

Sept. 6, 1955

P. POURET

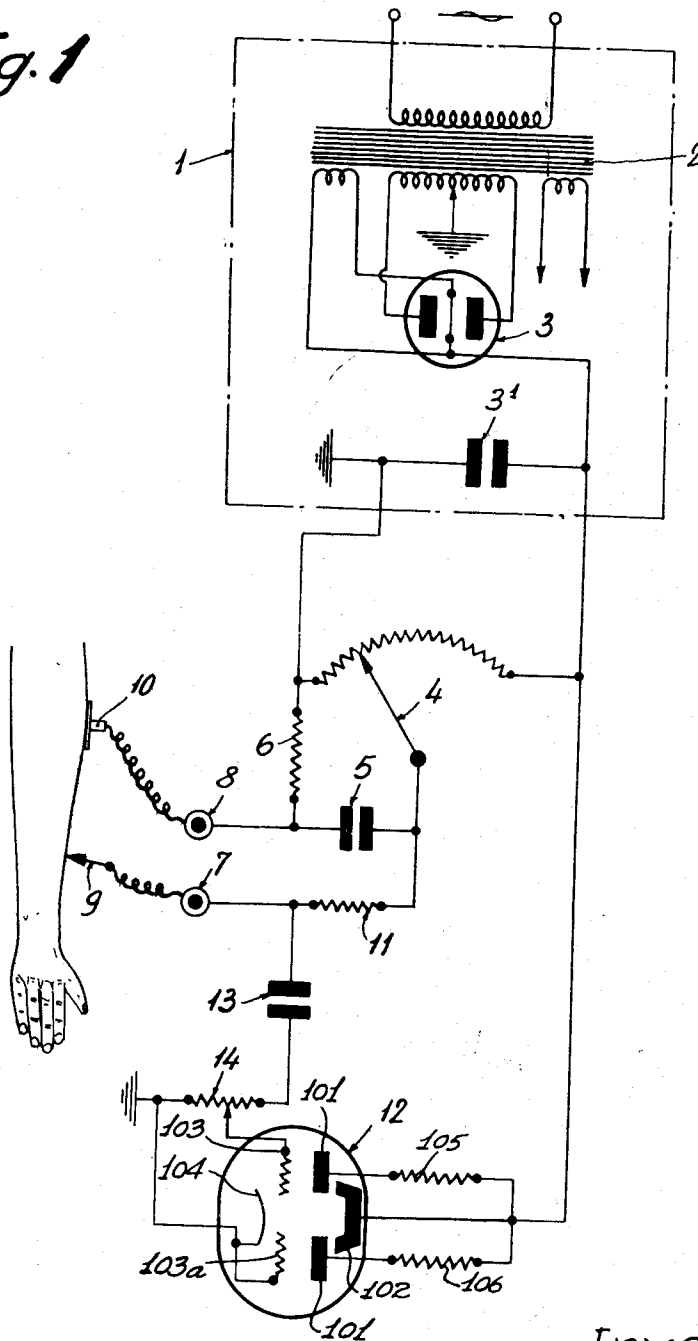
2,716,979

METHOD OF DETECTION AND ELECTRIC DETECTOR
OF ACUPUNCTURE AND IGNIPUNCTURE POINTS

Filed July 31, 1951

2 Sheets-Sheet 1

Fig. 1



Inventor
Pierre Pourret
By *Robert E. Burns*
Attorney

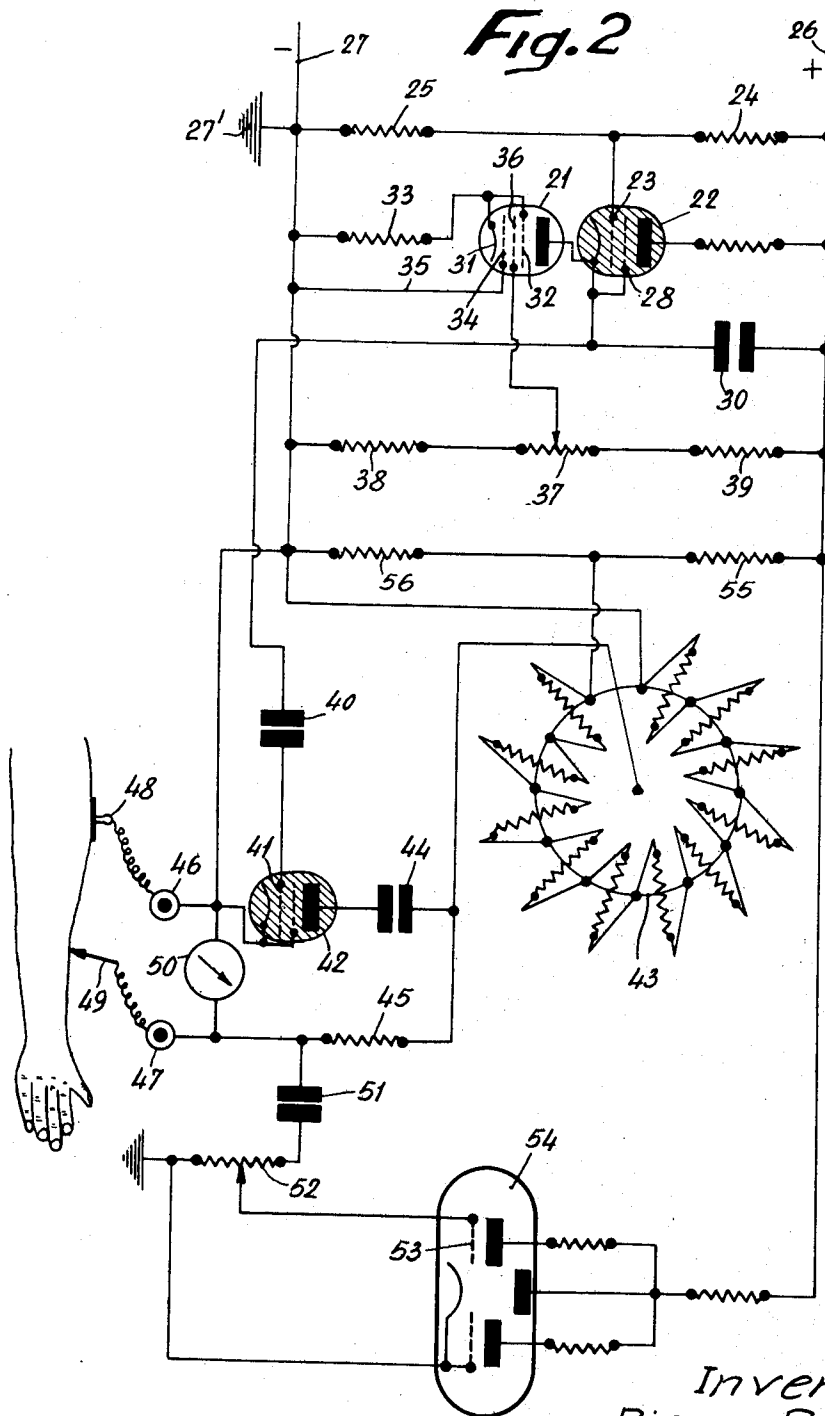
Sept. 6, 1955

P. POURET
METHOD OF DETECTION AND ELECTRIC DETECTOR
OF ACUPUNCTURE AND IGNIPUNCTURE POINTS

2,716,979

Filed July 31, 1951

2 Sheets-Sheet 2



Inventor
Pierre Pourret
By Robert E. Burns
Attorney

1

2,716,979

METHOD OF DETECTION AND ELECTRIC DETECTOR OF ACUPUNCTURE AND IGNIPUNCTURE POINTS

Pierre Pourcet, Chatellerault, France

Application July 31, 1951, Serial No. 239,515

Claims priority, application France August 3, 1950

13 Claims. (Cl. 128-2.1)

The object of the present invention is the electrical detection of particular cutaneous points the location of which is necessary for medical treatment by "acupuncture" or "ignipuncture."

It is recalled that in medical science, the word "acupuncture" means the introduction of needles into the cutaneous tissue and the word "ignipuncture" the burning of a point of the integuments in order to predetermine a hypodermic injection, said burning can be caused by electrical combustion, a cautery, etc.

It is undoubtedly proved that, when there is a dysfunction of a living organ, and only in such a case, certain "points" of the cutaneous covering become sensitive and even painful. These points have a maximum of 2 mm. diameter and in certain cases less than 2 mm., and each organ causes the sensitivity of one or several particular points.

