

DESCRIPTION

SOCKET DEVICE

TECHNICAL FIELD

5 The present invention relates to a socket device for a plug with plural plug blades, which is embedded in a wall surface in practical use.

BACKGROUND ART

 In the past, socket devices have been used to receive a plug with plural plug blades of an electric appliance and supply electric power to the electrical
10 appliance through the plug. In general, each of the socket devices is embedded in a wall surface in practical use. For example, as shown in FIG. 19, a conventional socket device for two plugs each having three plug blades comprises a socket housing 100 having two sets of three blade apertures 101a, 101b, 101c at its front panel and blade-receiving members (not shown) housed
15 therein to make electrical connection with the plug blades inserted through the blade apertures. The blade-receiving members are connected to electric wires extending from a power supply. This socket device can be secured to a switch box embedded in the wall surface by use of screws. The numeral 102 designates screw holes formed in the front panel of the socket housing
20 100.

 By the way, when a redecoration of a room is performed to change a wall color or pattern, there is a case that the exposed surface of the socket device embedded in a wall surface of the room does not match with the changed wall color or pattern. In such a case, it is necessary to exchange the
25 socket device with a new socket device having a more suitable color or pattern. However, this results in costly repairs or replacements of the socket device.

DISCLOSURE OF THE INVENTION

 From the above viewpoint, a primary concern of the present invention

is to provide a socket device for a plug with plural plug blades, which has an advantage that an appearance of the socket device can be matched with a variety of ornamental purposes without costly repairs or replacements of the socket device.

5 That is, the socket device of the present invention comprises:

a case made of an electrically insulating resin;

a socket cover of an electrically insulating resin secured to the case, the socket cover having means for securing the socket cover to a switch box embedded in a wall surface, and blade apertures at its front surface, to which

10 the plug blades can be inserted;

terminal members housed in the case and connected to electric wires extending from outside;

blade-receiving members housed in the case and electrically connected to the terminal members, the blade-receiving members having the capability of receiving the plug blades inserted into the blade apertures to make electrical and mechanical connections with the plug blades; and

15 a cosmetic cover detachably fitted to the front surface of the socket cover, and having an opening, through which the blade apertures of the socket cover are exposed.

20 It is preferred that the blade apertures has shapes compatible with the plug blades of the plug for 250 V, 13 A or 15A of rated voltage and current, respectively.

It is preferred that the socket device comprises a shutter unit for simultaneously opening and closing two of the blade apertures, which is provided with a shutter member having a pair of inclined surfaces and a spring for applying a spring bias in a direction of closing the blade apertures with the shutter member, and the shutter member is slidably supported in a space between the case and the socket cover such that when the plug blades are absent in the blade apertures, the blade apertures are closed by the inclined

surfaces of the shutter member, and when top ends of the plug blades are pressed against the inclined surfaces of the shutter member in the blade apertures by a required force to insert the plug blades into the blade apertures, the required force causes a slide movement of the shutter member against the
5 spring bias in a direction of opening the blade apertures to make electrical connections between the plug blades and the blade-receiving members. In this case, since the blade apertures are closed by the shutter member after the plug blades are pulled out, it is effective to avoid the occurrence of electric-shock hazards.

10 In addition, it is preferred that the shutter member is movably supported in a seesaw fashion in the space such that when only one of the plug blades is pressed against the inclined surface of the shutter member in the blade apertures, a seesaw motion of the shutter member is caused, so that a part of the shutter member is engaged to the socket cover to inhibit the slide
15 movement of the shutter member in the direction of opening the blade apertures. In this case, since the shutter member can not be moved when it is tried to insert only one of the plug blades into the blade aperture, it is possible to prevent an improper connection of the plug.

It is also preferred that the socket device comprises a switch unit for
20 switching between an ON position where at least two of the terminal members are electrically connected to corresponding blade-receiving members and an OFF position where the at least two of the terminal members are disconnected from the corresponding blade-receiving members, and wherein the switch unit has a switch lever that is exposed through windows formed in the socket cover
25 and the cosmetic cover to be operable from outside. In this case, there is an advantage that the supply of electric power to the plug inserted into the socket device can be stopped by operating the switch lever without pulling out the plug. To achieve this advantage, for example, it is preferred that the switch unit comprises a pair of switch members movably supported in a seesaw

fashion in the case such that when the switch lever is in the ON position, the blade-receiving members are electrically connected to the terminal members through the switch members, and when the switch lever is in the OFF position, the switch members are disconnected from the blade-receiving members.

