

June 20, 1933.

G. MEYER-JAGENBERG

1,915,028

ELECTRIC CIGARETTE TURNING PROCESS AND APPARATUS

Filed Jan. 22, 1932

3 Sheets-Sheet 1

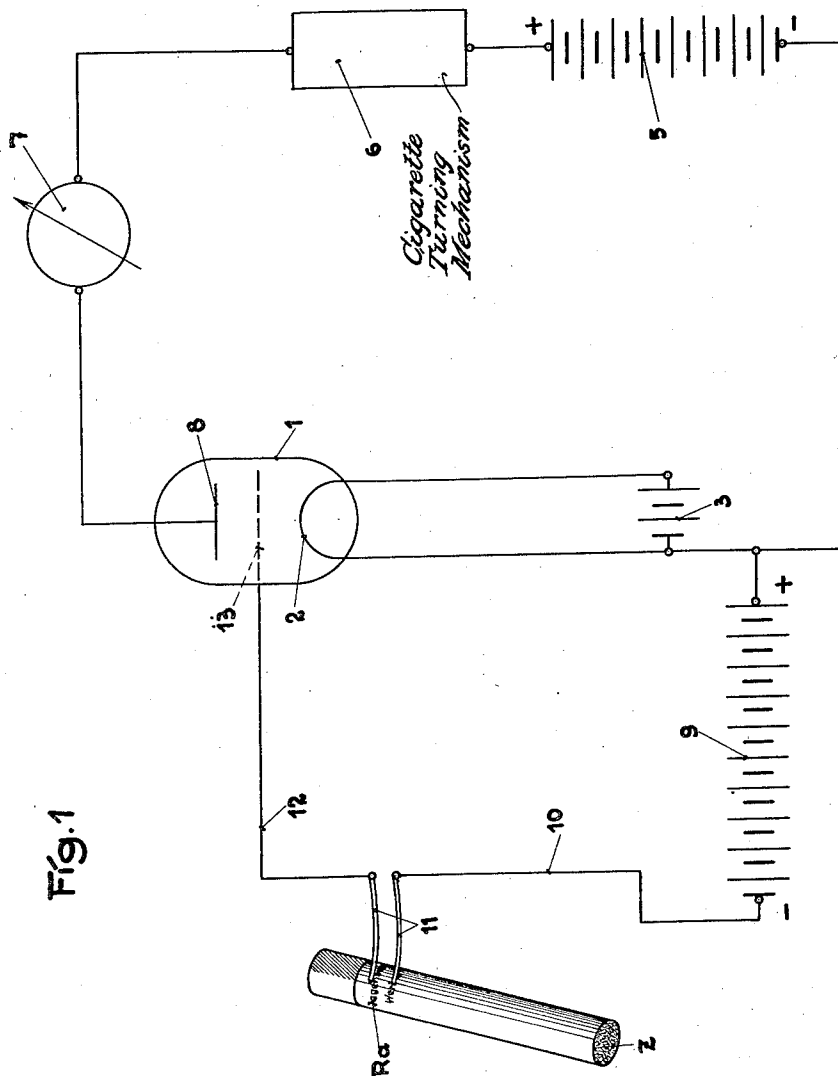


Fig. 1

Inventor
Günther Meyer-Jagenberg

by J. J. J. J.
Atty.

June 20, 1933.

