

[54] **ADJUSTING DEVICE FOR A COMMUNICATIONS RECEIVER**

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[56]

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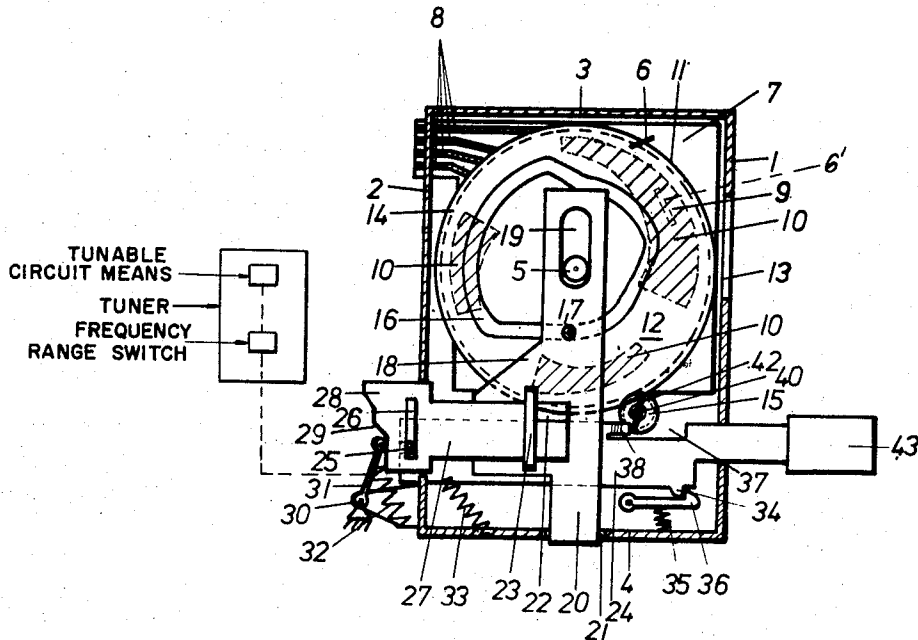
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[57]

ABSTRACT

An adjusting device for a communications receiver which comprises a plurality of potentiometers each having a plurality of resistance sections for different frequencies that can be moved over in succession by a movable wiper member. There is an actuator member for each potentiometer as well as a common frequency band changer device associated with a tuner in the receiver. The device is actuated by a linkage associated with said potentiometer between the movable wiper member, the actuator member and the frequency band changer device in dependence on the position of the movable wiper member when the actuator is operated.

10 Claims, 2 Drawing Figures



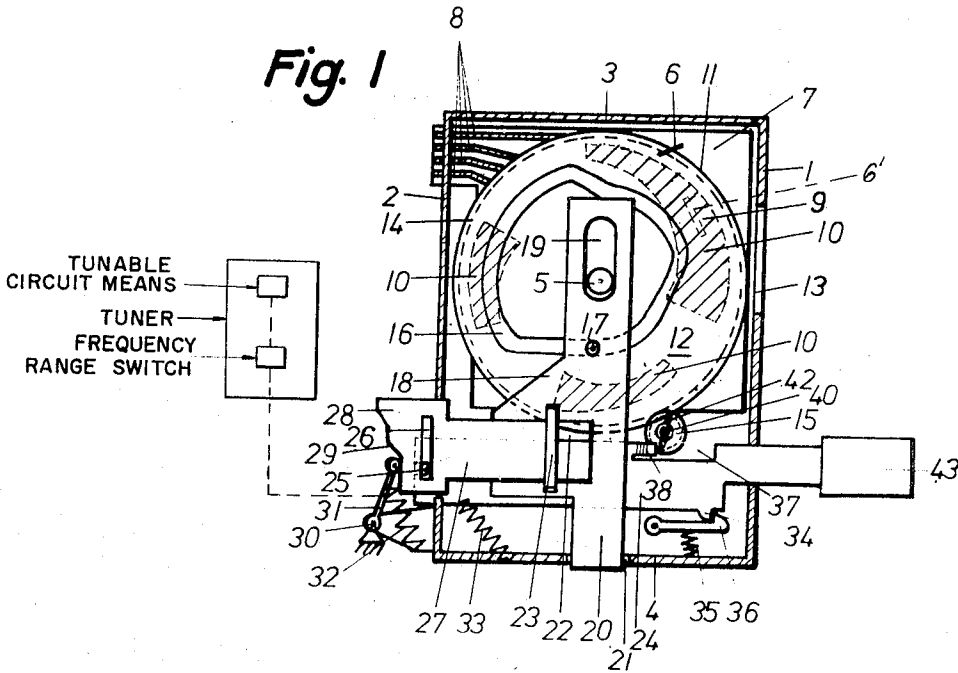
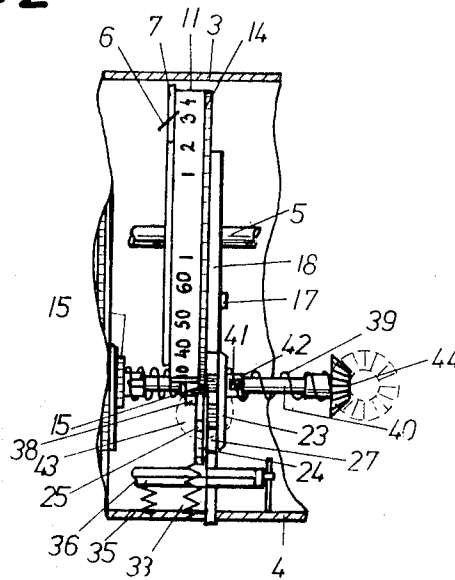