5 Moreover, it is preferred that the switch unit has an indicator for informing the ON/OFF position of the switch lever to a user, which comprises a pilot lamp and a resistance that are connected in series, and wherein leads of the pilot lamp are connected to a required pair of the blade-receiving members through the resistance to supply electric power to the pilot lamp when the
10 switch lever is in the ON position. In this case, the user can visually check the ON/OFF operation of the switch lever by the light of the pilot lamp.

To detachably fit the cosmetic cover to the front surface of the socket cover, for example, it is preferred that the cosmetic cover has a plurality of hooks projecting on a surface facing to the socket cover, and wherein the
15 cosmetic cover is detachably fitted to the socket cover by engaging the hooks into concaves formed in the front surface of the socket cover.

It is preferred that the switch lever has pivot shafts projecting in opposite two directions, which are supported by bearing portions formed in the socket cover to provide a seesaw motion of the switch lever. In addition,
20 it is preferred that the switch lever has at least one pair of engaging portions thereon and the switch lever can be held in a switch opening formed in the socket cover by friction between the engaging portions and inner walls of the socket cover in the switch opening.

In addition, it is preferred that each of the blade-receiving members is
25 composed of a first conductive piece having a pair of blade-catching arms at its one end and a second conductive piece having a first end, to which the other end of the first conductive piece is connected, and a second end, to which the terminal member is connected, and wherein the first conductive pieces have different shapes from each other, and at least two of the second

conductive pieces have a common shape.

When it is needed to provide a socket device having the capability of receiving a plurality of plugs each having the plug blades, it is preferred that the socket device comprises a single socket cover having the blade apertures for receiving the plug blades of the plugs, and a plurality of cases provided individually for the plugs. In addition, it is preferred that the socket device comprises a plurality of switch units, each of which has the capability of switching between an ON position where at least two of the terminal members are electrically connected to corresponding blade-receiving members and an OFF position where the at least two of the terminal members are disconnected from the corresponding blade-receiving members, and is provided with a switch lever that is exposed through windows formed in the socket cover and the cosmetic cover to be operable from outside. In this case, there is an advantage that the supply of electric power to a desired one of the plugs inserted into the socket device can be stopped by operating a corresponding switch lever without pulling out the plug.

These and still other objects and advantages will become more apparent from the following embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

- FIG. 1 is an exploded perspective view of a socket device according to a first embodiment of the present invention;
- FIG. 2 is an exploded perspective view of a blade-receiving member of the socket device;
- FIG. 3 is a top view of a socket cover of the socket device;
- FIG. 4 is a partially cross-sectional view showing an engagement between a cosmetic cover and the socket cover;
- FIG. 5 is a partially cross-sectional view showing an attachment of a blank cover to the socket cover;
- FIG. 6 is a perspective view of the cosmetic cover according to a modification

of the first embodiment;
FIG. 7 is an exploded perspective view of the cosmetic cover of FIG. 6;
FIG. 8 is a perspective view of a terminal member of the socket device;
FIG. 9 is an exploded perspective view of a socket device according to a
5 modification of the first embodiment;
FIG. 10 is an exploded perspective view of a socket device according to a
second embodiment of the present invention;
FIG. 11A is a cross sectional view of the socket device when no plug blade is
inserted, FIG. 11B is a schematic diagram showing a positional relation
10 between the plug blade and a shutter member of the socket device, and FIG.
11C a cross-sectional view of the socket device when plug blades are inserted;
FIGS. 12A and 12B are cross-sectional views of the socket device when only
one of the plug blades is inserted;
FIG. 13 is an exploded perspective view of a socket device according to a
15 third embodiment of the present invention;
FIG. 14 is a perspective of a switch lever of the socket device;
FIG. 15 is a schematic diagram showing an attachment of the switch lever to a
socket cover;
FIG. 16 is an exploded perspective view of the switch lever, indicator and
20 blade-receiving members of the socket device;
FIG. 17 is an exploded perspective view of the socket device according to a
modification of the third embodiment;
FIG. 18 is an exploded perspective view of the socket device according to a
further modification of the third embodiment; and
25 FIG. 19 is a perspective view of a conventional socket device.

