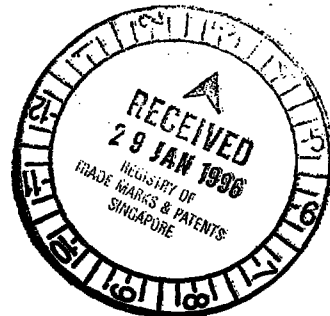


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CONNECTOR ATTACHMENT COMPONENT

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The present invention relates to a connector attachment component that attaches a wedge base bulb and flat fuse to an attaching member together with a connector by means of a flat holder.

An example of a small lamp using a wedge base bulb of the prior art is described in Japanese Examined Utility Model Publication No. 53-1825.

This example of the prior art is a small interior lamp for automobile use equipped with a housing, a lens located in the opening of said housing, a holder attached to said housing, and a wedge base bulb supported in said holder. Said holder is composed of a holder body, formed by bending a conductive metal strip into the shape of the letter "U", and an attachment piece integrated into a single unit with said holder body and extending in the opposite direction from said U-shaped conductive metal strip. Together with forming an engaging indentation with the

holder body in said housing, a center piece and right and left side pieces are provided in opposition at an interval protruding from the top and bottom of said engaging indentation, and the U-shaped portion of said holder body is clamped between said center piece and both said side pieces by fitting into said engaging indentation wherein said holder body is formed in said housing. In this state, the attachment piece of said holder body is fixed in said housing together with a conductive strip for connection. Since the prior art described above comprises an interior lamp by directly forming the holder portion of a wedge base bulb in the side edge of a hole in an interior lamp housing, and directly inserting a connector into a housing base, looseness occurs due to thermal deformation of the base caused by accumulation of heat in the bulb holder and its periphery accompanying lighting of the above-mentioned bulb when a bulb of roughly 5 W or more is used for the above-mentioned bulb. Moreover, contact resistance increases in riveted portions resulting in a further accelerated increase in looseness, ultimately leading to preventing the interior lamp from being used, thereby resulting in a first disadvantage of the prior art.

In addition, the prior art also has the second disadvantage of the connector peripheral members, such as the above-mentioned bulb holder, having a complex structure, which together with requiring manual post-processing and connection such as caulking,

made automated insertion of the connector as well as automated assembly of the interior lamp by automated wiring extremely difficult.

In order to eliminate each of the above-mentioned problems, together with ensuring an inexpensive and reliable bulb and fuse holding structure by integrally providing an upright and relatively small holder, which holds a wedge base bulb and so forth, on a relatively large plastic base, it would be desirable to enable automation of connection and mounting of a connector to other circuits within the above-mentioned holder, including attachment of said connector to said holder.

According to one aspect of the present invention there is provided a connector attachment component used for integrally forming an insulated holder, to which a connector is attached, with an attaching member; comprising: a plastic base, on which a box-shaped insulated frame is integrally provided upright; a pair of projections protruding from opposing inner surfaces of said insulated frame; two connectors, each having a pair of clamps composed of resilient conductive strips

formed into roughly the shape of the letter "U", and an insertion connection piece, formed through a rising base of its side edge, integrated into a single unit; and, attaching said two connectors in parallel between said opposing inner surfaces by means of said pair of projections through attachment holes formed in the bases of said clamps.

According to a further aspect of the present invention there is provided a connector attachment component used for integrally forming an insulated holder, to which a connector is attached, with an attaching member, comprising: a plastic box frame, in which a box-shaped insulated frame is integrally provided upright; a pair of projections protruding from opposing inner surfaces of said insulated frame; two connectors, each having a pair of clamps, composed of resilient conductive strips formed into roughly the shape of the letter "U", and a narrow conductive strip, provided continuously on its base; and, a holder wherein these two connectors are respectively attached in parallel between said opposing inner surfaces by means of said pair of projections through attachment holes formed near the bases of said clamps; wherein, an extending end of said narrow conductive strip in this holder is arranged protruding into a connector recess formed in said box frame.

A bulb holder was able to be composed by attaching two

connectors, respectively and integrally equipped with a pair of clamps composing resilient metal strips formed into roughly the shape of the letter "U", and an insertion connection piece formed through its rising base on the side edge, in parallel using the resilient force of each clamp between opposing inner surfaces of a box-shaped insulated base integrally provided upright on a plastic base by means of a pair of projections formed on said opposing inner surfaces through attachment holes formed in the bases of said clamps.

By integrally forming a pair of clamps and an insertion connection piece on a single connector, a wedge base bulb can be used by tightly clamping with the pair of clamps, and tightly and directly inserting a tab terminal or BUS bar into the insertion connection piece, thereby enabling connection to be made with low contact resistance.

Additionally,

together with integrally providing a relatively small insulated frame upright on a plastic box frame having a relatively large area, since a pair of connectors are attached in parallel within this insulated frame by engaging male and female portions, connection can be made by tightly holding only the connecting portions of a wedge base bulb or small flat fuse.

Thus, since the lamp or fuse is surrounded by an open area, heat

generated by the lamp and so forth is effectively released by convection and radiation. In addition, since the heat of the connector is effectively released through a narrow conductive strip provided continuously on each connector, local temperature increases of the insulated frame and box frame are minimized.

By way of examples only, embodiments of the invention will now be described in greater detail with reference to the accompanying drawings of which:

Fig. 1 is an exploded perspective view of an embodiment of the present invention.

Fig. 2 is a vertical cross-sectional view of the apparatus as an embodiment of the present invention.

Fig. 3 is a cross-sectional view taken along line III-III of Fig. 2.

Fig. 4 is a cross-sectional view taken along line IV-IV of Fig. 2.

Fig. 5 is a cross-sectional view taken along line V-V of Fig. 2.

Fig. 6 is a perspective view indicating an example of use of the

present invention.

Fig. 7 is a cross-sectional view taken along line VI-VI of Fig. 2.

Fig. 8 is an exploded perspective view of an embodiment of the present invention.

Fig. 9 is a vertical cross-sectional view of the apparatus as an embodiment of the present invention.

Fig. 10 is an exploded perspective view of an embodiment of the present invention.

Fig. 11 is a vertical cross-sectional view of the apparatus as an embodiment of the present invention.

Fig. 12 is a perspective view indicating an embodiment of the present invention.

Fig. 13 is an exploded perspective view of the essential portion of the present invention.

Fig. 14 is a vertical cross-sectional side view of the apparatus

of an embodiment of the present invention.

Fig. 15 is a vertical cross-sectional view of the apparatus of the present invention.

Fig. 16 is a cross-sectional view taken along line XVI-XVI of Fig. 15.

Fig. 17 is a perspective view indicating an example of use of the present invention.

Fig. 18 is a rear perspective view of Fig. 1.

Fig. 19 is a perspective view indicating another example of the apparatus of the present invention.

Fig. 20 is a perspective view indicating another example of the apparatus of the present invention.

First, with respect to the basic constitution of the present invention, in the composing of a connector attachment component used for attaching an insulated holder, to which a connector is attached, to an attaching member, together with providing projections 4 protruding in opposition to each other as shown in Fig. 3 on opposing inner surfaces 1a of an insulated frame 1, formed into the shape of a square cylinder in the manner of an inverted "T" as shown in Fig. 1 on base 2 made of a relatively inexpensive plastic having simple heat resistance such as polypropylene, two connectors 7, respectively and integrally equipped with a pair of clamps 5, composing resilient conductive strips made of phosphor bronze and so forth formed into roughly the shape of the letter "U" as shown in Fig. 1, and an eyeglass-shaped insertion connection piece 6 formed through side edge rising base 6a, are inserted into said insulated frame 1 as shown in Figs. 3 through 5.

Namely, at this time, rising base 6a of connection piece 6 is inserted into frame side groove 6b as said clamps 5 are inserted between opposing inner surfaces 1a while being narrowed in

opposition to their resilient force. The above-mentioned pair of projections 4 are then engaged with a snapping action, due to clamps 5 being returned to their original positions by their resilient force, into attachment holes 8 formed in the bases of clamps 5, and the above-mentioned connectors 7 are respectively attached as shown in Fig. 3 on both sides between base opposing inner surfaces 1a, thereby composing bulb holder 9.

Furthermore, if a connector provided with two protruding ribs 7a as shown in Fig. 1 is used for the above-mentioned connector 7, clamping resiliency can be strengthened thereby resulting in improved radiation of heat.

Next, the following provides an explanation of an example of use. Although a known wedge base bulb 12 like that shown in Fig. 1 is attached from the state shown with the broken line in Fig. 4 to the solid line in that same drawing, as well as in Figs. 3, 5 and 6, at its base in bulb holder 9, at this time, as a result of first inserting bulb 12 until its bulb base 12b makes contact with holder flange 9a while spreading apart clamps 5 of connector 7 with leads 12a of bulb 12 in opposition to the resilient force of each of these clamps, bulb 12 can be attached in holder 9 as shown in each of the above-mentioned drawings.

In addition, wedge base bulb 12 can then be lit by tightly inserting BUS bars 13 arranged along the surface of attaching body 11 into insertion connection pieces 6 of connectors 7 at



their bent portions 13a as shown in Figs. 2 and 7 resulting in electrical continuity.

Furthermore, although a known flat fuse may be inserted instead of the above-mentioned wedge base bulb 12, bulb holder 9 should be instead read as a fuse holder at that time.

In addition, wedge base bulb 12 can also be lit by forming lead wire 6, to which the above-mentioned BUS bar portions are connected and secured, and composing as shown in Figs. 8 and 9 resulting in electrical continuity.

In addition, the above-mentioned BUS bar portions can also be extended to be composed in the manner shown in Figs. 10 and 11.

As a result of being composed as explained above, the present invention offers the advantages described below.

