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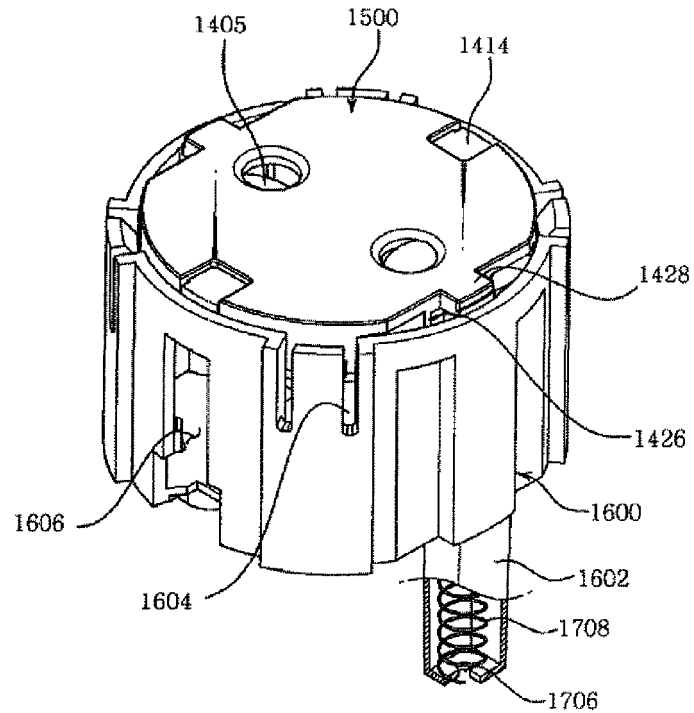
(54) **SAFE ELECTRICAL OUTLET**

(57) Provided is a safety electric outlet, which includes:
an electric outlet main body including a lower main body connected to a power line and having a power connection hole into which a plug connection terminal is inserted and an upper main body having a circular hole into which a plug is inserted;
a safety device including a circular cover having a guide cylinder and a through hole through which the plug connection terminal passes, a blade having a branch with an inclination configured so that the blade rotates in a direction perpendicular to an insertion direction of the plug connection terminal when the plug connection terminal is inserted, and a safety device lower portion having a through hole through which the plug connection terminal passes; and
a safety device receiving unit accommodating the safety device and inserted into the circular hole,
wherein the safety device receiving unit has a protrusion, and the lower main body has a concave portion into which the protrusion of the safety device receiving unit is fit and fixed,
wherein an elastic member of the safety device receiving unit for elastically moving the safety device in a vertical direction is included in the protrusion of the safety device receiving unit, a ground terminal is formed in a lower portion of the safety device receiving unit in a direction perpendicular to the protrusion of the safety device receiving unit, and the ground terminal is connected to a ground plate of the lower main body when the safety device receiving unit is fit into the lower main body, wherein a guide protrusion is formed near the through hole of the safety device, a guide member having a guide groove corresponding thereto is installed in the safety device receiving unit, and the safety device elastically moves along the guide member in a vertical direction by the elastic member of the safety device receiving unit, wherein a branch of the blade has a branch support supported by a stepped portion of the guide cylinder, and the safety device includes a torsion spring for restoring the branch support of the blade to the stepped portion of the guide cylinder when the insertion of the plug is released,
wherein the safety device includes a torsion spring receiving unit therein, a hooking groove is formed in the torsion spring receiving unit so that the hooking portion of the torsion spring is hooked thereto, and when the plug is inserted so that the inclination of the blade is pressed, the torsion spring is pressed on the torsion spring receiving unit and the inclination of the blade is able to elastically move in the same direction as the insertion direction of the plug,
wherein when the connection terminal is inserted into the through hole of the connection terminal and the inclination of the blade is pressed by the connection terminal and moves over the thickness of the circular cover of the safety device, the blade freely rotates in a direction perpendicular to the insertion direction of the plug by the inclination of the blade, and when the plug connection terminal further progresses and is inserted and fixed in the power connection hole, the circular cover of the safety device is pressed together and reaches the ground terminal of the safety device receiving unit, and
wherein when the plug connection terminal is released and deviates from the through hole of the circular cover of the

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safety device, the circular cover is restored to a position at the upper surface of the circular hole by the elastic force of the elastic member of the safety device receiving unit, and the inclination of the blade rotates in a direction opposite to the rotation direction when the connection terminal is inserted, by means of the restoring force of the torsion spring, so that the inclination of the blade is snapped to the through hole of the circular cover and comes into a locked state again.

[Fig. 16]



Description

[Technical Field]

[0001] The present disclosure relates to an electric outlet, and more particularly, to an electric outlet which opens a guide member and a ground terminal so that a plug connection terminal may be connected to a power connection hole only when the plug connection terminal passes through a through hole, thereby preventing an electric shock accident or other safety accidents of an infant or the like and providing a clearer appearance.

[Background Art]

[0002] Generally, a plug 10 provided to supply power to home appliances includes a main body 12 having a grip portion for facilitating easy detachment from an electric outlet and two connection terminals 14 partially buried in the main body and connected to a positive electrode and a negative electrode to protrude forwards, as shown in Fig. 12.

[0003] An electric outlet 20 has an intermediate plate formed in a concave groove into which the main body of the plug is partially inserted, and a through hole is formed in the intermediate plate so that a plug connection terminal passes through it. In addition, a power connection hole is formed in the lower portion of the intermediate plate at a position corresponding to the through hole, so that power is supplied to an electric product when the plug connection terminal passing through the through hole is connected to the power connection hole. Recently, as electric products are used more and more in home and offices, a multi electric outlet having a plurality of electric outlets for inserting many electric plugs thereto is frequently used.

[0004] However, the multi electric outlet is placed on a floor of a living room or an office or installed as a wall electric outlet, and accordingly impurities may easily enter into the concave groove. In particular, if a conductor such as a steel wire puts into the concave groove, an electric shock accident may occur. Such a multi electric outlet is danger and also has a bad appearance.

[0005] Moreover, since a general electric outlet has a deep concave groove for tight connection with a plug as shown in Fig. 1, it is not easy to insert the plug connection terminal into the power connection hole through the through hole of the intermediate plate of the electric outlet.

[0006] In addition, in the existing technique, when the plug connection terminal is used for a long time, a bad connection may occur between the plug connection terminal and the power connection hole of the electric outlet, which may generate heat and cause sparks.

[Disclosure]

[Technical Problem]

[0007] The present disclosure is directed to providing an electric outlet which is designed so that only when both plug connection terminals pass through a through hole of a circular cover of a safety device in an upper main body, a first branch support and a second branch cover of a blade of the safety device rotate to open a guide member and a ground terminal, thereby preventing impurities such as dust from entering a circular hole of the upper main body of the electric outlet and causing an electric shock accident or other safety accidents and also preventing a chopstick or the like from reaching a power connection hole of the lower main body in advance even though an infant or the like puts the chopstick or the like through the through hole of the safety device. In other words, the present disclosure is directed to providing an electric outlet which is designed so that the power connection hole is opened only when two chopsticks are simultaneously inserted into the through holes of the safety device.

[0008] In addition, even though a guide member and a ground terminal are exposed out in an existing technique, the present disclosure is designed to prevent all holes or grooves, including a guide member and a ground terminal, from being exposed. In addition, since the upper circular cover of the safety device not only closes the circular hole into which the plug connection terminal is inserted but also flattens the upper surface of the electric outlet, the present disclosure gives the sense of visual stability and beautiful appearance and also contributes to new creation of demand by means of such peculiar esthetic sense.

[0009] Moreover, since the circular cover of the safety device is located at the upper surface of the electric outlet due to the elastic force of the spring and a through hole is formed at a position corresponding to the power connection hole, a user may easily connect a plug connection terminal to the power connection hole just by inserting the plug connection terminal through the through hole.

[0010] In addition, by integrally producing a circular cover, a lower portion and a receiving unit of the safety device, the present disclosure enhances productivity of the electric outlet and lowers a fraction defective.

[0011] Other objects and advantages of the present disclosure will be understood more clearly from the following

descriptions and become apparent by the embodiments of the present disclosure with reference to the accompanied drawings.