DETAIL DESCRIPTION OF THE PREFERRED EMBODIMENTS

First Embodiment

Referring to FIGS. 1 to 9, a socket device according to a first embodiment of the present invention is explained. This socket device can

receive a plug of a three-pin type with 250 V, 13A of the rated voltage and current according to British Standards (BS). The socket device comprises a case 20, socket cover 30, and a cosmetic cover 40, as shown in FIG. 1.

The case 20 is made of a synthetic resin having electrical insulating properties. In the case 20, there are plural partitions to make rooms 21a, 21b, 21c for receiving spring arms 51 of blade-receiving members made of an electrically conductive material such as brass and rooms 22a, 22b, 22c for receiving terminal members 6 of a material having high hardness and electrical conductivity such as a copper-tin alloy, which are connected to a power source (not shown) through lead wires. The blade-receiving members comprise a first blade-receiving member 5a for one (N pole) of the plug blades, second blade-receiving member 5b for another one (L pole) of the plug blades, and a third blade-receiving member 5c for the rest one (ground pole) of the plug blades.

For example, as shown in FIG. 2, the first blade-receiving member 5a is composed of a first conductive piece 52 having a pair of spring arms 51 for catching the plug blade at its one end and a second conductive piece 54 having a first end, to which the other end 53 of the first conductive piece is fixed, and a bayonet 55 formed at a second end, which is inserted in the terminal member 6 of a tubular shape. In this case, protrusions 54d formed on the first end of the second conductive piece 54 are inserted into holes 53d formed in the other end 53 of the first conductive piece 52, and then the top ends of the protrusions 54d are crushed flat to fix the second conductive piece to the first conductive piece. The first conductive pieces 52 of the first and second blade-receiving members 5a, 5b have different shapes from each other. On the other hand, the second conductive pieces 54 of the first and second blade-receiving members have a common shape. This brings about a reduction in component counts to achieve cost reduction.

Each of the first and second blade-receiving members 5a, 5b can be

secured to the case 20 by forcing it into a slot 23 formed in the case. The numeral 53g designates a lead connector used when a switch lever with an indicator explained later is equipped to the socket device. The third blade-receiving member 5c has a pair of spring arms 51 for catching the plug blade of the ground pole at its one end and the bayonet 55 at the opposite end, which are integrally formed with the electrically conductive material. Each of the blade-receiving members 5a to 5c is electrically connected to the corresponding terminal member 6.

The socket cover 30 is made of a synthetic resin having electrical insulating properties, and formed in a substantially square-plate shape with a T-shaped projection 31 on its front surface and a rectangular opening 32. Three rectangular blade apertures 35a, 35b, 35c are formed in the T-shaped projection 31. The plug blades (not shown) can be inserted to those blade apertures. In this embodiment, the plug blades of the N and L poles can be inserted in the blade aperture 35a and 35b, respectively. The plug blade of the ground pole can be inserted in the blade aperture 35c.

The T-shape projection 31 is composed of a horizontal portion having the blade apertures 35a and 35b and a vertical portion having the blade aperture 35c. The blade apertures 35a and 35b are positioned on a straight line extending in a longitudinal direction of the horizontal portion. The blade aperture 35c is positioned on a straight line extending in a longitudinal direction of the vertical portion and passing a center point between the blade apertures 35a and 35b. The numerals 34a, 34b designate a pair of thread openings formed in the socket cover 30, to which screws (not shown) for securing the socket cover to a switch box embedded in a wall surface can be engaged. As shown in FIG. 3, since the thread opening 34a is formed in an elongate shape, it is possible to readily adjust a mounting position of the socket cover on the switch box.

The cosmetic cover 40 is made of the synthetic resin having electrical

insulating properties, and formed with a top plate 41 having a substantially square shape and side walls 42 integrally formed with the top plate. The top plate 41 has a T-shaped opening 43 for exposing the T-shaped projection 31, and a rectangular aperture 44 for exposing the rectangular opening 32 of the socket cover 30 when the cosmetic cover 40 is attached to the socket cover. The cosmetic cover 40 is detachable to the socket cover 30. That is, as shown in FIG. 4, the cosmetic cover 4 has hooks 45 projecting from four corners of the top plate 41 on its rear surface, which can be detachably engaged to concaves 33 formed in the front surface of the socket cover 30.