A hypodermic injection at these points produces an action on the corresponding organ.

The object of the present invention is a method and apparatus for locating these particular points which will be designated as "dermatomes," in which two electrodes, of which one, designated as explorer, is displaced on the patient, and the other, designated as return, placed in contact with a fixed point of the patient, are connected to a current source through the agency of a condenser, and appropriate regulating elements; when the explorer electrode is in contact with a "dermatome," it has been noted that the resistance between said two electrodes becomes practically zero and the condenser discharges, causing the functioning of a signal.

The present invention is hereinafter described with reference to the annexed drawing in which Figs. 1 and 2 are schematics of electronic devices embodying the present invention.

In Fig. 1, an appropriate direct current designated by 1, produced from a source of alternating current in any suitable manner (by transformer 2, rectifier tube 3 and filter condenser 3¹ on Fig. 1) is applied to voltage divider 4 which charges condenser 5 through resistance 6. Explorer electrode 9 is connected at 7 and return electrode 10 at 8. When explorer electrode 9 is on a "point," condenser 5 discharges by electrodes 9, 10, through resistance 11. The potential drop produced in resistance 11 causes an impulse to be transmitted to cathode eye 12 through capacitance 13. The cathode eye 12 has an anode 101, fluorescent screen 102, grid 103 and 103^a and cathode 104 in a bulb of very high vacuum. The anode 101 is connected through resistances 105 and 106 to a line connecting the fluorescent screen 102 with the voltage divider 4 which in turn is connected to one side of the condenser 5. When the condenser 5 is discharged through the resistance 11, there is produced a voltage $E=ri$ at the terminals of said resistance solely during the time of such discharge. This voltage impulse is transmitted to the grid 103 of the cathode eye 12. A decrease in voltage on the grid 103 produces an increase in current i on the plate 101 and therefore an increase in the voltage

2

drop between the two resistances 105 and 106 with a resulting variation in voltage between the plate 101 and the fluorescent screen 102. This variation causes a sector of shadow to appear on the screen, the extent of the dark surface being determined by the difference in potential occurring between the plate 101 and screen 102. For each discharge of the condenser 5, the cathodic eye blinks once only. The sensitivity of the cathodic eye 12 is regulated by potentiometer 14. It should be understood that any equivalent indicating means can be used instead of the cathode eye, which is also known as a magic eye or electron ray indicator.

In the assembly heretofore described a compromise between the adjustment of voltage divider 4 and potentiometer 14 allows contact with the patient in the best conditions of sensitivity. According to the degree of disfunction of the organ corresponding to the "point" under exploration, the resistance between 7 and 8 varies, and the maximum of sensitivity is reached for a patient, when the adjustment of voltage divider 4 and potentiometer 14 is such that it is just above the faculty of starting the flashing for a position outside of all "points" of the explorer electrode.

Referring now to Fig. 2, it is seen that a relaxation device, that is to say a device providing a predetermined time interval, is comprised of a pentode tube 21 and a gas or thyatron triode 22. The plate of the thyatron 22 is connected through a resistance 20 to the positive side of an incoming direct current line 26, 27. The control grid 23 is connected to a voltage divider comprising resistances 24 and 25 connected across the direct current line. The values of the resistances 24 and 25 are selected to provide the desired bias of the thyatron and hence its ignition voltage. The second grid 28 and the cathode of thyatron 29 are connected between the plate of pentode tube 21 and condenser 30 of which the charge voltage is thus regulated by the value of resistances 24, 25, the second plate of the condenser being connected to the conductor of incoming current 26. Cathode 31 and suppressor grid 32 of the pentode tube are connected by a common conductor through resistance 33 to incoming negative current conductor 27, eventually grounded at 27¹. The first grid (signal or control grid) 34 is connected to negative conductor 27 by conductor 35 and the voltage of second grid (screen grid) 36 is regulated by a resistance or potentiometer placed in bridge formed by resistances 38, 39, between conductors 26 and 27. Potentiometer 37 thus allows the modification of the tube screen voltage and consequently the condenser charge current, in other words the condenser charge and discharge time intervals.

The embodiment constituted by pentode 21, thyatron 22, resistances 24, 25, condenser 30 and potentiometer 37 functions like a clock giving electrical impulses in saw tooth form and at adjustable frequencies.

