

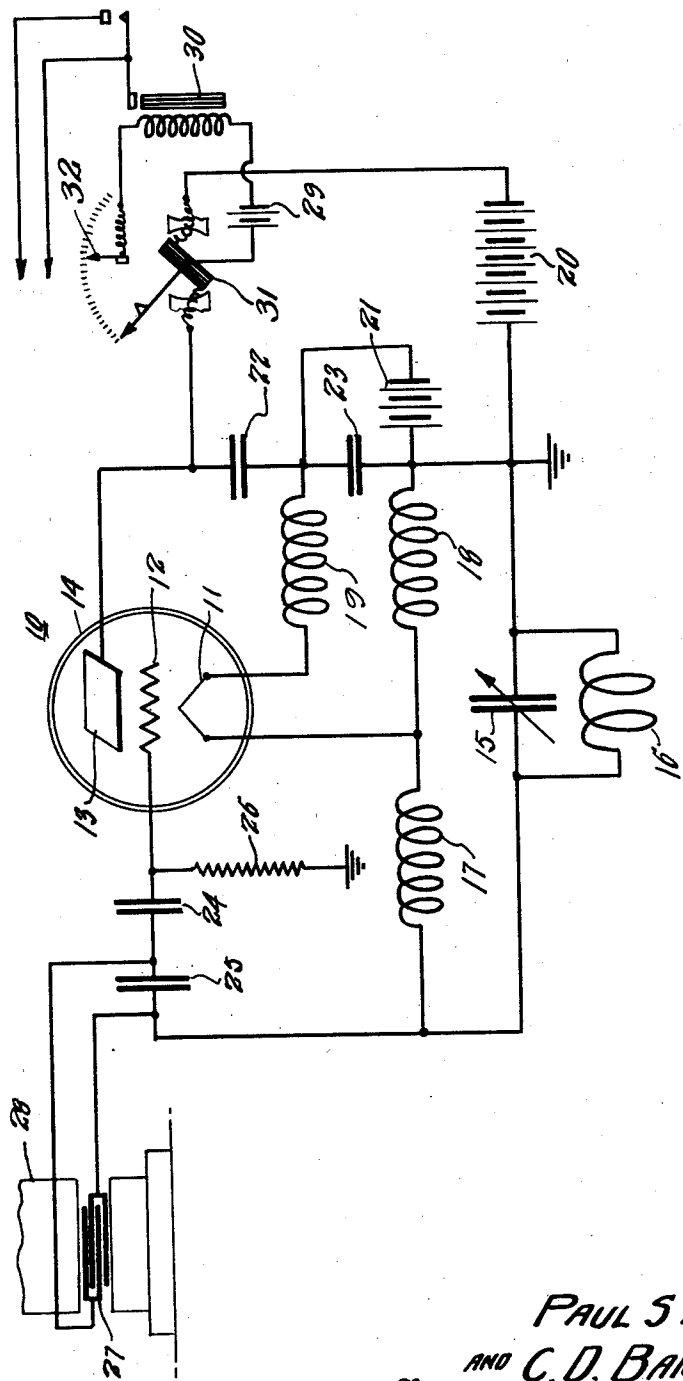
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APPARATUS AND METHOD FOR MANUFACTURING CONDENSERS

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APPARATUS AND METHOD FOR MANUFACTURING CONDENSERS

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This invention relates to an apparatus and a method for manufacturing condensers and more particularly to a means and method for producing condensers having uniform capacitance.

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As shown, 10 represents generally a vacuum tube having a filament 11, a grid 12 and a plate 13 enclosed within an evacuated envelope or container 14.

Connected to the input and output circuits of the tube is a low loss tank circuit comprising a large variable capacitance 15 and a small inductance 16. The value of this capacity and inductance determine and control the frequency at which the tube oscillates.

Connected with the filament 11 are high frequency choke coils 17 and 18. Those are composed of a relatively large number of turns of wire and are connected respectively in the grid and plate circuit of the tube.

When in operation, these choke coils introduce or generate two driving electromotive forces which may be considered substantially 180° out of phase. The geometric sum of these separate electromotive forces maintain a heavy oscillating current in the circuit. A third choke coil 19 is connected to the filament and serves to maintain it at high potential with respect to the ground.

