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(54) Radio frequency wall outlet and modules

(57) A filter and/or splitter module for attachment to a wall outlet which terminates a coaxial cable, the module presenting an electrical terminal (9) for electrical connection to a terminal on the wall outlet and a projection (10) extending from the module at a position spaced from the module terminal (9), the projection (10) having an undercut region (12) defining a head (13) for engagement in a slot in the outlet to retain the module with respect to the outlet. Also a wall outlet having an electrical terminal (3) for electrical connection of an end of a coaxial cable, the terminal (3) being accessible from a front of the outlet to enable a terminal of a plug-on filter and/or splitter module to be plugged onto and therefore electrically connected to the outlet, the front of the outlet having a slot (5) shaped to receive a projection on the module such that when the terminal on the module is initially engaged with the outlet terminal the projection enters a release region (6) of the slot, after which rotation of the module around the outlet terminal (3) as centre causes the projection to move into a locking region (7) of the slot (5) where the engagement of the projection with the outlet prevents the module being withdrawn from the outlet, release of the module from the outlet requiring counter-rotation of the module with respect to the outlet.

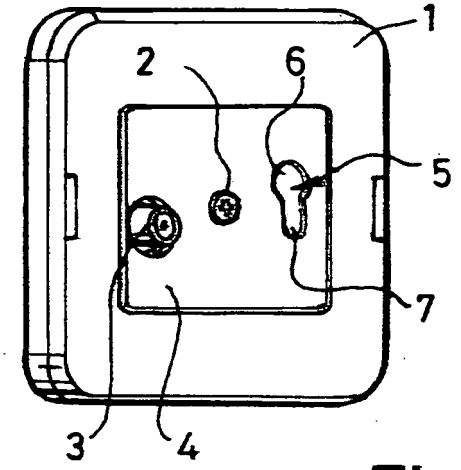


Fig. 1

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Description

Field of the Invention

[0001] This invention relates to radio frequency wall outlets and to filter and/or splitter modules which can be detachably plugged onto such outlets. These outlets are used to terminate coaxial cables carrying RF signals (e.g. television data or radio) and to provide protection or isolation against dangerous electrical currents and voltages. The degree and type of protection or isolation varies from product to product as does the number and type of output connectors, i.e. plugs or sockets. These devices are either mounted directly into the wall in a pre-cut hole or pattress box or surface mounted over a suitable back box. The installation is normally finished by screwing a plain cover or face plate to the box. In order to divide the outgoing signal between multiple pieces of receiving equipment it is common to plug filter and/or splitter modules onto wall outlets. These modules are held in place on the outlets by the friction of the connection between the module and the wall outlet. Because this connection is sometimes unsatisfactory, it is known to attach modules to outlets by means of screws. The invention aims to provide a firm but simple way of attaching a module to a wall outlet.

Summary of the Invention

[0002] According to one aspect of the invention there is provided a filter and/or splitter module for attachment to a wall outlet which terminates a coaxial cable, the module presenting an electrical terminal for electrical connection to a terminal on the wall outlet and a projection extending from the module at a position spaced from the module terminal, the projection having an undercut region defining a head for engagement in a slot in the outlet to retain the module with respect to the outlet.

[0003] The projection may be a stud having a stem terminating in an enlarged head, the stem defining the undercut region.

[0004] According to another aspect the invention provides a wall outlet having an electrical terminal for electrical connection of an end of a coaxial cable, the terminal being accessible from a front of the outlet to enable a terminal of a plug-on filter and/or splitter module to be plugged onto and therefore electrically connected to the outlet, the front of the outlet having a slot shaped to receive a projection on the module such that when the terminal on the module is initially engaged with the outlet terminal the projection enters a release region of the slot, after which rotation of the module around the outlet terminal as centre causes the projection to move into a locking region of the slot where the engagement of the projection with the outlet prevents the module being withdrawn from the outlet, release of the module from the outlet requiring counter-rotation of the module with respect to the outlet.

[0005] Preferably the slot is keyhole shaped, the circular part of the slot constituting the release region and the elongated channel part of the slot constituting the locking region.

[0006] The invention includes within its scope a module in association with a wall outlet. Thus, according to another aspect the invention provides the combination of a wall outlet and a filter and/or splitter module for plugging onto the outlet, the outlet having an electrical terminal for connection of one end of the coaxial cable and the module having an electrical terminal, one of the outlet and the module having a slot with a release region and a locking region, and the other having a projection shaped to co-operate with the slot such that when the module is plugged onto the outlet the terminal on the module makes initial engagement with the terminal on the outlet and the projection enters the release region of the slot, after which the module is rotated with respect to the outlet about the outlet terminal as centre, to cause the projection to enter the locking region of the slot where engagement of the projection with the slot prevents the module being unplugged from the outlet, release of the module from the outlet requiring counter-rotation of the module with respect to the outlet.

