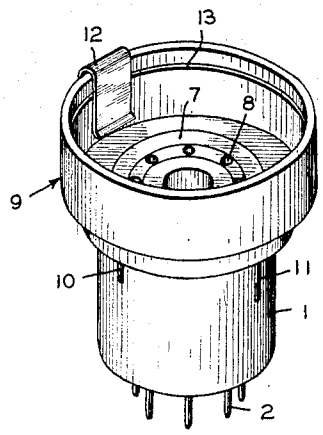
Nov. 15, 1960 R. J. MONTZ 2,960,605

TUBE ADAPTER WITH VARIABLY ADJUSTABLE INTERELECTRODE RHEOSTAT

Filed July 8, 1958

FIG. 1



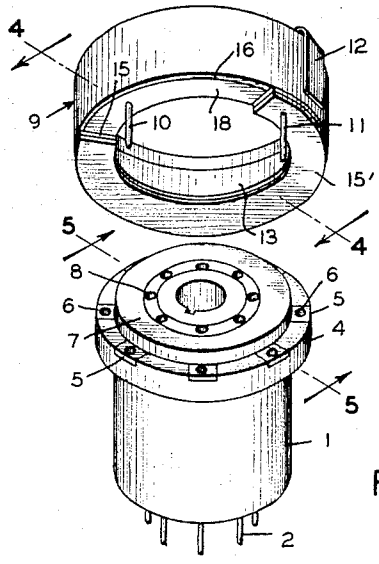
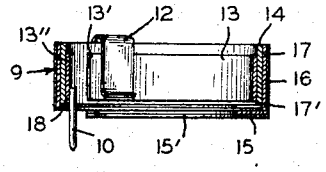


FIG. 2

FIG. 3

FIG. 4



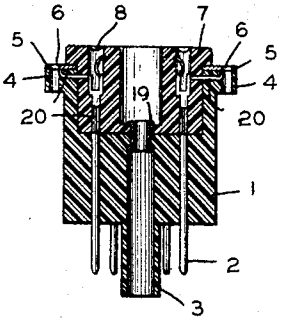


FIG. 5

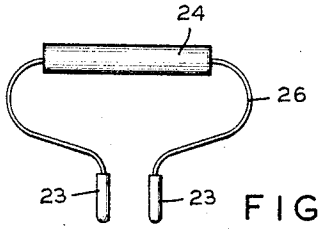


FIG. 6

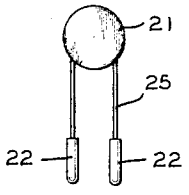


FIG. 7

INVENTOR,

ROY J. MONTZ

BY

ATTORNEY

United States Patent Office 2,960,605
Patented Nov. 15, 1960

2,960,605

TUBE ADAPTER WITH VARIABLY ADJUSTABLE INTERELECTRODE RHEOSTAT

Roy J. Montz, P.O. Box 426, La Place, La.

Filed July 8, 1958, Ser. No. 747,187

5 Claims. (Cl. 250—16)

The present invention relates to an adapter and more particularly an adapter for electronic tubes wherein there is provided means for varying the electrical characteristics across selective electrodes or contacts of said tubes.

More particularly the adapter of the present invention comprises a base portion, a plurality of prongs projecting therefrom, said prongs being spaced relative to each other in a pre-selected pattern, a plurality of prong-receiving contacts spaced relative to each other in said pre-selected pattern, said contacts being electrically connected to corresponding prongs, at least two additional contacts outwardly spaced from said prong-receiving contacts, each of said outwardly spaced contacts being electrically connected to one of said prongs. In addition, there is provided means for varying the electrical characteristics across said spaced contacts or the prongs associated therewith.

The means for varying the electrical characteristics preferably comprises a capacitor or a resistor which is removably mounted or secured to said spaced contacts.

According to the preferred construction the means for varying the electrical characteristics comprises a variable resistor. In the preferred construction, the spaced contacts comprise pin jacks and the resistor is plugged into the pin jacks.

