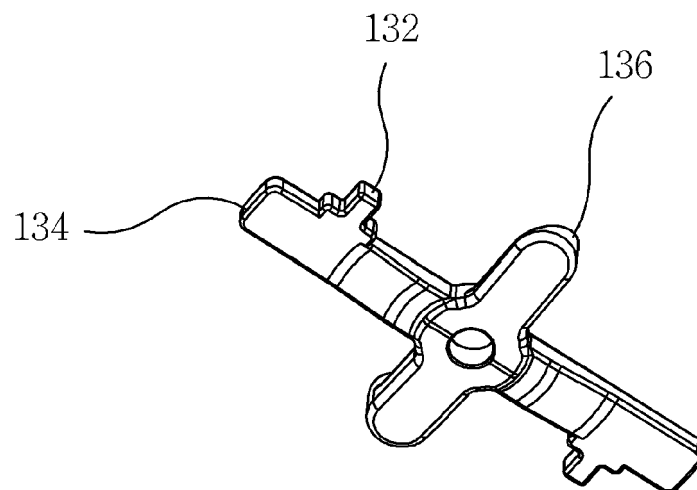
[FIG. 7A]



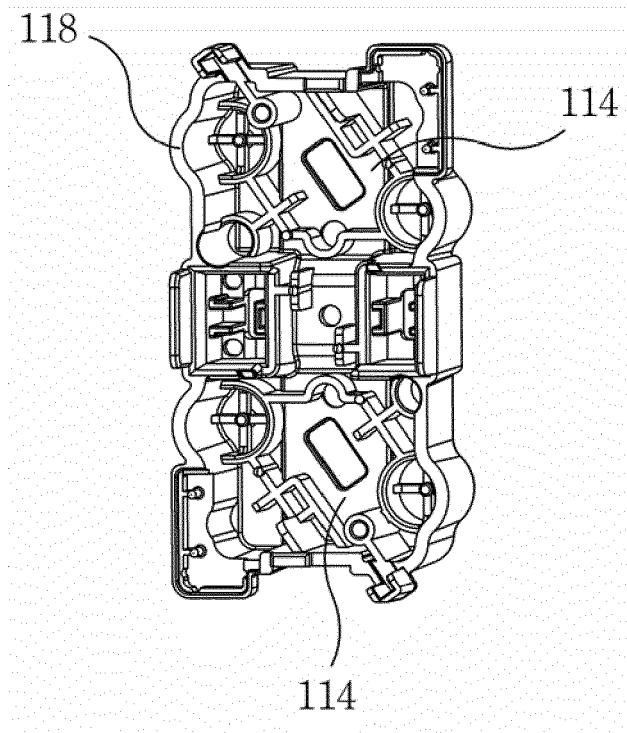
[FIG. 7B]



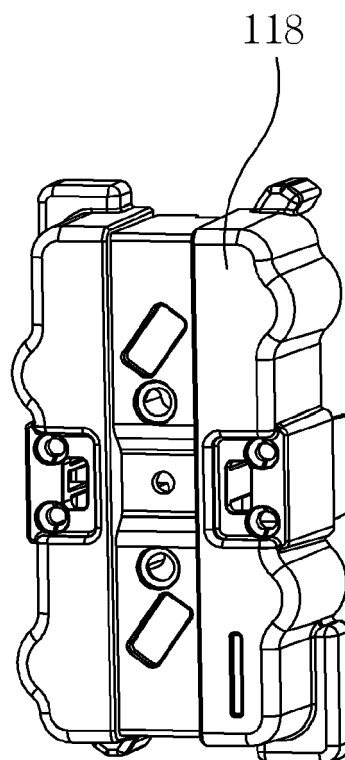
[FIG. 8A]



[FIG. 8B]



[FIG. 9A]



[FIG. 9B]



EUROPEAN SEARCH REPORT

Application Number
EP 15 20 2396

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	KR 101 420 123 B1 (RO SUNG TAE [KR]) 17 July 2014 (2014-07-17) * figures 1-16 *	1,2	INV. H01R13/453 H01R13/717
Y	----- KR 2014 0037905 A (KIM JONG IL [KR]; KIM KYUNG TAE [KR]) 27 March 2014 (2014-03-27) * figures 1-6 *	1,2	ADD. H01R25/00
Y,D	----- KR 2013 0122594 A (JIN Z) 7 November 2013 (2013-11-07) * figures 1-6 *	2	
A	& US 2015/104960 A1 (KIM JONG IL [KR] ET AL) 16 April 2015 (2015-04-16) * figures 1-6 * * paragraphs [0048], [0049] *	1	
A	----- EP 2 385 588 A1 (SHIN HUN-SOO [KR]) 9 November 2011 (2011-11-09) * figures 1, 2 * * paragraph [0069] *	1	
A	----- EP 2 403 071 A1 (SCHNEIDER ELECTRIC IND SAS [FR]) 4 January 2012 (2012-01-04) * figures 4, 5 * * paragraph [0018] *	1	TECHNICAL FIELDS SEARCHED (IPC) H01R
A	----- GB 2 359 202 A (MATSUSHITA ELECTRIC WORKS LTD [JP]) 15 August 2001 (2001-08-15) * page 17, line 21 - page 18, line 2 * * figure 16 *	1	
A	----- KR 100 883 663 B1 (JINHEUNG ELECTRIC CO LTD [KR]) 6 March 2009 (2009-03-06) * figures 1-4 *	1	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 April 2016	Examiner Kandyla, Maria
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 101420123 B1	17-07-2014	NONE	
KR 20140037905 A	27-03-2014	NONE	
KR 20130122594 A	07-11-2013	CN 104577430 A	29-04-2015
		JP 2015076406 A	20-04-2015
		KR 20130122594 A	07-11-2013
		US 2015104960 A1	16-04-2015
EP 2385588 A1	09-11-2011	CN 102273022 A	07-12-2011
		EP 2385588 A1	09-11-2011
		JP 5155458 B2	06-03-2013
		JP 2012513086 A	07-06-2012
		US 2011256745 A1	20-10-2011
		WO 2010076906 A1	08-07-2010
EP 2403071 A1	04-01-2012	NONE	
GB 2359202 A	15-08-2001	GB 2359202 A	15-08-2001
		JP 3675275 B2	27-07-2005
		JP 2001223052 A	17-08-2001
		MY 128767 A	28-02-2007
		SG 99345 A1	27-10-2003
KR 100883663 B1	06-03-2009	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 1020130120450 [0003]