Together with integrally providing relatively small insulated frame 1 upright on plastic base 2 having a relatively large area, since the connecting portions of a wedge base bulb or small flat fuse can be connected and used by being tightly held in a pair of connection pieces 6 mounted in parallel by engaging male and female portions within this insulated frame 1, the lamp or fuse is surrounded by an open area, and the heat generated by the lamp and so forth can be effectively released by convection and radiation, temperature increases of base 2 and frame 1 are minimal, and there is no thermal deformation even when

inexpensive plastic is used for the material of base 2 and frame 1, thus resulting in a first advantage of the present invention in terms of increased safety and excellent economic feasibility. Since the connectors themselves conserve on space and are able to be carried out while saving on resources and at low cost as a result of integrally forming insertion connection pieces 6 with a pair of clamps 5, and a tab terminal of BUS bar can be directly and tightly inserted into insertion connection piece 6 thus resulting in excellent general applicability due to being able to be connected and used with low contact resistance, caulking rivets or other caulking tools and so forth required in the above-mentioned prior art for connecting connection pieces to another circuit are no longer required, thus resulting in the additional advantages of allowing automated assembly as well as enabling connection work to be performed easily even in confined or dark locations such as the engine room of an automobile.

The following provides an explanation of further embodiments of the invention with reference to the drawings.

First, with respect to the basic constitution of the present invention, in the composing of a connector attachment component used for attaching an insulated holder, to which a connector is attached, to an attaching member, together with providing projections 4 protruding in opposition to each other as shown in

Fig. 14 on opposing inner surfaces 1a of an insulated frame 1, formed into the shape of a square cylinder as shown in Fig. 12 protruding from the bottom of box frame 2' made of a plastic having simple heat resistance such as polypropylene, two connectors 7, each having a pair of clamps 5 composing resilient conductive strips made of phosphor bronze and so forth formed into roughly the shape of the letter "U" as shown in Fig. 13, and equipped with narrow conductive metal strip 6c such as a BUS bar integrally provided protruding from base 6a of these clamps 5 as shown in Figs. 13 and 18, are clamped within said insulated frame 1 as shown in Figs. 12 and 14 through 17.

Furthermore, narrow conductive metal strip 6c may be formed by bending horizontally as is with respect to clamp base 6a as shown in Fig. 19 or may be led out by overlapping base 6a as shown in Fig. 20. In addition, said narrow conductive metal strip 6c may be fastened by press fitting to base 6a or fastened by soldering. At the time of the above-mentioned attachment, together with engaging the above-mentioned pair of projections 4 with a snapping action, as a result of clamps 5 being returned by their resilient force, in attachment holes 8 formed near base 6a of clamp 5 as clamps 5 are being inserted between opposing inner surfaces 1a of insulated frame 1 while being narrowed in opposition to their resilient force, and fitting the above-mentioned connectors 7 on both sides between insulated frame

opposing inner surfaces 1a as shown in Figs. 12 and 14, respectively, narrow conductive metal strip 6c is attached within rear recess groove 2a of box frame 2', thus composing bulb holder 9 overall.

Furthermore, if a connector provided with two protruding ribs 7a as shown in Fig. 12 is used for the above-mentioned connector 7, clamping resiliency can be strengthened thereby resulting in improved radiation of heat.

The apparatus of the present invention is composed by arranging extending end 6d of the above-mentioned narrow conductive metal strip 6c in this holder 9 to protrude into connector recess 2A formed in the above-mentioned frame 2'.

Next, the following provides an explanation of an example of use. Although a known wedge base bulb 12 like that shown in Figs. 12 and 13 is attached as shown in Figs. 14 through 17 at its connection base in bulb holder 9, at this time, as a result of first inserting bulb 12 until its bulb base 12b makes contact with holder flange 9a while spreading apart clamps 5 of connector 7 with leads 12a of bulb 12 in opposition to the resilient force of each of these clamps, bulb 12 can be attached in holder 9 as shown in each of the above-mentioned drawings, and wedge base bulb 12 can be lit by forming electrical continuity through a known female connector (plug-in jack) engaged with end 6d of

narrow conductive metal strip 6c.

Furthermore, although a known flat fuse may be inserted instead of the above-mentioned wedge base bulb 12, bulb holder 9 should be instead read as a fuse holder at that time.

CLAIMS

1. A connector attachment component comprising a holder for an electric bulb or fuse, the holder including an insulated base, a box-shaped insulated frame integral with and upstanding from said base, a pair of projections protruding inwardly of said frame from each of two opposed inner surfaces thereof, and a pair of electrical connectors located within said frame, each connector consisting of a resilient conductive strip of substantially U-shape the upper free ends of which define a clamp and in the opposed lower regions of each connector are formed a pair of attachment holes, the connectors being located in parallel between said opposed inner surfaces of the frame by co-operation between said projections and said attachment holes and whereby the clamps thereof receive therein, to make electrical contact with, said bulb or fuse, each connector being provided with connection means integrally formed therewith to permit an electrical connection thereto.

2. A component as claimed in claim 1 in which each connector has a protruding rib formed thereon.

3. A component as claimed in claim 1 or claim 2 in which each connection means comprises an insertion connection piece extending upwardly from the base of the conductive strip to one side of the associated connector.

4. A component as claimed in claim 1 or claim 2





in which each connection means comprises a wire connected to, to extend from the base of, the conductive strip of the associated connector.

5. A component as claimed in claim 1 or claim 2 wherein each connection means comprises a conductive metal plate forming a sideways continuation of the base of the conductive strip of the associated conductor.

6. A component as claimed in claim 1 or claim 2 and further comprising an outer box frame integrally formed with, and upstanding from the base to surround the frame housing said connectors, a wall of said outer frame having a recess formed therein, each connection means comprising a conductive metal plate forming a continuation of the base of the conductive strip of the associated conductor, said conductive metal plates each extending from the associated conductor into, to terminate within, said recess in the outer frame.

7. A connector attachment component substantially as described with reference to and as illustrated by the accompanying drawings.



FIG. 1

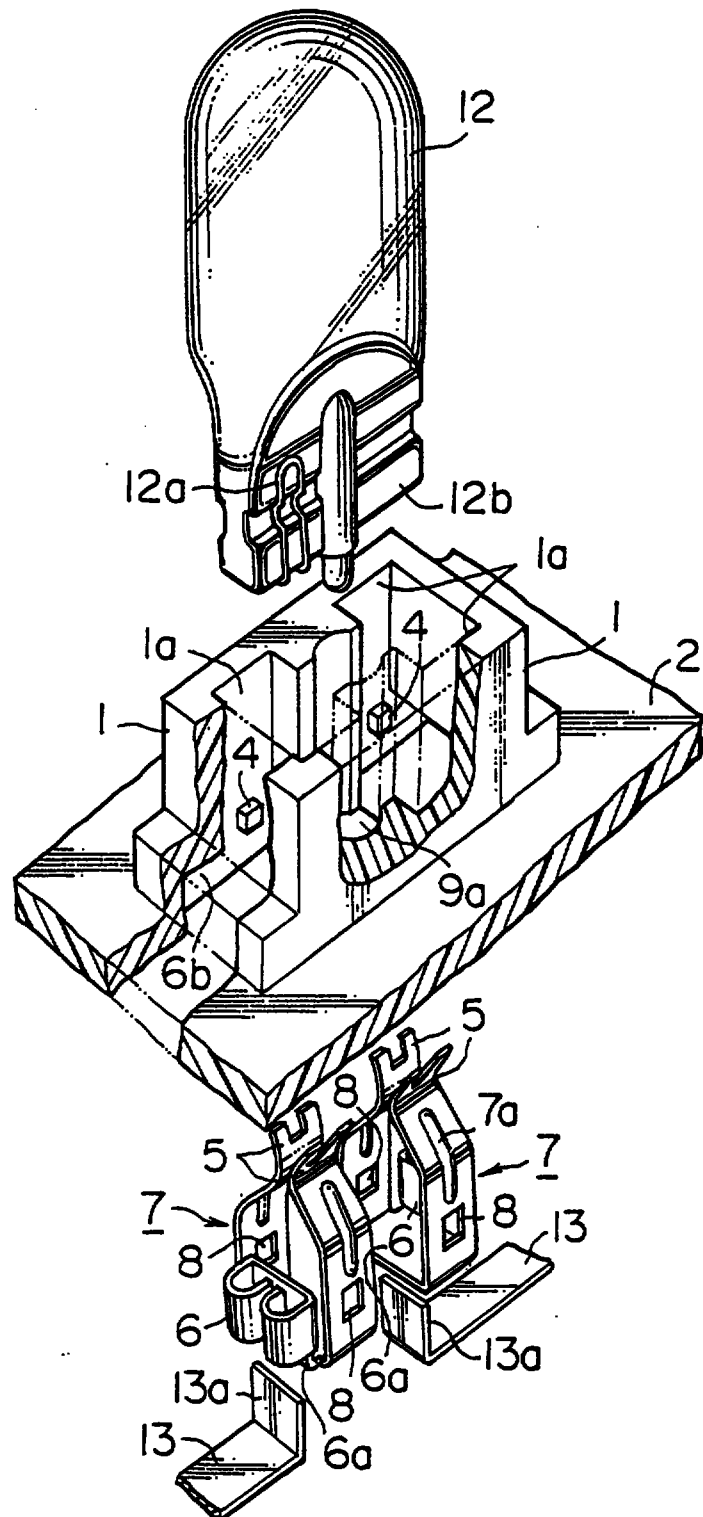
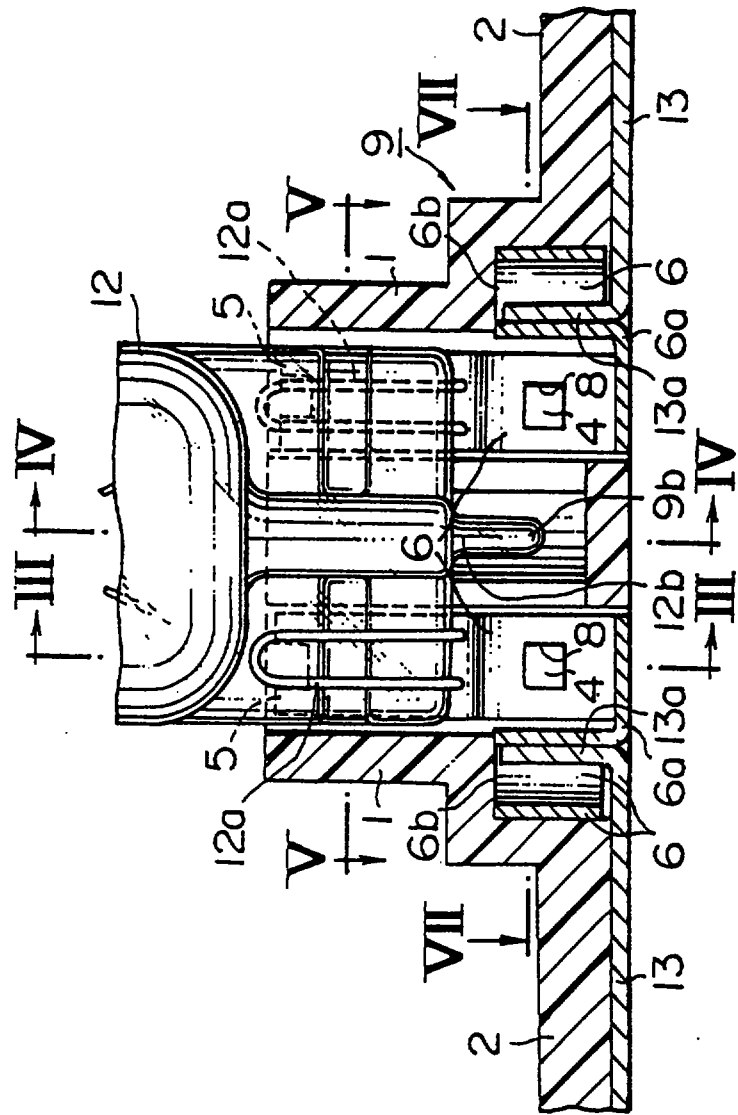