[Technical Solution]

[0012] In one general aspect, the present disclosure provides a safety electric outlet, which includes:

an electric outlet main body including a lower main body connected to a power line and having a power connection hole into which a plug connection terminal is inserted and an upper main body having a circular hole into which a plug is inserted;

a safety device including a circular cover having a guide cylinder and a through hole through which the plug connection terminal passes, a blade having a branch with an inclination configured so that the blade rotates in a direction perpendicular to an insertion direction of the plug connection terminal when the plug connection terminal is inserted, and a safety device lower portion having a through hole through which the plug connection terminal passes; and

a safety device receiving unit accommodating the safety device and inserted into the circular hole, wherein the safety device receiving unit has a protrusion, and the lower main body has a concave portion into which the protrusion of the safety device receiving unit is fit and fixed,

wherein an elastic member of the safety device receiving unit for elastically moving the safety device in a vertical direction is included in the protrusion of the safety device receiving unit, a ground terminal is formed in a lower portion of the safety device receiving unit in a direction perpendicular to the protrusion of the safety device receiving unit, and the ground terminal is connected to a ground plate of the lower main body when the safety device receiving unit is fit into the lower main body,

wherein a guide protrusion is formed near the through hole of the safety device, a guide member having a guide groove corresponding thereto is installed in the safety device receiving unit, and the safety device elastically moves along the guide member in a vertical direction by the elastic member of the safety device receiving unit,

wherein a branch of the blade has a branch support supported by a stepped portion of the guide cylinder, and the safety device includes a torsion spring for restoring the branch support of the blade to the stepped portion of the guide cylinder when the insertion of the plug is released,

wherein the safety device includes a torsion spring receiving unit therein, a hooking groove is formed in the torsion spring receiving unit so that the hooking portion of the torsion spring is hooked thereto, and when the plug is inserted so that the inclination of the blade is pressed, the torsion spring is pressed on the torsion spring receiving unit and the inclination of the blade is able to elastically move in the same direction as the insertion direction of the plug,

wherein when the connection terminal is inserted into the through hole of the connection terminal and the inclination of the blade is pressed by the connection terminal and moves over the thickness of the circular cover of the safety device, the blade freely rotates in a direction perpendicular to the insertion direction of the plug by the inclination of the blade, and when the plug connection terminal further progresses and is inserted and fixed in the power connection hole, the circular cover of the safety device is pressed together and reaches the ground terminal of the safety device receiving unit, and

wherein when the plug connection terminal is released and deviates from the through hole of the circular cover of the safety device, the circular cover is restored to a position at the upper surface of the circular hole by the elastic force of the elastic member of the safety device receiving unit, and the inclination of the blade rotates in a direction opposite to the rotation direction when the connection terminal is inserted, by means of the restoring force of the torsion spring, so that the inclination of the blade is snapped to the through hole of the circular cover and comes into a locked state again.

[0013] In another embodiment, a ground terminal cover perpendicular to the branch of the blade may be further included, a ground terminal groove may be formed in the circular cover and the lower portion of the safety device, and the ground terminal groove may be closed by the ground terminal cover when the plug is not inserted,

an inclination may be formed in the ground terminal cover, a ground terminal cover support may be installed between the ground terminal groove and the blade, and a pair of protrusions which is able to be fixed to a cover spring may be installed at the inner side of the ground terminal cover support and the inner side of the inclination of the ground terminal cover,

when the connection terminal is inserted, if the safety device moves downwards and the ground terminal of the safety device receiving unit contacts the inclination of the ground terminal cover, the ground terminal cover may move by the inclination of the ground terminal cover while pressing the cover spring toward the blade so that the ground terminal groove is opened, thereby allowing the ground terminal of the safety device receiving unit to be connected to a corresponding ground terminal of the plug, and

when the plug connection terminal deviates from the through hole of the circular cover of the safety device, the inclination

of the ground terminal cover may be released from the ground terminal so that the ground terminal groove is closed again by the ground terminal cover due to the elastic restoring force of the cover spring.

[0014] In another embodiment, the circular cover and the safety device lower portion may have fitting portions for coupling to each other, a circular cover protrusion may be formed at the side of the circular cover so that the safety device receiving unit is snapped thereto, and accordingly the circular cover, the safety device lower portion and the safety device receiving unit may be provided as a single unit.

[0015] In another embodiment, the electric outlet may be a multi electric outlet in which a plurality of electric outlets is arranged so that many electric plugs may be inserted together.

[0016] In another aspect, there is provided a safety electric outlet, which includes:

an electric outlet main body including a lower main body connected to a power line and having a power connection hole into which a plug connection terminal is inserted and an upper main body having a circular hole into which a plug is inserted; and

a safety device including a circular cover having a guide cylinder and a through hole through which the plug connection terminal passes, a blade having a first branch with an inclination configured so that the blade rotates in a direction perpendicular to an insertion direction of the plug connection terminal when the plug connection terminal is inserted, and a safety device lower portion having a through hole through which the plug connection terminal passes, wherein a lower spring is provided in the guide hole of the lower main body in which the guide cylinder is inserted, to give an elastic force between the lower main body and the safety device,

wherein a guide protrusion is installed near the through hole of the safety device, and a guide member having a guide groove corresponding thereto is installed in the circular hole of the upper main body,

wherein the first branch of the blade includes a first branch support supported by a stepped portion of the guide cylinder, and the safety device includes a blade spring for restoring the first branch support of the blade to the stepped portion of the guide cylinder again when the insertion of the plug is released,

wherein the guide member is covered by a support of the first branch of the blade when the plug is not inserted, the inclination of the first branch of the blade is able to elastically move in the same direction as the insertion direction when the plug is inserted, and when the inclination of the blade is pressed by the connection terminal and moves over the thickness of the circular cover of the safety device at the insertion of the connection terminal, the blade freely rotates in a direction perpendicular to the insertion direction by the inclination of the blade, and when the blade rotates, the support of the first branch rotates so that the guide member is opened, thereby allowing the safety device to move in the same direction as the insertion direction of the connection terminal, and

wherein when the plug connection terminal is inserted into the power connection hole, the circular cover of the safety device is pressed and the plug connection terminal is inserted into the power connection hole, and when the plug connection terminal deviates from the through hole of the circular cover of the safety device, the circular cover is restored to a position at the upper surface of the circular hole by the elastic force of the lower spring, and the inclination is snapped to the through hole of the circular cover and comes into a locked state again, thereby closing the guide member again.

[0017] In another embodiment, a ground terminal groove may be formed in the circular cover and the lower portion of the safety device, the ground terminal groove is closed by a cover of a second branch which is perpendicular to the first branch of the blade when the plug is not inserted, and when the connection terminal is inserted, the second branch rotates simultaneously with the rotation of the first branch so that the ground terminal groove is opened, thereby allowing the ground terminal of the lower main body to be connected to a corresponding ground terminal of the plug, and when the plug connection terminal deviates from the through hole of the circular cover of the safety device, the inclination may be snapped to the through hole of the circular cover and come into a locked state again, thereby closing the ground terminal groove again by means of the cover of the second branch.

[Advantageous Effects]

[0018] According to the present disclosure, since the electric outlet is designed so that only when both plug connection terminals pass through a through hole of a circular cover of a safety device in an upper main body, a first branch support and a second branch cover of a blade of the safety device rotate to open a guide member and a ground terminal, it is possible to prevent impurities such as dust from entering a circular hole of the upper main body of the electric outlet and causing an electric shock accident or other safety accidents and it is also possible to prevent a chopstick or the like from reaching a power connection hole of the lower main body in advance even though an infant or the like puts the chopstick or the like through the through hole of the safety device.

[0019] In addition, a guide member and a ground terminal are exposed out in an existing technique, however, the present disclosure makes it possible to prevent all holes or grooves, including a guide member and a ground terminal,

from being exposed. In addition, since the upper circular cover of the safety device not only closes the circular hole into which the plug connection terminal is inserted but also flattens the upper surface of the electric outlet, the present disclosure may give the sense of visual stability and beautiful appearance. Such peculiar esthetic sense may also contribute to new creation of demand.

[0020] Moreover, since the circular cover of the safety device is located at the upper surface of the electric outlet due to the elastic force of the spring and a through hole is formed at a position corresponding to the power connection hole, a user may easily connect a plug connection terminal to the power connection hole just by inserting the plug connection terminal through the through hole.

[0021] In addition, in the conventional technique, when the plug connection terminal is used for a long time, a bad connection may occur between the plug connection terminal and the power connection hole of the electric outlet, which may generate heat and cause sparks. However, in the present invention, when a bad connection occurs between the plug and the power connection hole, the safety device is restored to the upper surface of the upper main body of the electric outlet due to the lower spring installed at the lower main body of the electric outlet, thereby solving the above problem.

[0022] In addition, by integrally producing a circular cover, a lower portion and a receiving unit of the safety device, the present disclosure may enhance productivity of the electric outlet and greatly lower a fraction defective.

[Description of Drawings]

[0023]

Fig. 1 is an exploded perspective view showing a multi electric outlet according to an embodiment of the present disclosure.

Fig. 2 is an exploded perspective view showing a safety device according to an embodiment of the present disclosure.

Fig. 3 is a plane view showing a circular cover of a safety device to which a blade is attached according to an embodiment of the present disclosure.

