

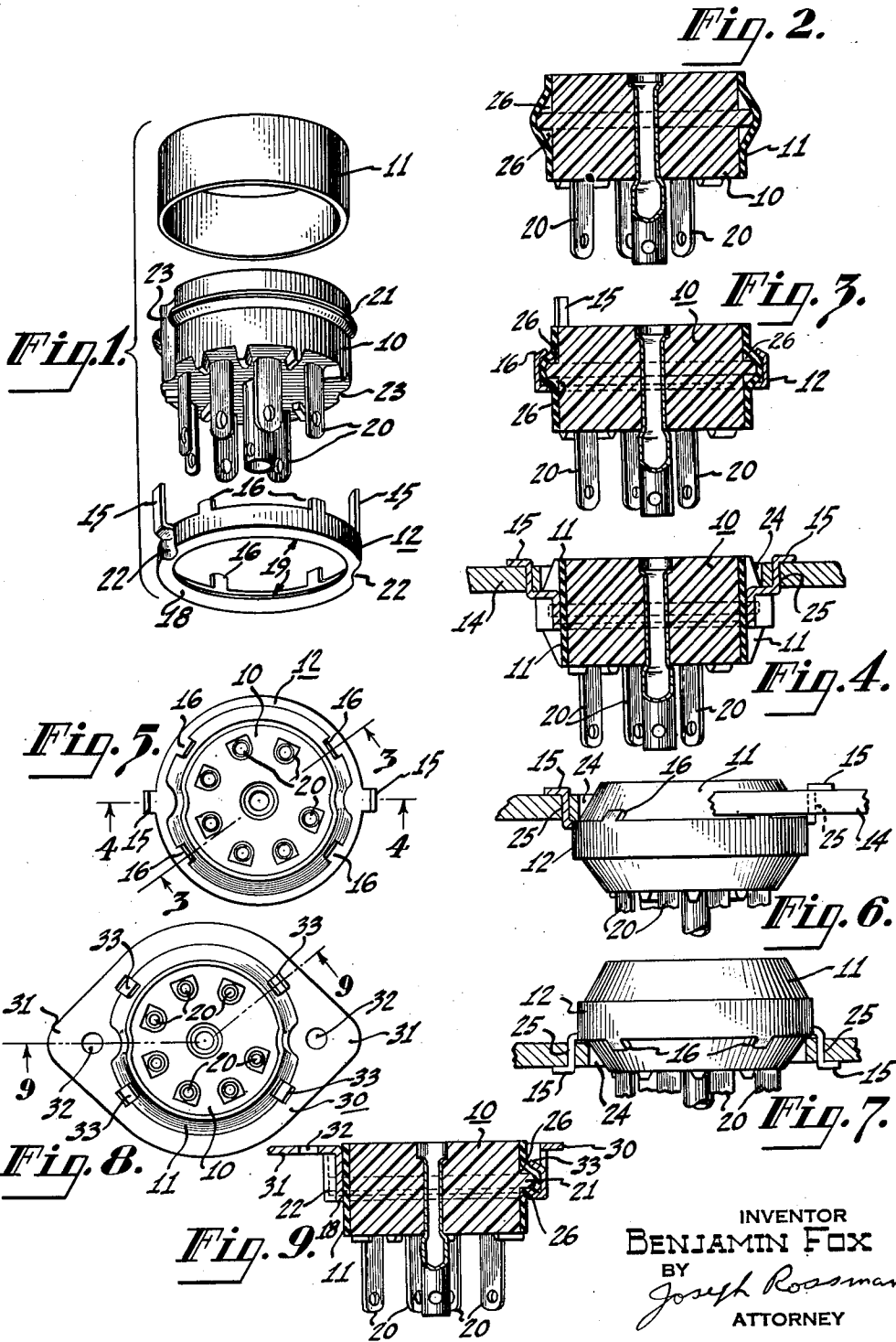
March 18, 1952

B. FOX

2,590,001

NONMICROPHONIC VACUUM TUBE SOCKET ASSEMBLY

Filed Dec. 28, 1948



INVENTOR
BENJAMIN FOX
BY
Joseph Roasman
ATTORNEY

UNITED STATES PATENT OFFICE

2,590,001

NONMICROPHONIC VACUUM TUBE SOCKET
ASSEMBLY

Benjamin Fox, Philadelphia, Pa.

Application December 28, 1948, Serial No. 67,583

3 Claims. (Cl. 173-339)

1

This invention relates to a shock-proof mounting assembly for radio or vacuum tubes used in high frequency radio circuits to prevent undesired oscillations producing the effect of "microphonics," sometimes also referred to as "howls" or "ringing." This effect appears to be produced by mechanical vibrations of the vacuum tubes originating at the points of physical contact between the socket of the vacuum tube and the chassis in which it is mounted.