FIG. 2



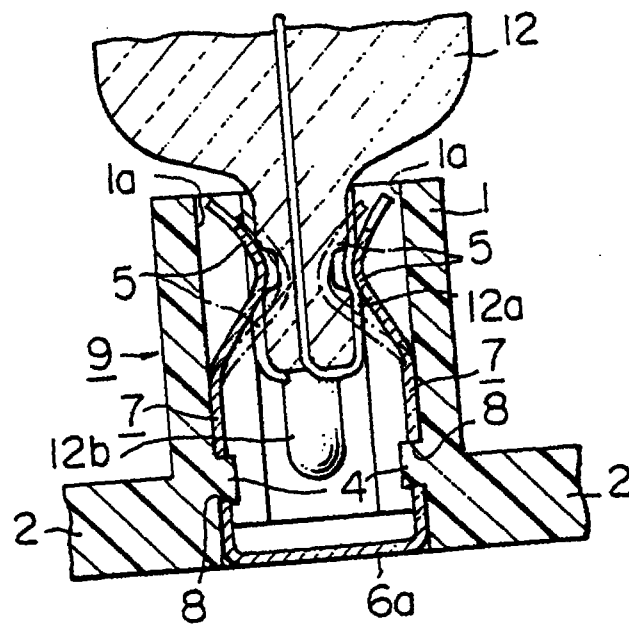


FIG. 4

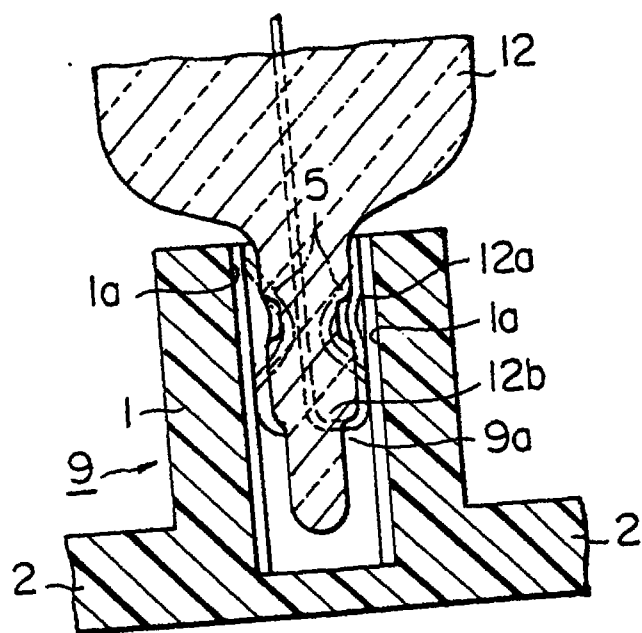
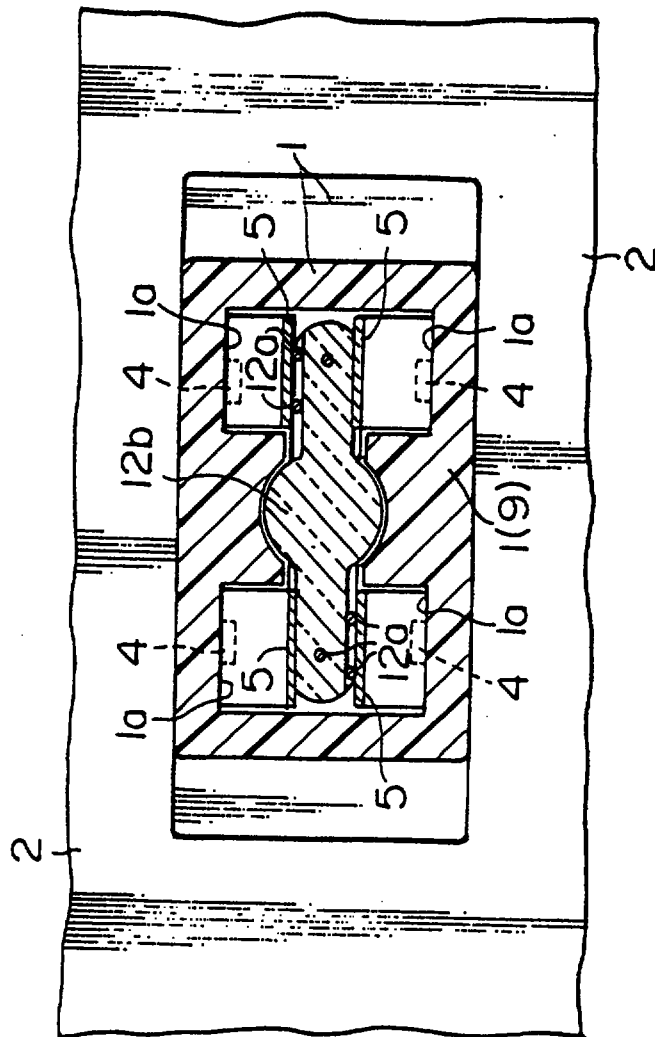