10 The cosmetic cover 40 can be detached from the socket cover 30 by inserting a tool such as a flatblade screwdriver into a clearance between the cosmetic cover and the socket cover, and applying a force to the cosmetic cover in a direction of opening up the clearance with the inserted tool to release the hook engagements. The numeral 36 designates a release portion
15 formed in a side wall of the socket cover 30 to enhance the insertion of the tool into the clearance between the socket cover and the cosmetic cover 40. The numeral 37 designates a rib projecting from the bottom end of the release portion to prevent a situation that the wall surface is hurt by mistake when the force is applied to the cosmetic cover by the tool inserted in the clearance.

20 In this embodiment, the rectangular opening 32 of the socket cover 30 can be covered by a blank cover 8 having shafts 8a projecting on its opposite side surfaces. To attach the blank cover 8 to the socket cover 30, the shafts 8a are engaged into grooves 32a of the socket cover formed in the rectangular opening 32, and the opposite end portions 8b of the blank cover 8 are abutted
25 against inner walls 32b of the socket cover in the rectangular opening 32, as shown in FIG. 5.

As described above, since the cosmetic cover 40 is separately provided to cover the socket cover 30, there is an advantage of matching an appearance of the socket device with a variety of ornamental purposes without

costly repairs or replacements of the socket device. Therefore, even when a redecoration of a room is performed to change a wall color or pattern, and the exposed surface of the socket device embedded in a wall surface of the room does not match with the changed wall color or pattern, it is possible to readily
5 deal with the redecoration by exchanging the old cosmetic cover of the socket device with a new cosmetic cover having a more suitable color or pattern.

For example, as shown in FIGS. 6 and 7, the cosmetic cover 40 may be composed of a synthetic-resin body 46 and a metal plate 47 having openings 47a, 47b for the T-shaped opening 43 and the rectangular aperture
10 44 of the synthetic-resin body. Opposite sides of the metal plate 47 are curved to fit side walls of the synthetic-resin body. The numeral 48 designates a guide frame for positioning the metal plate 47 in the right place on the synthetic-resin body 46. The metal plate 47 can be secured to the synthetic-resin body 46 by crimping or bonding.

15 As shown in FIG. 8, the terminal member 6 comprises a tubular body 90 having a screw hole 91. The terminal screw 7 can be engaged to the screw hole 91 to catch the electric wire (not shown) in the interior of the tubular body 90 and make the electrical and mechanical connection between the electric wire and the bayonet 55 of the blade-receiving member. The
20 numeral 96 designates a counter sink formed at the periphery of the screw hole 91 by burring to increase the contact area between the terminal screw 7 and the tubular body 90. As an example, the terminal member 6 can be produced by bending a metal sheet to form a tubular shape and coupling one end with the opposite end of the metal sheet. That is, the one end of the
25 metal sheet is formed to have a substantially T-shaped convex 92. The opposite end of the metal sheet has a concave 94, to which the T-shaped convex 92 can tightly fit.

When the terminal screw 7 engaged to the terminal member 6 is tightened up, a force occurs in a direction of pulling out the T-shaped convex

92 from the concave 94. However, the tubular structure of the terminal member 6 can be stably maintained against the force by the engagement between the T-shaped convex 92 and the concave 94. In this case, mechanical stresses F occur in the terminal member 6 in directions shown by the arrows in FIG. 8. Since each of first coupling surfaces 98a of the tubular body 90 intersects with the direction of the force F at substantially right angles, it can effectively receive the mechanical stress. In addition, the formation of second coupling surfaces 98b is useful to prevent the pulling-out of the T-shaped convex 92 from the concave 94.

Next, a shutter mechanism for opening and closing the blade apertures 35a, 35b is explained. The blade apertures 35a, 35b can be opened and closed by a shutter member 60, which is slidably supported in a space between the case 20 and the socket cover 30. The shutter member 60 comprises a slide portion 61 having a projection 63, a pair of gate portions 62 extending from the slide portion in opposite two directions. The slide portion 61 slidably fits a groove (not shown) formed in the rear surface of the socket cover 30 such that the shutter member 60 is movable in a longitudinal direction of the slide portion. The projection 63 of the slide portion 61 supports one end of a coil spring 64. The coil spring 64 is supported in a groove 24 formed in the top surface of the case 20. The other end of the coil spring 64 is supported by a wall formed at one end of the groove 24, so that the shutter member 60 receives a spring bias of the coil spring 64 in a direction of closing the blade apertures 35a, 35b with the gate portions 62. Therefore, when the plug is not connected to the socket device, the blade apertures 35a, 35b are closed by the shutter member 60.

