

[54] **PLUG FITTING FOR HF TRANSMISSION LINES**

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**..... **H01p 1/04, H01p 5/02**

[58] **Field of Search**..... **333/98 R, 97 R, 34**

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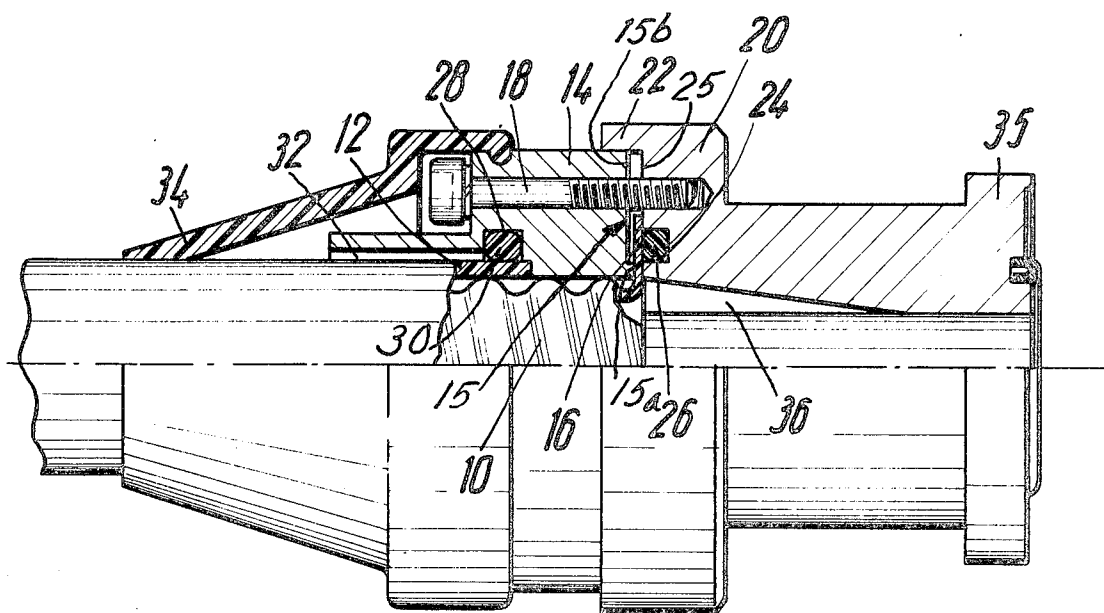
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[57] **ABSTRACT**

Plug fitting for corrugated wave guides and coaxial HF corrugated casing cable: the end of the wave guide casing is crimped over and extends radially outward between a holding ring positioned over the wave guide and a shaped part positioned over the cable; the holding ring includes a radially short height projecting step which presses against the radially inward portion of the crimped over wave guide end; the crimped over end extends past the step and at least partly over a sealing ring in a groove of the facing surface of the shaped part positioned over the casing cable.

