Nov. 24, 1959 R. R. FREELAND 2,914,639

COAXIAL SWITCH

Filed Aug. 20, 1957

Fig. 1.

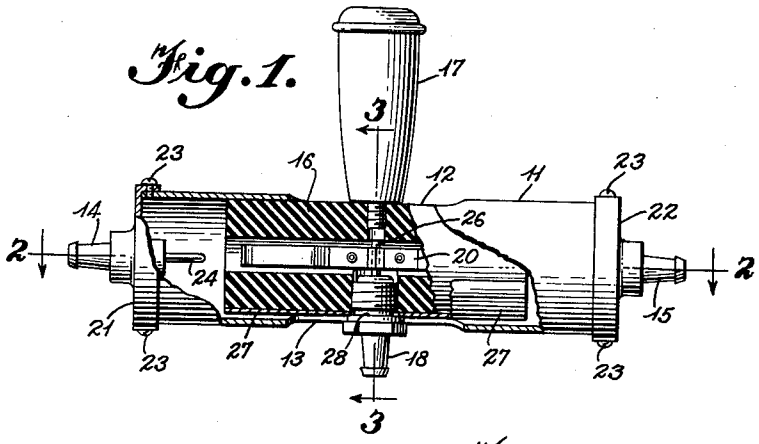


Fig. 2.

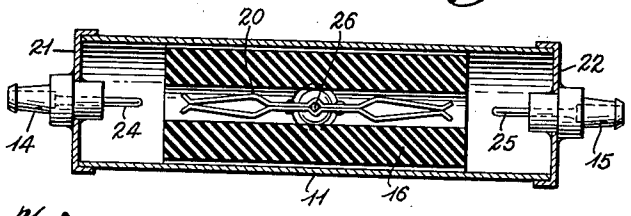


Fig. 3.

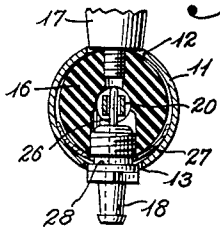


Fig. 4.

INVENTOR
ROYDEN R. FREELAND

BY Stevens, Davis, Miller & Mosher
ATTORNEYS

United States Patent Office 2,914,639
Patented Nov. 24, 1959

2,914,639

COAXIAL SWITCH

Royden R. Freeland, Oklahoma City, Okla.

Application August 20, 1957, Serial No. 679,177

16 Claims. (Cl. 200—153)

This invention relates to a new and improved coaxial switch designed to couple either of two signals to a television receiver without interference.

The invention comprises an outer tubular conductive casing within which slides a plastic barrel. In the middle of the barrel is mounted a leaf clip contact which runs completely through the barrel. The switching action is accomplished by sliding the plastic barrel to either end of the tube to make contact with the coaxial terminals mounted at each end of the tube.

Prior to this invention coaxial switches were known but the switches according to the prior art are more costly to produce, not as long lasting, and not as easy to operate as the switch according to the present invention. For example, one such switch in the prior art has an outer cylindrical member and inner conductive cylinder supported by two end members of the outer cylinder. The switching action is accomplished by sliding a movable contact along the inner cylindrical conductive member. Such an arrangement is subject to wear and the sliding contact often sticks on the inner cylindrical member making switching action difficult. This wear also results in poor contact, thus giving rise to interference with the signal transmitted through the switch.

The objects and advantages of this invention can be better understood with reference to the following figures wherein:

Figure 1 shows an elevation view of the switch partly in cross section.

Figure 2 shows a cross section through Figure 1 illustrating the internal mechanism of the switch.

Figure 3 shows another cross section through Figure 1.

Figure 4 shows an exploded view illustrating the various parts of the switch in detail.

The switch consists of an outer cylindrical conductive casing **11** which has two slots **12** and **13** running longitudinally along the casing diametrically opposite to one another. Mounted on each end of the casing **11** are conductive caps **21** and **22** which fit over the casing **11**. The caps are fastened to the casing by screws. Mounted respectively in the middle of the caps **21** and **22** are the coaxial terminals **14** and **15**. These coaxial terminals have conductive surfaces, which are soldered to make contact with the caps **21** and **22**, and conductive inner contact members **24** and **25** which are insulated from the outer surfaces. Fitting within the casing **11** is a plastic insulating cylindrical barrel **16**, which has a shorter axial dimension than the casing **11**. The barrel **16** has a smaller diameter than the inner wall of the casing so as to make a loose fit therewith. A leaf spring contact **27** is mounted in the casing between the plastic barrel and the inner wall of the casing opposite the lower slot **13**. This spring serves to press the barrel **16** against the upper inner wall of the casing to positively locate the axial position of the barrel and provide friction to hold the barrel longitudinally in place in the barrel but with a small enough force that the barrel may be slid without difficulty. A handle **17** is mounted with a screw

fit in the barrel **11** and this handle projects through the slot **12**. A third coaxial terminal **18** is mounted diametrically opposite to the handle **17** in the barrel **16**. This terminal makes a screw fit with the plastic barrel **16** and extends through the hole in the center of the spring contact **27** and the slot **13**. The terminal has an outer conductive surface and a conductive inner contact member **26**, which is insulated from the outer surface. The outer conductive surface of the coaxial terminal has a flange **28** which presses against the spring contact **27** and firmly mounts it against the barrel **16**. The contact spring **27** has the additional function of providing a conductive path between the casing **11** and the conductive surface of the coaxial terminal **18**. Mounted in the middle of the plastic barrel **16** is a leaf clip contact assembly **20** which runs throughout the length of the barrel and has leaf clip contacts at each end of the barrel. The member **26** makes contact with the leaf clip contact assembly in the exact center of the plastic barrel **16**.

