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ELECTRICAL RECEPTACLE FOR MOUNTING IN A PANEL

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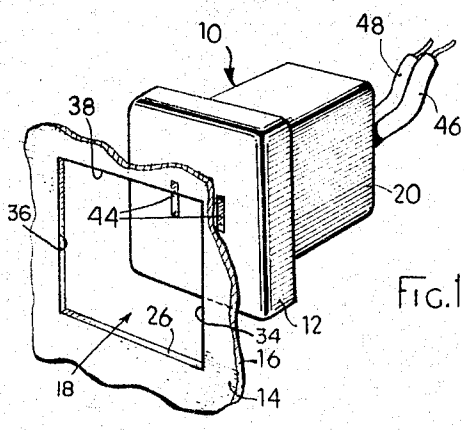


FIG. 1

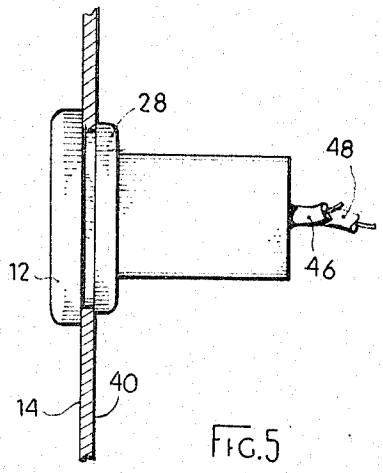


FIG. 5

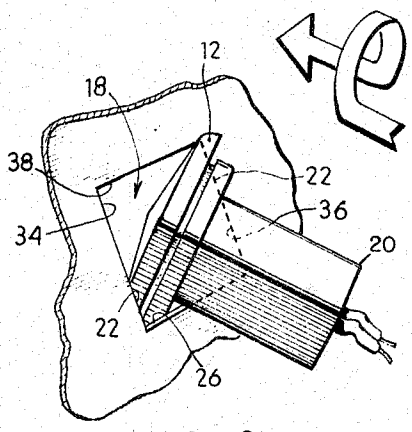


FIG. 2

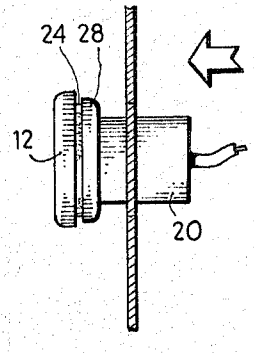


FIG. 3

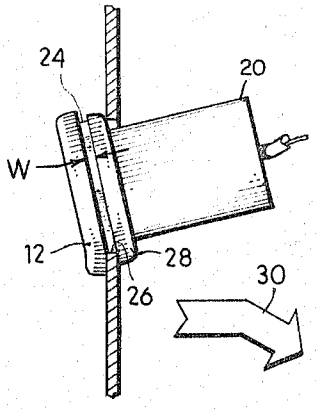


FIG. 4

INVENTORS.
CHESTER E. DEKKO
PHILLIP K. CARTER
BY Albert L. Jeffers
ATTORNEY

United States Patent Office

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ELECTRICAL RECEPTACLE FOR MOUNTING IN A PANEL

Chester E. Dekko and Phillip K. Carter, Albion, Ind., assignors to Lyall Electric, Inc., Albion, Ind., a corporation of Indiana

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This invention relates to various articles that employ a mounting receptacle which is constructed of resilient material and is adapted for mechanical mounting in the the walls of such structures as refrigerators or the like.

The electrical wiring for appliances such as refrigerators and the like are constructed in the form of a harness which is provided with electrical receptacles that must be mounted from the inside of the cabinet during the assembly operation.

The primary object of this invention is to provide a receptacle for use with an electrical harness the receptacle being easily inserted into a cabinet during assembly from an inside position so that the receptacle will have good retention with respect to the cabinet when an object is inserted into the receptacle from the outside position.

The invention includes, but is not limited to, such devices as refrigerator light sockets, male plugs, female receptacles and the like, and is particularly useful in mechanically mounting such devices.

Numerous mechanical mountings for resilient receptacles have been proposed in the past arts. Since rubber, or resilient plastic or the like are by themselves practically incompressible, the prior art has suggested voids making it possible to compress the article thereby to fit it into a mounting opening. The resulting mounting is unreliable because the product can easily distort and any such distortions of the product will dislodge the article. Another expedient which has been used in the mounting of articles of the class described is to proportion a connecting part of the article such that it can be squeezed through the mounting opening and thus snap fitted into place.

These foregoing approaches have proved unsatisfactory because of the general inadequacy of the resulting mounting to be readily installable, reliable in securement, and adapted to produce a hermetic seal about the edges, this being a particularly important consideration when the article is mounted in the walls of refrigeration equipment and it is desired to obtain an airtight seal around the edges of any article so mounted through openings in the walls of the refrigeration apparatus.

It is, therefore, one of the objects of the present invention to provide a new and improved structure for mounting a solid cross section receptacle having a rigid, reliable securement with a mounting structure.

It is a further object of the present invention to provide a process, and article adapted for use therewith, which lends itself to assembly of the article in a rapid and efficient manner leading to a secure and rigid mounting not readily susceptible to accidental dislodgement.

A further object of the invention is to provide a push-pull type of installation for a rubber receptacle as it is installed on a refrigerator panel wall or other mounting structure.