13 Claims, 3 Drawing Figures



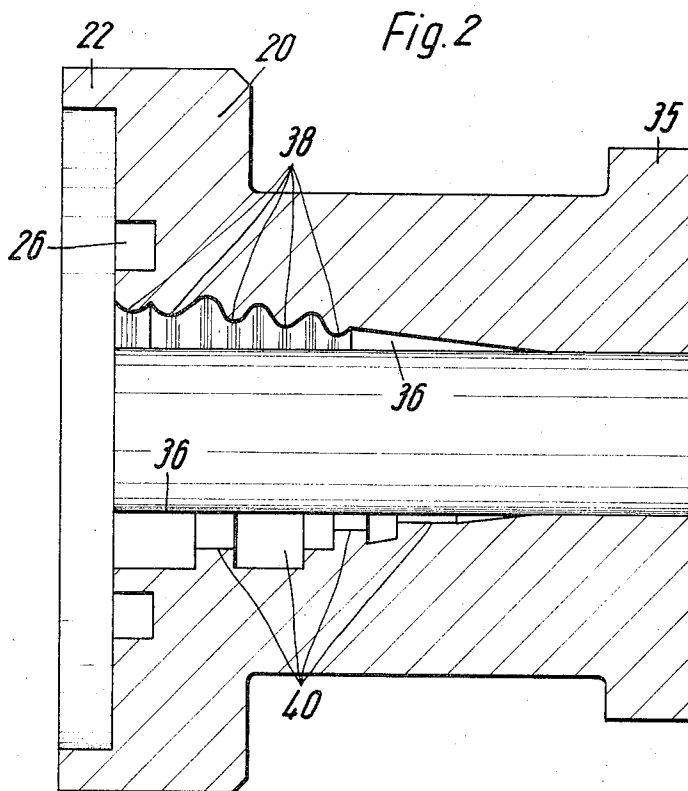
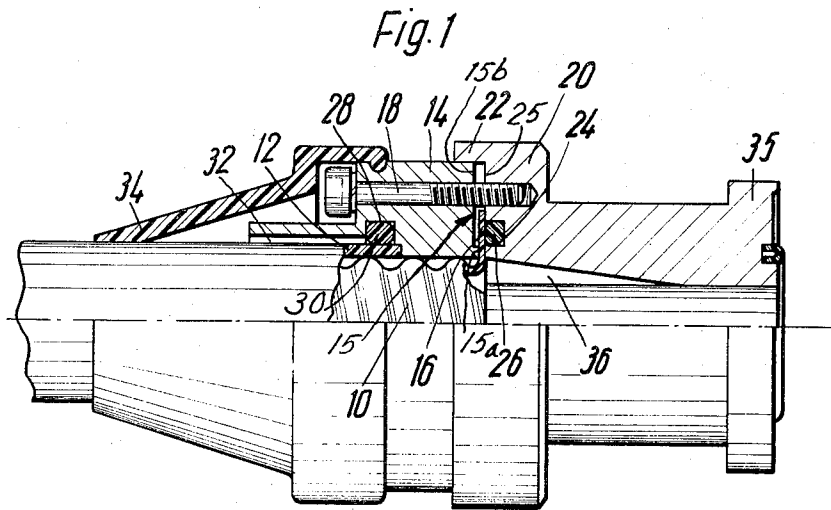
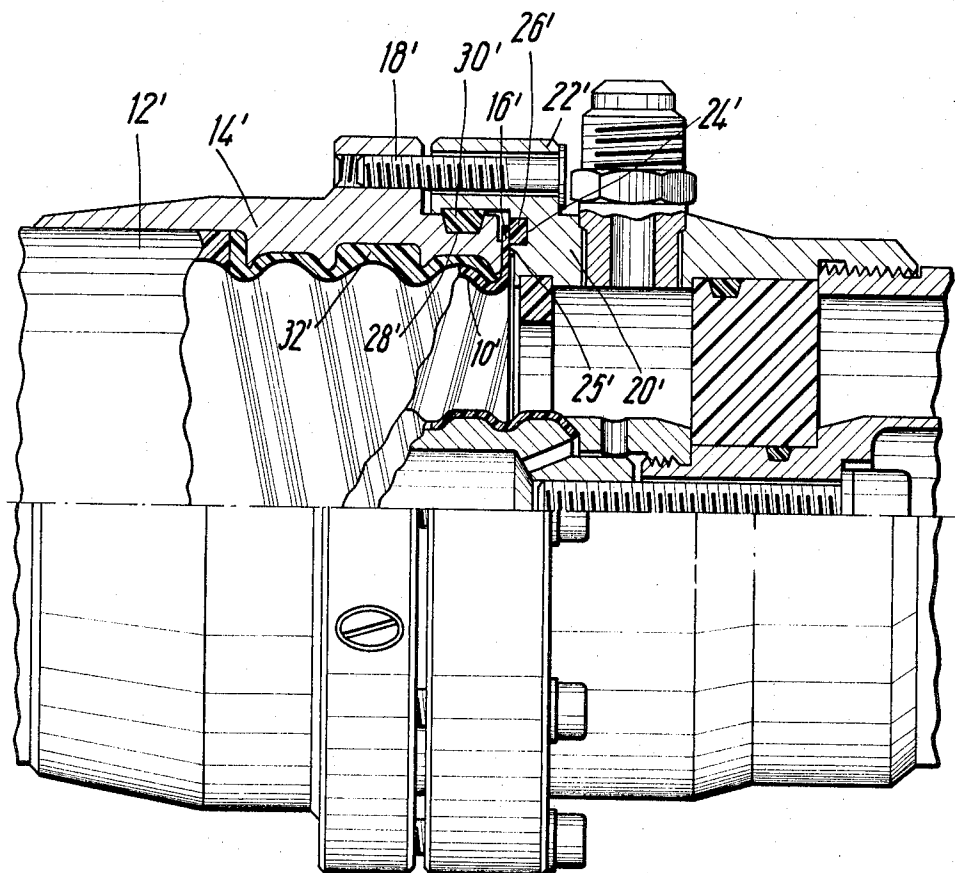