Each of the gate portions 62 has an inclined surface 62a, which has the following function. That is, when trying to insert the plug blades into the blade apertures 35a, 35b closed by the gate portions 62, the top ends of the plug blades firstly contact the inclined surfaces 62a of the gate portions.

Then, as the insertion of the plug blades further proceeds, the top ends of the plug blades slide down the inclined surfaces 62a and at the same time move the shutter member 60 against the spring bias of the coil spring 64 to start opening the blade apertures 35a, 35b. Finally, the blade apertures are opened by the plug blades to make the electrical and mechanical connections between the plug blades and the blade-receiving members 5a, 5b through the blade apertures 35a to 35c. According to this shutter mechanism, since the blade apertures 35a, 35b are always closed by the gate portions 62 of the shutter member 60 when the plug is disconnected from the socket device, it is effective to avoid electric-shock hazards.

In this embodiment, the socket device has a single T-shaped projection 31 with the blade apertures 35a, 35b, and 35c. Alternatively, the socket device may have a plurality of T-shaped projections each having the three blade apertures. For example, a socket device shown in FIG. 9 comprises a single socket cover 30 with a pair of T-shaped projections 31a, 31b each having the three blade apertures 35a, 35b, 35c, cases 20a, 20b provided individually for the plugs to house the terminal members 6 and the blade-receiving member 5a, 5b, 5c therein, and a single cosmetic cover 40 having two T-shaped openings 43a, 43b. Therefore, in this case, it is possible to supply the electric power to different two plugs of the three-pin type by use of a single socket device.

Second Embodiment

Referring to FIGS. 10 to 12, a socket device according to a second embodiment of the present invention is explained. This socket device can receive a plug of a three-pin type with 250 V, 15A of the rated voltage and current. The socket device of this embodiment is substantially same as that of the first embodiment except for the following features. Therefore, duplicate explanations are omitted.

In this embodiment, since the plug blades are of a cylindrical shape,

circular blade apertures 35a, 35b, 35c are formed in a T-shaped projection 35 of a socket cover 30. Two of the blade apertures 35a, 35b for the N and L poles can be opened and closed by a shutter member 60', which is slidably supported in a space between a case 20 and the socket cover 30. The shutter member 60' is formed in a rectangular-plate shape with a pair of gate projections 65 each having an inclined surface 62a on its top, through hole 66 to which one of the plug blades can be inserted, and ribs 62b formed on both sides of each of the gate projections. The through hole 66 is formed in the shutter member 60' between the gate projections 65. In addition, the shutter member 60' has a fulcrum projection 67 on its bottom surface at a center position between the gate projections 65, which is used to provide a seesaw motion of the shutter member 60', as described later. The numeral 25 designates a guide projection of the case 20, on which the shutter member 60' are placed. The guide projection 25 is effective to provide a steady slide movement of the shutter member 60'.

As shown in FIGS. 11A to 11C, the shutter member 60' is disposed in a space between the case 20 and the socket cover 30 together with a coil spring 64 such that one end of the coil spring is abutted against a spring receiving wall 62c formed at a side of one of the gate projections 65 and the other end of the coil spring is pressed against an inner wall of the socket cover 30. The shutter member 60' receives a spring bias of the coil spring 64 in a direction of closing the blade apertures 35a and 35b with the gate projections 65. Therefore, when the plug blades are disconnected from the socket device, the blade apertures 35a, 35b are closed by the gate projections 65 of the shutter member 60', as shown in FIG. 11A.

On the other hand, when trying to insert the plug blades into the blade apertures 35a, 35b closed by the shutter member 60', the top ends of the plug blades firstly contact inclined surfaces 62a of the gate projections 65. Then, as the insertion of the plug blades further proceeds, the plug blades slide down

the inclined surfaces and at the same time move the shutter member 60' against the spring bias of the coil spring 64 in a horizontal direction to start opening the blade apertures 35a, 35b. Finally, the blade apertures 35a, 35b are opened to make the electrical and mechanical connections between the plug blades the blade-receiving members 5a, 5b, as shown in FIGS. 11B and 11C. According to this shutter mechanism, since the blade apertures 35a, 35b are always closed by the shutter member 60' when the plug is disconnected from the socket device, it is effective to avoid electric-shock hazards.

