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CATV TAMPER-PROOF ELECTRICAL TERMINATION

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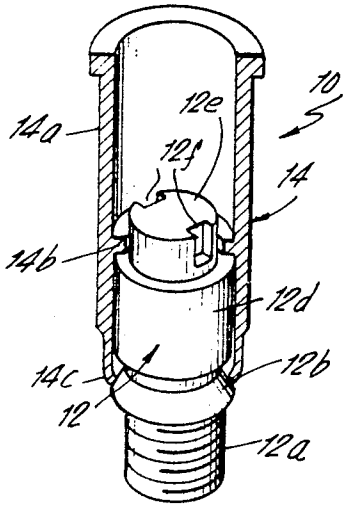


FIG. 1

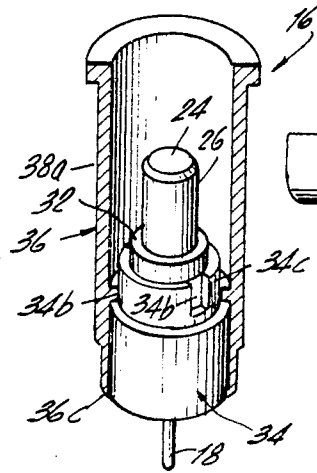


FIG. 2

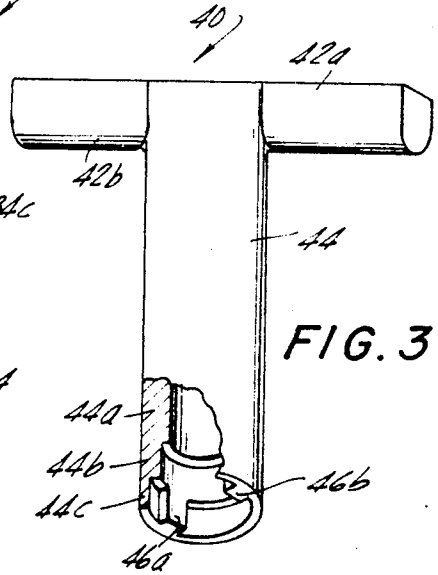


FIG. 3

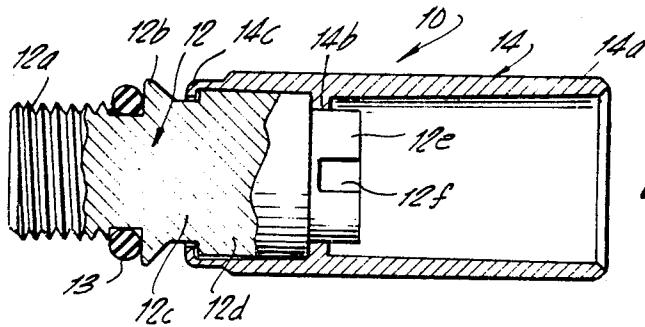


FIG. 4

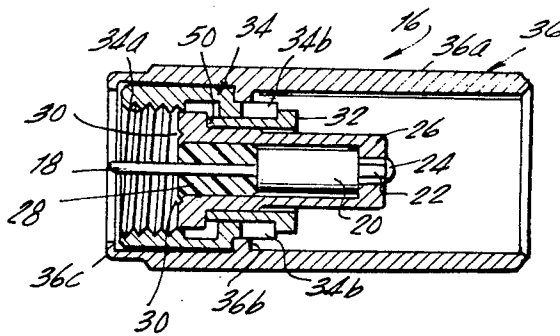


FIG. 5

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TAMPER-PROOF ELECTRICAL TERMINATION
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4 Claims

ABSTRACT OF THE DISCLOSURE

A tamper-proof tap termination for CATV terminal boxes. The tap termination includes a plug, a first end of which is screw-connected to the terminal tap and the second end of which has a configuration for mating with an associated key. A sleeve is attached to the plug and although fixed in longitudinal relation to it is capable of rotation around it. The sleeve projects past the second end of the plug and has a hollow bore for insertion of the key therein. The key has an end which mates with the second end of the plug. The plug can be unscrewed from the terminal box only by the use of the special key which is not available to unauthorized personnel.