Fig. 3



PLUG FITTING FOR HF TRANSMISSION LINES

The present invention relates to a plug fitting for preferably corrugated wave guides and coaxial HF corrugated casing cable, in the case of which the crimped over end of the wave guide or corrugated casing tube is held axially between a holding ring and the shaped part, forming a continuation of the line, and which contacts it, with the interposition of a sealing ring accommodated in a groove, and a further seal is provided between the plastic casing surrounding the conductor tube and the inner wall of the holding ring.

One aim of the present invention is to simplify assembly in the case of such a plug fitting and using simple sealing rings to provide for satisfactory and permanent sealing between the continuing part of the line and the conducting tube while simultaneously ensuring satisfactory electrical contact between these two parts.

In accordance with the invention this aim is achieved in that the groove is arranged in the annular end face of the shaped part forming a continuation of the line and in that on the sealing ring lying in the groove the zone, lying outermost in the radial direction, of the crimped over end of the wave guide tube or the corrugated casing — covering at least partly the exposed sealing ring surface — is pressed, while only the inner part of the crimped over end of the wave guide tube or the corrugated casing contacts the shaped part itself.

The aim of the invention is connected with the fact that owing to assembly of the seal within the contact end ring surface in such a manner that at least a contact ring surface remains on the radially inner side, and is intended to solve the problem of sealing in the simplest possible manner. Previously those in the art were of the view that on an end ring contact surface providing the electrical contacting an electrically non-conducting seal would have a harmful effect on electrical contacting. It has now been found in accordance with the invention that this electrical contacting remains entirely if the inner part of the crimped over end of the wave guide tube contacts the shaped part itself.

In the case of a plug fitting with a transition between an oval wave guide and a rectangular wave guide by means of a matched transition cone the compensation in accordance with a further form of the invention is brought about by machining or turning grooves in the transition cone. These machined out portions can be constructed as rounded beads or can be in the form of cylindrical steps.

In what follows embodiments of the invention will be described with reference to the accompanying drawings.

FIG. 1 is a sectional view of a plug fitting constructed in accordance with the invention, mounted on an oval corrugated casing, the plane of the drawing intersecting the smaller dimension of the oval wave guide and the following rectangular cross-section wave guide, while the broader dimension runs perpendicularly to the plane of the drawing.

FIG. 2 shows the transition piece as a single part in accordance with FIG. 1 with differing compensation turned or machined out parts in both section halves.

FIG. 3 is a sectional view of a plug fitting in accordance with the invention mounted on a coaxial flex corrugated cable.

The corrugated cable of the wave guide (FIG. 1) is denoted by reference numeral 10. It is surrounded by

a plastic casing 12, which in the front part is removed in a known manner. On the front end of the corrugated casing 10 a holding ring 14 of oval shape is mounted. Holding ring 14 has a front end face 15 with a radially, inwardly positioned, forwardly projecting portion 15a and a radially further outwardly positioned, non-projecting portion 15b, whereby front end face 15 is stepped. Around front end face 15 of holding ring 14 the front end 16 of the corrugated wave guide casing 10 is crimped. This holding ring 14 is held by means of axially extending holding screws 18 acting against the end face of a shaped part 20 forming the junction. This shaped part 20 fits around the holding ring 14 with a short cylindrical extension 22.

The end annular surface 25 lying opposite the annular end surface 15 of the holding ring 14 has an oval groove 24 preferably of rectangular cross-section, in which a sealing ring 26 of full or solid cross section is fitted. Groove 24 is, at least in part, opposite the radially further outward portion 56 of holding ring end face 15. The groove 24 is so mounted that the crimped over end 16 extends to the inside and also to the outside radially beyond the limiting edges. On its inner periphery the holding ring has the groove 28, into which a seal 30 is fitted, which brings about a sealing action between the plastic casing 12 and the fitting. If necessary the annular gap 32 remaining in front of and/or behind the seal 30 can be filled with cast resin and it is possible additionally to provide additionally or instead of this a sealing sleeve 34, which is fixed on the holding ring 14.