In the preferred construction, the resistor comprising a support, a resistance element, a first pin electrically connected to one end of said resistance element, a second pin, and movable conductor means electrically connected to said second pin, said movable means slidably contacting said resistance element to vary the electrical resistance between said pins as said movable means is moved, the pins being removably mounted in the pin jacks of the base.

An object of the present invention is to provide means for varying the electrical characteristics across the circuit in an electronic device while said electronic device is operating.

A further object of the present invention is to provide means for varying the electrical characteristics across two electrodes or contacts of an electronic tube while said electronic tube is in an electronic device without necessitating removal of the chassis of said device from its cabinet.

These and other objects of the invention will be readily apparent from the accompanying description with particular reference to the accompanying drawings wherein:

Fig. 1 shows a perspective view of the adapter of the present invention with the variable resistance element in place.

Fig. 2 shows a perspective view of the variable resistance element from the bottom thereof.

Fig. 3 shows a perspective view of the adapter of the present invention without the variable resistance element plugged in.

Fig. 4 is a cross-section of the variable resistance element taken along the line 4—4 of Fig. 2.

Fig. 5 is a cross-section of the adapter base of Fig. 3 taken along the line 5—5 of Fig. 3.

Fig. 6 is a plan view of a modification of the present invention and shows a capacitor adapted to be plugged into the adapter shown in Fig. 3.

Fig. 7 is another modification of a capacitor to be used in the present invention, and shows a ceramic capacitor.

The adapter of the present invention comprises a base portion 1 having a plurality of circumferentially spaced prongs 2 projecting from one side thereof and a guide post 3. In other words, the base portion 1 of the invention is generally fashioned in the same manner as a conventional base of an electronic tube. On the other side of the base 1 there is an annular shoulder or enlargement 4 having mounted thereon a plurality of circumferentially spaced contacts or pin jacks 5, each contact having a hole 6 therein for a purpose to be later described.

On the upper side of the base portion 1 is mounted an insert or socket portion 7, said socket portion including a plurality of circumferentially spaced prong-receiving contacts 8. The prongs 2 are spaced relative to each other in a pre-selected pattern as is conventional with electronic tube bases. The prong-receiving recesses in the socket portion 7 are also spaced from each other in the same pre-selected pattern. Thus, it is evident that when the adapter of the present invention is inserted in a conventional socket in the chassis of an electronic device, the tube which is normally inserted in the socket can now be inserted into the socket portion 7.

Each of the prongs 2 is electrically connected to its corresponding prong-receiving contact 8 and the corresponding pin jack 5 by means of wires 20. In this manner, when the adapter is plugged into the chassis socket and the tube is plugged into the adapter, the tube will function in precisely the same manner as it would in the absence of the adapter of the present invention.

It is frequently desirable to vary the electrical characteristics across a pair of electrodes or contacts of an electronic tube while the tube is in operation in the electronic device. It is evident from the above description that the adapter of the present invention provides a series of contacts, each corresponding to an element or electrode of the tube which contacts are easily accessible while the tube is in operation.

In the preferred form of the present invention, there are provided at least two pin jacks 5 outwardly radially spaced from said prong-receiving contacts and an electrical element can be connected across such pin jacks while the tube is in operation. This electrical element may be either a ceramic capacitor (see Fig. 7) including capacitor 21, leads 25 terminating in pins 22, or a variable resistor as shown in Figs. 1, 2 and 4.

When pins 22 are plugged into openings 6 in the pin jacks, the capacitance across the pin jacks is varied. Instead of using a ceramic capacitor, a paper capacitor (see Fig. 6) may be used comprising a paper capacitor 24, leads 26 and pins 23. The preferred form of the present invention provides a resistor, preferably a variable resistor, which can be plugged into the pin jacks (see Figs. 1, 2 and 4).