Fig. 4 is a plane view showing a circular cover of a safety device from which a blade is removed according to an embodiment of the present disclosure.

Fig. 5 is a plane view showing a circular cover of a safety device to which a blade rotated by the insertion of a plug connection terminal is attached according to an embodiment of the present disclosure.

Fig. 6 is a cross-sectional view, taken along the line A-A of Fig. 3, in which a stepped portion of an inclination of the blade is locked by the support of the circular cover of the safety device according to an embodiment of the present disclosure.

Fig. 7 is a cross-sectional view, taken along the line B-B of Fig. 3, in which a support of the blade is supported of the circular cover of the safety device according to an embodiment of the present disclosure.

Fig. 8 is a diagram showing that the plug connection terminal of Fig. 6 is inserted into an insert hole of the safety device to contact the inclination of the blade.

Fig. 9 is a diagram showing that the plug connection terminal of Fig. 8 is additionally inserted into the insert hole of the safety device so that the stepped portion of the inclination of the blade is released from the circular cover of the safety device.

Fig. 10 is a diagram showing a blade having a branch which elastically moves in a vertical direction.

Fig. 11 is a diagram showing the multi electric outlet of Fig. 1, which is in a coupled state.

Fig. 12 is a diagram showing a general plug and a circular hole of a general electric outlet.

Fig. 13 is a diagram showing a wall electric outlet according to an embodiment of the present disclosure.

Fig. 14 is a diagram showing a circular cover of a safety device according to another embodiment of the present disclosure.

Fig. 15 is a diagram showing a circular cover of the safety device and a lower portion of the safety device coupled to the circular cover, observed in a direction opposite to Fig. 14.

Fig. 16 is a diagram showing that a circular cover, a lower portion and a receiving unit of a safety device are integrally coupled as a single unit according to another embodiment of the present disclosure.

Fig. 17 is a diagram showing that a ground terminal is coupled to the unit of Fig. 16.

Fig. 18 is a diagram for illustrating a state in which the unit of the circular cover, the lower portion and the receiving unit of the safety device is assembled to an upper main body and a lower main body of an electric outlet according to another embodiment of the present disclosure.

Fig. 19 is a photograph showing the electric outlet of Fig. 18, which is finally assembled for sale.

[Best Mode]

[0024] Hereinafter, the embodiments of the present disclosure will be described in detail with reference to accompanying drawings. These embodiments are just for better understanding of the present disclosure, and it will be apparent to those skilled in the art that the scope of the present disclosure is not limited by the embodiments.

[First Embodiment]

[0025] Fig. 1 is an exploded perspective view showing a multi electric outlet according to an embodiment of the present disclosure. As shown in Fig. 1, an electric outlet main body 100 of a multi electric outlet according to the present disclosure includes a lower main body 134 connected to a power line and having a power connection hole 124 into which a plug connection terminal 14 (see Fig. 12) is inserted, and an upper main body 106 having a circular hole 104 into which a plug is inserted.

[0026] The upper main body 106 has holes into which a main switch 128 and a sub switch 126 may be inserted.

[0027] The lower main body 134 has a ground terminal 120 of the lower main body to which a corresponding ground terminal of the plug is connected.

[0028] A safety device is depicted between the upper main body and the lower main body 134. The safety device includes an upper circular cover, a blade and a lower plate.

[0029] The lower spring 116 is provided in the guide hole 118 of the lower main body in which a guide cylinder 112 is inserted, thereby giving an elastic force between the lower main body and the safety device. Guide protrusions 132 are installed at both sides of the circular cover 108 near the through holes of the safety device 200, and a guide member 136 having a guide groove corresponding thereto is installed in the circular hole 104 of the upper main body 106. As shown in Figs. 2, 3 and 6, the safety device 200 includes a blade 114 having a first branch 230 at which an inclination 214 is formed so that the blade 114 rotates in a direction perpendicular to an insertion direction of the plug connection terminal when the plug connection terminal 14 is inserted, and a safety device lower plate 130 having a through hole 206 through which the plug connection terminal passes.

[0030] As shown in Fig. 3, the guide member 136 (see Fig. 1) is covered by a support 212 of the first branch 230 of the blade 222 when the plug is not inserted. However, if the connection terminal is inserted, the support 212 of the first branch rotates as shown in Fig. 5 to expose the guide member 136, so that the safety device 200 may move in the same direction as the insertion direction of the connection terminal 14.

[0031] Fig. 2 shows an overturned state of the safety device 200. The safety device 200 of the present disclosure includes a circular cover 228 having a guide cylinder 210 and a through hole 110 (see Fig. 1) through which the plug connection terminal 14 passes, a blade 222 having a first branch 230 in which an inclination 214 is formed so that the blade 222 may rotate in a direction perpendicular to the insertion direction of the plug connection terminal 14 when the plug connection terminal 14 is inserted, and a safety device lower portion 202 having a through hole 206 through which the plug connection terminal 14 passes.

[0032] The first branch 230 of the blade 222 includes a first branch support 212 whose one end is supported by a guide protrusion 232, and the safety device 200 includes a blade spring 218 for restoring the first branch support 212 of the blade 222 to the guide protrusion 232 again when the insertion of the plug 10 is released. The circular cover 228 includes a spring protrusion 220 for fixing the blade spring 218 and a blade spring support 224 for supporting the blade spring 218. The blade 222 is rotatable along a shaft 410 (Fig. 4), and in the absence of the plug connection terminal, the cover 216 of the second branch 226 covers a ground terminal groove 204 of the lower portion and a ground terminal groove 406 (see Fig. 4) of the circular cover. Fig. 3 shows that the inclination 214 of the first branch 230 covers a through hole 404 (Fig. 4) of the connection terminal and the cover 216 of the second branch covers the ground terminal groove 406.

[0033] In this state, if the plug connection terminal is inserted, the blade 222 rotates in a clockwise direction as much as Δc (see Fig. 5). This principle will be described with reference to Figs. 6 to 10.

[0034] Fig. 6 is a cross-sectional view according to an embodiment of the present disclosure, taken along the line A-A of Fig. 3, in which a stepped portion 602 of the inclination 214 of the blade is locked by the support of the circular cover 228 of the safety device. Here, the inclination 214 is not able to rotate since its stepped portion 602 is locked to the circular cover 228.

[0035] Fig. 7 is a cross-sectional view according to an embodiment of the present disclosure, taken along the line B-B of Fig. 3, in which the support 212 of the first branch is supported by the guide protrusion 232 of the circular cover of the safety device 200.

[0036] In this state, as shown in Fig. 8, the plug connection terminal is inserted into the through hole 404 of the circular cover 228 of the safety device 200 and contacts the inclination 214 of the first branch.

[0037] Here, if the plug connection terminal is further inserted so that the inclination 214 moves upwards as much as Δa which is the thickness of the circular cover 228, the inclination 214 is released from the circular cover 228 and is able to freely rotate. In other words, as shown in Fig. 9, the plug connection terminal 14 is additionally inserted through the

through hole 404 of the safety device 200, and the stepped portion 602 of the inclination 214 is released from the circular cover 228 of the safety device to rotate to the left as much as Δc .

[0038] If the stepped portion 602 rotates in this way, as shown in Fig. 5, the support 212 of the first branch rotates in an arrow direction, namely in a clockwise direction, so that the guide member 136 (see Fig. 1) hidden by the support 212 of the first branch is exposed, which allows the safety device 200 to move in the same direction as the insertion direction of the connection terminal 14. In addition, the ground terminal groove 406 of the circular cover 228 is opened, and thus the ground terminal 120 of Fig. 1 is ready for connecting to the ground terminal of the plug. However, in a normal state where the plug is not inserted, the through hole 214 and the ground terminal groove 406 are covered or closed.

[0039] In addition, the ground terminal groove 406 may be opened only when two plug connection terminals are inserted simultaneously. This is because the blade 222 is able to rotate only when both corresponding inclinations 214 move as much as Δa as shown in Fig. 8.

[0040] Fig. 10 shows that the blade 222 is installed on the blade shaft 410. The first branch 230 having the inclination 214 is configured to elastically move when the plug connection terminal is inserted (see Figs. 8 and 9). Here, when the moving distance Δb is identical to or greater than Δa which is the thickness of the circular cover 228 of Fig. 8, the blade 222 is able to freely rotate. When the blade 222 rotates, the support 212 of the first branch 230 rotates so that the guide member 136 (Fig. 1) is exposed, thereby allowing the safety device 200 to move in the same direction as the insertion direction of the connection terminal 14.

