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(71) Applicant: **GEM Terminal Ind.Co., Ltd.**
Hsiang, Kaohsiung Hsien (TW)

(72) Inventor: **Su, Tun-Li**
Kaohsiung Hsien (TW)

(74) Representative: **Casalonga, Axel et al**
BUREAU D.A. CASALONGA - JOSSE
Paul-Heyse-Strasse 33
80336 München (DE)

(54) Grounding plate for a plug

(57) A grounding plate (3) for a plug includes a tubular core-receiving member (31; 31A; 31B) provided thereon for receiving cores (51) of a grounding wire. The tubular core-receiving member includes a flange (311; 311A; 311B) on an outer end thereof. The flange has a diameter greater than a main body of the tubular core-receiving member. The cores of a grounding wire are extended through the tubular core-receiving member and an end of a plastic layer (52) of the grounding wire abuts against the flange in an insertion operation of the grounding wire. This provides a restraining effect for the grounding wire and allows stable operation.

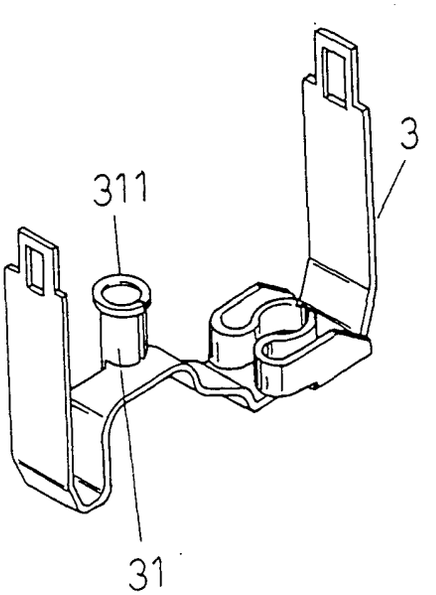

FIG.6

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Description

Background of the Invention

1. Field of the Invention

[0001] The present invention relates to a grounding plate for a plug.

2. Description of the Related Art

[0002] Fig. 1 of the drawings illustrates a typical three-pole plug includes positive and negative prongs 11 and 12 and a grounding plate 13 having a hole 131. In use, the plug is engaged with a receptacle, with the positive and negative prongs 11 and 12 being engaged with two slots of the receptacle, and with a prong on the receptacle being inserted through the hole 131 of the grounding plate 13, providing a grounding effect.

[0003] The grounding plate of this type includes a metal plate that is bent to a desired shape for engaging with a semi-product of a plug by means of insertion or other suitable means. The grounding plate has a tubular core-receiving member provided thereon for receiving a grounding wire that includes a plurality of cores covered by a layer of plastic material. It was found that some of the cores of the grounding wire extended radially outward and thus could not be smoothly extended into the tubular core-receiving member. The insertion operation of the cores of the grounding wire was thus adversely affected.

[0004] Figs. 2 through 4 illustrate a grounding plate 2 disclosed in DE 39 11 316 C2. The grounding plate 2 includes a tubular core-receiving member 21 having a conic end portion 211 for guiding the cores 212 of a grounding wire. The cores 212 are covered by a plastic layer that is cut at an end thereof to expose the cores 212 before the insertion operation of the grounding wire. Nevertheless, if the cut length of the plastic layer is not precisely controlled or if the machine for proceeding with the insertion operation or the workpiece is undesirably moved, the plastic layer is pushed by the machine, resulting in unreliable positioning of the cores.

Summary of the Invention

[0005] An object of the present invention is to provide a grounding plate for a plug, allowing reliable positioning of a grounding wire during an insertion operation of the cores of the grounding wire into a wire-receiving tubular member of the grounding plate.

[0006] In accordance with an aspect of the invention, a grounding plate for a plug is a metal plate and includes a tubular core-receiving member provided thereon for receiving cores of a grounding wire. The tubular core-receiving member includes a flange on an outer end thereof. The flange has a diameter greater than a main body of the tubular core-receiving member. The cores of a grounding wire are extended through the tubular core-receiving member and an end of a plastic layer of the grounding wire abuts against the flange in an insertion operation of the grounding wire. This provides a restraining effect for the grounding wire and allows stable operation.

