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W. P. HERMAN

2,318,485

FEMALE CONNECTOR

Filed March 8, 1941

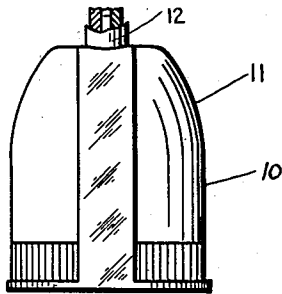


FIG. 1

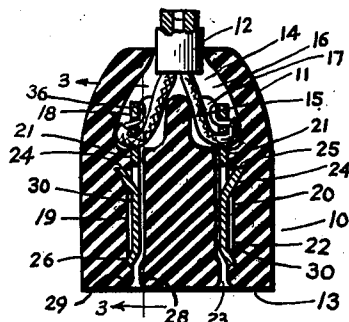


FIG. 2

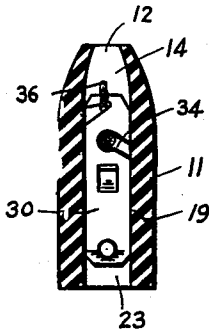


FIG. 3

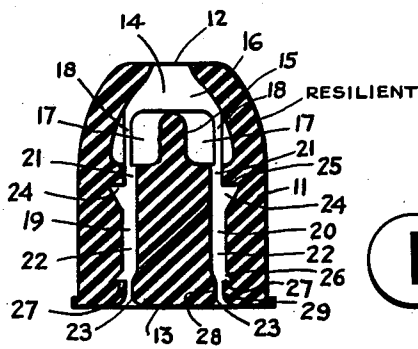


FIG. 4

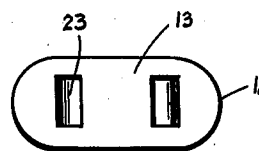


FIG. 5

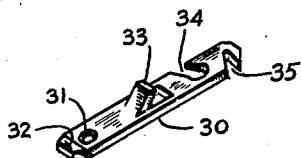


FIG. 6

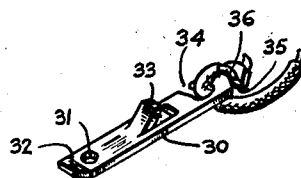


FIG. 7

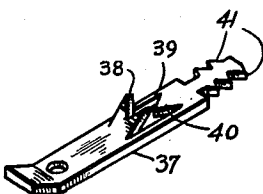


FIG. 8

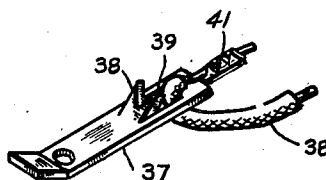


FIG. 9

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2,318,485

FEMALE CONNECTOR

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5 Claims. (Cl. 173-332)

My present invention relates to the manufacture of a one-piece connector element, and has particular reference to a novel construction of female type connector and a novel method of assembly of the same.

The principal object of the present invention is to provide a flat-slotted female type connector in which the connector body is made of an integral, one-piece body of resilient material such as soft rubber.

It is an additional object of my invention to provide a female type connector in which the various parts of the connector are anchored together without the use of screws, bolts, or other outside anchoring means.

Another object of my invention is to provide a female connector in which the body is adapted to eliminate the danger of short-circuiting or arcing.

A further object of my invention is to provide a female connector which will withstand abuse without danger of short-circuiting or breaking of the connection, and which will not break, shatter, or come apart.

Another object of my invention is to provide a construction which will take up the strain on the body and cord lead connection in accordance with the requirements of the underwriter's laboratory.

Another object of my invention is to provide a female connector which can be used with the standard type flat male terminals or with round pin terminals.

With the above and other objects and advantageous features in view, my invention consists of a novel arrangement of parts and a novel method of manufacture and assembly, more fully disclosed in the detailed description following, in conjunction with the accompanying drawing, and more specifically defined in the claims appended hereto.

In the drawing:

Fig. 1 is a front elevation of a female connector embodying my invention;

Fig. 2 is a vertical section of the same;

Fig. 3 is a section taken on line 3-3 on Fig. 2;

Fig. 4 is a view similar to Fig. 2, the cord and blade assembly being removed;

Fig. 5 is a bottom plan view of the female connector;

Fig. 6 is a perspective view of one of the blades;

Fig. 7 is a similar view of the blade and cord assembly;

Fig. 8 is a perspective view of another form of blade; and

Fig. 9 is a similar view of the blade and cord assembly.

