

May 10, 1932.

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1,857,769

METHOD OF AND APPARATUS FOR MANUFACTURING HIGH OHMIC RESISTANCES

Filed June 28, 1928

Fig.1

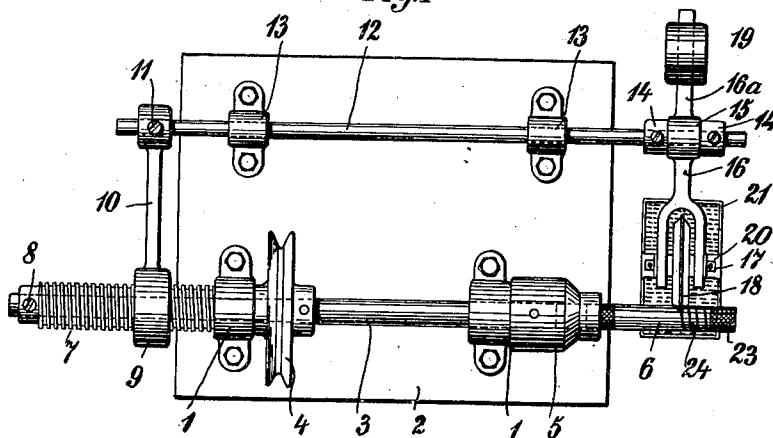


Fig.2

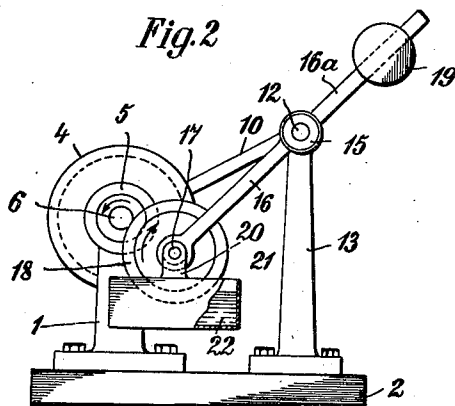
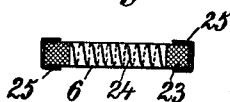


Fig.3



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METHOD OF AND APPARATUS FOR MANUFACTURING HIGH OHMIC RESISTANCES

Application filed June 28, 1928, Serial No. 253,965, and in Germany July 2, 1927.

My invention relates to a method of, and apparatus for, manufacturing high-ohmic resistances comprising an insulating body and a strip of a suitable resistor on the body, and it is an object of my invention to provide a resistance of this type in which the length of the resistor as compared with the length of the body is a maximum.

To this end, I arrange the resistor strip in a helical line on the body.

My resistance is particularly suitable for wireless systems though by no means limited to such.

Resistances of this type are made by applying to a body of insulating material, generally a rod, a strip or line of a poor conductor or resistor, as carbon. The carbon or other substance or compound is dissolved or suspended in a liquid which serves as the vehicle for applying it to the body. The load which a resistance will stand, is a function of proper distribution of heat over its area, and such distribution is favoured by applying the strip in a helical line.

In a preferred embodiment of a machine for reducing my invention to practice, I provide a roller which carries the liquid with the resistor suspended or dissolved therein and I move the roller past the rotating insulator so as to generate thereon a helical resistor strip. This, or an analogous, method is suitable for the quantity production, by simple means, of resistances which are endowed with the high ohmic capacity required and will stand heavy load.

In the accompanying drawings a machine for making resistances according to my invention, and a resistance, are illustrated by way of example.

Fig. 1 is a plan view,

Fig. 2 is an elevation of the machine, viewed from the right in Fig. 1.

Fig. 3 is an elevation of the resistance.

Referring now to the drawings, and first to Figs. 1 and 2, 2 is a base plate, 1, 1 are bearings on the plate, 3 is a shaft in the bearings, 4 is a pulley on the shaft, 5 is a chuck or holder at one end of the shaft, 6 is a body of insulating material, for instance, a glass rod, a pipe or the like, 7 is a threaded sleeve on

the other end of the shaft which is preferably exchangeable, and 8 is a nut for holding the sleeve 7 in position between the end of the shaft 3 and one of its bearings 1.

The sleeve 7 acts in the manner of a guide screw, 9 is a nut on the sleeve, 10 is an arm on the nut 9, 11 is a screw in an eye at the end of the arm 10, 12 is a slide which is held in the eye of the arm by the screw 11, 13, 13 are brackets on the base plate 2 in which the slide is adapted to move, 16, 16a is a double-armed lever on the end of the slide adjacent the chucked body 6, 17 is a pin in the forked end of the lever arm 16, 18 is a rotary carrier or roller on the pin the edge of which concave at either side, 19 is a balance weight on the other arm 16a of the lever, instead of which a spring may be provided, and 21 is a reservoir which is suspended on the pin 17 by suitable lugs 20.