The variable resistor includes adapter ring 9 on which is mounted pins 10 and 11 which can be received within openings 6 of contact 5 and make contact therewith. The adapter ring comprises an arcuate resistance element 13 and an arcuate or annular contact ring or element 16 concentric with and spaced from the resistance element. The arcuate resistance element 13 does not define a closed annulus, the two ends 13' and 13'' being spaced from each other. Pin 11 is electrically con-

nected to end 13'' of the resistance element leaving end 13' free of any fixed electrical connection. Pin 11 is electrically connected to the contact ring 16.

In order to close the circuit between resistance element 13 and the contact ring 16, there is provided a movable or slidable contact or conductor means 12 which is preferably U-shaped or folded about the adapter ring 9 in such a manner that one leg or arm of the U slidably contacts the resistance element 13 while the other arm or leg slidably contacts the contact ring 16. As the slidable contact 12 is circumferentially moved around the adapter ring 9 in the direction toward the pin 11, resistance across pins 10 and 11 is decreased and as the slidable contact 12 is moved in the opposite direction, namely, toward the free end 13' of the resistance element, the resistance between contacts 10 and 11 is increased. The resistance element 13 may be any conventional resistance element such as a carbon element.

Resistance element 13 is mounted on insulating support 14. In order to provide the necessary rigidity and strength of the adapter ring, there may be provided a spacer ring 17 and spaced base plates 15 and 18. Arcuate base plate 15 extends around a major portion of the circumference of the adapter ring and has pin 11 mounted therein. When base plate 15 is a conductor, it may be in physical contact with contact element 16 thereby maintaining pin 11 in electrical contact with contact element 16. There is also provided an insulating layer 15' on the underside of plate 15 to prevent plate 15 from short-circuiting pin jacks 5. Alternatively, plate 15 may be of insulating material and pin 11 may be electrically connected to contact element 16 by means of a wire (not shown). Base plate 18 supports pin 10 and when base plate 18 is a conductor, it is maintained out of contact with element 16 by means of bottom portion 17' of spacer ring 17.

When using the device illustrated in Figs. 1, 2 and 4, the base 1 is plugged into the socket of the chassis of the electronic device, and the adapter ring is positioned about the socket portion of the adapter in the manner shown in Fig. 1 with the pins 10 and 11 being seated in and making contact with the appropriate pin jacks 5. The tube is then inserted into the socket portion. Then with the electronic device operating, the slide contact 12 can be moved to vary the resistance across pins 10 and 11 and therefore across the corresponding electrodes of the electronic tube.

The device of the present invention is particularly adaptable to be used with a television set to make temporary repairs without removal of the chassis from the cabinet. A frequent problem arising in the maintenance of a television set is the tendency of the picture to roll due to changes in the resistors and capacitors in the vertical oscillator stage of the television receiver. Frequently these values change to such an extent that the vertical hold control is at the end of its range and cannot be properly adjusted. When such a condition occurs, it is only necessary to remove the vertical oscillator tube, plug in the adapter of the present invention in the oscillator tube socket and plug the oscillator tube into the adapter. The pins of the adapter ring will be plugged into pin jacks corresponding to the grid and either the cathode or ground. In most cases, it is merely necessary to increase the resistance between the grid and cathode or ground and, therefore, the resistance as shown in Figs. 1, 2 and 4 may be plugged in and adjusted to the proper value.

On the other hand, if the condition is such that a capacitor should be added, the modification of Figs. 6 or 7 can be used. Thus it is seen that it is very simple to make an emergency temporary repair of the television receiver. Of course, the adapter of the present invention may be left in the chassis as long as desired although generally the chassis will ultimately be removed from the cabinet and a permanent repair made to the chassis wiring.

In the illustrated embodiment as shown in Fig. 5, the socket portion is made as a separate molded unit from the base portion 1 and the two portions are secured to each other by means of grommet 19. It is evident that the socket portion and the base portion may be made as one unitary article by molding if so desired.