This invention relates to cable tap terminations, and more particularly to tamper-proof cable tap terminations.

In the CATV industry, when cables are laid they are coupled to terminal boxes each having a number of cable taps. In order to connect a subscriber to the system it is only necessary to screw his cable termination into one of the taps in the box and to establish an electrical connection. As a result of this simplicity of connection, a problem has developed in the industry with respect to illegal taps.

If a tap terminal on the box is unused, it is especially easy for an illegal tap to be made—all that is necessary is for a homeowner to hook up his cable to the terminal. For this reason plug assemblies are often inserted into unused terminals. However, this does not completely solve the problem because an illegal tap can be made by first unscrewing the plug.

It is an object of this invention to provide tamper-proof plugs for preventing unauthorized removal thereof.

Briefly, in accordance with the principles of my invention, the tamper-proof termination (either a simple plug assembly without an electrical termination or a 75-ohm terminator) is provided with a plug element to be secured to the tap together with an outside sleeve which is freely rotatable around the plug. The sleeve extends past the forward end of the plug, and in order to grip the plug to unscrew it, it is necessary to insert a tool through the forward end of the sleeve. The forward end of the plug has a configuration such that it cannot be gripped securely by ordinary household tools inserted into the sleeve. A specially designed key having a configuration which mates with the forward end of the plug is provided to authorized personnel for insertion through the sleeve to engage the plug. The plug can be gripped only with the use of this key, and since it is unavailable to the public at large, illegal cable tapping can be prevented.

It is a feature of my invention to provide a plug for attachment to the tap surrounded by a forwardly extending freely rotatable sleeve, the forward end of the plug having a configuration which mates only with a specially designed key which can be inserted into the sleeve.

Further objects, features and advantages of my invention will become apparent upon consideration of the following detailed description in conjunction with the drawing, in which:

FIG. 1 is a perspective view, partly broken away, of a plug assembly designed for attachment to a tap-off-block

when its output connector to a subscriber is not in use;

FIG. 2 is a perspective view, partly broken away, of a similar assembly provided with a 75-ohm terminator;

FIG. 3 is a perspective view, partly broken away, of a mating key for use with either plug assembly;

FIG. 4 is a sectional view, partly broken away, of the assembly of FIG. 1; and

FIG. 5 is a sectional view, partly broken away, of the assembly of FIG. 2.

Referring to FIGS. 1 and 4, assembly 10 is provided with two main components—dummy plug 12 and sleeve 14. The plug includes a screw section 12a, a flange 12b, body portions 12c and 12d, and a forward end 12e. The forward end is provided with two notches or slots 12f. An O ring seal 13 is provided as shown in FIG. 4 at the right end portion of screw section 12a.

Sleeve 14 includes a forward projecting end 14a, a ring section 14b and a roll-over end 14c. In assembling the unit, the sleeve is slipped onto the plug and end 14c then rolled over adjacent body section 12c to secure the two pieces 12 and 14 in a fixed longitudinal relationship. The sleeve, however, is freely rotatable around the plug.

When in position, the only way to turn plug 12 is with the specially designed tool of FIG. 3, the operating end of which can be inserted into the projecting sleeve to mate with the irregularly-shaped forward end 12e of the plug. Ordinary household tools are incapable of insertion through the sleeve to grip the plug. Of course, the sleeve can be turned even by hand, but this has no effect since it is the plug which is screwed into the tap, and the sleeve, when turned, simply rotates around the plug.

The assembly of FIGS. 2 and 5 is similar to that of FIGS. 1 and 4 except that it includes a 75-ohm, 1/4-watt resistor 20 termination for connection to the cable. This assembly is provided with female threads 34a so that the unit can be employed on unused F type output connectors of directional taps, hybrids splitters or couplers. The unit includes six main components—sleeve 36, captive nut 34, retainer 32, shank 26, resistor 20 and insulator 28. Resistor 20 is provided with two leads 18 and 22. Lead 18 is used for connection to the tap itself inside the terminal box. Lead 22 is soldered, as shown at 24, to shank 26. Insulator 28 surrounds the end of lead 18 adjacent resistor 20. Shank 26 is staked as shown at 30 for securing the insulator in place.