The electrical supply for the tube comprises a filament battery 21 and a plate battery 20 both of which are maintained at ground potential, and bypass condensers 22 and 23 of large value permitting circulation of high frequency currents are connected in the plate circuit.

The frequency at which the tube operates is controlled mainly by the value of the condenser 15 and the inductance 16. The condenser 15 is of large value and hence the interelectrode capacity of the tube becomes substantially negligible in effect.

Connected in the grid circuit are grid condensers 24 and 25, and a leak resistance 26. The value of the condensers and resistance is so chosen that the high frequency oscillations generated in the tank circuit will periodically charge the condensers up to a certain value and then discharge through the leak resistance to the ground. Therefore, the condensers 24 and 25 and the resistance 26 produce a periodic interruption or choking of the high frequency oscillations. Connected in parallel with the condenser 25 is a condenser 27 in the process of manufacture. As shown, the condenser 27 is positioned between the jaws of a press 28 which may be of any conventional type.

A movable coil relay 31 is connected in the output circuit. This relay is adapted to close a

5 In the manufacture of fixed condensers of the type where pressure is applied during an impregnation or binding process, the usual method is to regulate the size of the conductive plates, the insulating medium, the pressure and other factors entering into the process to the nearest possible value. This necessitates measuring and segregating the produce after manufacture according to the capacitance value resulting from the approximate standards set up and the factory-run average. Such a method, while it undoubtedly results in quantitative production, naturally does not insure a high average of specific values.

It has been found that in the manufacture of paper condensers of the wound insulator conductor type, the same inaccuracies prevail, and that in the producing of variable condensers of the precision type, the pressure applied to the assembly may vary the value of the condenser. The present invention aims to overcome these objections.

An object of the invention is to provide means for manufacturing condensers wherein the exact amount of capacitance during the process of manufacture may be determined.

Another object of the invention is to provide means for manufacturing condensers having the advantages of a quick accurate method of determining the capacitance values during the process of manufacture.

A further object of the invention is to provide a means and method for the manufacture of condensers having a checking control on the capacitance values of the condensers during the manufacture thereof.

A still further object of the invention is to provide a means and a method for the manufacture of condensers whereby a uniform capacitance of the condensers may be attained during the process of manufacture.

Further objects and advantages of the invention reside in the various structural details hereinafter described and claimed as will appear upon reference to the following specification and to the accompanying drawing.

The drawing is a comprehensive schematic view illustrating the various parts that go to make up the present invention.

This invention is a continuation in part of ap-

secondary circuit having connected therein, a battery 29 and a more powerful relay 30. As shown, a contact 32 is provided and this contact is set to a position corresponding to the desired capacity of the condenser in the process of manufacture. The relay 30 is adapted to close a circuit having means therein, not shown, for controlling the press.

When the plate current has reached a value corresponding to the desired capacity of the condenser as set by the contact 32 in the process of manufacture, the sensitive relay closes the secondary circuit whereupon the more powerful relay 30 is actuated to stop the press and relieve the pressure. It is, of course, to be understood that the sensitive relay 31 is made adjustable, so that it may be set according to a predetermined value.

From the foregoing, it will be perfectly obvious that as pressure is applied through the medium of the press to the condenser in the process of manufacture, a change in the frequency of modulation is effected by reason of a change in the capacitance of the condenser in the process of manufacture which is connected in parallel with the condenser 25. This change in the modulating frequency effects the plate current and the change in the plate current actuates the sensitive relay to close the more powerful relay to stop the press and relieve the pressure.

While one illustrative embodiment has been described, it is not our intention to limit the scope of the invention to the particular embodiment otherwise than by the terms of the appended claims.

Having thus described the various features of the invention, what we claim as new and desire to secure by Letters Patent, is:—

1. An apparatus for producing condensers of uniform capacitance in a process of manufacture comprising a self-modulated radio frequency oscillator, means for connecting the condenser under manufacture in the grid circuit of the oscillator, a press for compacting the condenser, and means connected in the plate circuit for automatically stopping the operation of the press.