With this construction, the barrel **16** can slide back and forth within the tube **11** and at one end of the barrel the leaf clip contacts assembly will make contact with the inner conductive contact member **25** of the coaxial terminal **15** and at the other end of the barrel the leaf clip assembly will make contact with the inner contact member **24** of the terminal **14**. Thus, the input signals from terminals **14** or **15** can be alternatively connected to the output coaxial terminal **18** simply by sliding the barrel from one position to the other and this sliding is accomplished by means of the knob **17**.

In the preferred embodiment the casing and the barrel have been shown as cylindrical. However, they may be oblong or any other configuration. It is necessary, however, that the inner walls of the casing have the shape of the development of a movement straight line maintained parallel to a reference line, so that the barrel will slide within the casing. These and numerous other modifications can be made in the disclosed embodiment without departing from the spirit and scope of the invention which is to be limited only as defined in the appended claims.

I claim:

1. A coaxial switch comprising a conductive tubular casing having slots defined therein running longitudinally on said cylindrical casing, a cylindrical barrel made of insulating material making a sliding fit with the inner walls of said casing having an axial dimension shorter than said casing, a handle mounted on said barrel and projecting through said one of said slots, a leaf clip contact member mounted in said barrel running axially throughout the length thereof, a conductor mounted in said insulating member making contact with said leaf clip contact member and projecting through the other of said slots, a first conductive cap covering one end of said casing, a conductor mounted in said cap but insulated therefrom and positioned so as to make contact with said leaf clip contact member when said insulating member is slid to said one end of said casing, a second conductive cap covering the other end of said casing, a conductor mounted in said second cap but insulated therefrom and positioned so as to make contact with said leaf clip contact member when said insulating member is slid to the other end of said casing.

2. A coaxial switch comprising an outer conductive casing having an inner wall whose surface is in the shape of a development of the movement of a straight line which is constantly maintained parallel to a reference line, an insulating member making a sliding fit with said surface of the inner wall of said casing, a first conductor mounted on said insulating member, a second conductor mounted on said casing positioned to make contact with

said first conductor, and means to slide said insulating member within said casing to selectively make or break the conductive path between said conductors.

3. A coaxial switch as recited in claim 2 wherein said second conductor is insulated from said casing.

4. A coaxial switch as recited in claim 2 wherein said casing has a slot defined therein running in the same direction as said reference line and wherein said means to slide said insulating member comprises a handle mounted on said insulating member and extending through said slot.

5. A coaxial switch as recited in claim 2 wherein said casing has a slot defined therein running in the same direction as said reference line and wherein there is a third conductor directly connected to said first conductor and extending through said slot.

6. A coaxial switch comprising an outer conductive casing having an inner wall of which the surface is in the shape of a development of the movement of a straight line which is constantly maintained parallel to a reference line, an insulating member making a sliding fit with said surface of the inner wall of said casing, a first conductor mounted on said insulating member, a second conductor mounted on said casing positioned to contact said first conductor when said insulating member is slid to a first position, a third conductor mounted on said casing positioned to contact said first conductor when said insulating member is slid to a second position and means to slide said insulating member between said first and second positions.

7. A coaxial switch as recited in claim 6 wherein said second and third conductors are insulated from said casing.

8. A coaxial switch as recited in claim 6 wherein said casing has a slot defined therein running in the same direction as said reference line and wherein said means to slide said insulating member comprises a handle mounted on said member and extending through said slot.

9. A coaxial switch as recited in claim 6 wherein said casing has a slot defined therein running in the same direction as said reference line and wherein there is provided a fourth conductor mounted on said insulating member directly connected to said first conductor and extending through said slot.

10. A coaxial switch as recited in claim 6 wherein said first conductor runs from one end of said insulating member to the other in the same direction as said reference line and said second and third conductors are positioned to contact said conductor at opposite ends of said insulating member.

11. A coaxial switch as recited in claim 10 wherein said first conductor comprises a leaf clip contact member.

12. A coaxial switch as recited in claim 11 wherein said casing has a slot defined therein running the same direction as said reference line and wherein there is provided a fourth conductor mounted in said insulating member directly connected to said leaf clip contact member, said fourth conductor extending through said slot.

13. A coaxial switch comprising an outer conductive casing, an insulating member making a sliding fit with the inner wall of said casing, a first contact member mounted in said insulating member, and a second contact member mounted on said casing, positioned to make contact with said first contact member, and means to slide said insulating member within said casing to selectively make or break the conductive path between said contacts.

14. A coaxial switch as recited in claim 13 wherein there is provided a leaf spring mounted on said insulating member to press against the inner walls of said casing.

15. A coaxial switch comprising an outer conductive casing, an insulating member making a sliding fit with the inner wall of said casing, a contact member mounted in said insulating member, a coaxial terminal having an outer conductive surface and an inner contact member insulated from said surface, said terminal being mounted on said casing so that said outer surface makes contact with said casing, said terminal being positioned so that said inner contact member of said terminal makes contact with said first mentioned contact member, and means to slide said insulating member within said casing to make or break the conductive path between said first mentioned contact member and said inner contact member of said coaxial terminal.

16. A coaxial switch as recited in claim 15 wherein a slot is defined in said casing and there is provided a conductive leaf spring having a hole defined therein, a second coaxial terminal having an outer conductive surface and an inner contact member insulated from said conductive surface, said coaxial terminal having a flange and being mounted on said insulating member, said flange pinning said leaf spring to said insulating member between said member and the inner wall of said casing, said leaf spring pressing against the inner wall of said casing, said second coaxial terminal extending through said slot.

References Cited in the file of this patent

UNITED STATES PATENTS

2,550,921 Greene ---------- May 1, 1951