10 In addition, the socket device of this embodiment presents an advantage that when trying to insert the plug blade P to only one of the blade apertures 35a, 35b, the insertion of the plug blade is rejected by the shutter member 60'. That is, as shown in FIG. 12A, when trying to insert the plug blade P into only the blade aperture 35a, one of the gate projections 65 (left gate projection) of the shutter member 60' is pushed down in a seesaw fashion about the fulcrum projection 67, so that the ribs 62b of the other gate projection 65 (right gate projection) are engaged to concaves 38 formed in the rear surface of the socket cover 30. These engagements of the ribs 62b to the concaves 38 inhibit the slide motion of the shutter member 60' in the direction of opening the blade aperture 35a.

On the other hand, as shown in FIG. 12B, when trying to insert the plug blade P into only the blade aperture 35b, one of the gate projections 65 (right gate projection) of the shutter member 60' is pushed down in a seesaw fashion about the fulcrum projection 67, so that the ribs 62b of the other gate projection 65 (left gate projection) are engaged to the concaves 38 of the socket cover 30. These engagements of the ribs 62b to the concaves 38 inhibit the slide motion of the shutter member 60' in the direction of opening the blade aperture 35b according to the similar manner to the above. Therefore, the socket device of this embodiment can prevent an improper

connection of the plug.

Third Embodiment

Referring to FIGS. 13 to 18, a socket device according to a third embodiment of the present invention is explained. This socket device can receive a plug of a three-pin type with 250 V, 13A of the rated voltage and current. The socket device of this embodiment is substantially same as that of the first embodiment except for the following features. Therefore, duplicate explanations are omitted.

The socket device of this embodiment is characterized by comprising a switch lever 10 for switching between an ON position where electric power is supplied to the plug inserted into the socket device, and an OFF position where the supply of electric power to the plug is stopped without pulling out the plug. As shown in FIG. 14, the switch lever 10 is made of an electrically conductive material, and provided with a switch housing 10a, a pair of tubular portions 10b for housing springs 11 and sliders 12 therein, a coupling portion 10c extending between the tubular portions, and pivot shafts 10d formed on the opposite sides of the switch housing 10a. One of the pivot shafts 10d is supported in one of grooves 32a formed in inner walls of the socket cover 30 in a rectangular opening 32. The other one of the pivot shafts 10d is supported in a bearing portion (not shown) formed in the socket cover 30 through the other one of the grooves 32a. Therefore, the switch lever 10 can be moved in a seesaw fashion about the pivot shafts 10d in the rectangular opening 32.

The numeral 10e designates a guide knob formed on the operation surface of the switch housing 10a to visually check the ON/OFF position of the switch lever 10. The numeral 10f designates first bumps formed on the opposite sides of the socket housing 10a, which are useful to stably hold the switch lever 10 in the rectangular opening 32 without shaking. That is, the first bumps 10f can be engaged to second bumps 39 formed on the inner wall

of the socket cover 30 in the rectangular opening 32, as shown in the circle of FIG. 15. Since a height of the second bump 39 is sufficiently low, there is no need to worry about preventing the seesaw motion of the switch lever 10. In addition, the engagements between the first bumps 10f and the second bumps 39 are useful to temporarily hold the switch lever 10 in the rectangular opening 32 during an assemble task of the socket device.

As described above, the slider 12 having a pointed-end is housed in each of the tubular portions 10b of the switch lever 10 through the spring 11. Therefore, the slider 12 receives a spring bias of the spring 11 in a direction of ejecting the slider from the tubular portion 10b. The pointed-end of the slider 12 is pressed against a flat 78 of a switch member 75. The switch member 75 has a first contact 76 on its one end, a pair of pivot shafts 77 extending from the flat 78 in opposite two directions, and a stopper 79 on its other end. The pivot shafts 77 are disposed in bearing grooves (not shown) formed in the case 20, so that the switch member 75 is movably supported in a seesaw fashion about the pivot shafts.

In this embodiment, each of the first and second blade-receiving members 5a, 5b is provided with a first conductive piece 52 having a pair of spring arms 51 for catching the plug blade at its one end and a second contact 53c at the other end, and a second conductive piece 54 having a bayonet 55 at its one end, and a fulcrum edge 56 at the other end. The first conductive piece 52 can be secured to the case 20 by forcing it into a slot 23 formed in the case. The switch member 75 is placed on the fulcrum edge 56 of the second conductive piece 54 to make an electrical connection between the switch member and the second conductive piece. The bayonet 55 of the second conductive piece 54 is connected to a terminal member 6 of the tubular shape. An electric wire extending from a power source is connected to the terminal member 6 by use of a terminal screw 7.