2. An apparatus for producing condensers of uniform capacitance in a process of manufacture comprising a self-modulated radio frequency oscillator, a condenser connected in the grid circuit of the oscillator, means for connecting a condenser in the process of manufacture in parallel to the condenser in the grid circuit, a press for compacting the last named condenser, and means connected in the plate circuit of the oscillator adapted to automatically relieve the pressure exerted by the press when the condenser under manufacture has reached the desired value.

3. An apparatus for producing condensers of uniform capacitance in a process of manufacture comprising a self-modulated radio frequency oscillator, a capacitance and resistance connected in the grid circuit of the oscillator, a capacitance connected in series with the first mentioned capacitance, means for connecting a condenser in the process of manufacture in parallel with the last mentioned capacitance a press for applying pressure to the capacitance, and means connected in the plate circuit of the oscillator adapted to automatically release the press when the condenser in the process of manufacture has reached the desired value of capacitance.

4. An apparatus for producing condensers of uniform capacitance in a process of manufacture

comprising a self-modulated radio frequency oscillator, condensers connected in series in the grid leak of the oscillator, a resistance connected in the grid leak, means for connecting a condenser in the process of manufacture in parallel to the other condenser in the grid circuit, a press for applying pressure to the condenser being manufactured, a sensitive relay connected in the plate circuit of the oscillator and a more powerful relay associated therewith adapted to automatically release the press when the condenser in the process of manufacture has reached the desired value.

5. An apparatus for producing condensers of uniform capacitance in a process of manufacture comprising a self-modulated radio frequency oscillator adapted to produce high frequency oscillations modulated at audible frequency, a grid circuit having a condenser and a resistance connected therein, a condenser connected in series with the condenser and resistance, means for connecting a condenser in the process of manufacture in parallel with the last mentioned condenser, a press for applying pressure to the condenser being manufactured, a plate circuit having a sensitive relay adapted to automatically operate a more powerful relay to release the press, and a tank circuit having a low loss and a condenser connected between the plate and grid of the oscillator.

6. An apparatus for producing condensers of uniform capacitance in a process of manufacture comprising a press, a high frequency electronic tube oscillator adapted to produce high frequency oscillations modulated at audible frequency, a tank circuit of low loss connected between the plate and grid of the tube, a plate circuit in which the mean value of the plate current is dependent upon the values of the modulated frequency, a sensitive relay connected in the plate circuit, a more powerful relay operable by the sensitive relay to automatically stop the movement of the press, a condenser connected in the grid circuit of the oscillator and means for connecting a condenser in the process of manufacture in parallel with the condenser in the grid circuit.

7. An apparatus for producing condensers of uniform capacitance in a process of manufacture comprising a press, a high frequency electronic tube oscillator of the constant frequency type, a grid circuit comprising condensers and a resistance, means for connecting a condenser in parallel with one of the condensers in the grid circuit said last mentioned condensers being positioned between the jaws of the press, a tank circuit connected between the grid and plate of the oscillator having small inductance, large capacitance and low losses, a plate circuit in which the mean value of the plate current is a function of the reactance of the tank circuit, a more powerful relay actuated by the sensitive relay adapted to automatically stop the movement of the jaws of the press.

8. An apparatus for producing condensers of a uniform capacitance in a process of manufacture comprising a press, a high frequency electronic tube oscillator of the constant frequency type, a grid circuit for the oscillator having condensers and a resistance discharging at audible frequency, a tank circuit connected between the grid and plate having small inductance, large capacitance and low loss, a plate circuit in which the mean value of the plate current is a function

of the reactance of the tank circuit, means for connecting a condenser positioned in the press in parallel to one of the condensers in the grid circuit, a sensitive relay in the plate circuit and a more powerful relay actuated by the sensitive relay to automatically stop the press when the condenser in the process of manufacture has reached the desired value.

9. An apparatus for producing condensers of a uniform capacitance in a process of manufacture comprising a press, a high frequency oscillator of the electronic tube type adapted to pro-

duce high frequency oscillations modulated at audible frequency, a tank circuit of low loss connected thereto, a plate circuit including a relay adapted to actuate a more powerful relay for automatically stopping the press, condensers and a resistance connected in the grid circuit of the oscillator and means for connecting a condenser in the process of manufacture in parallel with one of the condensers in the grid circuit.

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