[0041] If the plug connection terminal 14 is inserted into the power connection hole 124 (Fig. 1), as shown in Figs. 2 to 5, the circular cover 108, 228 of the safety device 200 is pressed and the plug connection terminal is inserted into the power connection hole. When the plug connection terminal 14 is released from the power connection hole 124, the circular cover 108, 228 of the safety device 200 is restored to a position at the upper surface of the circular hole 104 by the elastic force of the lower spring 116 (Fig. 1), and the guide member 136 is closed again. If the connection of the connection terminal 14 is released so that the connection terminal 14 is entirely deviated from the circular cover 108, 228 of the safety device 200, namely if the connection terminal 14 is entirely separated from the through holes 110, 404 of the connection terminal, as shown in Fig. 8, the inclination 214 is snapped to and locked by the through holes 110, 404 again.

[0042] If the ground terminal groove 406 is formed in the circular cover 108, 228 of the safety device 200 and the lower plate 130, 202 and the plug 14 is not inserted into the ground terminal groove 406, the ground terminal groove 406 is closed by the cover 216 of the second branch 226 which is perpendicular to the first branch 230 of the blade 222, and when the connection terminal is inserted, the second branch 226 rotates simultaneously with the rotation of the first branch 230 so that the ground terminal groove 406 is opened, thereby allowing the ground terminal 120 of the lower main body 134 to be connected to a corresponding ground terminal of the plug.

[0043] Fig. 11 is a diagram showing the multi electric outlet of Fig. 1, which is in a coupled state. Here, if the plug is not inserted, the inclination 214 of the first branch 230 covers the through hole 404 (Fig. 4) of the connection terminal. In addition, the guide member 136 is closed or covered by the support 212 of the first branch 230 of the blade 222, and the ground terminal groove 204 of the lower portion and the ground terminal groove 406 (Fig. 4) of the circular cover are also covered by the cover 216 of the second branch 226.

[0044] Fig. 13 is a diagram showing that the safety electric outlet of the present disclosure is applied as a wall electric outlet.

[Second Embodiment]

[0045] Fig. 14 is a diagram showing a circular cover of a safety device according to another embodiment of the present disclosure.

[0046] Fig. 15 is a diagram showing a circular cover of the safety device and a lower portion of the safety device coupled to the circular cover, observed in a direction opposite to Fig. 14.

[0047] Fig. 16 is a diagram showing that a circular cover, a lower portion and a receiving unit of a safety device are coupled as a single unit according to another embodiment of the present disclosure.

[0048] Fig. 17 is a diagram showing that a ground terminal is coupled to the unit of Fig. 16.

[0049] Fig. 18 is a diagram for illustrating a state in which the unit of the circular cover, the lower portion and the receiving unit of the safety device is assembled to an upper main body and a lower main body of an electric outlet according to another embodiment of the present disclosure.

[0050] The same component as in the first embodiment is designated with the same reference symbol and not detailed in detail here.

[0051] In the second embodiment, the electric outlet includes a main body composed of a lower main body 1834 (Fig. 18) connected to a power line and having a power connection hole into which a plug connection terminal 14 (Fig. 12) is inserted and an upper main body 1806 (Fig. 18) having a circular hole 1804 (Fig. 18) into which a plug is inserted; a safety device including a circular cover 1400 (Fig. 14) having a guide cylinder and a through hole through which the plug

connection terminal 14 passes, a blade 1404 having a branch 1406 (Fig. 14) with an inclination (see a blade 1405 of Fig. 15) configured to allow the blade to rotate in a direction perpendicular to an insertion direction of the plug connection terminal when the plug connection terminal 14 is inserted, and a safety device lower plate 1504 (see Fig. 15) having a through hole through which the plug connection terminal passes; and a safety device receiving unit 1600 (Fig. 16) accommodating the safety device and inserted into the circular hole 104.

[0052] The safety device receiving unit 1600 has a protrusion 1602, and the lower main body 1834 has a concave portion 1818 (Fig. 18) formed at the lower main body so that the protrusion 1602 of the safety device receiving unit is fit and fixed therein.

[0053] An elastic member 1708 (Fig. 16) of the safety device receiving unit for elastically moving the safety device in a vertical direction is included in the protrusion 1602 of the safety device receiving unit, and a ground terminal 1702 (Fig. 17) of the safety device receiving unit is formed in a lower portion of the safety device receiving unit in a direction perpendicular to the protrusion of the safety device receiving unit. Moreover, the ground terminal 1702 of the safety device receiving unit is connected to the ground plate 1822 of the lower main body when the safety device receiving unit 1600 is fit onto the lower main body 1834.

[0054] A guide protrusion 1428 is formed near the through hole of the safety device, and a guide member having a guide groove corresponding thereto is installed in the safety device receiving unit 1600. In addition, the safety device elastically moves along the guide member in a vertical direction by the elastic member 1708 of the safety device receiving unit.

[0055] The branch 1406 of the blade 1404 has a branch support supported by a stepped portion 1426 of the guide cylinder 1402, and the safety device includes a torsion spring 1412 for restoring the branch support of the blade 1404 to the stepped portion 1426 of the guide cylinder 1402 when the insertion of the plug 10 is released.

[0056] The safety device includes a torsion spring receiving unit 1408 therein, and a hooking groove 1418 is formed in the receiving unit so that the hooking portion of the torsion spring 1412 is hooked thereto. Therefore, when the plug is inserted so that the inclination of the blade 1404 is pressed, the torsion spring 1412 is pressed on the torsion spring receiving unit 1408, and the inclination of the blade 1404 is able to elastically move in the same direction as the insertion direction of the plug 10.

[0057] If the connection terminal 14 is inserted into the through hole of the connection terminal and the inclination of the blade 1414 is pressed by the connection terminal 14 and moves over the thickness of the circular cover 1400 of the safety device, the blade 1414 freely rotates based on the center of a rotary shaft 1410 in a direction perpendicular to the insertion direction of the plug by the inclination of the blade. In addition, if the plug connection terminal 14 further progresses and is inserted and fixed in the power connection hole of the lower main body 134, the circular cover 1400 of the safety device is pressed together and reaches the ground terminal 1702 of the safety device receiving unit.

[0058] If the plug connection terminal 14 is released and deviates from the through hole of the circular cover 1400 of the safety device, the circular cover 1400 is restored to a position at the upper surface of the circular hole 104 by the elastic force of the elastic member 1708 of the safety device receiving unit, and the inclination of the blade 1404 rotates in a direction opposite to the rotation direction when the connection terminal 14 is inserted, by means of the restoring force of the torsion spring 1412 whose both ends are fixed to the hooking groove and the rotary shaft 1410. Therefore, the inclination of the blade 1404 is snapped to the through hole of the circular cover 1400 and comes into a locked state again (see Fig. 6).

[0059] The electric outlet of the present disclosure further includes a ground terminal cover 1414 (Fig. 15) in a direction perpendicular to the branch 1406 of the blade 1404.

[0060] A ground terminal groove is formed in the circular cover 1400 and the lower portion 1504 (see Fig. 15) of the safety device, and the ground terminal groove is closed by the ground terminal cover 1414 if the plug 10 is not inserted.

[0061] An inclination 1422 (Fig. 14) is formed in the ground terminal cover 1414, and a ground terminal cover support 1430 is installed between the ground terminal groove, namely the ground terminal cover 1414, and the center of the circular cover. In addition, a pair of protrusions 1424 which the cover spring 1416 may be fixed is installed at the inner sides of the ground terminal cover support 1430 and the inclination 1422 of the ground terminal cover.

[0062] When the connection terminal 14 is inserted, if the ground terminal 1702 of the safety device receiving unit contacts the inclination 1422 of the ground terminal cover, the ground terminal cover 1414 slides by the inclination 1422 of the ground terminal cover to shrink the cover spring 1422 toward the center of the circular cover so that the ground terminal groove is opened, thereby allowing the ground terminal 1702 of the safety device receiving unit to be connected to a corresponding ground terminal of the plug 10.

[0063] If the plug connection terminal 14 deviates from the through hole of the circular cover 1400 of the safety device, the inclination 1422 of the ground terminal cover is released from the ground terminal 120 so that the ground terminal groove is closed again by the ground terminal cover 1414 due to the elastic restoring force of the cover spring 1416.

[0064] The circular cover 1400 and the safety device lower portion 1504 have fitting portions 1432 for coupling them, and a circular cover protrusion 1502 (Fig. 15) is formed at the side of the circular cover so that the safety device receiving unit 1600 is snapped thereto. Accordingly, as shown in Figs. 16 and 17, the circular cover 1400, the lower portion 1504

of the safety device and the receiving unit 1600 of the safety device may be provided as a single unit. The ground terminal 1702 of the safety device receiving unit is generally provided in a state of being coupled to the safety device receiving unit 1600.

[0065] A main body guide (not shown) may be provided at the electric outlet of the present disclosure so that the upper main body 1806 and the lower main body 1834 are fit with each other. The upper main body 1806 and the lower main body 1834 may also be coupled using screws or the like.