Said impulses are transmitted by the agency of condenser 40 to control grid 41 of a second thyatron 42. Said thyatron is part of an embodiment comprising voltage divider 43, condenser 44, resistance 45 and two terminals 46 and 47 to which are connected fixed electrode 48 and explorer 49 applied to the patient. The charging circuit of the condenser 44 is constituted by thyatron 42 in series with condenser 44 and voltage divider 43, connected in shunt on the lower half bridge comprised of resistances 55 and 56 placed between negative conductor 27 and positive conductor 26, and its discharge circuit is constituted by resistance 45, terminals 46, 47 and electrodes 48, 49.

A high internal resistance voltmeter 50 (about 5000 ohms per volt) placed in shunt between terminals 46, 47, indicates at each moment the resistance variations between explorer electrode 49 and return electrode 48.

Branched between resistance 45 and terminal 47, condenser 51 transmits impulses, the amplitude of which is regulated by the agency of potentiometer 52, to grid 53 of cathode eye 54 mounted in the known manner.

For convenience of employing this latter indicator, the cathode eye is mounted with advantage in a holder or "probe" terminated by explorer electrode needle 49, the whole joined to the main body of the apparatus by a flexible cord.

As heretofore described, the relaxation device comprised of thyatron 22, charge pentode 21, and condenser 30, produces saw tooth impulses, the frequency of which is regulated by potentiometer 37.

These impulses free periodically, in acting on the grid of thyatron 42, a charge circuit comprising condenser 44 and voltage divider 43.

It is recalled that the anodic current of a gas triode is created suddenly when, for a predetermined negative grid polarisation, the anodic voltage exceeds a given value.

The level of this charge is shown by the high internal resistance voltmeter (5000 ohms per volt).

When terminals 46 and 47 are connected to the patient by the agency of explorer electrode 49 and return electrode 48, and said explorer electrode is on a "point" or "dermatome," the condenser discharges at each relaxation device impulse and the voltmeter tends to indicate towards zero. The voltage drop indicated for a predetermined position of voltage divider 43 gives what is known as the "value" of the "point." Said "value" can be defined as the difference between the voltage drop produced in the segment 48, 49 ($E^1 = ri$) and the nominal voltage E of voltage divider 43.

These impulses are then transmitted by the agency of condenser 51 and potentiometer 52 to grid 53 of cathode eye 54 and cause a greater or lesser opening of the luminous part of said cathode eye.

In order to ensure the best sensitive conditions, potentiometer 52 is adjusted in such a manner that the luminous sectors of the cathode eye are just joined when electrodes 48 and 49 are not connected to the patient. In proceeding in the manner heretofore described, there can be appreciated, at the moment when said electrodes are applied to the patient, the differences of the order of a few tenths in the cathode eye opening, and therefore the determination of the approach of the "point."

For an ideal functioning condition, that is to say for a practically zero resistance between electrodes 48 and 49, the voltmeter needle returns practically to zero and the cathode eye sector opens at the maximum.

The cathode eye is also known by designation "electron ray indicator" or "magic eye."

I claim:

1. A method for locating particular cutaneous tissue points for the practice of ignipuncture and acupuncture comprising the steps of charging a condenser, electrically connecting one terminal of the condenser with an area of contact on said cutaneous tissue, intermittently making an electrical connection between the opposite terminal of the condenser and different points of contact on said cutaneous tissue spaced from said area of contact and indicating the discharge of said condenser when the electrical resistance between said area of contact and one of said points of contact is sufficiently low to discharge the condenser through the cutaneous tissue and the connections between the condenser and said tissue.

2. A method for locating particular cutaneous tissue points for the practice of ignipuncture and acupuncture comprising the steps of charging a condenser with a voltage of saw-tooth waveform, electrically connecting one terminal of the condenser with an area of contact on said cutaneous tissue, intermittently making an electrical connection between the opposite terminal of the condenser and different points of contact on said cutaneous tissue spaced from said area of contact and indicating the discharge of said condenser when the resistance between

said area of contact and one of said points of contact is sufficiently low to discharge the condenser through the cutaneous tissue and the connections between the condenser and said tissue.