G. MEYER-JAGENBERG

1,915,028

ELECTRIC CIGARETTE TURNING PROCESS AND APPARATUS

Filed Jan. 22, 1932

3 Sheets-Sheet 2

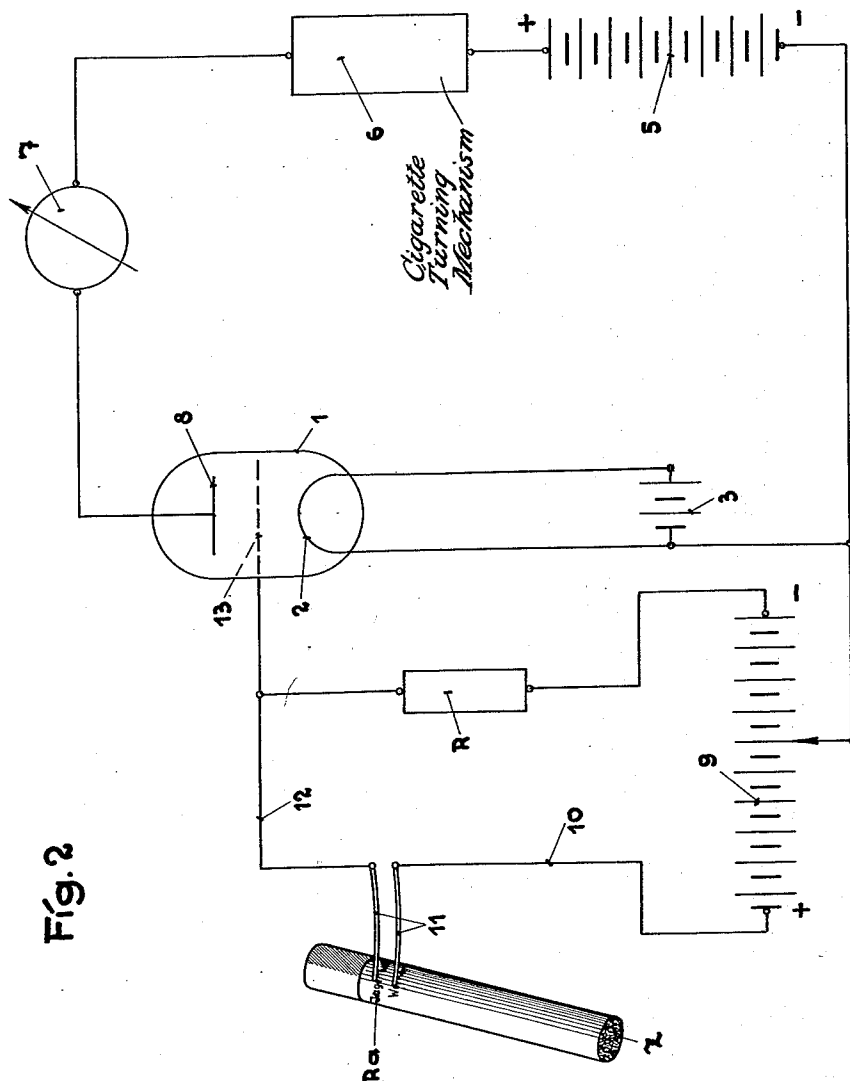


Fig. 2

Inventor
Günther Meyer-Jagenberg

By *J. J. J. J.*
Att'y

June 20, 1933.