Certain types of electrical appliances are normally provided with spaced protruding blade terminals, and it is necessary to provide a cord lead wire with a female type connector adapted to receive the terminals on the appliance. Furthermore, extension cords are often required for lamps, radios, and other types of appliances positioned too far from a wall receptacle. Such cords are provided at one end with a conventional plug for the wall receptacle and at the other end with a female connector adapted to receive the contact plug attached to the appliance cord.

The female connector of the present invention is easy and economical to manufacture and assemble, it can be readily molded from resilient soft rubber so that it will not chip or break and will be pliable when used, and it can be made in one integral piece requiring no screws or clamping to hold together. The cord lead wire and contact blades are externally assembled and firmly held in place by predetermined, molded landings in the connector body.

Referring to the drawings illustrating my invention, the female connector 10 comprises a body portion 11 which is preferably of resilient soft rubber in a one-piece, integral construction. The upper end of the body 11 tapers towards a central cable opening 12 and the lower end terminates in a flat bottom 13 in which the slot entrances are located.

The central cable opening 12 opens into an upper cable receiving chamber 14 of generally conical shape, the lower portion of the chamber being wider than the spacing of the slots. Extending upwardly into the center of the chamber 14 is an integral baffle 15 which divides the lower portion of the chamber 14 and serves to dielectrically separate the ends of the blades and the bared ends of the cord lead connections, and thus prevent short-circuiting. The lower portion of the chamber 14 is also reduced in thickness, as at 16, on both sides of the baffle 15, as by integral stepped portions 17 extending into the chamber 14. The portions 17 are provided with vertical grooves 18 in alignment with the vertical slots 19 and 20 and forming continuations thereof.

Slots 19 and 20 are vertically disposed and extend in spaced parallel relation from the chamber 14 downwardly through the connector, terminating in the bottom 13. Each slot 19 and 20 comprises an upper restricted slot portion 21 communicating with the chamber 14, an intermediate wider slot portion 22, and a restricted

lower slot portion 23 communicating with the bottom 13. The upper ends of the intermediate slot portions 22 are provided with recesses 24 in the outer walls of the slots, see Figs. 2 and 3, each recess forming a transverse shoulder or landing 25. The lower ends of the intermediate slot portions 22 are provided with similar wall recesses 26, slightly shallower than the recesses 24, and providing shoulders or landings 27 in opposed relation to the landings 25. The lower restricted slot portions 23 are formed by slightly extending the slot walls toward each other, as at 28 and 29, for a purpose hereinafter to be described.

Referring to Figs. 2, 4, 6 and 7, each slot 19 and 20 is provided with a contact blade 30, which is preferably of a type which can be anchored permanently within the connector body by the interlocking of the slots and blades. In the form of blade illustrated in Figs. 6 and 7, each blade 30 is stamped from sheet stock in a generally rectangular shape. The lower end of the blade is provided with an opening 31 for assembly purposes and is bent inwardly, as at 32. The intermediate portion of the blade is provided with an integral, struck-up lug or tang 33 extending laterally from the body of the blade on the same side as the bent end 32.

While the blade 30 is herein described and illustrated as being anchored in the plug body by the use of lugs or tangs extending laterally from its face, interlocking type of anchoring means shown in my Patent No. 2,191,384, issued February 20, 1940, may be utilized instead.

The upper end of the blade is designed to be effectively secured to an electrical conductor to provide a connection that will withstand strain and pulling without breaking. The upper end of the blade, therefore, comprises an intermediate slot 34 opening from one side of the blade and extending at a slight upward angle to approximately the center portion, and an upper slot 35 extending in a similar manner from the opposite side of the blade.

In attaching the blade to a cord lead connection, the end of the wire is bared for a short distance, as at 36, and the end 36 is positioned in the upper slot 35 and firmly soldered therein. The cord is then reentrantly bent through the intermediate slot 34, as shown in Fig. 7. After the assembly of the blades and cord ends, one of the blades must be turned so that the tangs 33 will face in opposite directions. While any method of assembly may be used, I prefer to use the machine and method disclosed in my Patent No. 2,198,966, issued April 30, 1940. The central cable opening 12 is distended, and the blades 30 with the cord lead connections are pulled into the connector body 11, so that the lower bent ends 32 enter the recesses 26 and abut the landings 27, and the lugs or tangs 33 will enter the recesses 24 and abut the landings 25. The upper ends of the blades with their cord lead connections will extend into the lower portion of the chamber 14 and are separated by the dielectric baffle 15. The upper blade ends enter into the grooves 18 and the cord is tightly retained by the portions 17, so that twisting of the cord and blade in the chamber 14 is eliminated. Furthermore, the cooperation between the blade ends 32 and lugs or tangs 33 with the recesses 24 and 26 prevent the blades from pulling out of the connector body, and the reentrantly bent portions of the cord bearing on the bottom of the

chamber 14 prevent their being pulled through from the opposite end.