Retainer 32, which is electrically conductive just as are shank 26 and captive nut 34, surrounds the shank as shown in FIG. 5 and is secured thereto at butt area 50 by a press fit. Captive nut 34, in turn, surrounds retainer 32. The captive nut includes two notches or slots 34b as seen most clearly in FIG. 2. The nut also includes a ring portion 34c for engagement with ring portion 36b of sleeve 36. The sleeve is rolled over at end 36c to secure the assembly in a fixed longitudinal relationship.

The electrical connection is extended from lead 18 through resistor 20, and then through lead 22 solder 24, shank 26, retainer 32 and captive nut 34. The captive nut serves as the ground connection to the terminal box while lead 18 is connected to the tap itself when the assembly is put in use.

As in the assembly of FIGS. 1 and 4, the assembly of FIGS. 2 and 5 is such that sleeve 36 is freely rotatable around the other elements. In order to remove the assembly from the terminal box it is necessary to turn captive nut 34. The nut cannot be gripped by conventional tools since they cannot be fitted through the sleeve. Instead, the special tool of FIG. 3 is required. Referring to FIGS. 1 and 2 it is seen that each of the units is provided with similar notches (12f and 34b). While in the unit of FIG. 2 various elements project above the notches, this is of no moment since the key of FIG. 3 has a hollow bore which can be inserted around elements 24, 26 and 32.

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Insofar as the key of FIG. 3, is concerned, it mates in the same way with both plug 12 of FIGS. 1 and 4, and captive nut 34 of FIGS. 2 and 5.

Key 40 (FIG. 3) includes gripping sections 42a, 42b and a main shank 44. The shank is hollow and its bore has three diameters as indicated by sections 44a, 44b, 44c. In the forwardmost section of the bore 44c, two projections 46a, 46b are formed for mating with the slots on either of the plug assemblies. The outside diameter of shank 44 is such that it can be inserted into either sleeve 14 or sleeve 36. In the case of the assembly of FIGS. 2 and 5, the bore diameter of section 44a of the key is such that it fits over elements 24, 26 and 32. With both assemblies the forward end of the key fits over either element 12e or element 34c, with the two lugs 46a, 46b mating with slots 12f or 34b. When the key is inserted into either sleeve and turned, the unit can be unscrewed from the terminal box.

Although the invention has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the application of the principles of the invention. Numerous modifications may be made therein and other arrangement may be devised without departing from the spirit and scope of the invention.

What is claimed is:

1. A tamper-proof tap termination comprising a plug having two ends, a first end including means for screw-on connection to a terminal tap, the second end having a configuration for mating with an associated key, a sleeve fixed in longitudinal relation to said plug and mounted for free rotation therearound, said sleeve projecting past the second end of said plug and having a hollow bore therein for insertion of said key, and a resistive element in said plug for connection to said terminal tap.

2. A tamper-proof tap termination comprising a plug having two ends, a first end including means for screw-on connection to a terminal tap, the second end having a configuration for mating with an associated key, said plug including a resistive element for connection to said terminal tap, and a sleeve fixed in longitudinal relation to said

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plug and mounted for free rotation therearound, said sleeve projecting past the second end of said plug and having a hollow bore therein for insertion of said key, the second end of said plug having a cylindrical section with at least one notch therein and said key having a cylindrical bore with at least one projection therein for mating with said plug.

3. The combination of a tamper-proof tap termination and a key comprising a tap termination having a plug, a first end of said plug including means for connection to a terminal tap, a second end of said plug having a pre-designed configuration, and a sleeve fixed for rotation around said plug and extending forward of said plug past said second end, said plug including an electrical circuit for connection to said terminal tap; and a key having a handle and a shank portion, said shank portion having an outer diameter small enough for insertion into said sleeve and a pre-designed end configuration for mating with the second end of said plug.

4. A combination in accordance with claim 3 wherein the second end of said plug includes a cylindrical section having at least one slot therein and the end of the shank of said key includes a bore with a mating projection therein.

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70—404; 85—45; 339—147