[0007] Other objects, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

[0008]

Fig. 1 is a perspective view of a conventional three-pole plug.

Fig. 2 is a top view of a conventional grounding plate for a plug.

Fig. 3 is a sectional view of a tubular core-receiving member of the grounding plate in Fig. 2.

Fig. 4 is a view similar to Fig. 3, wherein cores are received in the tubular core-receiving member.

Fig. 5 is a sectional view of a semi-product of a plug with a grounding plate in accordance with the present invention.

Fig. 6 is a perspective view of the grounding plate in accordance with the present invention.

Fig. 7 is a perspective view of the semi-product of the plug in accordance with the present invention.

Fig. 8 is a top view of the grounding plate in accordance with the present invention.

Fig. 9 is a perspective view of a tubular core-receiving member of the grounding plate in accordance with the present invention.

Fig. 10 is a sectional view of the tubular core-receiving member in Fig. 9.

Fig. 11 is a view similar to Fig. 10, wherein cores are received in the tubular core-receiving member.

Fig. 12 is a perspective view of a modified embodiment of the tubular core-receiving member of the grounding plate in accordance with the present invention.

Fig. 13 is a sectional view of the tubular core-receiving member in Fig. 12.

Fig. 14 is a view similar to Fig. 13, wherein cores are received in the tubular core-receiving member.

Fig. 15 is a perspective view of another modified embodiment of the tubular core-receiving member of the grounding plate in accordance with the present invention.

Fig. 16 is a sectional view of the tubular core-receiving member in Fig. 15.

Fig. 17 is a view similar to Fig. 16, wherein cores are received in the tubular core-receiving member.

Detailed Description of the Preferred Embodiments

[0009] Figs. 6 and 8 show a grounding plate 3 in accordance with the present invention that is a metal plate bent to an appropriate shape. The grounding plate 3 is coupled with an inner frame 4 (Figs. 5 and 7) to form a plug (not shown) after subsequent manufacturing procedures. The grounding plate 3 includes a tubular core-receiving member 31.

[0010] In an embodiment of the invention, as illustrated in Figs. 9 through 11, the tubular core-receiving member 31 includes a flange 311 on an outer end thereof. The flange 311 has a diameter greater than that of a main body of the tubular core-receiving member 31. In an insertion operation of a grounding wire, the cores 51 of the grounding wire are inserted into the tubular core-receiving member 31 until an end of a plastic layer 52 of the grounding wire abuts against the flange 311. This provides a restraining effect for the grounding wire and allows stable operation.

[0011] Figs. 12 through 14 illustrate a modified embodiment of the tubular core-receiving member (now designated by 31A), wherein the flange (now designated by 311A) has a curved outer edge 312A.

[0012] Figs. 15 through 17 illustrate another modified embodiment of the tubular core-receiving member (now designated by 31B), wherein the outer edge of the flange (now designated by 311B) bends rearward and thus has a section 312B extending in a direction parallel to the main body of the tubular core-receiving member 31B.

[0013] Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the invention as hereinafter claimed.

Claims

1. A grounding plate for a plug, the grounding plate (3) being a metal plate and having a tubular core-receiving member (31; 31A; 31B) provided thereon for receiving cores (51) of a grounding wire, **characterized in that**:

   the tubular core-receiving member (31; 31A; 31B) includes a flange (311; 311A; 311B) on an outer end thereof, the flange has a diameter greater than a main body of the tubular core-receiving member, the cores (51) of the grounding wire are extended through the tubular core-receiving member and an end of a plastic layer (52) of the grounding wire abuts against the flange (311; 311A; 311B) in an insertion operation of the grounding wire.

2. The grounding plate for a plug as claimed in claim 1, wherein the flange (31A) has a curved outer edge (312A).

3. The grounding plate for a plug as claimed in claim 1, wherein the outer edge of the flange (311B) bends rearward and has a section (312B) extending in a direction parallel to the main body of the tubular core-receiving member (31B).