Fig. 2



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ADJUSTING DEVICE FOR A COMMUNICATIONS RECEIVER

BACKGROUND OF THE INVENTION

The present invention relates to an adjusting unit for a tuner, for example, a tuner which can be tuned over a plurality of frequency ranges by means of voltage-dependent capacitors. The adjusting unit consists of a plurality of potentiometers which can be switched on one at a time by means of an associated pushbutton. The potentiometer which is switched on can be actuated through a tuning knob, and each potentiometer comprises a plurality of resistance sections which can be covered in succession by a slider. Each resistance section is associated with one frequency range in the tuner.

In one such known adjusting device, the potentiometers are constructed in the form of rotary potentiometers which are disposed parallel to one another and one behind the other centrally with respect to an imaginary axis (German Gebrauchsmuster No. 1,983,074.) In this case, the drive of the individual potentiometers is effected either through a key button which is associated with each potentiometer and is made rotatable for this purpose, or through a common central tuning knob which, on pressing a key associated with one potentiometer, can be coupled, through a gearwheel or a worm, to the gearwheel provided on the potentiometer.

In another known adjusting device for receiving sets in the communication art, using rotary potentiometers, it is known to render band switching possible by the fact that the rotatable part comprises an insulating member, the peripheral surface of which is at various radial distances from the axis of rotation and a lever actuating a frequency-range switch bears against this peripheral surface (German Gebrauchsmuster No. 1,912,957). In this adjusting device, a click-stop mechanism is provided which only permits the rotation of the shaft through fixed angular amounts.

SUMMARY OF THE INVENTION

It is the object of the present invention to construct an adjusting device with band switching in such a manner that the band switching is effected automatically. The purpose of this is that no separate means are needed for switching over the frequency-range switch and instead the frequency ranges are switched over automatically in the course of sweeping over all of them.

According to the invention, there is provided an adjusting device for a tuner for a communications receiver comprising a plurality of potentiometers each having a plurality of resistance sections corresponding to different frequency bands and a movable wiper member having a wiper or slider adapted to move over said resistance sections in succession. There is an actuator member for actuating each said potentiometer, a frequency band changer device common to all potentiometers and mechanical linkage means, associated with each said potentiometer. This linkage means extends between the associated movable wiper member, the associated actuator member and said frequency band changer device for actuating said frequency band changer device in dependence on the position of said associated movable wiper member at the time said associated actuator member is operated.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in greater detail, by way of example with reference to the accompanying drawings in which:

FIG. 1 is a sectional view and block diagram showing one potentiometer and associated equipment for a device in accordance with the invention, and

FIG. 2 is a side view, with the casing removed of the part of the device shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, 1 is a front wall, 2 a rear wall, 3 the top and 4 the bottom of the housing of an adjusting unit. In this unit there is provided a central shaft 5 on which are mounted one or more potentiometers 6 which are constructed in the form of rotary potentiometers and disposed side by side.

A potentiometer 6 consists of a printed circuit 7 on which the lead-in connections 8 and the resistance paths 9 are disposed in the form of segments 10. A specific frequency range is associated with each segment 10 and the segment 10 is made correspondingly large according to the extent of the frequency range.