The transition or junction piece 20, which on its front end is provided with a connection flange 35 in the form of a rectangular wave guide, has a conventional conical transition 36. In accordance with the invention this conical transition is provided with machined out recesses, which either as indicated in FIG. 2 provide beads 38 or, as indicated in the lower part of FIG. 2, forms cylindrical steps 40. Both the beads 38 and also the steps 40 are constructed empirically and can be reproduced using copying templates in the simplest possible manner.

In the case of the embodiment in accordance with FIG. 3, which shows a plug fitting for coaxial cable, corresponding parts are denoted with corresponding primed (') reference numerals.

The corrugated casing 10' of the coaxial cable is surrounded by a plastic casing 12', which is removed in the front section. On the front end of the corrugated casing cable a tubular nut 14' is screwed, over whose front annular end face the front end 16' of the corrugated casing 10' is crimped. This tubular nut 14' is held by axially directed holding screws 18' against the end face of a shaped part 20', which surrounds the tubular nut 14' with a short cylindrical extension 22'.

The annular face 25', lying opposite to the annular end face of the tubular nut 14', of the shaped part 20' has a groove 24' preferably of rectangular cross-section, into which a sealing ring 26' is fitted. The outer edge of the crimped over end 16' of the corrugated casing lies against the sealing ring in the central section. Instead of this the edge could also project to the outside over the groove 24' accommodating the sealing groove. The tubular nut 14' has an external peripheral groove 28', into which a sealing ring 30' is inserted, which brings about a sealing action between the cylindrical section 22' of the shaped part 20' and the tubular nut.

The annular gap remaining between the tubular nut 14' and the corrugated casing 10' or the plastic casing 12' is filled out by means of cast resin 32'.

The embodiments of the invention in which an exclusive property or privilege is claimed are as follows:

1. A plug fitting for wave guides, or the like, and for coaxial HF casing cable, or the like, comprising:

a wave guide and cable; one end of said wave guide facing toward one end of said cable; one of said wave guide and said cable one ends being crimped over in the portion at its said end to extend radially outwardly with respect to said wave guide and said cable;

a holding ring around the one of said wave guide and said cable that includes said crimped over end, and a shaped part around the other of said wave guide and said cable;

said holding ring having an end face that faces toward said shaped part; a first radially inwardly located portion of said holding ring end face projects more toward said shaped part than a second portion of said holding ring end face which is radially outward of said holding ring end face first portion, thereby stepping said holding ring end face radially outwardly;

said shaped part having an annular end face which faces toward said holding ring; a groove in said shaped part annular end face; said groove being opposite said second radially outward portion of said holding ring; a sealing ring in said groove; said crimped over end portion contacting said holding ring first portion on one side of said crimped over end portion and contacting and at least partially covering said sealing ring on the other side of said crimped over end portion.

2. A fitting in accordance with claim 1, in which the holding ring at the insertion end of the wave guide or

the external wave guide is provided with a sealing sleeve which tapers conically towards the rear.

3. A fitting in accordance with claims 1, in which the holding ring is in one piece.

4. A fitting in accordance with claim 1, in which said sealing ring has a full or solid cross-section.

5. A fitting in accordance with anyone of claim 1 with a junction or transition between an oval wave guide and a rectangular wave guide by means of a matched transition cone, in which the transition cone is provided with machined out parts for compensation.

6. A fitting in accordance with claim 5, in which the machined out part form beads.

7. A fitting in accordance with claim 5, in which the machined out parts form undercut cylindrical steps.

8. A fitting in accordance with claim 1, further comprising a second seal between said holding ring and the one of said wave guide and said cable that said holding ring is around.

9. A fitting in accordance with claim 8, in which said holding ring part has a peripheral groove on its inner wall, in which said second seal is fitted.

10. A fitting in accordance with claim 9, in which the annular gap between said inner wall of said holding ring and the element it is around is filled with cast resin in the vicinity of said second seal.

11. A fitting in accordance with claim 1, wherein it is said wave guide one end that is crimped over.

12. A fitting in accordance with claim 11, in which said crimped over end portion of said wave guide projects across said groove accommodating said sealing ring.

13. A fitting in accordance with claim 11, in which the outer edge of said crimped over end portion of said wave guide lies against said sealing ring.

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