When one end having the guide knob 10e of the switch lever 10 is

pushed down, a downward force is applied to the slider 12 against the spring bias of the spring 11, so that the pointed end of the slider is moved on the flat 78 toward the stopper 79. At this time, since the switch member 75 is moved in the seesaw fashion about the pivot shafts 77 on the fulcrum edge 56 such that one end having the stopper 79 of the switch member 75 is pushed down by the pointed end of the slider 12, the other end having the first contact 76 of the switch member 75 comes into contact with the second contact 53c of the first conductive piece 52 to make an electrical connection between the first and second conductive pieces 52, 54 through the switch member 75.

On the other hand, when the other end of the switch lever 10 is pushed down, the force is released from the slider 12, so that the pointed end of the slider is moved on the flat 78 toward the first contact 76. At this time, since the switch member 75 is moved in the seesaw fashion such that the end having the first contact 76 of the switch member 75 is pushed down by the pointed end of the slider 12 with help of the spring bias of the spring 11, the first contact 76 is spaced away from the second contact 53c of the first conductive piece 52 to brake the electrical connection between the first and second conductive pieces 52, 54. Thus, the supply of electric power to the plug inserted into the socket device can be stopped by operating the switch lever 10 without pulling out the plug.

As shown in FIG. 16, it is preferred that the socket device comprises an indicator of informing an ON/OFF operation of the switch lever 10 to a user. That is, the indicator comprises a pilot lamp (neon lamp) 80 and a resistance 81 for limiting an amount of electric current supplied to the pilot lamp, which are connected in series. In this case, a window 10g is formed in the switch lever 10 to provide the light of the pilot lamp 80 to the outside. Leads 82 of the pilot lamp 80 are connected to lead connectors 53g formed on the ends 53 of the first conductive pieces 52 of the first and second blade-receiving members 5a, 5b. Therefore, when the switch lever 10 is turned to

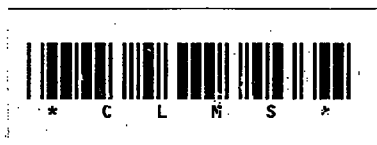
the ON position, the electric current is supplied to the pilot lamp 80 to provide the indicator's light through the window 10g.

In this embodiment, the socket device has a single T-shaped projection 31 with the blade apertures 35a, 35b, 35c. Alternatively, the socket device
5 may have a plurality of T-shaped projections each having three blade apertures. For example, a socket device shown in FIG. 17 comprises a single socket cover 30 with a pair of T-shaped projections 31a, 31b each having three blade apertures 35a, 35b, 35c, cases 20a, 20b provided individually for the two plugs to house the terminal members 6 and the blade-receiving
10 member 5a, 5b, 5c therein, a single cosmetic cover 40 having two T-shaped openings 43a, 43b, and switch levers 10 provided individually for the two plugs. Therefore, in this modification, it is possible to supply the electric power to different two plugs of the three-pin type by use of a single socket device, and also stop the supply of electric power to a desired plug by
15 operating one of the switch levers 10 without pulling out the plugs. In addition, the switch mechanism explained above may be applied to the socket device of the second embodiment, as shown in FIG. 18.

As understood from the above embodiments, the socket device of the present invention can provide the following advantages of:

- 20 (1) matching the appearance of the socket device with a variety of ornamental purposes without costly repairs or replacements of the socket device,
(2) stopping the supply of electric power to the plug inserted into the socket device by operating the switch lever without pulling out the plug, and
(3) avoiding electric-shock hazards and improper connection of the plug by
25 the shutter member 60, 60' to offer a superior level of safety of the socket device.

CLAIMS



1. A socket device for a plug with plural plug blades comprising:
a case made of an electrically insulating resin;
5 a socket cover of an electrically insulating resin secured to said case, said socket cover having means for securing said socket cover to a switch box embedded in a wall surface, and blade apertures at its front surface, to which said plug blades can be inserted;
terminal members housed in said case and connected to electric wires
10 extending from outside;
blade-receiving members housed in said case and electrically connected to said terminal members, said blade-receiving members having the capability of receiving said plug blades inserted into said blade apertures to make electrical and mechanical connections with said plug blades; and
15 a cosmetic cover detachably fitted to the front surface of said socket cover, and having an opening, through which said blade apertures of said socket cover are exposed.
- 20 2. The socket device as set forth in claim 1, wherein said blade apertures has shapes compatible with said plug blades of the plug for 250 V, 13 A of rated voltage and current, respectively.
- 25 3. The socket device as set forth in claim 1, wherein said blade apertures has shapes compatible with said plug blades of the plug for 250 V, 15 A of rated voltage and current, respectively.