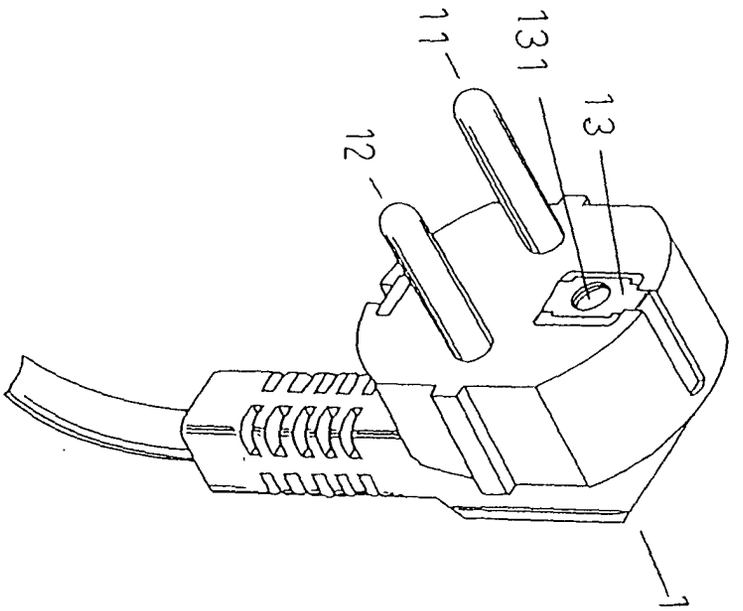


FIG.1
PRIOR ART

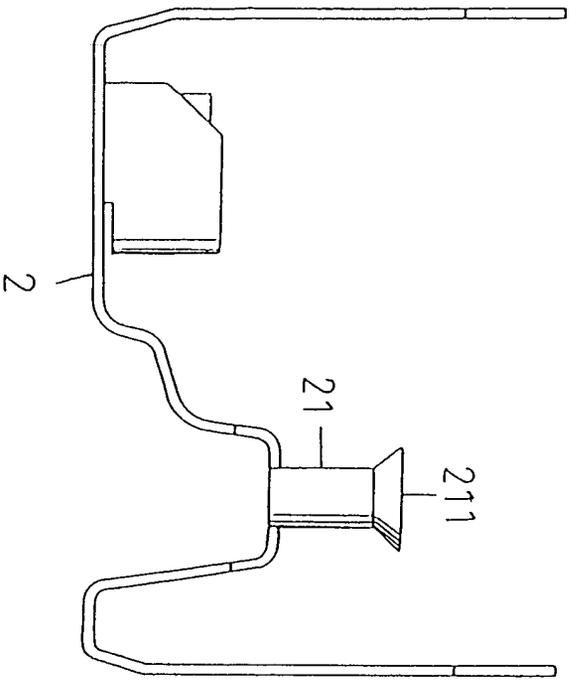


FIG.2
PRIOR ART

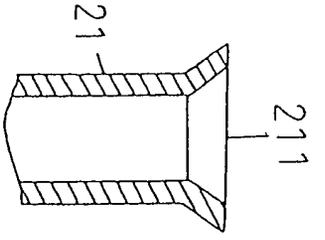


FIG.3
PRIOR ART

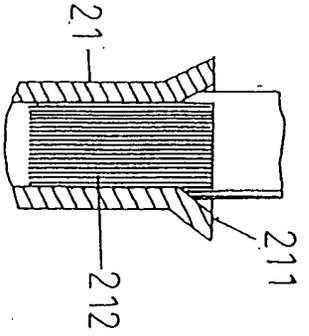