FIG. 5



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FIG. 6

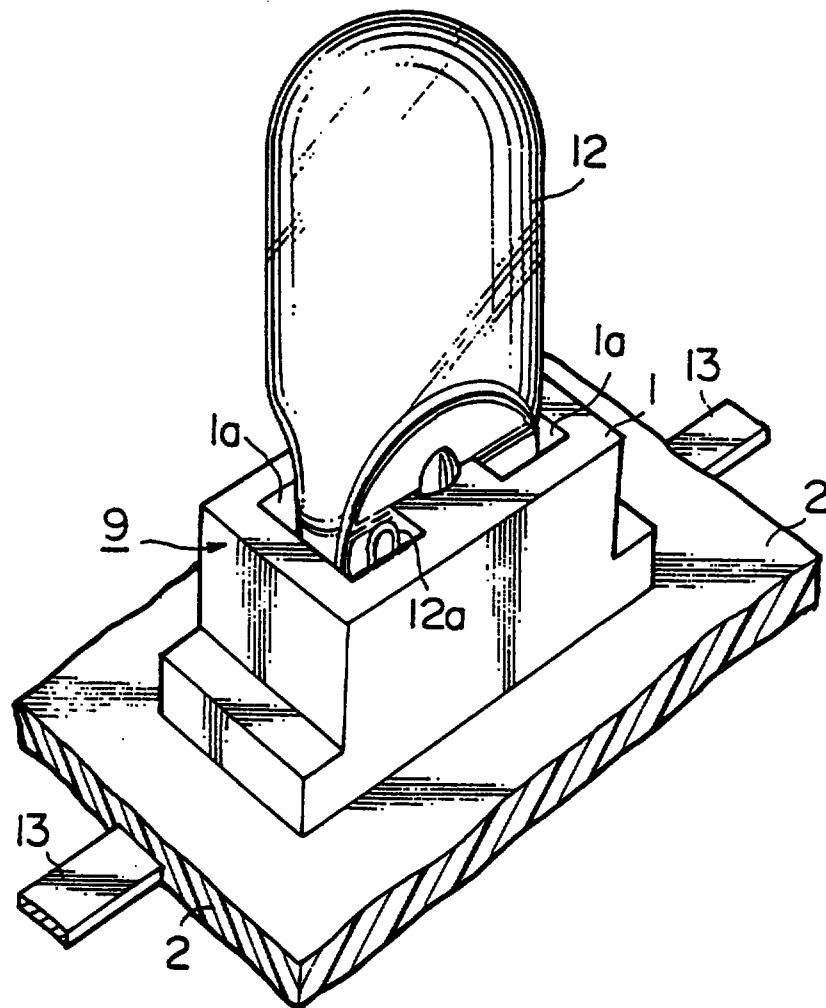


FIG. 7

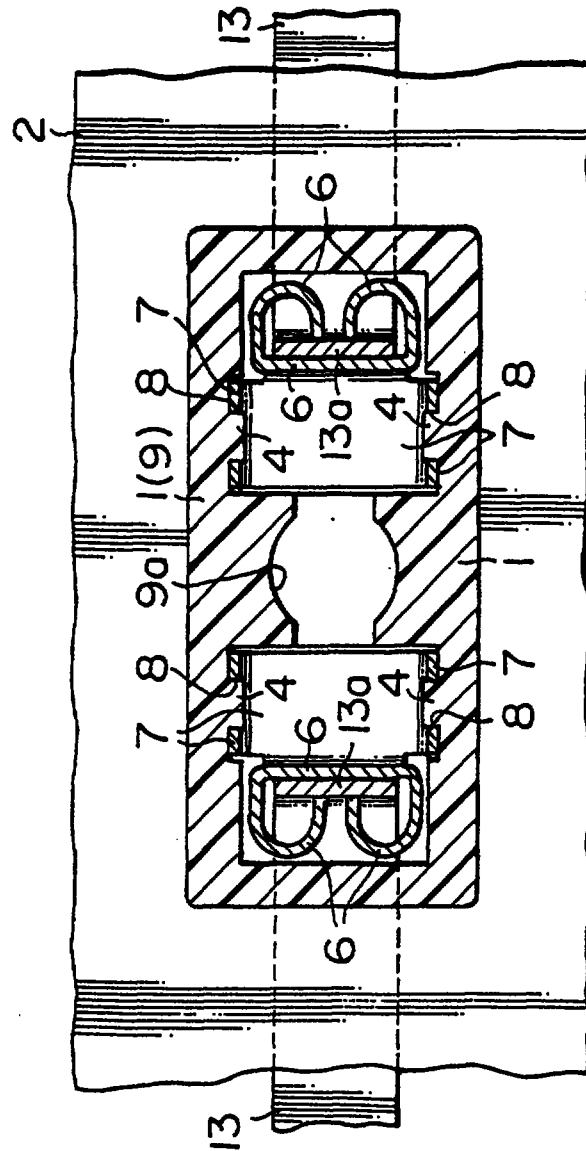
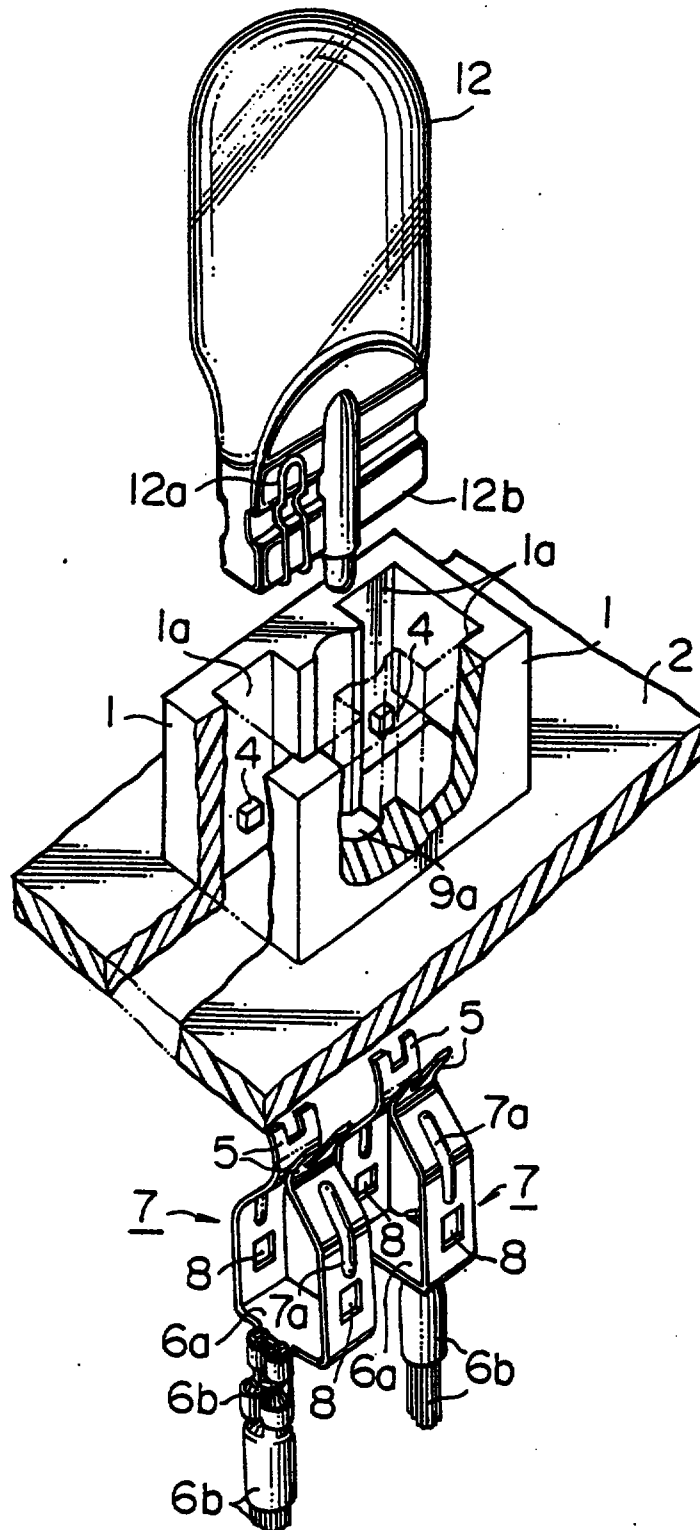


FIG. 8



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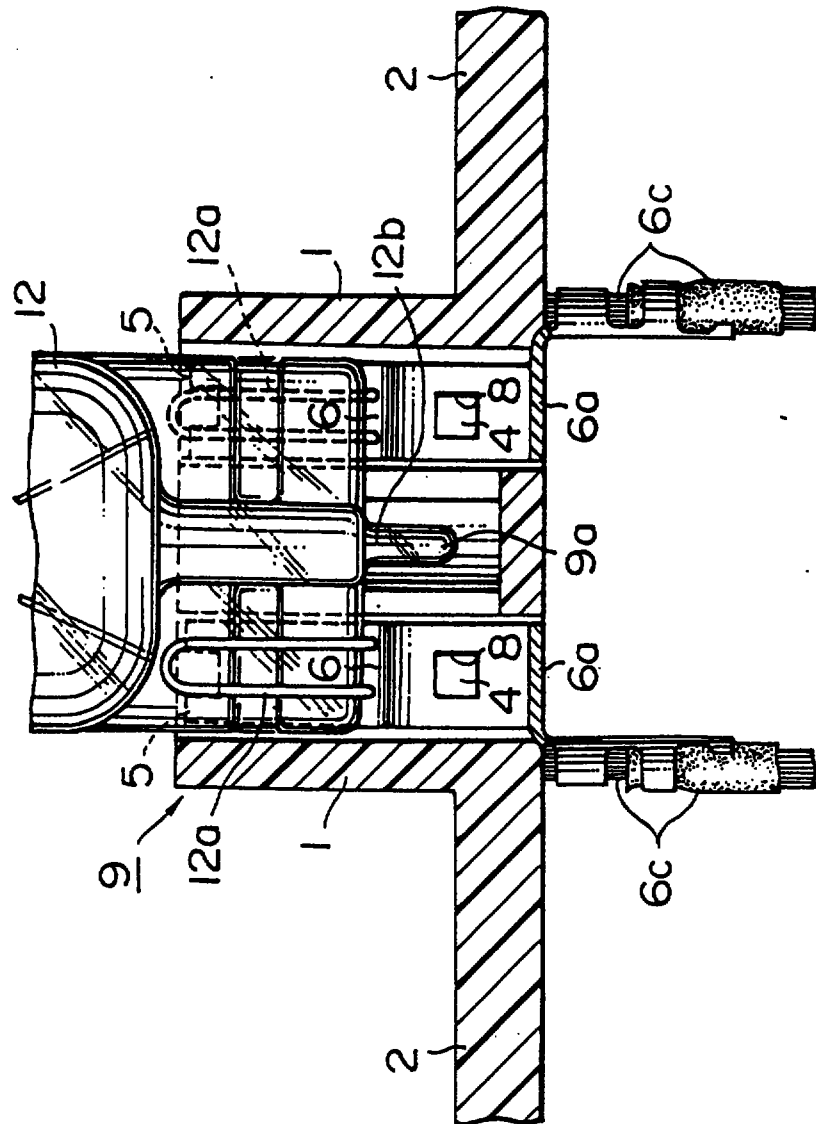