It has been proposed previously to mount vacuum tubes on resilient pads or bases, such as sponge rubber, to overcome this difficulty. This mode of mounting is however expensive and inconvenient for assembly purposes. The present invention overcomes the previous difficulties in a simple and relatively inexpensive manner by providing a shock-proof floating type of mounting for vacuum tubes that absorbs mechanical vibrations and shocks.

The advantages and effectiveness of my invention will be apparent from the following specification and drawings, wherein like parts are indicated by the same numerals, but it is to be understood that the detailed description given hereinafter is merely illustrative of a typical specific embodiment of my invention. The essential features of my invention may, of course, be embodied in other specific embodiments and variations of the construction hereinafter described which are intended to be included in the appended claims.

Referring to the drawings:

Figure 1 is an exploded, perspective view of one form of a socket assembly according to my present invention,

Figure 2 is a central, sectional view of the partly assembled socket prior to application of the mounting ring,

Figure 3 is a sectional view taken on the line 3-3 of Figure 5,

Figure 4 is a sectional view taken on the line 4-4 of Figure 5,

Figure 5 is a top plan view of the completely assembled socket of Figure 1,

Figure 6 is a side elevation, partly in section, of a socket of the "bottom mounted" type formed in accordance with my invention, the socket being shown mounted on a support,

Figure 7 is a view similar to Figure 6, but showing a socket of the "top mounted" type constructed according to my invention,

Figure 8 is a top plan view of a completely assembled socket according to a somewhat different form of my invention, and

Figure 9 is a sectional view taken on the line 9-9 of Figure 8.

The vacuum tube socket body is indicated in the drawing by the numeral 10 and is made of any suitable, conventional, molded phenolic

2

plastic or other insulator material. The socket body 10, which is made of suitable, conventional shape and size and is provided with openings to receive suitable electrical metal contacts 20, is also formed with an annular circumferentially extending rib 21 which is recessed or broken away at diametrically opposite points to provide a pair of seats 23.

An elastic, soft, yieldable, tubular sleeve 11 of suitable thickness and dimensions is provided on the socket body 10. The sleeve 11 may be of vulcanized rubber or other resilient and yieldable material, such as synthetic rubber or other elastomers or polymers. The sleeve 11 is of initially slightly smaller internal diameter than the diameter of the insulator socket body 10 but it can be readily stretched and slipped endwise over the socket body 10. As shown in Figure 2, the sleeve 11 snugly embraces the socket body 10 and extends over the rib 21 and engages the body portions above and below the rib to provide circumferentially extending air pockets 26 adjacent each side of the rib 21 for a purpose to be explained hereinafter.

The elastic sleeve 11 is preferably tubular in form and of a relatively thin wall thickness, say $\frac{1}{8}$ ", and is of such length as to cover the full length or external surface of the socket body 10, but if desired, it may be of greater length.

A metal mounting ring 12 of suitable dimensions is employed for mounting the socket on a chassis 14. The ring 12 is provided with a pair of diametrically opposed mounting ears 15 and a plurality of circumferentially distributed retaining lugs 16 all extending from one end of the mounting ring 12 in the same direction. At its opposite end, the ring 12 is formed with an inwardly extending, substantially continuous flange 18. The flange 18 is formed with diametrically opposed, inwardly extending indentations 22, in alignment with mounting ears 15. These indentations correspond to the contour of the seats or recesses 23 provided in socket 10. The mounting ring 12 is adapted to be slipped axially over the elastic sleeve 11 until its flange 18 engages the bulging portion of the sleeve 11 extending over the rib 21, and with its indentations 22 fitted into the seats 23 whereby the ring 12 is prevented from rotating on the sleeve 11 and the socket body 10. The retaining lugs 16 are then pressed down over the opposite portion of the rib 21, as shown in Figures 3 and 5, to thereby fasten the mounting ring 12 in place over the sleeve 11. It is to be noted that the external diameter of the rib 21 is such that the mounting ring 12 will freely embrace the sleeve 11 whereby the socket body 10 will be free to rock in all directions relative to the mounting ring 12.

The socket may be mounted on a chassis 14

3

or the like by inserting it through a suitable socket opening 24 therein and with the mounting ears 15 inserted through adjacent openings 25 and bent over laterally, as shown in Figures 4, 6 and 7. If desired, the laterally bent portions of the mounting ears 15 may be secured to the chassis 14 by solder, screws, rivets or in any other suitable manner. In this way, the ring 12 is securely fastened to the chassis 14, while the socket body 10 is floatingly suspended thereon. In accordance with customary practice, my improved socket may be "bottom mounted" on the chassis 14 by inserting the mounting ears 15 upwardly through the openings 25, as shown in Figure 6, or it may be "top mounted" by inserting the mounting ears 15 downwardly through the openings 25, as shown in Figure 7.