FIG.4
PRIOR ART

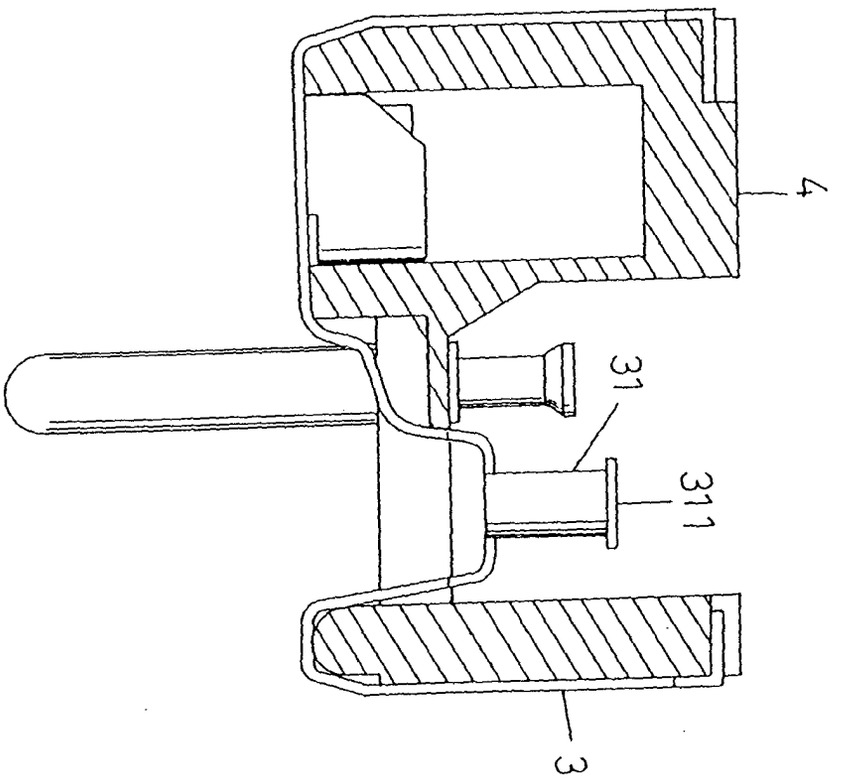


FIG. 5

FIG.6

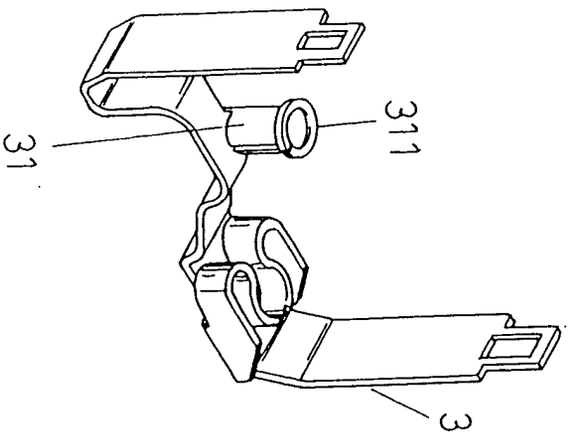


FIG.7

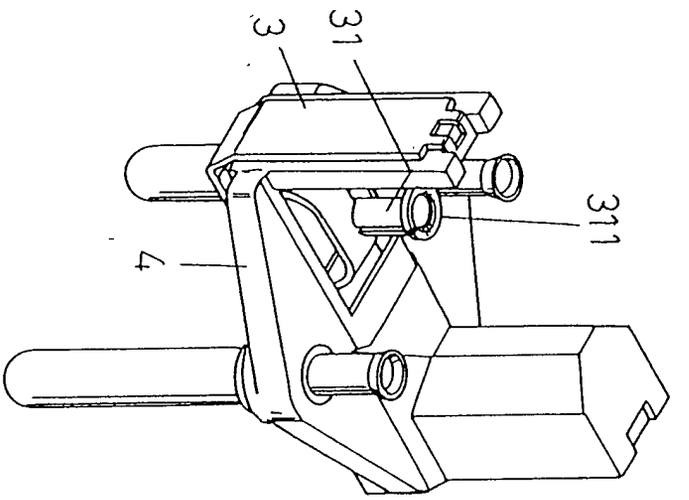
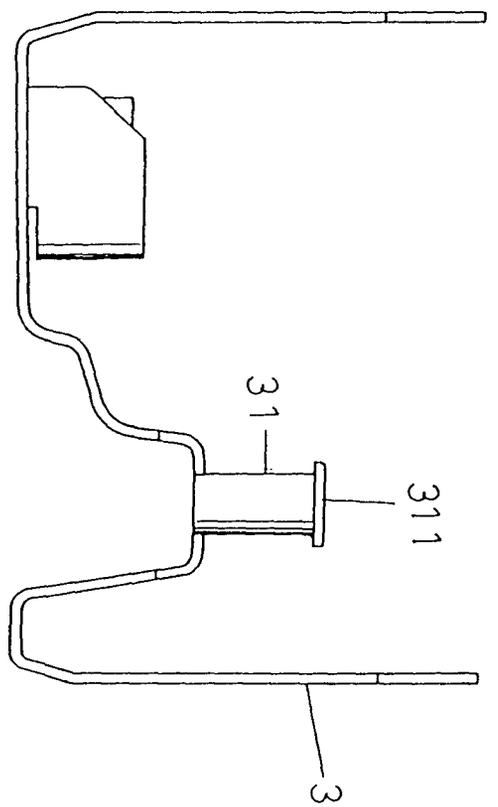