[0066] The electric outlet may also be applied to a multi electric outlet in which a plurality of electric outlets is arranged so that many electric plugs may be inserted together.

[0067] Fig. 18 is a diagram for illustrating a state in which a unit 1700 of the circular cover, the lower portion and the receiving unit of the safety device of the present disclosure is assembled to the upper main body 1806 and the lower main body 1834 of the electric outlet. By this configuration, the present disclosure may enhance productivity and lower a fraction defective. In addition, if a single unit 1700 malfunctions, a user may easily exchange only the corresponding unit 1700, without exchanging the entire electric outlet 1800.

[0068] Fig. 19 is a photograph showing the electric outlet of Fig. 18, which is finally assembled for sale.

[0069] The present disclosure has been described specifically by specific embodiments. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the disclosure, are given by way of illustration only, since various changes and modifications within the spirit and scope of the disclosure will become apparent to those skilled in the art from this detailed description.

[Industrial Applicability]

[0070] The electric outlet of the present disclosure is excellent in safety, appearance and convenience in comparison to conventional electric outlets and is thus expected to contribute to new creation of demand.

[Reference Symbols]

[0071]

106: upper main body	134: lower main body
136: guide member	200: safety device
218: spring	222: blade
214: inclination	230: first branch
226: second branch	214: first branch cover
212: first branch support	216: second branch cover
406: ground terminal groove	1412: torsion spring
1414: ground terminal cover	1416: cover spring
1418: hooking groove	1600: safety device receiving unit
1602: protrusion of the safety device	
1702: ground terminal of the safety device receiving unit	
1708: elastic member of the protrusion of the safety device	

Claims

1. A safety electric outlet, comprising:

an electric outlet main body including a lower main body connected to a power line and having a power connection hole into which a plug connection terminal is inserted and an upper main body having a circular hole into which a plug is inserted;

a safety device including a circular cover having a guide cylinder and a through hole through which the plug connection terminal passes, a blade having a branch with an inclination configured so that the blade rotates in a direction perpendicular to an insertion direction of the plug connection terminal when the plug connection terminal is inserted, and a safety device lower portion having a through hole through which the plug connection terminal passes; and

a safety device receiving unit accommodating the safety device and inserted into the circular hole, wherein the safety device receiving unit has a protrusion, and the lower main body has a concave portion into

which the protrusion of the safety device receiving unit is fit and fixed,
 wherein an elastic member of the safety device receiving unit for elastically moving the safety device in a vertical
 direction is included in the protrusion of the safety device receiving unit, a ground terminal is formed in a lower
 portion of the safety device receiving unit in a direction perpendicular to the protrusion of the safety device
 receiving unit, and the ground terminal is connected to a ground plate of the lower main body when the safety
 device receiving unit is fit into the lower main body,
 wherein a guide protrusion is formed near the through hole of the safety device, a guide member having a guide
 groove corresponding thereto is installed in the safety device receiving unit, and the safety device elastically
 moves along the guide member in a vertical direction by the elastic member of the safety device receiving unit,
 wherein a branch of the blade has a branch support supported by a stepped portion of the guide cylinder, and
 the safety device includes a torsion spring for restoring the branch support of the blade to the stepped portion
 of the guide cylinder when the insertion of the plug is released,
 wherein the safety device includes a torsion spring receiving unit therein, a hooking groove is formed in the
 torsion spring receiving unit so that the hooking portion of the torsion spring is hooked thereto, and when the
 plug is inserted so that the inclination of the blade is pressed, the torsion spring is pressed on the torsion spring
 receiving unit and the inclination of the blade is able to elastically move in the same direction as the insertion
 direction of the plug,
 wherein when the connection terminal is inserted into the through hole of the connection terminal and the
 inclination of the blade is pressed by the connection terminal and moves over the thickness of the circular cover
 of the safety device, the blade freely rotates in a direction perpendicular to the insertion direction of the plug by
 the inclination of the blade, and when the plug connection terminal further progresses and is inserted and fixed
 in the power connection hole, the circular cover of the safety device is pressed together and reaches the ground
 terminal of the safety device receiving unit, and
 wherein when the plug connection terminal is released and deviates from the through hole of the circular cover
 of the safety device, the circular cover is restored to a position at the upper surface of the circular hole by the
 elastic force of the elastic member of the safety device receiving unit, and the inclination of the blade rotates in
 a direction opposite to the rotation direction when the connection terminal is inserted, by means of the restoring
 force of the torsion spring, so that the inclination of the blade is snapped to the through hole of the circular cover
 and comes into a locked state again.

2. The safety electric outlet according to claim 1,

wherein a ground terminal cover perpendicular to the branch of the blade is further included,
 wherein a ground terminal groove is formed in the circular cover and the lower portion of the safety device, and the
 ground terminal groove is closed by the ground terminal cover when the plug is not inserted,
 wherein an inclination is formed in the ground terminal cover, a ground terminal cover support is installed between
 the ground terminal groove and the blade, and a pair of protrusions which is able to be fixed to a cover spring is
 installed at the inner sides of the ground terminal cover support and the inclination of the ground terminal cover,
 wherein when the connection terminal is inserted, if the safety device moves downwards and the ground terminal
 of the safety device receiving unit contacts the inclination of the ground terminal cover, the ground terminal cover
 moves by the inclination of the ground terminal cover while pressing the cover spring toward the blade so that the
 ground terminal groove is opened, thereby allowing the ground terminal of the safety device receiving unit to be
 connected to a corresponding ground terminal of the plug, and
 wherein when the plug connection terminal deviates from the through hole of the circular cover of the safety device,
 the inclination of the ground terminal cover is released from the ground terminal so that the ground terminal groove
 is closed again by the ground terminal cover due to the elastic restoring force of the cover spring.

3. The safety electric outlet according to claim 1 or 2,

wherein the circular cover and the safety device lower portion have fitting portions for coupling to each other, a
 circular cover protrusion is formed at the side of the circular cover so that the safety device receiving unit is snapped
 thereto, and accordingly the circular cover, the safety device lower portion and the safety device receiving unit is
 capable of being provided as a single unit.

4. The safety electric outlet according to claim 1 or 2,

wherein the electric outlet is a multi electric outlet in which a plurality of electric outlets is arranged so that many
 electric plugs may be inserted together.

5. A safety electric outlet, comprising:

an electric outlet main body including a lower main body connected to a power line and having a power connection hole into which a plug connection terminal is inserted and an upper main body having a circular hole into which a plug is inserted; and

a safety device including a circular cover having a guide cylinder and a through hole through which the plug connection terminal passes, a blade having a first branch with an inclination configured so that the blade rotates in a direction perpendicular to an insertion direction of the plug connection terminal when the plug connection terminal is inserted, and a safety device lower portion having a through hole through which the plug connection terminal passes,

wherein a lower spring is provided in the guide hole of the lower main body in which the guide cylinder is inserted, to give an elastic force between the lower main body and the safety device,

wherein a guide protrusion is installed near the through hole of the safety device, and a guide member having a guide groove corresponding thereto is installed in the circular hole of the upper main body,

wherein the first branch of the blade includes a first branch support supported by a stepped portion of the guide cylinder, and the safety device includes a blade spring for restoring the first branch support of the blade to the stepped portion of the guide cylinder again when the insertion of the plug is released,

wherein the guide member is covered by a support of the first branch of the blade when the plug is not inserted, the inclination of the first branch of the blade is able to elastically move in the same direction as the insertion direction when the plug is inserted, and when the inclination of the blade is pressed by the connection terminal and moves over the thickness of the circular cover of the safety device at the insertion of the connection terminal, and

the blade freely rotates in a direction perpendicular to the insertion direction by the inclination of the blade, and when the blade rotates, the support of the first branch rotates so that the guide member is opened, thereby

allowing the safety device to move in the same direction as the insertion direction of the connection terminal, and wherein when the plug connection terminal is inserted into the power connection hole, the circular cover of the