While the natural elasticity of the connector body may be used to retain the wires and blades in place, it is preferred that the parts be so formed that they will fit snugly without distorting the connector body, the blades being anchored by the tangs and cooperating landings.

The restricted slot portions 28 and 29 are designed to frictionally engage and exert a wiping action on the inserted terminals which prevent arcing.

In the modification shown in Figs. 8 and 9, the blade 37 is adapted to be attached to the cord 38 without soldering. This is especially advantageous where tinsel cord is used because it is almost impossible to solder tinsel cord. The blade 37 is similar to the blade 30 except that the intermediate portion of the blade 37 is stamped out to provide a struck-up lug or tang 38 having a V-shaped cut-out and leaving an opening 39 with an integral depending tooth 40; the upper end of the blade being provided with two rows of lugs 41. The cord is passed through the opening 39 and impaled on the tooth 40, the bare end of the cord being gripped in the upper end by bending over the lugs 41. This provides an effective electrical connection which can withstand heavy strain without breaking. The blade can then be assembled with the connector body in the identical manner as the blade 30.

The above-described female connector is therefore easy and economical to manufacture and assemble; it is made up of a minimum number of parts; it is pliable and will not separate or break; and it does not require screws or clamps for locking the cord and blade assembly within the connector body.

While I have described a specific constructional embodiment of my invention and a specific method of assembly, thereof, it is obvious that these are merely illustrative, and that changes in the size and shape of the parts, in their relative arrangement, and in the method of assembly may be made to suit requirements for different female connectors, without departing from the spirit and the scope of the invention as defined in the appended claims.

I claim:

1. A female connector comprising a one-piece integral body of resilient material having an upper cable recess and two flat slots extending downwardly therefrom through the connector, said slots having restricted portions at each end thereof, and flat contact blades mounted within said slots, the upper end of each blade having spaced transverse slots extending inwardly from opposite edges of said blade to provide a strain relief connection with a cord lead wire, said blades having integral interlocking portions cooperating with the walls of said slots for anchoring said blades within said slots.

2. A female connector comprising a one-piece integral body of resilient material having an upper cable recess and two flat slots extending downwardly therefrom through the connector, said slots having restricted portions at each end thereof, one wall of each slot having upper and lower recesses with shoulders, and flat contact blades mounted within said slots, the lower ends of said blades being turned inwardly and cooperating with the lower recesses of said slots and said blades having integral lugs cooperating

with the upper recesses of said slots for anchoring said blades within said slots.

3. A female connector comprising a one-piece integral body of resilient material having an upper cable recess and two flat slots extending downwardly therefrom through the connector, said slots having restricted portions at each end thereof, said cable recess having a lower portion of narrow width for frictionally retaining the cord lead connection and grooves extending through the portion of narrow width in alignment with said slots, and flat contact blades mounted within said slots, said blades having integral interlocking portions cooperating with the walls of said slots for anchoring said blades within said slots, the upper ends of said blades extending into the grooves in said cable recess.

4. A female connector comprising a one-piece integral body of resilient material having an upper cable recess and two flat slots extending downwardly therefrom through the connector, said slots having restricted portions at each end thereof, one wall of each slot having upper and lower recesses with shoulders, said cable recess having a lower portion of narrow width and grooves in alignment with said slots, and flat contact blades mounted within said slots, the

lower ends of said blades being turned inwardly and cooperating with the lower recesses of said slots and said blades having integral lugs cooperating with the upper recesses of said slots for anchoring said blades within said slots, the upper ends of said blades extending into the grooves in said cable recess.

5. A female connector comprising a one-piece integral body of resilient material having an upper cable recess and two flat slots extending downwardly therefrom through the connector, said slots having restricted portions at each end thereof, said cable recess having a lower portion of narrow width for frictionally retaining the cord lead connection and grooves extending through the portion of narrow width in alignment with said slots, the upper end of each blade having spaced transverse slots extending inwardly from opposite edges of said blade to provide a strain relief connection with a cord lead wire, and flat contact blades mounted within said slots, said blades having integral interlocking portions cooperating with the walls of said slots for anchoring said blades within said slots, the upper ends of said blades extending into the grooves in said cable recess.

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