[0007] Preferably the outlet has the slot and the module has the projection.

Brief Description of the Drawings

[0008] A wall outlet and module, each according to the invention, will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is an isometric view of the wall outlet,
Figure 2 is an isometric view of the module,
Figure 3 is a front view of the outlet,
Figure 4 is a rear view of the module,
Figure 5 is an enlarged side view of a projection of the module, and
Figure 6 shows the geometry of the slot in the wall outlet.

Detailed Description of the Drawings

[0009] Referring to Figure 1, the wall outlet has a face plate 1 fixed by two screws (not shown) to a back box (not shown) of the outlet. The back box has an electrical connector terminal 3 which projects through a circular off-centre hole in a central recessed area of the face plate 1.

[0010] A face plate cover 4 is fixed into the central recessed area of the face plate 1 by a central screw 2. The electrical connector terminal 3 also projects through a corresponding circular off-centre hole in the face plate cover 4. The face plate cover conceals the two screws that fix the face plate 1 to the back box.

[0011] On the other side of the central screw 2 the face plate cover 4 has a keyhole shaped slot 5 with a circular

release region 6 and an elongated channel-shaped locking region 7.

[0012] Referring to Figure 2, the filter and/or splitter module comprises a casing 8 from one surface of which projects a push-on connector terminal 9 complimentary to the terminal 3 on the outlet. The terminal 9 is positioned towards one side of the module and towards the other side there is a projection 10 in the form of a spigot having a cylindrical shank 12 terminating in an enlarged diameter disc-like head 13. The projection 10 is surrounded by a circular projecting rim forming a spacer 14.

[0013] From one edge of the module project three connector terminals 15 providing coaxial outputs for distributing RF signals to a computer, television or radio.

[0014] The spacing (R, Figure 3) between the centre of the outlet terminal 3 and the centre of the slot 5 matches the spacing (R, Figure 4) between the centre of the module terminal 9 and the centre of the projection 10 so that when the module is plugged onto the outlet, with the terminals 3 and 9 in initial engagement, the head 13 of the projection 10 is capable of entering the circular region 6 of the slot 5. After this, the module is rotated (as indicated by the arc 16 in Figure 3) with respect to the outlet, about the outlet terminal 3 as fulcrum, to cause the projection to enter the locking region of the slot where the head 13 of the projection locates behind the slot edge to prevent the module being unplugged from the outlet. Thus, the module is held firmly in engagement with the outlet with the terminals 3 and 9 electrically interconnected, enabling RF signals communicated to the terminal 3 to be distributed to the three connector terminals 15. When plugged onto the outlet, the module sits neatly against the face plate cover 4.

[0015] To unplug the module from the outlet, the module must first be rotated (in the opposite direction to that employed in plugging the module onto the outlet) until the head 13 of the projection 10 enters the release region of the slot, whereupon the module can be pulled away from the outlet to unplug the module and thereby separate the terminals 3 and 9.

[0016] It will be appreciated that on the face plate cover 4 the diameter of the release region 6 must be larger than the diameter (A, Figure 5) of the head 13. Also, the width of the channel forming the locking region 7 must be greater than the diameter B of the shank 12 but less than the diameter of the head 13.

[0017] The end of the channel forming the locking region 7 is below the centre of the terminal hole by a distance (as shown in Figure 6) corresponding to half the diameter B of the shank 12.

[0018] On the module, the distance (h, Figure 5) from the top of the spacer (or the back of the module casing if a spacer is not used) to the bottom of the head 13 must be greater than the thickness of the face plate cover adjacent to the retaining channel forming the locking region.

Claims

1. A filter and/or splitter module for attachment to a wall outlet which terminates a coaxial cable, the module presenting an electrical terminal (9) for electrical connection to a terminal (3) on the wall outlet and a projection (10) extending from the module at a position spaced from the module terminal (9), the projection (10) having an undercut region defining a head (13) for engagement in a slot (5) in the outlet to retain the module with respect to the outlet.

2. A module according to claim 1, wherein the projection (10) is a stud having a stem (12) terminating in an enlarged head (13), the stem (12) defining the undercut region.

3. A wall outlet having an electrical terminal (3) for electrical connection of an end of a coaxial cable, the terminal (3) being accessible from a front of the outlet to enable a terminal (9) of a plug-on filter and/or splitter module to be plugged onto and therefore electrically connected to the outlet, the front of the outlet having a slot (5) shaped to receive a projection (10) on the module such that when the terminal (9) on the module is initially engaged with the outlet terminal the projection (10) enters a release region (6) of the slot (5), after which rotation of the module around the outlet terminal (3) as centre causes the projection (10) to move into a locking region (7) of the slot (5) where the engagement of the projection (10) with the outlet prevents the module being withdrawn from the outlet, release of the module from the outlet requiring counter-rotation of the module with respect to the outlet.