4. The socket device as set forth in claim 1, comprising switch means for switching between an ON position where at least two of said terminal members are electrically connected to corresponding blade-receiving members and an OFF position where said at least two of said terminal members are disconnected from the corresponding blade-receiving members, and wherein said switch means has a switch lever that is exposed through windows formed in said socket cover and said cosmetic cover to be operable from outside.

5. The socket device as set forth in claim 1, comprising shutter means for simultaneously opening and closing two of said blade apertures, which is provided with a shutter member having a pair of inclined surfaces and a spring for applying a spring bias in a direction of closing said blade apertures with said shutter member, and wherein said shutter member is slidably supported in a space between said case and said socket cover such that: when said plug blades are absent in said blade apertures, said blade apertures are closed by the inclined surfaces of said shutter member, and when top ends of said plug blades are pressed against the inclined surfaces of the shutter member in said blade apertures by a required force to insert said plug blades into said blade apertures, the required force causes a slide movement of the shutter member against the spring bias in a direction of opening said blade apertures to make electrical connections between said plug blades and said blade-receiving members.

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6. The socket device as set forth in claim 5, wherein said shutter member is movably supported in a seesaw fashion in said space such that when only one of said plug blades is pressed against the inclined surface of said shutter member in said blade apertures, a seesaw motion of said shutter member is



caused, so that a part of the shutter member is engaged to the socket cover to inhibit the slide movement of the shutter member in the direction of opening said blade apertures.

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7. The socket device as set forth in claim 4, wherein said switch means comprises a pair of switch members movably supported in a seesaw fashion in said case such that when said switch lever is in the ON position, said blade-receiving members are electrically connected to said terminal members
10 through said switch members, and when said switch lever is in the OFF position, said switch members are disconnected from said blade-receiving members.

15 8. The socket device as set forth in claim 7, wherein said switch means has an indicator for informing the ON/OFF position of the switch lever to a user, which comprises a pilot lamp and a resistance that are connected in series, and wherein leads of said pilot lamp are connected to a required pair of said blade-receiving members through said resistance to supply an electric power to said
20 pilot lamp when said switch lever is in the ON position.

9. The socket device as set forth in claim 4, wherein said switch lever has pivot shafts projecting in opposite two directions, which are supported by
25 bearing portions formed in said socket cover to provide a seesaw motion of said switch lever.

10. The socket device as set forth in claim 4, wherein said switch lever has at



least one pair of engaging portions thereon and said switch lever can be held in an switch opening formed in said socket cover by friction between said engaging portions and inner walls of said socket cover in said switch opening.

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11. The socket device as set forth in claim 1, wherein said cosmetic cover has a plurality of hooks projecting on a surface facing to said socket cover, and wherein said cosmetic cover is detachably fitted to said socket cover by engaging said hooks into concaves formed in said front surface of said socket
10 cover.

12. The socket device as set forth in claim 1, wherein each of said blade-receiving members is composed of a first conductive piece having a pair of
15 blade-catching arms at its one end and a second conductive piece having a first end, to which the other end of said first conductive piece is connected, and a second end, to which said terminal member is connected, and wherein said first conductive pieces have different shapes from each other, and at least two of said second conductive pieces have a common shape.

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13. The socket device as set forth in claim 1, wherein said socket device has the capability of receiving a plurality of plugs each having said plug blades, and comprises a single socket cover having said blade apertures for receiving
25 said plug blades of said plugs, and a plurality of cases provided individually for said plugs.

14. The socket device as set forth in claim 13, comprising a plurality of switch



means, each of which has the capability of switching between an ON position where at least two of said terminal members are electrically connected to corresponding blade-receiving members and an OFF position where said at least two of said terminal members are disconnected from the corresponding

5 blade-receiving members, and is provided with a switch lever that is exposed through windows formed in said socket cover and said cosmetic cover to be operable from outside.