FIG. 10

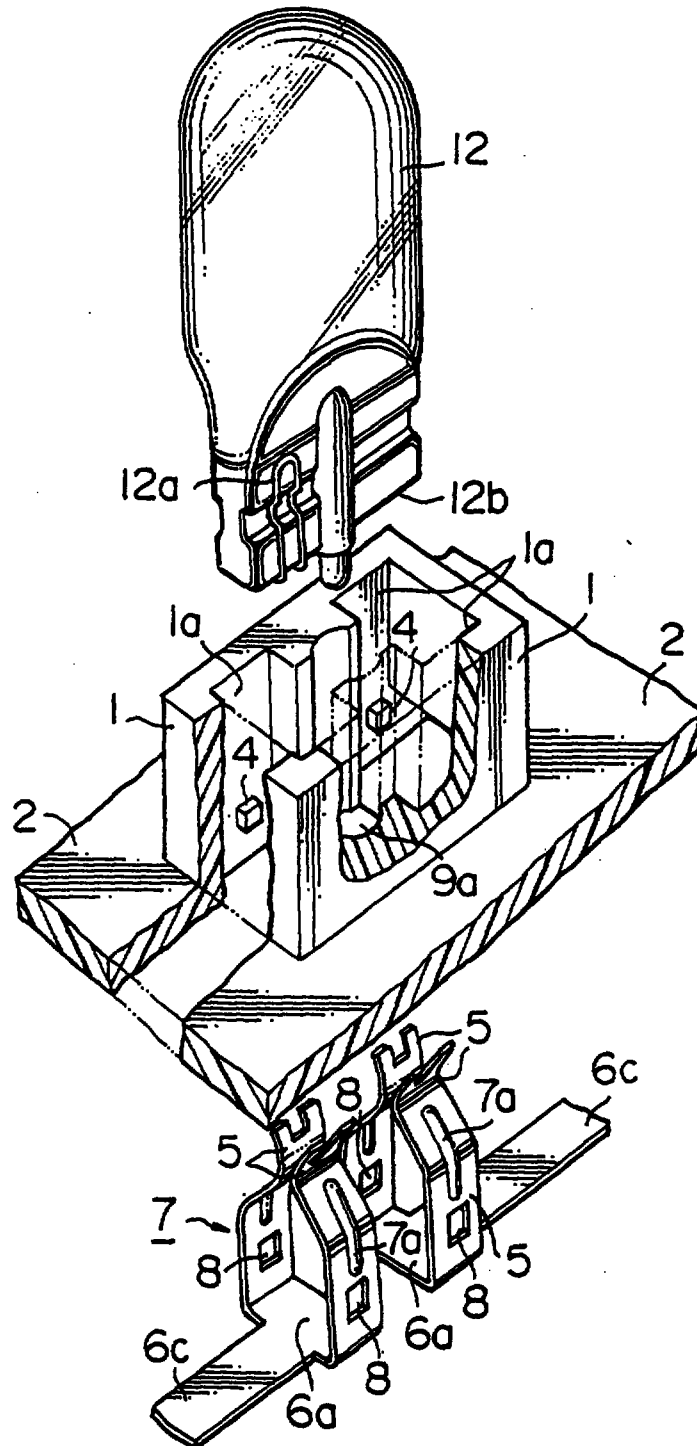


FIG. 11

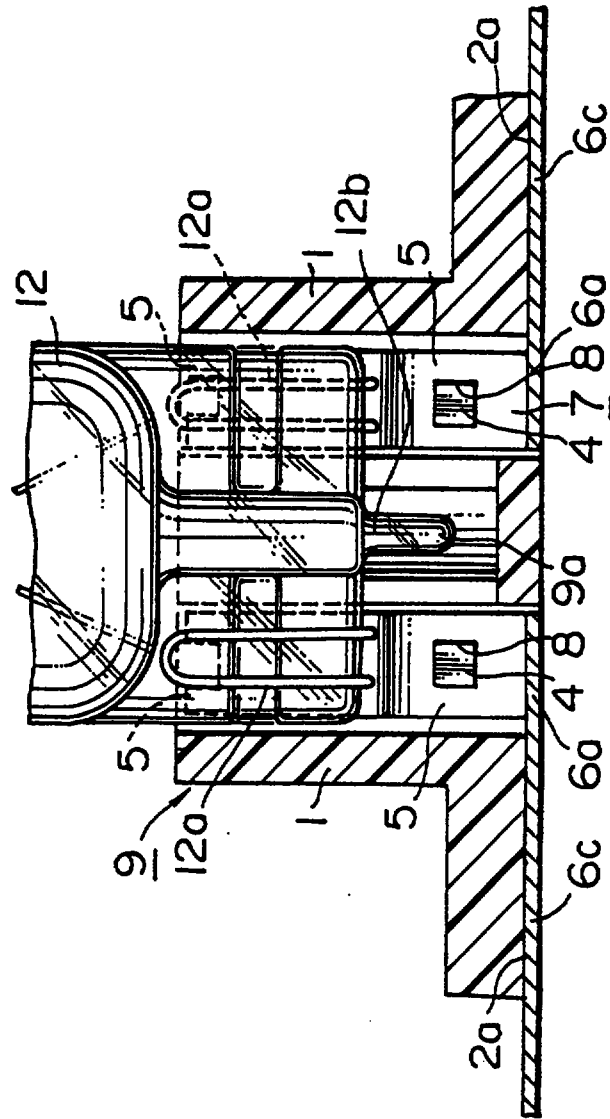


FIG. 12

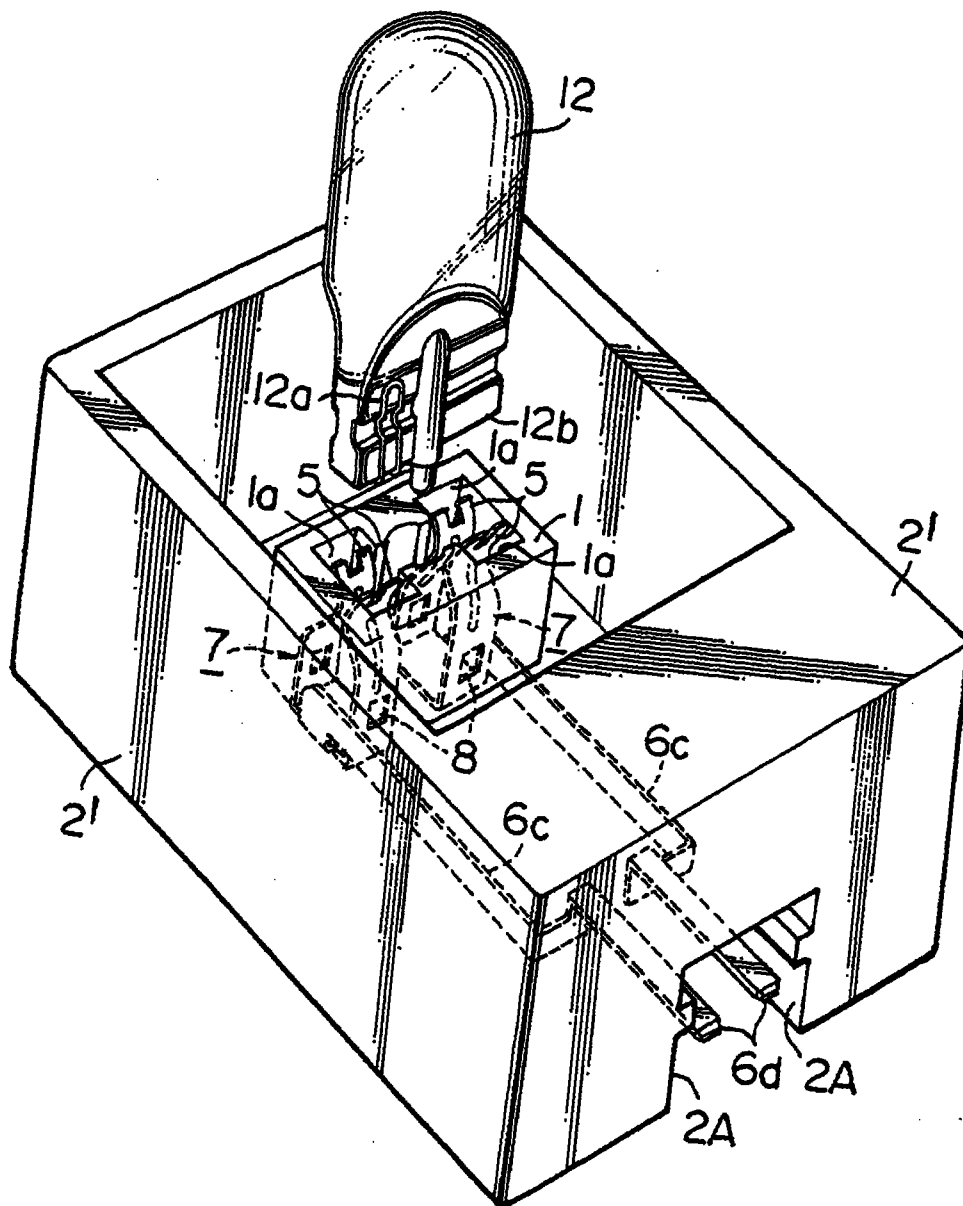


FIG. 13

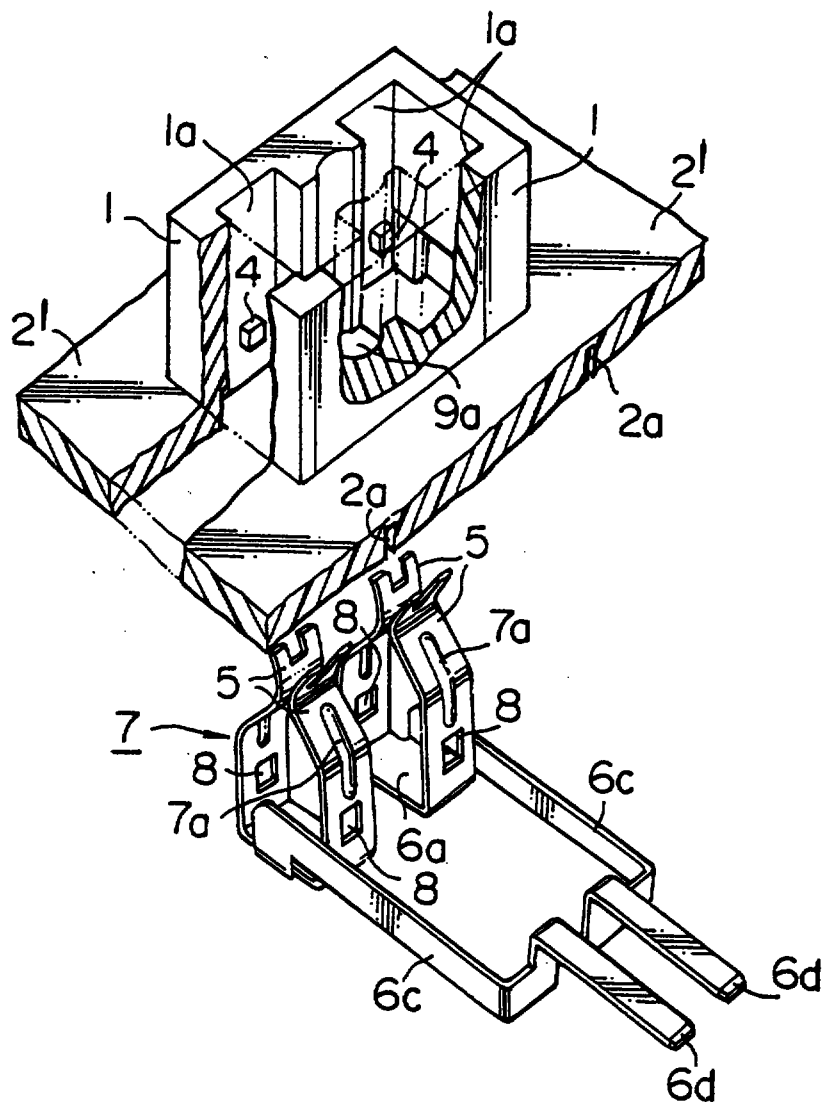


FIG. 14

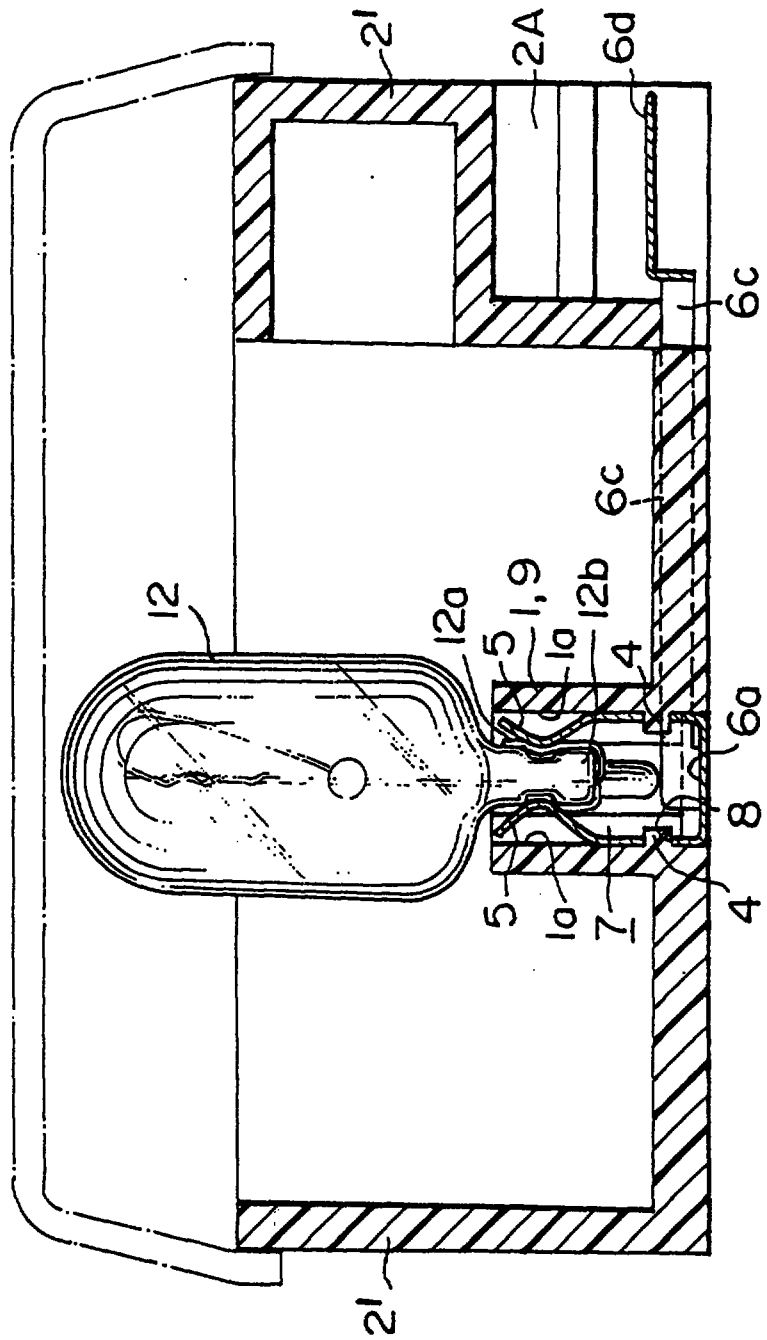


FIG. 15

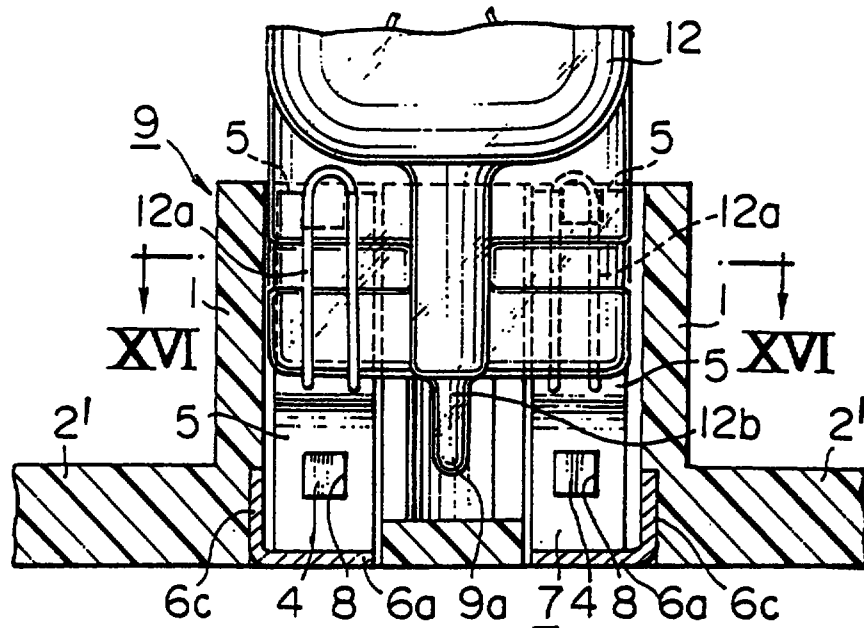


FIG. 16

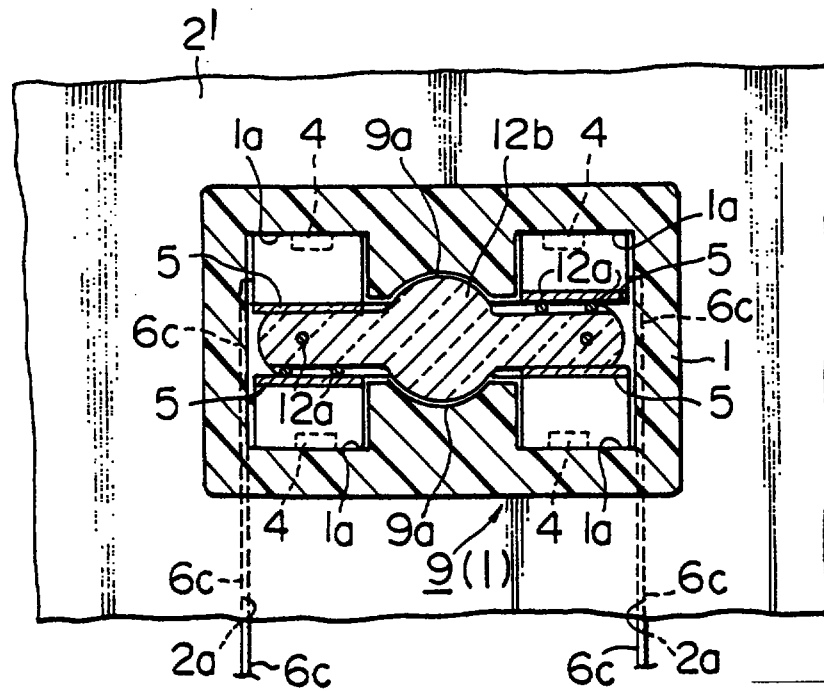


FIG. 17

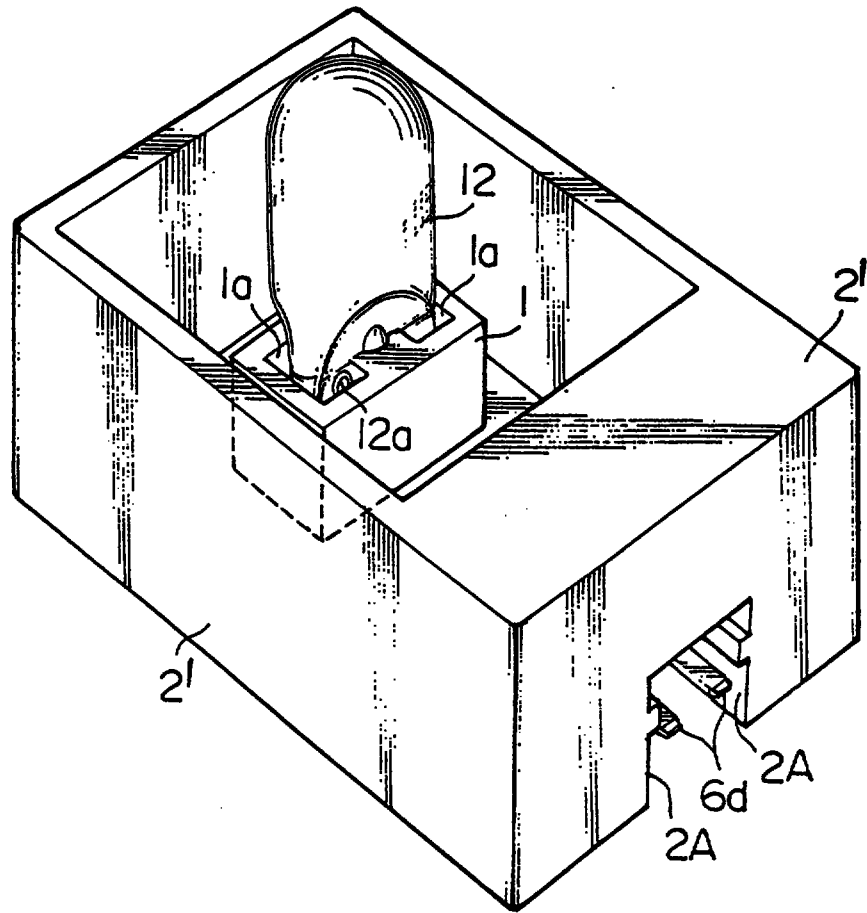


FIG. 18

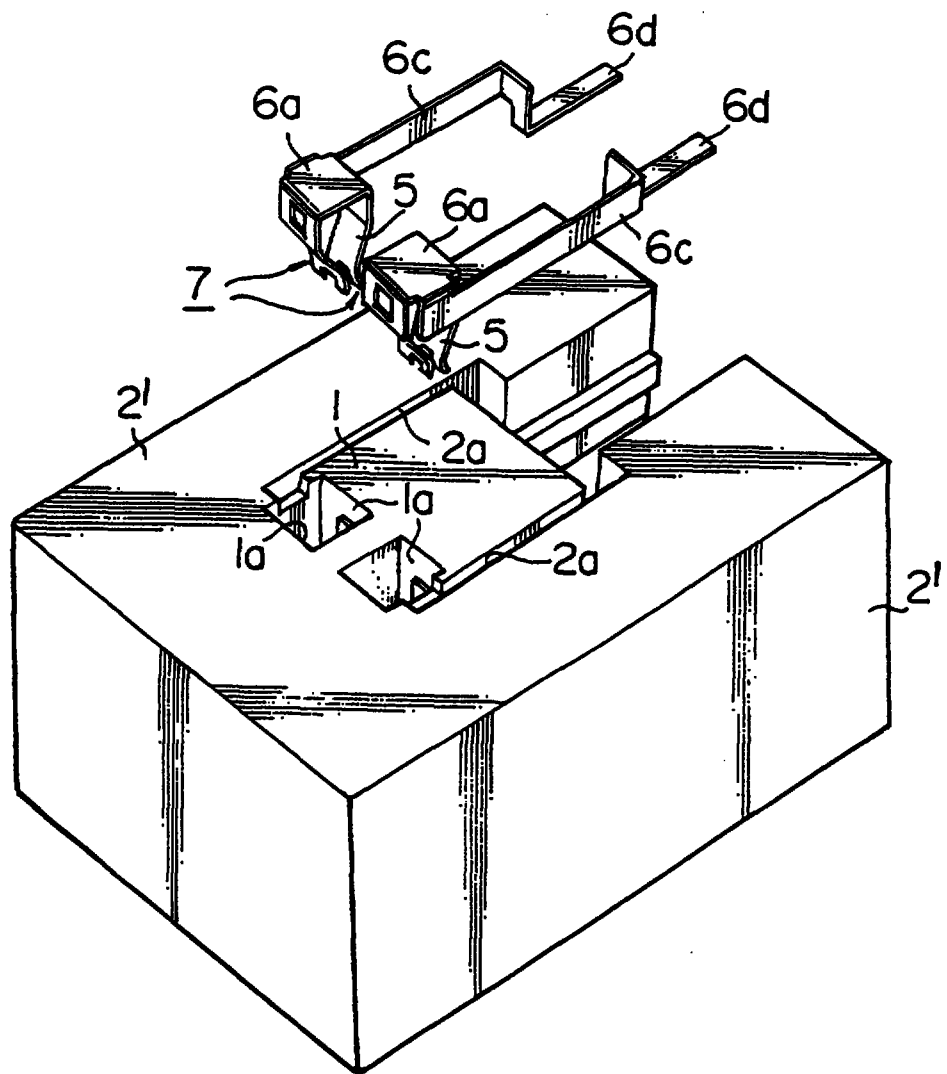


FIG. 19

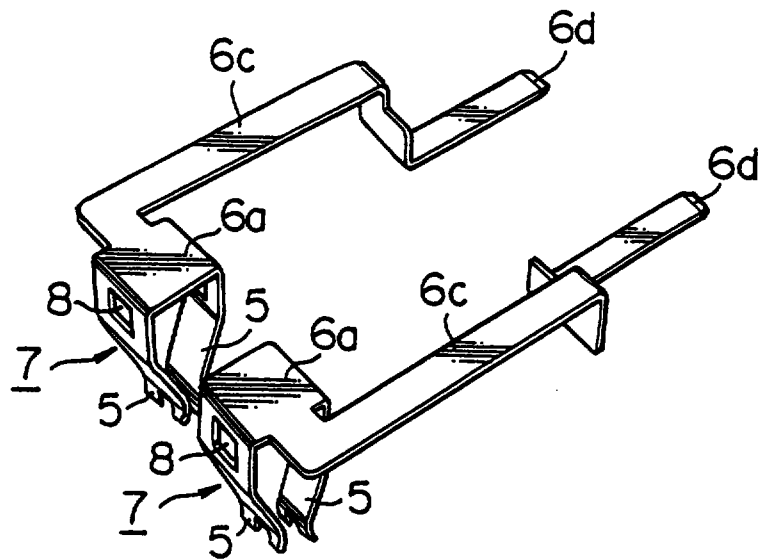