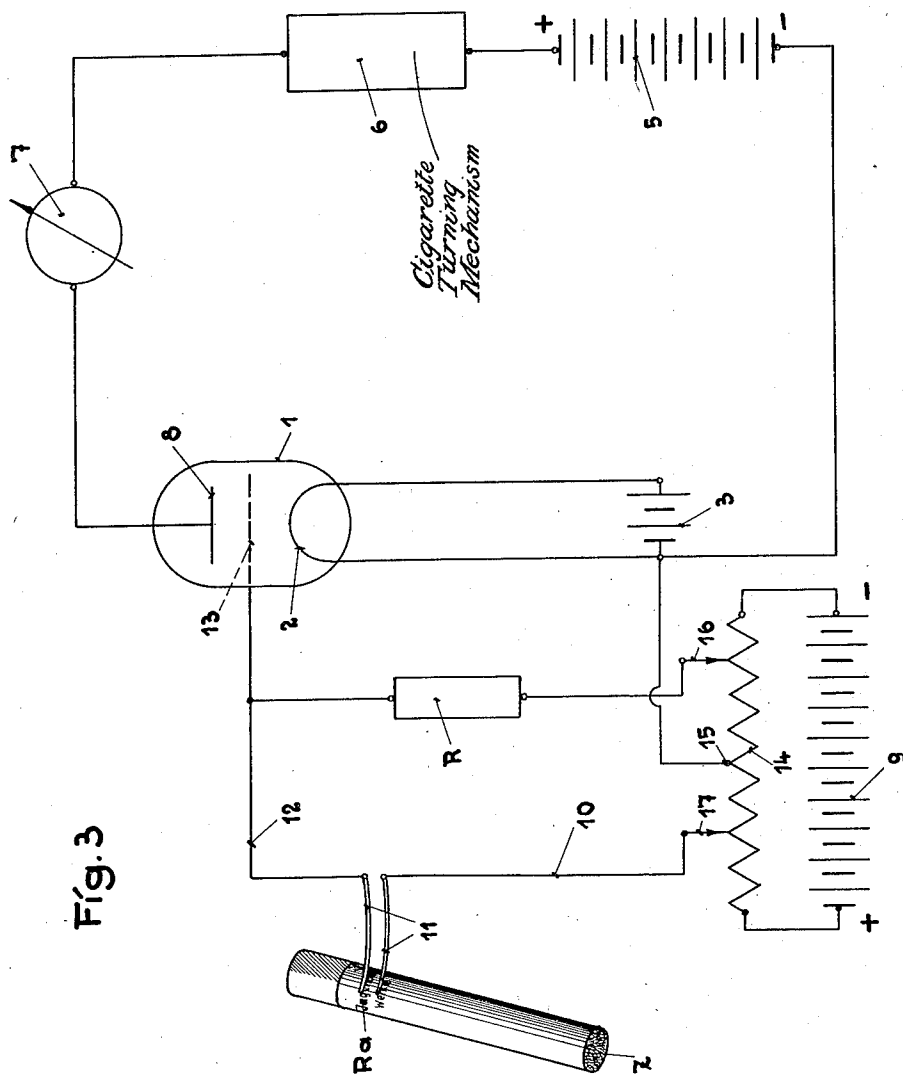
G. MEYER-JAGENBERG

1,915,028

ELECTRIC CIGARETTE TURNING PROCESS AND APPARATUS

Filed Jan. 22, 1932

3 Sheets-Sheet 3



Inventor
Günther Meyer-Jagenberg

by *J. Smiric*
Atty.

UNITED STATES PATENT OFFICE

GÜNTHER MEYER-JAGENBERG, OF DUSSELDORF, GERMANY

ELECTRIC CIGARETTE TURNING PROCESS AND APPARATUS

Application filed January 22, 1932, Serial No. 588,221, and in Germany January 19, 1931.

This invention is directed to a process for automatically determining the position of inscriptions on cigarettes in cigarette packing machines through the medium of an electrical agency, of which the inscription on the cigarette forms a part, through the printing of such inscription with, for example, an electrically conductive ink.

In cigarette packing machines, for example, it is important that the inscription on the respective cigarettes be arranged uppermost in uniform order to present the desired appearance in the package, and while mechanical means have been heretofore provided for turning the cigarettes whose inscriptions are out of proper line, the difficulty and problem has been in preselecting the cigarettes to be operated upon.

The present process is concerned with a normally open circuit having terminals adapted to bridge the conductive ink inscription on the cigarette, with the effect of closing this particular circuit, with the process further including the provision of means, such as an electron valve, for the eventual control of the operating circuit through which the cigarette turning means or preselectors for such turning means may be operated through the medium of well known electrical instrumentalities in necessary elements of the process.

In carrying out the process, the anode current of the valve is varied in strength by the current fed to the grid of the valve. Thus the low current strengths possible in an electric circuit, of which the ink of the cigarette inscription forms a part, can be relied on to control the electron valve for the current requirements of such control are exceptionally low and obviously the current conducting inscription on the cigarette can only safely permit the passage of low current strengths.

In carrying out the process, the feeler circuit, that is, the circuit to be closed by the passage of the current through the inscription on the cigarette, is used as a bias current for the grid of the electron valve. The anode current output is produced where

of energy through the utilization of a second source of current supply having the negative pole connected with a filament or cathode and the positive pole connected with the anode. If the bias current is applied to the grid by means of the feeler circuit, the anode current output is varied in accordance with the character of the grid current. Thus, if the feeler circuit is, when closed through the cigarette inscription, so arranged that the current bias to the grid is positive, the anode current is increased, while if the feeler circuit influence on the grid is negative, with the positive of such current connected to the cathode, the anode current output is decreased, and by adjusting the negative influence of the feeler current, the anode current output may be reduced to practically zero.