Other objects and features of the invention will become apparent from a consideration of the following description which proceeds with reference to the accompanying drawing, wherein:

FIGURE 1 is a perspective view of the mounting structure and the receptacle prior to assembly;

FIGURE 2 shows the initial step of assembling the parts, which is to pass a portion of the body thereof through the mounting opening;

FIGURE 3 is a side view showing the nose portion of the receptacle on the other side of the mounting opening;

FIGURE 4 shows how one edge of the slot in a receptacle is snapped in place and then is pulled and bent downwardly to snap the remaining edges in place; and,

FIGURE 5 is a section view of the receptacle after it is completely installed.

Referring now to FIGURE 1, the receptacle designated generally by reference numeral **10**, can be either a connector or socket, i.e., either adapted as a plug or as a lampholder, there being shown, for purposes of illustration, a connector or plug type receptacle. The receptacle is of solid rubber or rubber-like material which is resilient and is deformable for effecting the assembly. The receptacle includes a generally rectangular nose portion **12** which bears against the face **14** of a panel structure **16** and is of greater outline than a rectangular opening **18** in the panel structure **16**.

The receptacle includes an integral projecting portion, or body portion **20** which passes freely through the opening **18** and provides a gripping surface whereby the nose portion **12** and other portions of the receptacle structure at the end can be manipulated for assembly. As shown in FIGURE 2, the nose portion **12** and body **20** are partially passed through the opening **18** and the receptacle is then twisted to the position shown in FIGURE 2, with a portion of the nose **12** extending through the opening **18** and with the nose portion **12** being canted or twisted so that it only makes diagonal contact at points **22**. This limited area of contact permits the receptacle to be twisted from the position shown in FIGURE 2, to the position shown in FIGURE 3, wherein a rectangular slot portion **24** adjacent nose **12** may then be snap fitted against the edge **26** of the opening **18** as shown in FIGURE 4. The slot **24** is formed between rectangular or square shaped rear boss **28** and nose **12**. The width "W" of the slot corresponds generally to the cross sectional thickness of the mounting structure **16** so as to form a tight connection around the edges of the opening **18**, preventing movement of air through the opening once the receptacle **10** is positioned in place.

The body **20** must be in proper proportion with respect to the nose portion **12** so that on insertion into the opening **18** there is a minimum amount of interference of material in contact with the opening **18**.

The depth of the slot **24** is such that upon bending and "pulling" the receptacle downwardly in the direction of the arrows **30** (FIGURE 4) the boss **28** will be resiliently deformed to pass through the opening **18** and surround the opening edges **26**, **34**, **36** and **38**, to obtain the final assembled position shown in FIGURE 5.

The boss **28** and the nose portion **12** are proportioned so that their lengths and widths overlie the edges **26**, **34**, **36** and **38** and press against the opposite faces **14** and **40** of the mounting plate, insuring an air-tight seal around the outer periphery of the opening. This gripping connection provides good retention of the receptacle and supports the receptacle in its operative position shown in FIGURE 5. The receptacle has structure **44** for a plug-in connection and the conductors **46**, **48** are connected to a motor or the like.

The receptacle as a whole, is a solid cross section member, i.e., referring to FIGURE 5, there are no voids or internal discontinuities to permit a collapse of a part in assembly. Consequently, the grip is a tighter one and a more reliable one which resists dislodgement from accidental contacts with any portion of the receptacle.

In order to disassemble the receptacle, the body **20** is forced upwardly or downwardly and pushed to the left (FIGURE 4) and the receptacle as a whole is then twisted and pushed forward to the position shown in

FIGURE 3 to disengage the last remaining slot and edge of opening **18**. The member is then withdrawn, as shown in FIGURE 2, and then totally removed as shown in FIGURE 1.

The method of assembly described, is known as a "push-pull" method of assembly, because in the process of assembling the part, and tracing the steps of assembly from FIGURES 1–4, the body of the receptacle is first pushed through the mounting opening **18** by placing the nose portion twisted to the position shown in FIGURE 2, and then pushed through as shown in FIGURE 3, and the one edge pulled into snap fitting connection with edge **26** (FIGURE 4) and the body then pulled and turned downwardly in the direction of the arrow **30** (FIGURE 4) to snap the remaining portions of the slot into assembled relation with the complementary edges of the opening **18** (FIGURE 5).

The process as described, can be performed very rapidly and each of the connections so obtained is airtight and reliable in mounting.

Although the present invention has been illustrated and described in connection with a single example embodiment, it will be understood that this is illustrative of the invention and is by no means restrictive thereof. It is reasonably to be expected that those skilled in the art can make numerous revisions and adaptations of the invention to suit individual design requirements and it is intended that such revisions which incorporate the herein disclosed principles, will be included within the scope of the following claims as equivalents of the invention.

What is claimed is:

1. An electrical receptacle adapted to be mounted on a panel having a predetermined thickness and a rectangular opening therethrough, said opening having a predetermiend width, height, and diagonal dimensions, comprising: (a) an elongated body; (b) a rectangular nose

portion formed around said body at one end thereof, said nose portion having a width and height which are respectively greater than said opening width and height and that are respectively less than said opening diagonal; (c) a rectangular boss portion formed around said body and spaced from said nose portion a predetermined distance substantially equal to said panel thickness, said boss portion having a width and height that are respectively greater than said opening width and height and that are respectively less than said nose portion width and height; (d) a rectangular slot portion formed around said body between said nose portion and said boss portion, said slot portion having a width and height that are substantially equal to said opening width and height; (e) said nose, slot, and boss portions forming a grommet for mounting said body on said panel from one side thereof with said boss portion on said one side of said panel and with said nose portion on the opposite side of said panel; (f) and electrical connecting means mounted on said body.

2. The receptacle defined in claim **1** wherein said body, said nose portion, said slot portion, and said boss portion are integrally formed of a resilient insulating material.

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LARAMIE E. ASKIN, *Primary Examiner.*