FIG.8



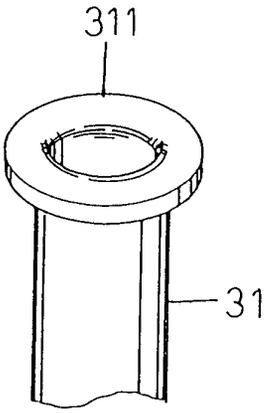


FIG.9

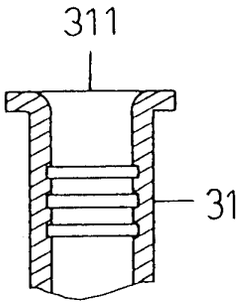


FIG.10

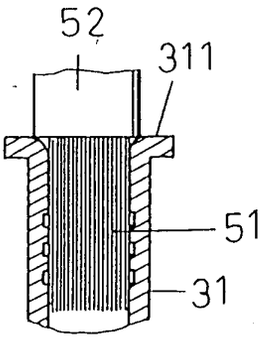


FIG.11

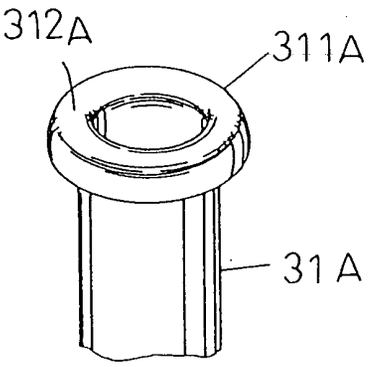


FIG. 12

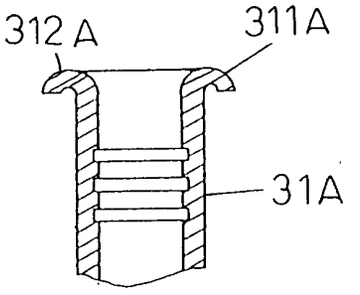


FIG. 13

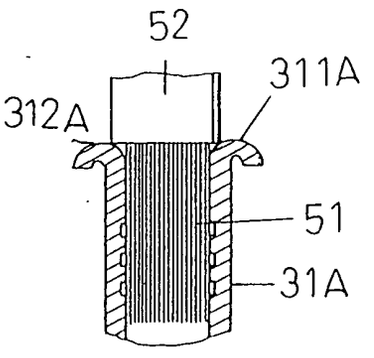


FIG. 14

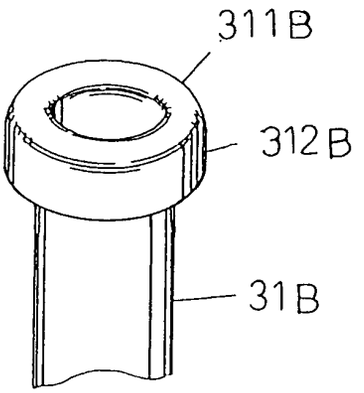


FIG.15

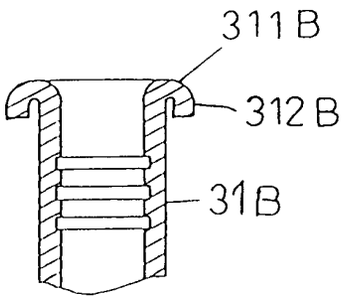


FIG.16

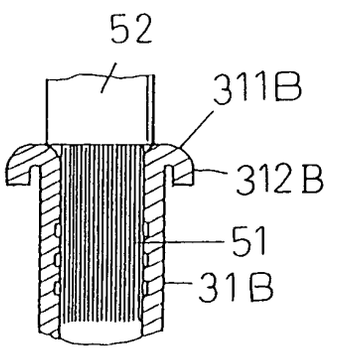


FIG.17

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 02 2433

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

H01R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	23 February 2004	Corrales, D

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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2

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 02 2433

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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23-02-2004

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