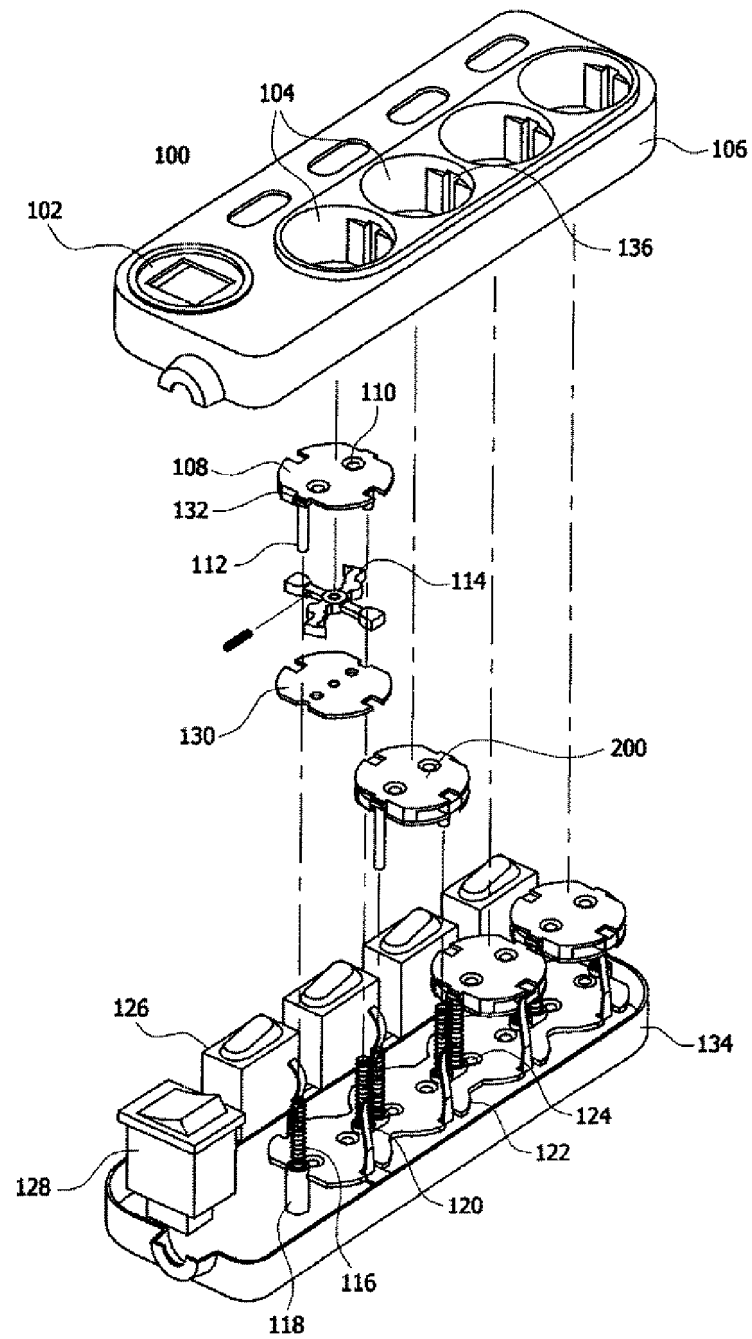
safety device is pressed and the plug connection terminal is inserted into the power connection hole, and when the plug connection terminal deviates from the through hole of the circular cover of the safety device, the circular cover is restored to a position at the upper surface of the circular hole by the elastic force of the lower spring, and the inclination is snapped to the through hole of the circular cover and comes into a locked state again, thereby closing the guide member again.

6. The safety electric outlet according to claim 5,

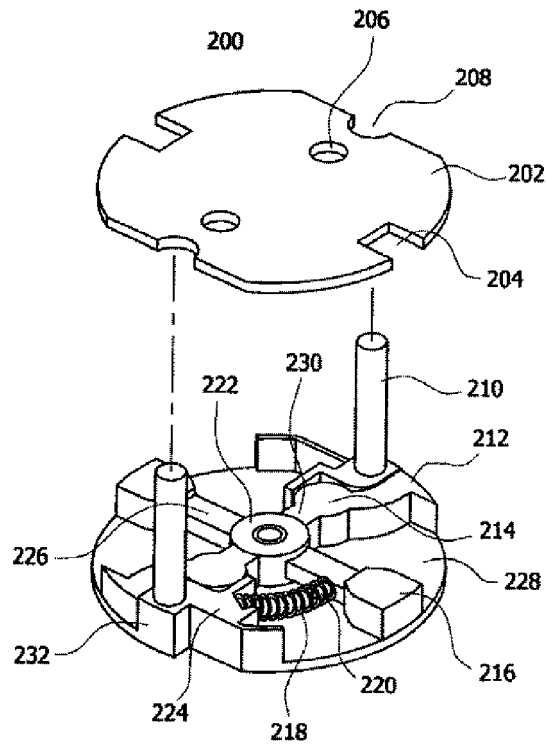
wherein a ground terminal groove is formed in the circular cover and the lower portion of the safety device, the ground terminal groove is closed by a cover of a second branch which is perpendicular to the first branch of the blade when the plug is not inserted, and when the connection terminal is inserted, the second branch rotates simultaneously with the rotation of the first branch so that the ground terminal groove is opened, thereby allowing

the ground terminal of the lower main body to be connected to a corresponding ground terminal of the plug, and wherein when the plug connection terminal deviates from the through hole of the circular cover of the safety device, the inclination is snapped to the through hole of the circular cover and comes into a locked state again, thereby closing the ground terminal groove again by means of the cover of the second branch.

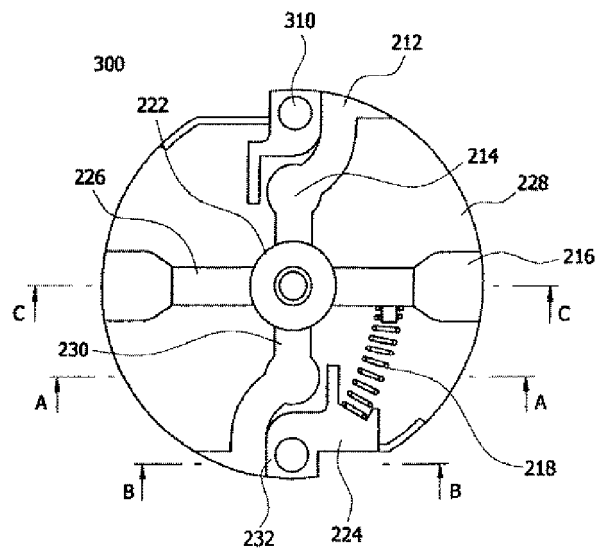
[Fig. 1]



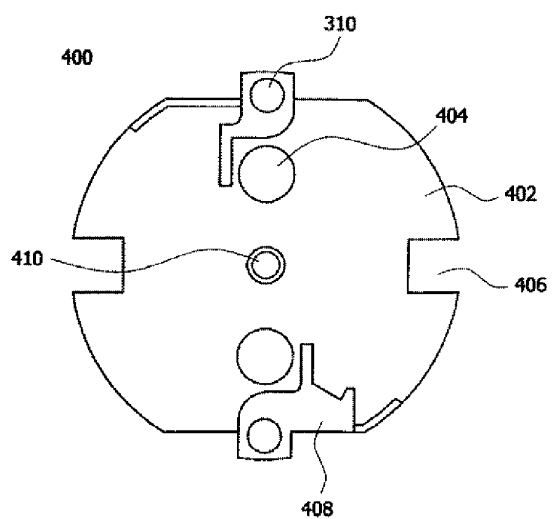
[Fig. 2]



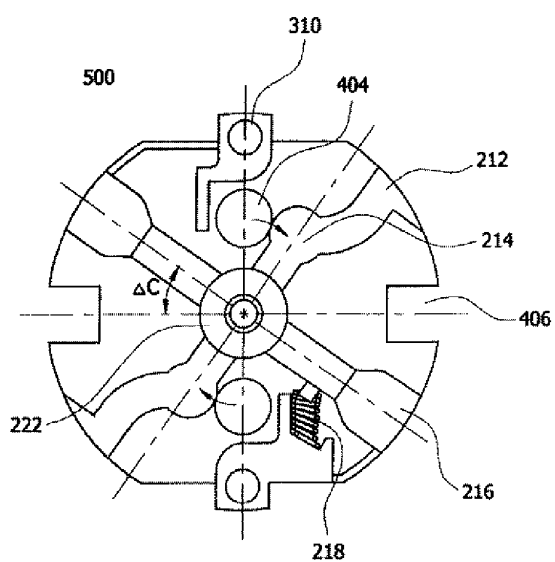
[Fig. 3]



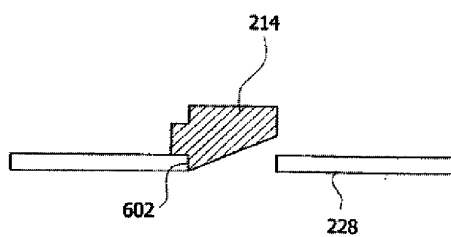
[Fig. 4]



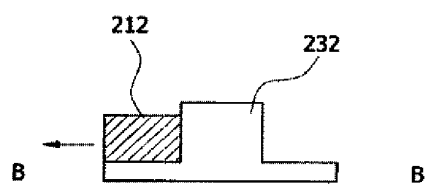
[Fig. 5]