The carrying out of the process is indicated more particularly in the accompanying drawings, in which:—

Figure 1 is a diagrammatic view illustrating a simple development of the process;

Figure 2 is a similar view showing as a step in the process a means for preventing a constant anode current output when the feeler circuit is open;

Figure 3 is a similar view showing a further development of the process, wherein provision is made for an adjustability of the negative bias current to the grid in order to avoid an anode current output incident to the closing of the feeler circuit through the inherent moisture of the cigarette wrapper, which moisture provides a means for a closing of the feeler circuit.

The process as exemplified in Figure 1 includes an electron valve 1 having the filament or cathode 2 heated by a source of current 3 whereby there is provided a constant anode current in the circuit including the filament 2, with the circuit including for the purposes of this process a source of anode current energy 5, the field of an electromagnet 6, a milliamperemeter 7, and the anode 8 of the valve. The feeler circuit of the process includes a circuit including a source of energy 9, from the negative side of which a conductor 10—12 leads to the grid

13 of the valve. The conductor 10—12 is interrupted by spaced metallic feelers 11, which may be brought into contact with the cigarette and through which the circuit is closed under the conductivity of the ink forming the inscription on the cigarette. The positive side of the source of energy 9 is connected with one end of the cathode or filament 2.

10 In this simple development of the process, when the feelers 11 are in contact with the cigarette inscription, a negative bias is given the grid 13, and if the negative current is of requisite strength, the anode current output is practically zero, the field of the electro-magnet 6 is without energy, and through well known electrical instrumentalities this condition may serve to operate a suitable indicator or other detail with which the present invention is not particularly concerned.

This simple method of carrying out the process, however, presents the disadvantage that when the feeler circuit is open, that is, not closed through the feelers, which is naturally a very large proportion of the time in which the device is in use, the grid is without the negative bias current and there is as a result a constant anode current output. This, of course, tends to a more or less continuous functioning of the valve, which materially shortens its effective life for the particular function desired by the process. This particular disadvantage, however, may be overcome by an extension of the process contemplated as a part of the invention and shown more particularly in Figure 2. Here the conductors 10—12 interrupted by the feelers 11 are led from the positive side of the source of energy 9 to the grid 13. The filament 2 is connected to the negative side of the source of energy 9 and a fixed resistance R is introduced into a circuit leading from the negative side of the source of energy 9 to the positive conductor 12 from such source of energy in advance of the grid. In this arrangement, the grid of the electron valve receives a constant bias current in relation to the cathode or filament 2 since the feelers 11 are not bridged. Thus, the anode current output remains at zero or practically at zero. When the feelers are bridged by the current conducting inscription on the cigarette, the grid 13 receives a positive current supply or bias in relation to the cathode or filament 2 which counteracts wholly or in part the normal negative bias. The anode current output is thus set up, energizing the field of the electro-magnet 6, which in this instance is utilized as a means for operating through appropriate instrumentalities the indicator to advise of the position of the cigarette or other selectors or controlling means. Of course, in this adaptation of the process, the fixed resistance R must be in

such ratio to the resistance of the current conducting inscription on the cigarette, indicated at R^a , that when the feelers are bridged, the negative bias normal to the grid when the feelers are not bridged is so far cut down as to insure the desirable anode current output.

In this adaptation of the process, the anode current output flows only during the period of bridging the feelers by the cigarette inscription and at other times the valve is inactive and hence is capable of a much longer life than under the simple adaptation of the process shown in Figure 1.

In connection with the process, however, in practical use, there ordinarily arises a condition which must be taken into consideration and which leads to a further development of the process. This condition is due to the fact that the paper wrapper of the cigarette will gradually absorb the moisture of the tobacco contained and conventional manufacture requires that the moisture content of the tobacco be approximately 14%. With the cigarette wrapper moistened, there is a continual liability that the feelers will be bridged by the moisture of the cigarette paper, and under the forms of the process heretofore described, a sufficiently high positive bias current is passed to the grid to overcome the normal negative bias thereof and permit an anode current output.