4. A wall outlet according to claim 3, wherein the slot (5) is keyhole shaped, the circular part of the slot (5) constituting the release region (6) and the elongated channel part of the slot (5) constituting the locking region (7).

5. A combination of a wall outlet and a filter and/or splitter module for plugging onto the outlet, the outlet having an electrical terminal (3) for connection of one end of the coaxial cable and the module having an electrical terminal (9), one of the outlet and the module having a slot (5) with a release region (6) and a locking region (7), and the other having a projection (10) shaped to co-operate with the slot such that when the module is plugged onto the outlet the terminal (9) on the module makes initial engagement with the terminal (3) on the outlet and the projection (10) enters the release region (6) of the slot (5), after which the module is rotated with respect to the outlet about the outlet terminal (3) as centre, to cause the projection (10) to enter the locking region (7) of the slot (5) where engagement of the projection (10) with

the slot (5) prevents the module being unplugged from the outlet, release of the module from the outlet requiring counter-rotation of the module with respect to the outlet.

6. A combination of a wall outlet and a filter and/or splitter module according to claim 5, wherein the outlet has the slot (5) and the module has the projection (10).

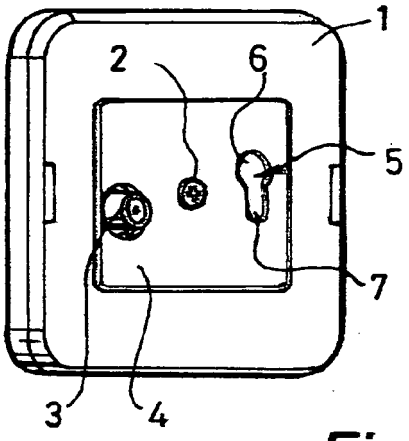


Fig. 1

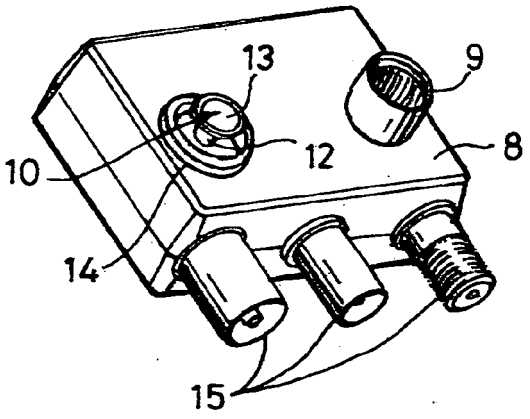


Fig. 2

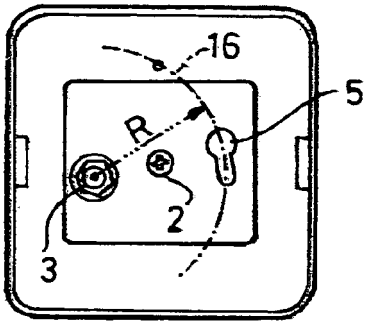


Fig. 3

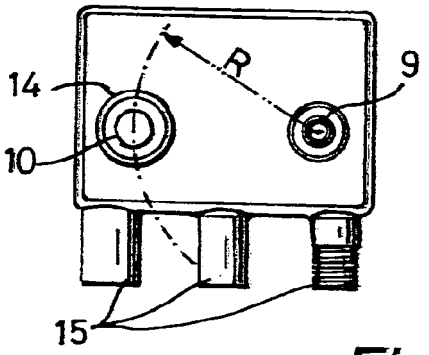


Fig. 4

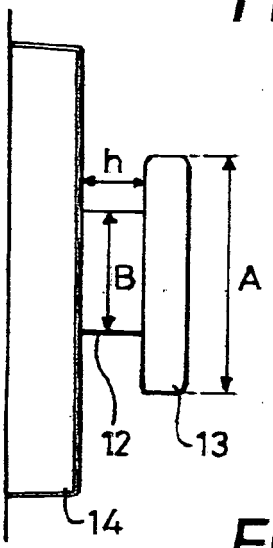


Fig. 5

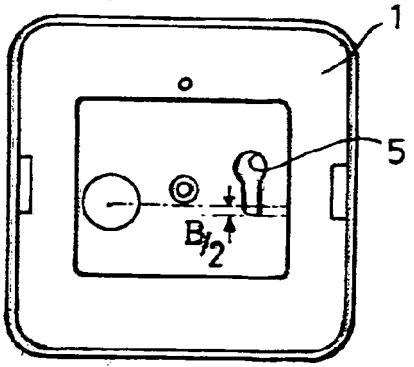


Fig. 6