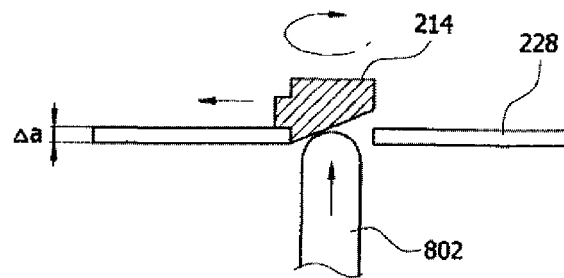
[Fig. 6]



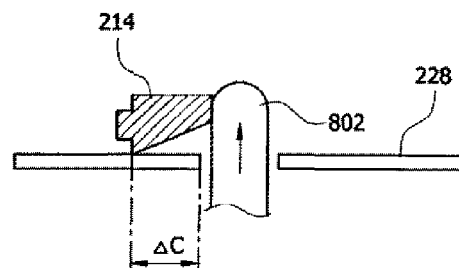
[Fig. 7]



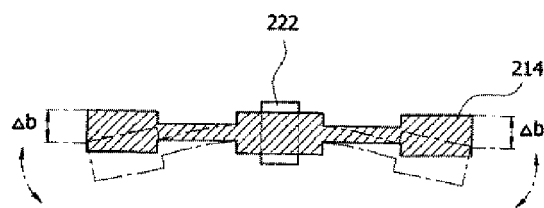
[Fig. 8]



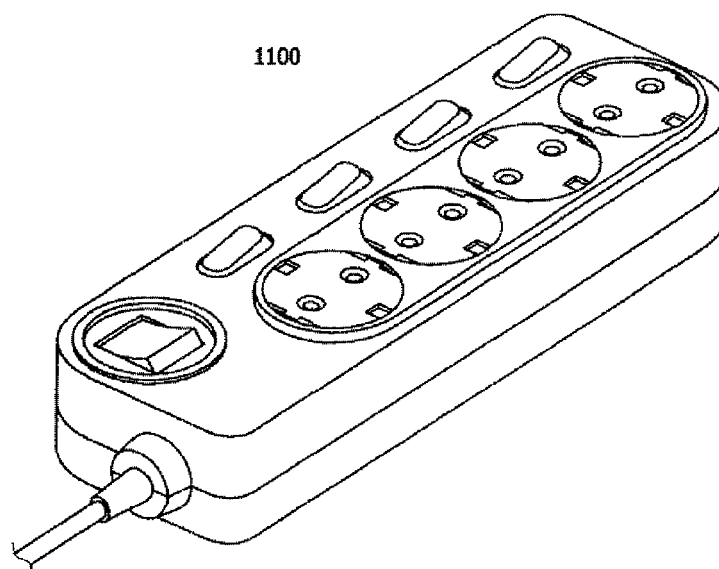
[Fig. 9]



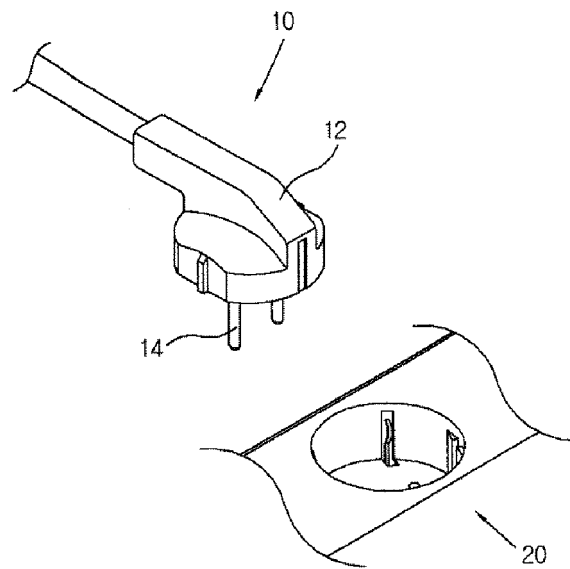
[Fig. 10]



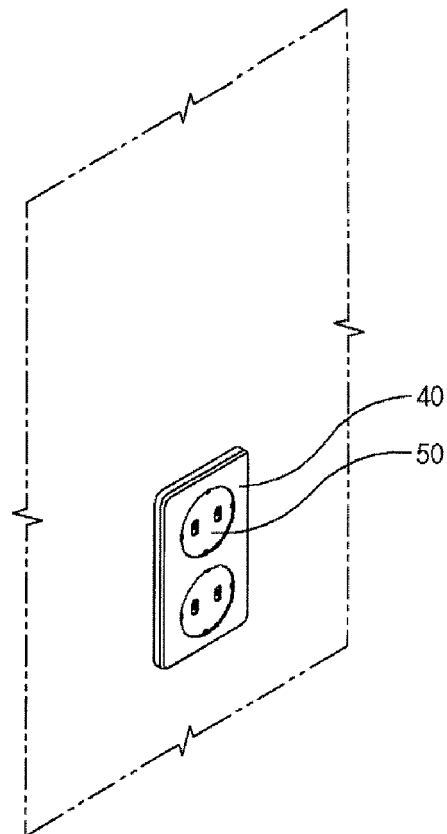
[Fig. 11]



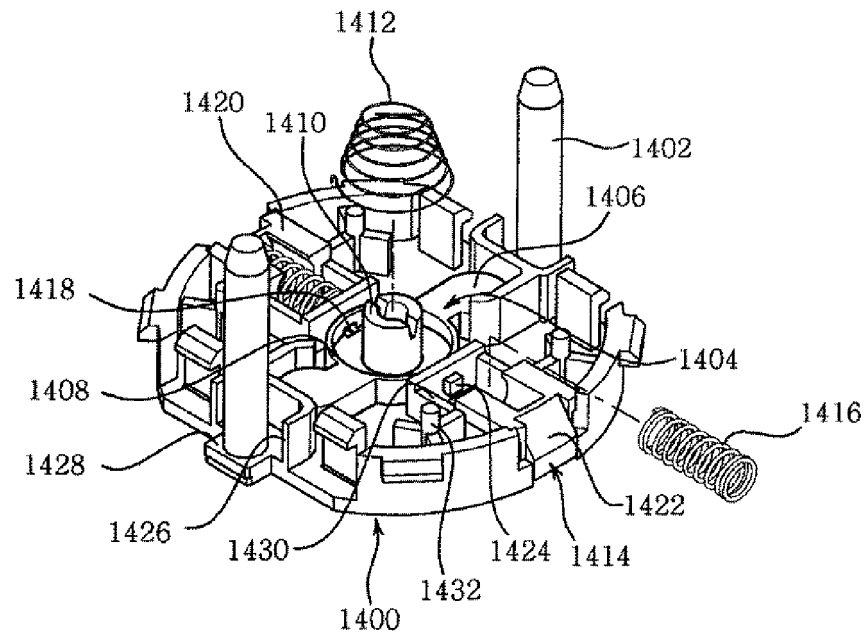
[Fig. 12]



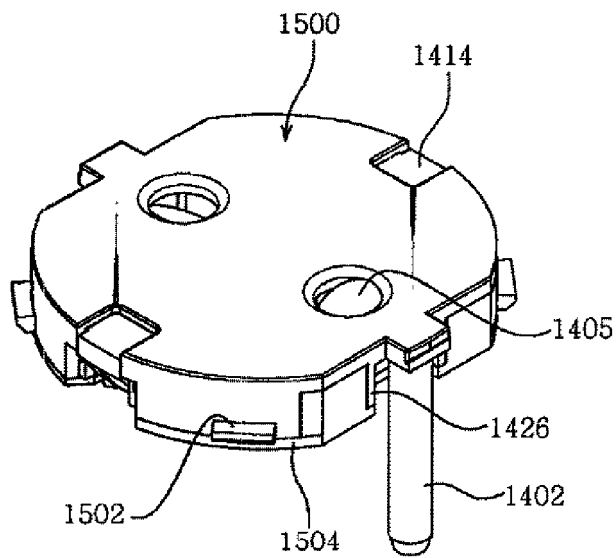
[Fig. 13]



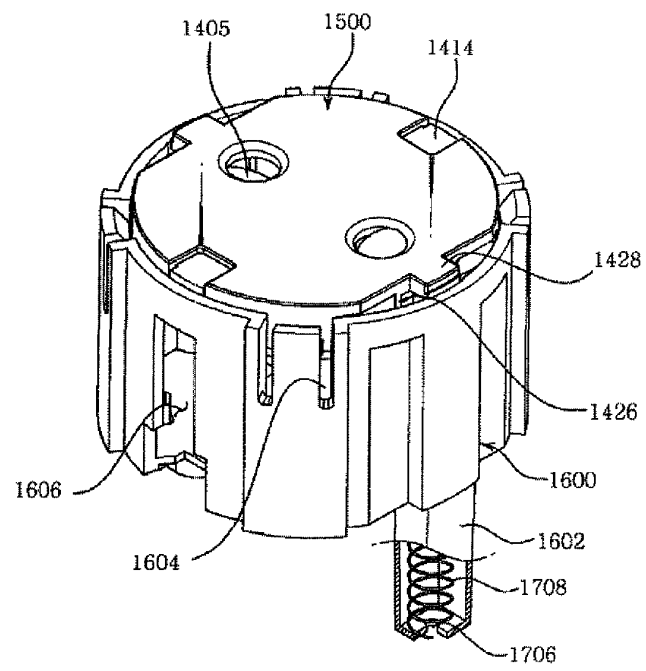
[Fig. 14]