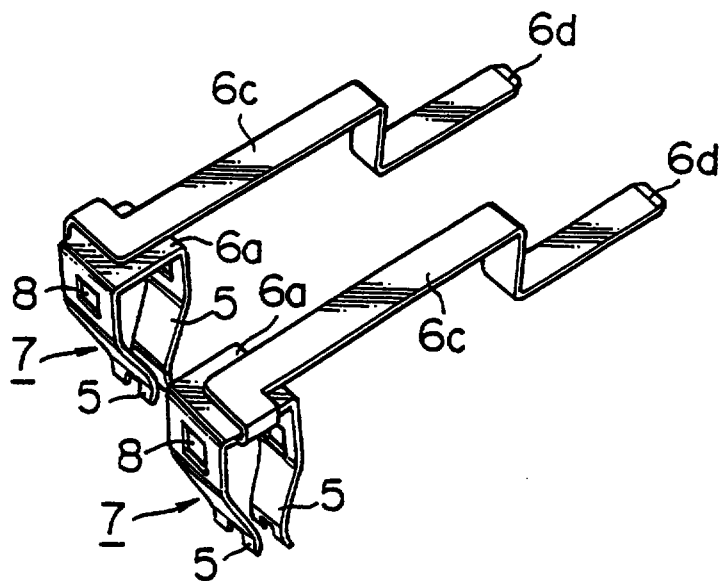


FIG. 20



ABSTRACT

A CONNECTOR ATTACHMENT COMPONENT

A connector attachment component for holding a bulb (12) or fuse and enabling attachment thereof to other circuits comprises a holder (9) including an insulated base (2), a box-shaped insulating frame (1) integral with and upstanding from said base (2), a pair of projections (4) protruding inwardly from opposed inner surfaces (1a) of said frame (1), and a pair of electrical connectors (7) each consisting of a substantially U-shaped conductive strip defining a clamp (5) at its upper end and having opposed attachment holes (8) in its lower regions, the connectors (7) being located in parallel within the frame (1) by co-operation between the projections (4) and the attachment holes (8), each connector (7) being provided with connection means (6) integrally formed therewith to permit an electrical connection thereto.

FIG. 1. is to accompany the abstract when published.