The peripheral surface 11 of the movable wiper member 12 which is cup-shaped and carries, in the interior thereof, a wiper 6' adapted to contact segments 10, is constructed in the form of an indicating scale and marked with the individual frequency channels. A recess 13 is provided in the front wall 1 and through it the peripheral surface 11 and hence the set channel can be seen.

Mounted at the side of the peripheral surface 11 is an extension 14 which is constructed in the form of a toothed rim or gearwheel and which can be driven by means of a pinion 15. Furthermore, the movable wiper member 12 is provided with a groove 16 which is sunk in the face of the disc and constructed in the form of a cam. Engaging in this groove 16 is a pin 17 of a setting member 18 which is guided for displacement by means of a slot 19 in which there engages the central shaft 5 and by means of an extension 20 which is held for displacement in a slot 21 in the bottom 4.

The cam track of the groove 16 is so selected that its radial spacing from the central shaft 5 comprises a plurality of arcs about this central shaft 5 corresponding to the number of resistance segments 10 present, and the length of which also corresponds to the length thereof although its radial spacing from the central shaft 5 varies. By this arrangement, a resistance path and switching over the frequency-range switch of an associated tuner is available for each frequency range.

The setting member 18 comprises a groove 22 which extends horizontally and is provided on one side with a guide web 23 and is covered, at least partially, at the other side by a pushbutton slide or actuator member 24. The pushbutton slide 24 has an outwardly curved extension 25 which engages in a vertical slot 26 in a slide 27. The latter is so constructed that it is displaceable in the groove 22 and is held in position by the web 23 and the pushbutton slide 24. In addition, an end portion 28 of the slide 27 projects through the rear wall 2 and is likewise guided by this means. The terminal edge 29 of the end portion 28 is stepped and inclined, and an actuating lever, or frequency band changer device 31 mounted for pivoting about a pin 30 can bear against it under the force of a tension spring 32. As seen in FIG. 1, the actuating lever 31 is interconnected with the frequency-range switch in the tuner of an associated receiver. This frequency-range switch can switch on associated tunable circuit means with capacity varying diodes so that the tuning unit can be tuned.

The pushbutton slide 24 is subject to the action of a tension spring 33 by means of which it can be pulled into its position of rest. Also provided on the pushbutton slide 24 is a detent 34 which can co-operate with a latch 36 subject to the action of a compression spring 35.

The upper edge of the pushbutton slide 24 is provided with a recess 37 which is formed, for example, by means of bent-out lug 38. This lug is bent obliquely and serves to bring the pinion 15 out of engagement with the gearwheel 14 against the action of a compression spring 39 as the push-button slide 24 slides back. For this purpose, the pinion is guided for axial displacement on a drive shaft 40 and held against rotation by means of a slot 41 in which there engages a pin 42 rigidly mounted on the drive shaft 40.

The actuation of the drive shaft 40 may be effected directly through a drive knob or, as illustrated in FIG. 2, through a bevel gear 44 so that the drive knob can project at the same

side as the key or pushbutton or buttons 43 provided on the pushbutton slide(s) 24.

The mode of operation of the adjusting device according to the invention is as follows:

When the key button 43 is pressed, the pushbutton slide or actuator 24 is displaced towards the left in the course of which the detent 34 comes behind that of the latch 36 and the pushbutton slide 24 is locked in this position. Simultaneously with this movement, the slide 27 is entrained by the same distance through the link 25, in the course of which it slides in the groove 22 in the setting member 18. The terminal edge 29 impinges on the end of the actuating lever 31 and moves this against the spring force 32. By this means, the frequency-range switch is brought into a specific position so that the frequency range in the tuner which corresponds to the setting of the actuating lever 31 in the position shown is switched on. At the same time, the pinion 15 is displaced towards the left towards the gearwheel 14 as a result of the spring force of the spring 39 and engages therein when the teeth coincide precisely. On actuating of the drive shaft 40, the movable wiper member 12 with the wiper 6' is turned so that a specific potential can be taken off at the resistance path 9 which is currently switched on and which is associated with a specific frequency range or from the associated segment 10, and be supplied to the voltage-dependent capacitors of the tuning unit. By this means, a specific channel, or transmitter, in the set frequency range is selected. When the drive shaft 40 is turned further, a part of the cam 16 at a different radial spacing engages the pin 17 so that the pin, and with it the setting member 18, is moved completely downwards, for example, on counterclockwise rotation of the movable wiper member 12 in FIG. 1. With this movement, the slide 27 is also displaced downwards and the terminal edge 29, as a result of its construction, displaces the actuating lever 31 further towards the left so that the frequency-range switch in the tuner is actuated and another frequency range is switched on. At the same time, the wiper 6' on movable wiper member 12 coincides with the next following associated segment 10 so that a specific transmitter in the preset frequency range can be tuned in.