The mounting ring 12 is preferably of a width less than the width of the socket body member 10, so as to extend only about the median position of the socket member 10 in the region of the rib 21, whereby portions of the rubber sleeve 11 are exposed above and below the ring 12. These exposed portions of the sleeve are adapted to contact the exposed edges of the opening 24 in the support or chassis in which the socket is to be inserted, as explained hereinafter.

My invention provides a shock-proof mounting assembly for vacuum tube sockets which prevents "microphonics" because of the floating mounting described above. It will be noted from Figures 6 and 7 that, when the socket is mounted on the chassis 14, the inner circumference 19 of the flange 18 engages the sleeve 11 at one of the air pockets 26 and that the chassis 14 engages the sleeve 11 at the other air pocket 26. This provides a floating mounting which, in combination with the rubber sleeve 11, will absorb any mechanical vibration that may otherwise be transmitted so that substantially no vibration will reach the socket.

In the modified socket assembly shown in Figures 8 and 9, there is employed in lieu of the mounting ring 12, a metal saddle 30 having diametrically opposite ears 31 which are provided with openings 32 for alignment with similarly spaced openings in the chassis or other support and for reception of a rivet or the like (not shown) in well known manner. Like the mounting ring 12, the saddle 30 is formed with indentations 22 for cooperation with the seats 23 in the body member 10, and with an inwardly-directed flange 18 which cooperates with the rib 21 of the body 10. A plurality of lugs or tabs 33 formed in the cylindrical wall of the saddle take the place of the tabs 16 of the ring 12 and are pressed inwardly against the flange 21 after the saddle has been applied to thereby lock the saddle to the body member 10 and the rubber sleeve 11. Here, again, it will be noted that an air pocket 26 is left between the rubber sleeve and both sides of the rib 21 to provide the floating mounting for the socket.

From the foregoing description, it will be seen that the vacuum tube socket 10 is yieldingly suspended in the resilient sleeve 11 which is retained in the chassis in the manner previously described. Such yielding suspension prevents any external physical vibrations from being transmitted to the socket and consequently to the vacuum tube positioned in the socket. When a vacuum tube is inserted in the socket 10, the resilient sleeve 11 is slightly depressed, but as soon as the pressure of the hand inserting the

4

tube is released, the socket will return to its normal suspended position.

The present invention thus provides a very inexpensive construction for shock-proof mountings for radio and vacuum tubes which is efficient, simple in construction and easy to assemble.

The foregoing details have been given for the purpose of explanation and not limitation, since many changes and modifications may be made in the disclosed embodiments without departing from the scope of the invention.

I claim:

1. A vacuum tube socket assembly comprising a socket body member having an external circumferentially extending rib thereon, a soft, resilient sleeve snugly embracing and frictionally engaging said socket body member, said sleeve hanging an initial internal diameter less than the external diameter of said body member whereby said sleeve is under tension on said body member, said sleeve extending over said rib in both directions therebeyond longitudinally of said body member to provide a sealed air pocket on each side of said rib and adjacent thereto, a mounting member embracing said sleeve in frictional engagement therewith in the region of said rib, said mounting member being provided with inwardly directed portions for retaining it on said sleeve, said mounting member being of less width than said sleeve in a direction longitudinally of said body member whereby said sleeve has at least a portion thereof external to said mounting member in said longitudinal direction, said inwardly directed portions contacting said sleeve in the region of said air pockets and pressingly engaging said sleeve, and additional means integral with said mounting member for suspending said mounting member on a suitable support.

2. A vacuum tube socket assembly according to claim 1 wherein said rib is provided with recesses at diametrically opposed points constituting a pair of seats on said body member, and wherein said mounting member is provided with diametrically opposed, inwardly extending indentations which are seated in said seats.

3. A vacuum tube socket assembly according to claim 1 wherein said mounting member comprises a saddle embracing said sleeve about said rib, said saddle including diametrically opposed ears for attaching said saddle to a support, said saddle also including inwardly directed portions cooperatively associated with and embracing said rib for retaining said saddle on said sleeve, and said inwardly directed portions pressingly engaging said sleeve.

BENJAMIN FOX.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,098,747	Henning	Nov. 9, 1937
2,195,180	Marzetti	Mar. 26, 1940
2,205,051	Schmitt	June 18, 1940
2,455,324	Wagstaff	Nov. 30, 1948
2,505,163	Wanner	Apr. 25, 1950

FOREIGN PATENTS

Number	Country	Date
242,443	Great Britain	Nov. 12, 1925