In operation the reservoir 21 is filled with a liquid 22, for instance, a suspension or solution of a resistor or high-resistance conductor of electricity such as carbon, the roller 18 being partly immersed in the liquid 22. The insulating body 6 is annealed in an electric furnace before being chucked on the shaft 3, and is provided at either end with a layer 23 of a good conductor, as copper which may be protected by metal sleeves 25 before or after the formation of the resistor strip thereon. After the body 6 has been chucked, rotation is imparted to the shaft 3 and this rotation causes the roller 18 on the lever 16, 16a to travel along the body 6 by the means described. The roller 18 is held to the rod 6 under slight pressure by the weight 19, or its equivalent, not shown, and therefore is rotated by the body 6. Its edge lifts liquid from the reservoir 21 and applies it to the rod at the point of contact, generating thereon a resistor strip 24 which at either end is in contact with the good conductors 23.

By annealing the rod before treating it any foreign matter adhering to its surface, as organic particles, water vapour, and the like, is removed so that the resistor liquid adheres uniformly to its surface. By suitably selecting the annealing temperature, it is also possible to influence, within certain limits, the ad-

hesion between the body 6 and the resistor, and to obtain strips of various widths, without exchanging the roller 18.

The pitch of the helical line 24 may be varied by exchanging the sleeve 7 for one of another pitch.

It will be understood that the peripheral shape of the roller 18 dipping into the reservoir 21 is such as to produce on such roller, a peripheral line or stripe of the liquid taken up from said reservoir, which stripe is transferred by contact to the peripheral surface of the insulating body 6, producing on the latter a uniform helical stripe with well-defined outline.

I claim:

1. A machine for making high-ohmic resistances comprising a shaft, means for rotating said shaft, a chuck on said shaft adapted to hold an insulating body, a rocking lever, a roller adapted to carry a resistor and pivotally supported on said lever, means for holding said roller in contact with said body, and means for imparting relative axial displacement to said chuck and said roller.

2. A machine for making high-ohmic resistances comprising a chuck adapted to hold an insulating body, means for applying a strip of a resistor to said insulating body, a reservoir containing a supply of resistor liquid, a movable support for immersing said applying means in said reservoir and for holding said applying means against the insulating body, and mechanism for imparting to said chuck and said applying means movement with respect to each other so as to apply said strip in a helical line the convolutions of which are out of contact with each other.

3. The method of making electric resistances, which consists in forming on a rotating carrier, a line or stripe of a liquid containing a high-resistance conductor of electricity, and transferring such stripe by contact to the peripheral surface of an insulating body with a motion which will apply said stripe to the body along a helical line the convolutions of which are out of contact with each other.

4. A machine for making electric resistances, comprising a holder for an insulating body, a reservoir for a liquid containing a high-resistance conductor of electricity, a roller arranged to dip into said liquid and having its periphery shaped to form such liquid into a stripe and to transfer such stripe to said body, and means for effecting a relative rotary motion of said holder and said roller about the axis of the holder and at the same time a relative translation lengthwise of said axis, the extent of such translation being greater than the width of the stripe, whereby there will be formed on said body, a helical stripe the convolutions of which are out of contact with each other.

5. The method of making electric resist-

ances, which consists in bringing a carrier bearing a liquid which contains a high-resistance conductor of electricity, in contact with the peripheral surface of an insulating body while effecting a relative rotary motion of said body and said carrier about the axis of the body and also a relative translation lengthwise of said axis, the extent of such translation being greater than the width of the carrier portion in contact with the peripheral surface of the insulating body whereby a stripe of said liquid is applied to said body along a helical line the convolutions of which are out of contact with each other.

6. A machine for making electric resistances, comprising a holder for an insulating body, a carrier adapted to bear a liquid containing a high-resistance conductor of electricity and to transfer a stripe of such liquid by contact to said insulating body, and means for effecting a relative rotary motion of said holder and said carrier about the axis of the holder and at the same time a relative translation lengthwise of said axis, the extent of such translation being greater than the width of the stripe, whereby there will be formed on said body, a helical stripe the convolutions of which are out of contact with each other.

In testimony whereof, I hereunto affix my signature.

ISIDOR SILBERSTEIN.