By pressing another key button, not shown, the latch 36 is displaced downwards so that the key button 43 previously depressed is disengaged and the one which has been freshly pressed is locked. As the slide 24 slides back, the pinion 15 is brought out of engagement with the gearwheel 14 as a result of the inclination of the lug 38 being displaced towards the right by the spring force 39. In this manner, it is possible to set each pushbutton to a specific transmitter and to store this transmitter of any desired frequency range.

By use of the above described device, it can be ensured, in a simple manner, that the frequency range associated with each resistance segment on the potentiometer is switched on or that, when turning the potentiometer slider or wiper, the particular resistance range which is being covered, is connected to the frequency-determining means of a tuning unit by the frequency-range switch.

The invention is not restricted to rotary potentiometers but may also be used for linear flat-path potentiometers or spindle potentiometers or the like.

It will be understood that the above description of the present invention is susceptible to various modifications, changes and adaptations.

What is claimed is:

1. An adjusting device for a tuner in a communications receiver that includes a frequency range switch and associated tunable circuit means, comprising a plurality of potentiometers rotatably supported in housing means, each potentiometer having a plurality of resistance sections corresponding to different frequency bands in the tuner and adapted to be

selectively connected to the tunable circuit means, a movable wiper member adapted to move over said resistance sections in succession, an actuator member for actuating each said potentiometer, a frequency band changer device common to all potentiometers and connected to the frequency-range switch, mechanical linkage means, associated with each said potentiometer, between the associated movable wiper member, the associated actuator member and said frequency band changer device for actuating said frequency band changer device, said mechanical linkage means including a mechanical setting member displaceable variably by said movable wiper member in dependence on the position of said associated movable wiper member on operation of said associated actuator member.

2. Device as defined in claim 1, wherein each of said potentiometers comprises a rotary potentiometer having a plurality of resistance segments each associated with a different frequency band in the tuner, connecting lines for said individual segments, said lines being connected to the tunable circuit means in the associated tuner and said movable wiper member is a rotatable member which includes a cam track for actuating the frequency band changer device through said mechanical setting member.

3. A device as defined in claim 2 wherein each said movable wiper member comprises a disc defining said cam track in a plane surface thereof and wherein said mechanical setting member carries a pin which is engaged in said cam track.

4. A device as defined in claim 2, wherein each said movable wiper member comprises a cup, a wiper mounted in the interior of said cup and said cam track positioned at the outside of the bottom of said cup.

5. A device as defined in claim 3 further comprises a shaft means supporting said potentiometers and on which each said movable wiper member rotates, each of said mechanical setting members being guided for sliding movement over said shaft means by a slot defined therein, and guide means in said housing means through which each of said mechanical setting members projects.

6. A device as defined in claim 3 wherein said pin is concentric with a shaft means of the axis of rotation of said movable wiper member, said mechanical setting member being guided for sliding movement over said shaft means by a slot defined therein, and guide means for each of said mechanical setting members in said housing means.

7. A device as defined in claim 5, wherein said frequency band changer device includes a slide member associated with each potentiometer, means for guiding said slide in said mechanical setting member for displacement transversely with respect to the direction of sliding of said mechanical setting member, and wherein said actuator member includes a pushbutton slide, and means for coupling said slide member with said push-button slide.

8. A device as defined in claim 7, wherein said coupling means comprises an extension on said pushbutton slide and a slot in said slide member engaged by said extension.

9. A device as defined in claim 8, wherein said frequency band changer device includes an element for actuating the frequency-range switch and wherein an inclined terminal edge on each of said slide members is designed to bear against and actuate said element when an associated push-button is depressed on a push-button slide.

10. A device as defined in claim 9 wherein each potentiometer includes a toothed rim on said movable wiper member, a drive portion engagement with said toothed rim when a push-button is depressed and a portion on said pushbutton slide being bent away obliquely therefrom to engage said drive portion when said push-button is depressed.

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