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FIG. 5

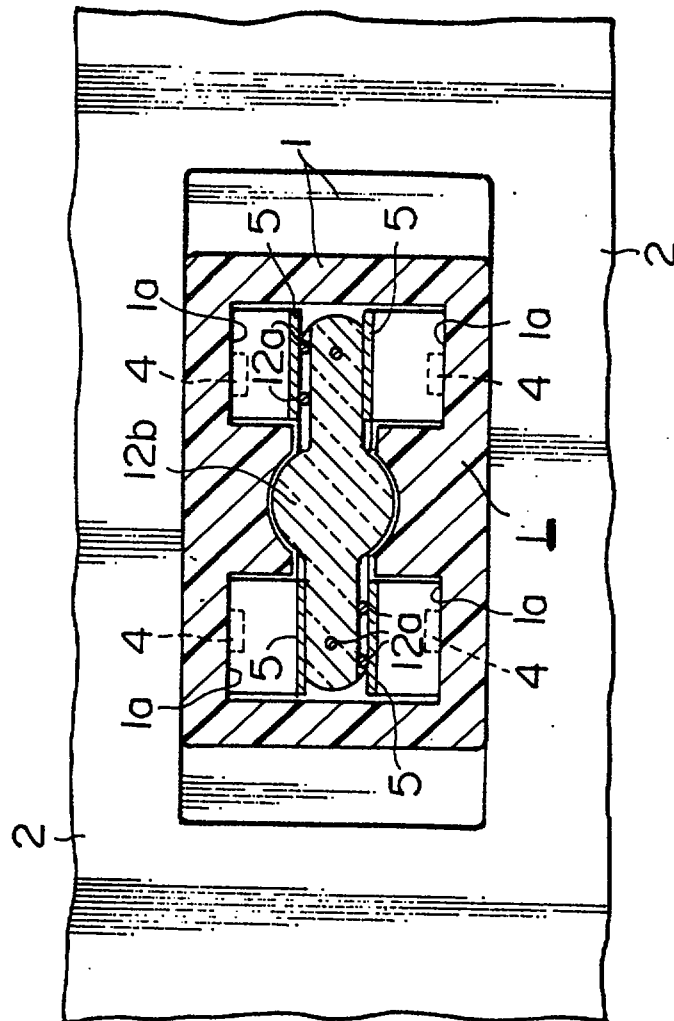


FIG. 7

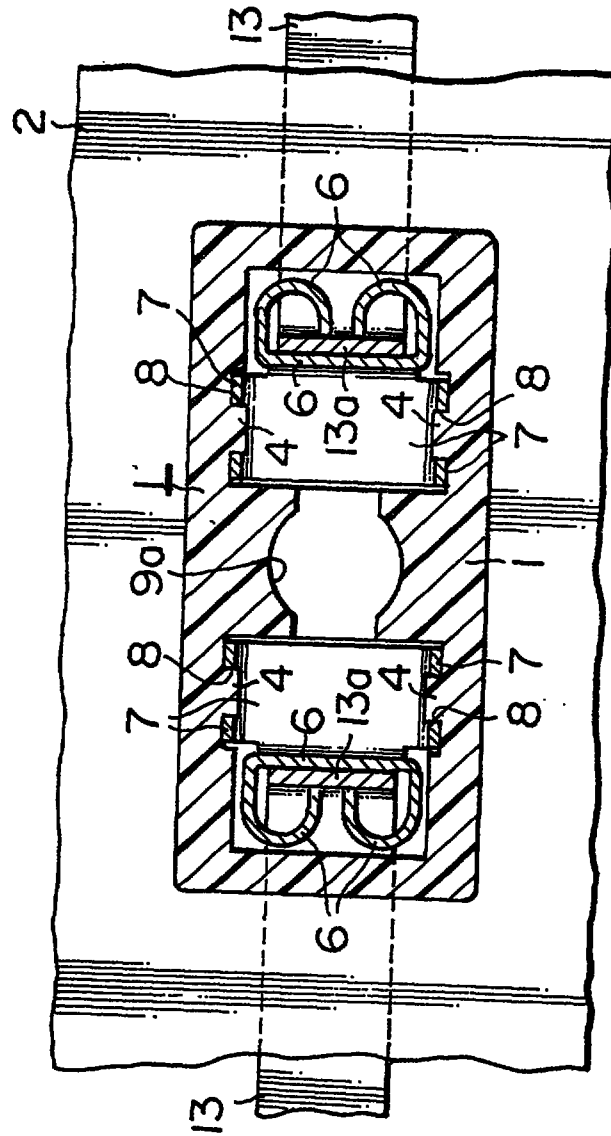


FIG. 15

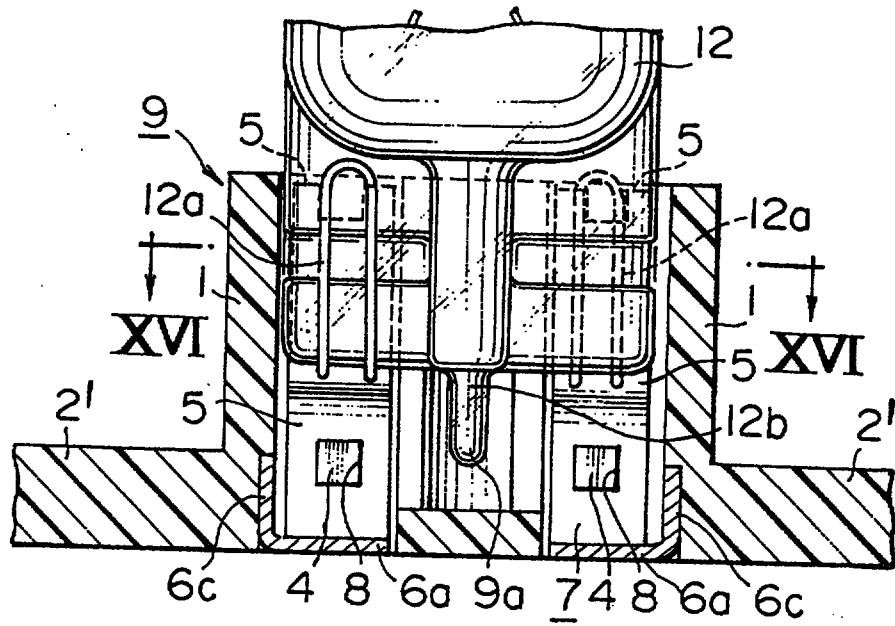
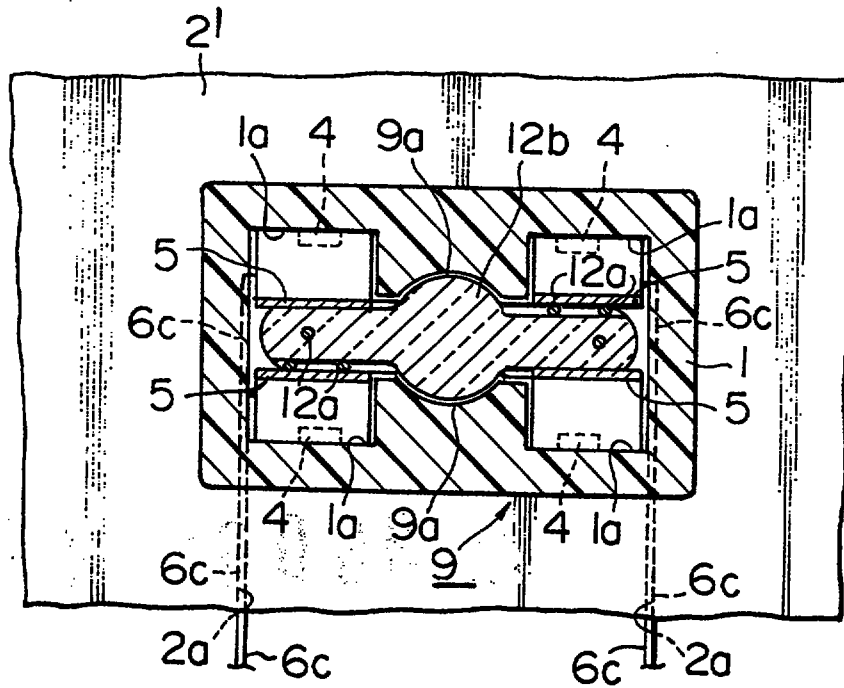


FIG. 16

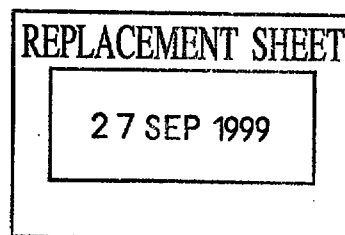


CONNECTOR ATTACHMENT COMPONENT

A connector attachment component for holding a bulb (12) or fuse, and enabling attachment thereof to other circuits comprises a holder including an insulated base (2), a box-shaped insulating frame (1) integral with and upstanding from said base (2), the pairs of projections (4) protruding inwardly from opposed inner surfaces (1a) of frame (1), and a pair of electrical connectors (7) each consisting of a U-shaped conductive strip defining a clamp (5) at its upper end and having opposed attachment holes (8) in its lower regions.

The connectors (7) are located in parallel within the frame (1) by cooperation between the projections (4) and the attachment holes (8), each connector (7) being provided with connection means (6) integrally formed therewith to permit an electrical connection thereto. The frame (1) may be surrounded by an outer box frame integral with the base.

Fig. 1



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CLAIMS:

1. A connector component comprising an electrically insulating holder (9) for an electric bulb (12) or fuse, the holder (9) including a base (2) integrally formed with which is an upstanding frame (1) of generally inverted T-shape defining therein a central space bounded by the walls of the frame (1), the central space including a pair of laterally-spaced socket spaces, each socket space having a pair of projections (4) protruding inwardly of the frame one from each of two opposed inner surfaces (1a) thereof, the frame (1) further defining therein an opposed pair of lateral pockets (6b) one to each end of said central space which open into a lower portion of said central space, and a pair of electrical connectors (7) located one in each of said socket spaces, each connector (7) consisting of a resilient conductive strip of substantially U-shape the upper free ends of which define a clamp (5) and in the lower region of each connector (7) are formed a pair of opposed attachment holes (8), the connectors (7) being located in the associated socket spaces by co-operation between said projections (4) and said attachment holes (8) and whereby the clamps (5) thereof, in use, receive therein, to make electrical contact with, said bulb (12) or fuse, each connector (7) being provided with electrical

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connection means (6) located in the associated lateral pocket (6b) and to which, in use, an electrical connection can be made.

2. A component as claimed in claim 1 in which each connector (7) has a protruding rib (7a) formed thereon.

3. A component as claimed in claim 1 or claim 2 in which each connection means (6) comprises a connection piece extending upwardly from the base (6a) of the conductive strip to one side of the associated connector (7) and into which can be inserted an electrical conductor (13).

4. A component as claimed in any one of claims 1 to 3 wherein said connectors (7,7) have lead wires (6,6) connected and fixed through the base (6a) of the conductive strips.

5. A component as claimed in any one of claims 1 to 3 wherein said connectors (7,7) have a narrow conductive metal strip (6c) provided continuously through the base (6a) of the conductive strips.



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their bent portions 13a as shown in Figs. 2 and 7 resulting in electrical continuity.

Furthermore, although a known flat fuse may be inserted instead of the above-mentioned wedge base bulb 12, bulb holder 9 should be instead read as a fuse holder at that time.

In addition, wedge base bulb 12 can also be lit by forming lead wires 6b, 6c, ~~wire 6,~~ to which the above-mentioned BUS bar portions are connected and secured, and composing as shown in Figs. 8 and 9 resulting in electrical continuity.

In addition, the above-mentioned BUS bar portions can also be extended to be composed in the manner shown in Figs. 10 and 11.

As a result of being composed as explained above, the present invention offers the advantages described below.

Together with integrally providing relatively small insulated frame 1 upright on plastic base 2 having a relatively large area, since the connecting portions of a wedge base bulb or small flat fuse can be connected and used by being tightly held in a pair of connection pieces 6 mounted in parallel by engaging male and female portions within this insulated frame 1, the lamp or fuse is surrounded by an open area, and the heat generated by the lamp and so forth can be effectively released by convection and radiation, temperature increases of base 2 and frame 1 are minimal, and there is no thermal deformation even when

CLAIMS:

1. A connector component comprising an electrically insulating holder (9) for an electric bulb (12) or fuse, the holder (9) including a base (2) integrally formed with which is an upstanding frame (1) of generally inverted T-shape defining therein a central space bounded by the walls of the frame (1), the central space including a pair of laterally-spaced socket spaces, each socket space having a pair of projections (4) protruding inwardly of the frame one from each of two opposed inner surfaces (1a) thereof, the frame (1) further defining therein an opposed pair of lateral pockets (6b) one to each end of said central space which open into a lower portion of said central space, and a pair of electrical connectors (7) located one in each of said socket spaces, each connector (7) consisting of a resilient conductive strip of substantially U-shape the upper free ends of which define a clamp (5) and in the lower region of each connector (7) are formed a pair of opposed attachment holes (8), the connectors (7) being located in the associated socket spaces by co-operation between said projections (4) and said attachment holes (8) and whereby the clamps (5) thereof, in use, receive therein, to make electrical contact with, said bulb (12) ^{or} ~~of~~ fuse, each connector (7) being provided with electrical



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