Although the adapter of the present invention is particularly adapted to temporary repair of television receivers, it is evident that such an adapter has wide utility in various electronic equipment since various tests and/or adjustments can be made in parts of the circuit while the electronic equipment is operating.

It is apparent that the adapter ring can be so constructed that the pins 10 and 11 are movable relative to each other about a center which is the center of the adapter ring in order to change the relative spacing between the pins for proper seating in selected pin jacks.

I claim:

1. An adapter comprising a base portion, a plurality of prongs projecting therefrom, said prongs being spaced relative to each other in a pre-selected pattern, a plurality of prong-receiving contacts spaced relative to each other in said pre-selected pattern, said contacts being electrically connected to corresponding prongs, at least two pin jacks outwardly spaced from said prong-receiving contacts, each of said jacks being electrically connected to one of said prongs, and means for varying the electrical characteristics across said prongs, said means comprising a support, a resistance element, a first pin electrically connected to one end of said element, a second pin, and movable conductor means connected to said second pin, said movable means slidably contacting said resistance element to vary the electrical resistance between said pins as said movable means is moved, said pins being removably mounted in said pin jacks.

2. An adapter comprising a base portion, a plurality of circumferentially spaced prongs projecting from one side thereof, said prongs being spaced relative to each other in a pre-selected pattern, a socket portion comprising a plurality of prong receiving contacts facing the opposite side of said base portion, said prong receiving contacts being spaced relative to each other in said pre-selected pattern, said contacts being electrically connected to corresponding prongs, at least two pin jacks facing said opposite side of said base portion, said pin jacks being radially outwardly spaced from said prong receiving contacts, each of said jacks being electrically connected to one of said prongs, and variable resistance means removably plugged into said pin jacks, said resistance means comprising an arcuate resistance element, an arcuate contact element spaced from and concentric with said resistance element, a pair of spaced pins parallel to the axis of said resistance element, the first of said pins being electrically connected to one end of said resistance element, the second of said pins being electrically connected to said contact element, and a slidable contact in sliding electrical contact with said contact element and said resistance element to vary the electrical resistance between said pins as said slidable contact is moved, said pins being removably mounted in said pin jacks.

3. An adapter comprising a base portion, a plurality of prongs projecting therefrom, said prongs being spaced relative to each other in a pre-selected pattern, a plurality of prong-receiving contacts spaced relative to each other in said pre-selected pattern, said contacts being electrically connected to corresponding prongs, at least two pin jacks outwardly spaced from said prong-receiving contacts, each of said jacks being electrically connected to one of said prongs, and means for varying the electrical characteristics across said prongs, said means comprising an arcuate resistance element spaced from and concentric with said resistance element, a pair of spaced pins parallel to the axis of said resistance element, the first of said pins being electrically connected to one end of said resistance element, the second of said pins being electrically con-

nected to said contact element, and a slidable contact in sliding electrical contact with said contact element and said resistance element to vary the electrical resistance between said pins as said slidable contact is moved, said pins being removably mounted in said pin jacks.

4. An adapter as recited in claim 3 wherein there is provided an annular insulating support between said resistance element and said contact element, and wherein there is provided a pair of spaced base plates, the first of said pins being secured to one of said plates, the second of said pins being secured to the second of said plates.

5. An adapter as recited in claim 2 wherein there is provided an annular insulating support between said resistance element and said contact element, and wherein there is provided a pair of spaced base plates, the first of said pins being secured to one of said plates, the second of said pins being secured to the second of said plates.

References Cited in the file of this patent

UNITED STATES PATENTS

1,838,987	Cooper	Dec. 29, 1931
2,421,780	Frear	June 10, 1947
2,578,288	Cook	Dec. 11, 1951
2,647,990	Peterson	Aug. 4, 1953
2,752,537	Wolfe	June 26, 1956

FOREIGN PATENTS

564,541	France	Oct. 20, 1923