3. Apparatus for locating particular cutaneous tissue points for the practice of ignipuncture and acupuncture comprising a condenser, means for charging said condenser, a discharge circuit comprising a plate adapted to be held in contact with an area of said cutaneous tissue, a contact point adapted to be brought into contact successively with selected points on said cutaneous tissue and means including a resistance coupling said plate and contact point respectively with the terminals of the condenser, and an indicating device connected to the circuit including said resistance to indicate flow of current through said resistance upon discharge of the condenser when said contact point is brought into contact with a low resistance point on said cutaneous tissue.

4. Apparatus for locating particular cutaneous tissue points for the practice of ignipuncture and acupuncture comprising a condenser, a source of saw-tooth-form pulsating potential, means connecting said circuit to said condenser to charge the condenser, a discharge circuit comprising a plate electrode adapted to be held in contact with an area of said cutaneous tissue, a contact point adapted to be brought into contact successively with selected points on said cutaneous tissue and means including a resistance coupling said plate and contact point electrode respectively with the terminals of the condenser, and an indicating device connected to the circuit including said resistance to indicate flow of current through said resistance upon discharge of the condenser when said contact point is brought into contact with a low resistance point on said cutaneous tissue.

5. Apparatus for locating particular cutaneous tissue points for the practice of ignipuncture and acupuncture comprising a condenser having terminals of opposite polarity, means for charging said condenser, a discharge circuit comprising a plate adapted to be held in contact with an area of said cutaneous tissue, a contact point adapted to be brought into contact successively with selected points on said cutaneous tissue and means including a resistance connecting said plate and contact point respectively with the terminals of the condenser, and an electron ray indicator connected to the circuit including said resistance to indicate flow of current through said resistance upon discharge of the condenser when said contact point is brought into contact with a low resistance point on said cutaneous tissue.

6. Apparatus for locating particular cutaneous tissue points for the practice of ignipuncture and acupuncture comprising a condenser having terminals of opposite polarity, a circuit for producing a saw-tooth-form pulsating current, means connecting said circuit to said condenser to charge the condenser, a discharge circuit comprising a plate adapted to be held in contact with an area of said cutaneous tissue, a contact point adapted to be brought into contact successively with selected points on said cutaneous tissue and means including a resistance coupling said plate and contact point respectively with the terminals of the condenser, and an electron ray indicator connected to the circuit including said resistance to indicate flow of current through said resistance upon discharge of the condenser when said contact point is brought into contact with a low resistance point on said cutaneous tissue.

7. Apparatus for locating particular cutaneous tissue points for the practice of ignipuncture and acupuncture comprising a condenser, a source of saw-tooth-form pulsating potential, means connecting said circuit to said condenser to charge the condenser, a discharge circuit comprising a plate electrode adapted to be held in contact with an area of said cutaneous tissue, a contact point adapted to be brought into contact successively with selected points on said cutaneous tissue, a discharge circuit

5

coupling said electrodes respectively to opposite terminals of said condenser, and indicating means connected to said discharge circuit to indicate changes in the resistance of said cutaneous tissue when said contact point is brought into contact therewith.

8. Apparatus according to claim 7, wherein in said indicating means is a high resistance voltmeter connected between said electrodes.

9. Apparatus according to claim 7, wherein said discharge circuit comprises a grid-controlled thyatron having its space current path connected between one of said electrodes and one terminal of said condenser, and means for applying a pulsating potential from said source to said grid.

10. Apparatus according to claim 7, wherein said source of pulsating potential comprises a relaxation oscillator including a source of direct current potential, a thyatron tube and a pentode tube having their space current paths connected in series with said source of direct current potential, and a condenser connected between the anode and cathode of said thyatron tube.

6

11. Apparatus according to claim 7, wherein said discharge circuit comprises a thyatron having an anode, cathode, and grid, said anode being connected to one terminal of said condenser, said cathode being connected to one of said electrodes, the other of said electrodes being connected in series with a resistance to the other terminal of said condenser, and means for applying a pulsating potential from said source between said grid and cathode.

12. Apparatus according to claim 11, wherein said indicating means comprises a high resistance voltmeter connected between said electrodes.

13. Apparatus according to claim 11, wherein said indicating means comprises an electron ray indicator operatively connected to the circuit including said resistance.

References Cited in the file of this patent

UNITED STATES PATENTS

2,012,316	Miles	Aug. 27, 1935
2,298,506	Parker	Oct. 13, 1942