In this particular development of the process, the grid is ordinarily provided initially with a higher negative bias than that necessary to counteract the cathode or filament to insure that the anode current output is maintained at zero, but as the conductive capabilities of the dampened cigarette paper or wrapper will vary, the negative bias given the grid must be adjustable. Provision for this in the development of the process is shown more particularly in Figure 3, in which the source of energy for the feeler current is provided with a voltage divider, indicated at 14. The cathode or filament 2 is connected to a central fixed point 15 of this voltage divider, while the fixed resistance through which the normal negative bias is supplied to the filament is adjustably connected through one of the various points of tapings of the voltage divider 14, as at 16. The positive current influence of the feeler circuit is also adjustable through the connection of the conductor 10 to one of the tapings of the voltage divider. The normal negative bias of the grid 15 can be regulated and controlled to suit particular conditions by varying the point of contact 16 at the voltage divider, and this may be determined by causing the feelers 11 to contact with an unprinted side of a particular cigarette and varying the connection of the point 16 on the voltage divider until the negative bias

of the grid 13 effectively overcomes or counteracts the cathode influence and no anode current output results, as indicated through the milliamperemeter 7. The positive bias to the grid is similarly regulated by appropriate connection at the point 17 when the feelers are bridged by the inscription on the cigarette and the connection is made so that the grid receives sufficient positive current to indicate on the milliamperemeter an anode current of sufficient strength to properly energize the field of the electromagnet 6 for the control of the desired turning or other mechanism. The invention is not concerned with the particular type of instrumentalities to be controlled, but for the sake of clearness, reference may be had to Patent #1,800,290, April 14, 1931, as showing a type of machine which may be controlled.

I claim:—

1. A process for controlling operating current supply to a cigarette turning mechanism of the type utilizing the output of an electron valve for such current supply, consisting in providing each of the cigarettes to be turned with a current-conducting inscription, and utilizing the current-conducting inscription on the cigarette for producing a bias effect on the electron valve to control the output thereof.

2. A process for controlling operating current supply to a cigarette turning mechanism of the type utilizing the output of an electron valve for such current supply, consisting in providing each of the cigarettes to be turned with a current-conducting inscription, and utilizing the current-conducting inscription on the cigarette for producing a negative bias effect on the electron valve to control the output thereof.

3. A process for controlling operating current supply to a cigarette turning mechanism of the type utilizing the output of an electron valve for such current supply, consisting in providing each of the cigarettes to be turned with a current-conducting inscription, and utilizing the current conducting inscription on the cigarette for producing a positive bias effect on the electron valve to control the output thereof.

4. A method according to claim 3, wherein said biasing current is varied to maintain a normal bias of the valve output current for maintaining said current at zero.

5. A method according to claim 2, wherein the negative bias influence of said current is varied.

6. An apparatus for electrically controlling the operation of a cigarette turning machine of the type cooperating with cigarettes having current-conducting inscriptions thereon, comprising an electron valve, a source of current for the cathode, cigarette turning mechanism, the output current

from the anode operating the cigarette turning mechanism, a grid controlling the influence of the cathode on the anode, a circuiting source connected to the cathode and to the grid, the latter connection having spaced circuit-closing elements in position to be bridged by the current-conducting inscription on the cigarette to close the circuit, said closing of the circuit biasing the grid current for purposes of anode current control.

7. An apparatus for turning cigarettes of the type involving a cigarette turning mechanism and utilizing cigarettes having a current-conducting inscription, said apparatus comprising an electron valve, an independent source of energy for the cathode, cigarette-turning means energized by the current output from the anode, a grid interposed between the cathode and anode, a source of energy having the negative side connected to the cathode and the positive side connected to the grid, said positive side of the current being interrupted and provided with circuit-closing elements normally open and closed through contact with the current-conducting inscription on the cigarette, and a resistance bridging the negative side of the said current and the positive side between the circuiting elements and grid, said resistance providing a constant bias current for the grid to maintain the anode output at zero, the closing of the circuit through said cigarette inscription creating a positive bias in the grid to increase the current output of the anode.

8. An apparatus according to claim 7, wherein the resistance connection is variable with respect to the negative side of the current.

In testimony whereof I affix my signature.
GÜNTHER MEYER-JAGENBERG.