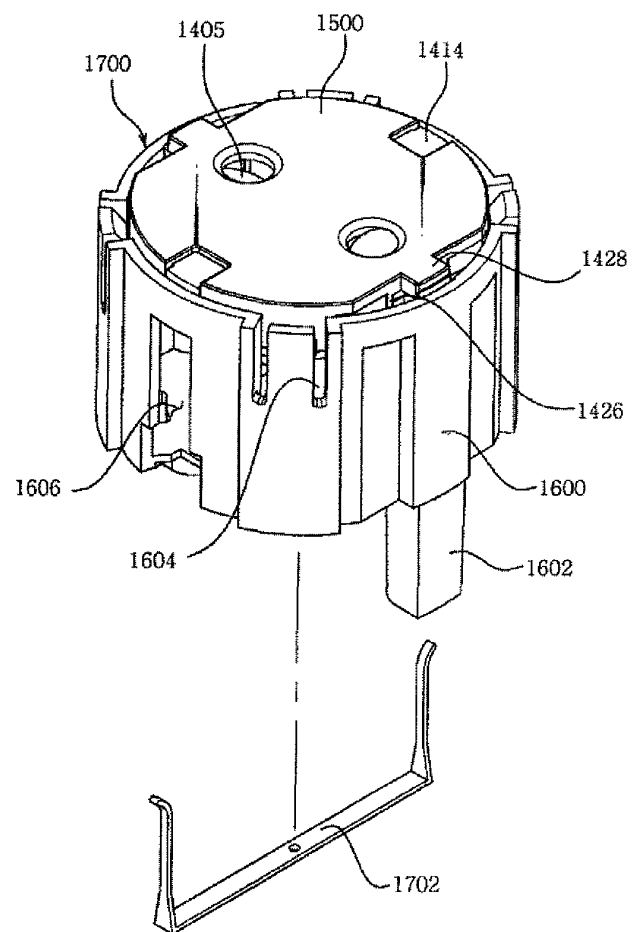
[Fig. 15]



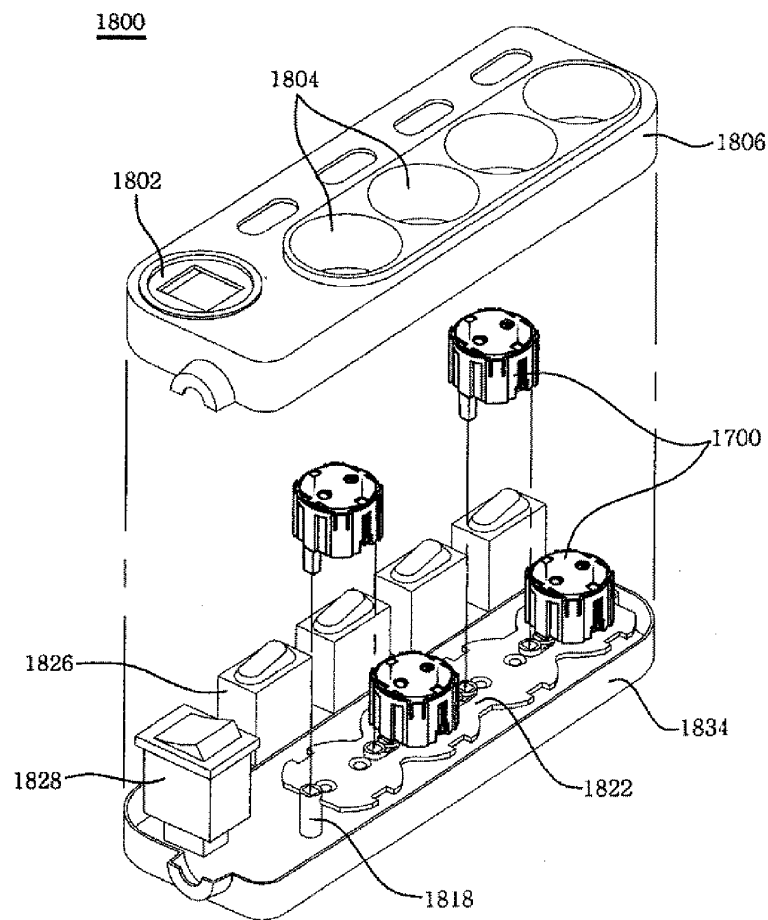
[Fig. 16]



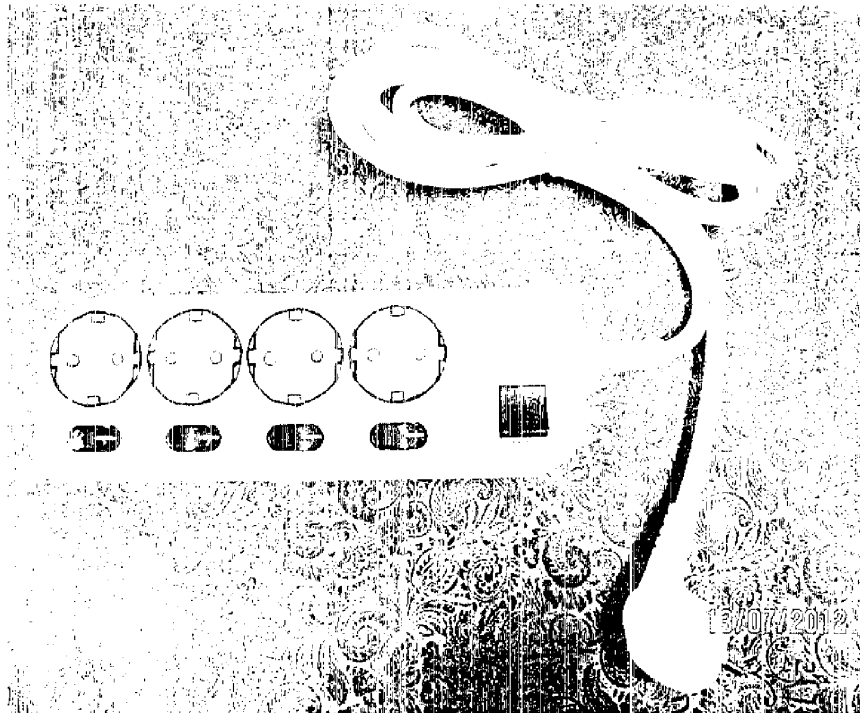
[Fig. 17]



[Fig. 18]



[Fig. 19]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2012/007958

A. CLASSIFICATION OF SUBJECT MATTER

H01R 13/447(2006.01)i, H01R 13/66(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)

H01R 13/447; H01R 13/66; H01R 13/46; H01R 35/00; H01R 13/10; H01R 13/44

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: outlet, outlet, outlet, outlet, outlet, outlet, cover, cover, cover, safety cover, safety, foreign substance, electric shock, spring, spring, elasticity, rotation, blade

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 20-0443067 Y1 (RO, SUNG TAE) 17 January 2009 See claim 1, figure 2 and paragraphs [0017-0026]	1-6
A	KR 10-1025477 B1 (HA, JAI HOON) 04 April 2011 See figure 1 and claim 1	1-6
A	KR 20-0212538 Y1 (LEE, CHIU-SHAN) 15 February 2001 See abstract, claim 1, figures 8,12	1-6
A	KR 20-2011-0008954 U (HA, JAI HOON) 21 September 2011 See abstract, claim 1 and figure 1	1-6
A	KR 10-0754251 B1 (KANG, DAE-YOON) 05 September 2007 See abstract and figure 1	1-6

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

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"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

22 FEBRUARY 2013 (22.02.2013)

Date of mailing of the international search report

25 FEBRUARY 2013 (25.02.2013)

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2012/007958

Patent document cited in search report	Publication date	Patent family member	Publication date
KR 20-0443067 Y1	07.01.2009	NONE	
KR 10-1025477 B1	04.04.2011	NONE	
KR 20-0212538 Y1	15.02.2001	NONE	
KR 20-2011-0008954 U	21.09.2011	NONE	
KR 10-0754251 B1	05.09.2007	WO 2007-055502 A1	18.05.2007

Form PCT/ISA/210 (patent family annex) (July 2009)