(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 177 899**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **85112519.5**

(22) Date of filing: **03.10.85**

(51) Int. Cl.⁴: **H 05 C 1/06**

(30) Priority: **08.10.84 IT 2304584**

(43) Date of publication of application: **16.04.86**
Bulletin 86/16

(84) Designated Contracting States: **DE FR GB IT NL**

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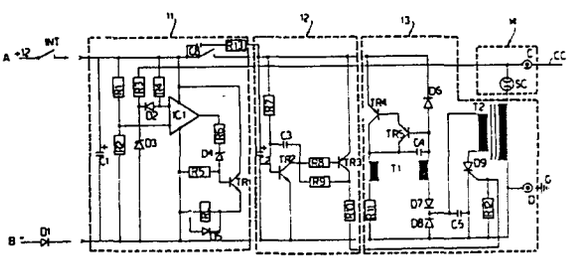
(54) Electrifying device for pasture fencing and activation process of said device.

(57) An electronic-type electrifying device for pasture fencing is described.

The circuit includes at least one time switch (12) and at least one oscillator means (13), suitable for emitting high-voltage pulses at a preset frequency and duration, said circuit being connected to a ground reference (G) and to at least one conductor (CC) running along the pasture fencing. Provision is made for at least one comparator device (11) with one of the inputs (−) connected to the line of fencing (CC), suitable for coming into contact with an animal; said input is connected to the positive pole (A) of the power supply by means of a suitable chosen impedance (R4). The comparator (11) only emits a signal when input (−) drops to a level lower than that of the other input (+), caused by an animal having come into contact with the fencing.



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"ELECTRIFYING DEVICE FOR PASTURE FENCING AND ACTIVATION PROCESS OF SAID DEVICE"

This invention relates to an electrifying device for pasture fencing which is only activated if an animal comes into contact with a part of the said fencing and to the activation process of said device.

Known electronic-type electrifying devices provide a circuit conveniently fed from either batteries or a suitably transformed alternate mains supply, said circuit being connected to at least one conductor running along the fencing wire and to the ground reference.

Provision is made on said known circuit for, among other things, a time switch and an oscillator for sending through at least one conductor, always referring to the ground reference, high voltage pulses at preset intensity, frequency and duration according to the appropriate controls, so that the animal is not harmed. If, therefore, an animal should inadvertently touch the fencing, a pulsed current will pass through it which is harmless but sufficiently irritating to cause said animal to move away from the fencing.

with some known electrifying devices, the circuit is always activated, that is to say, pulses are always emitted through the conductor running along the fencing, always referring to the ground reference, even when no animal comes into contact with the fencing. This results in a useless consumption of the power supply and, if it is fed from a battery, the latter will run down, even if no animal comes into contact with the fencing.

FR-A-1.119.402 describes a control circuit to be applied to fencing for animals, which only emits pulses when an animal comes into contact with the fencing.

The component used by this circuit for activating the pulse timing is a relay. As known, high currents are needed to activate a relay. Said activating currents depend on the fence resistance (which depends on length) and the resistance of the animal and the soil (which depend on the degree of humidity). Therefore, the activation of the relay is correlated with

factors which can not be predicted at the design stage.

Furthermore, a preset time interval is always needed to activate the relay after an animal has come into contact with the fencing. If the animal moves away inside this time interval, the power discharge is conveyed to the relay only, causing serious damage to the device.

Even if the total resistance of the series resistance of the fence and of the animal is greater than the resistance of the relay, a large part of the power is discharged onto the relay and not the animal, damaging the device.

FR-A-1.583.813 describes an electrified fence activated by the animal itself. This circuit provides two separate batteries: one powers the generation of pulses, the other activates the control circuit. The control circuit comprises an internal resistance at a preselected value which, when an animal comes into contact with the fencing, is in parallel with the resistance of the fence plus that of the animal, producing an actuating signal.

Therefore, in this case as well, the actuating signal depends on the resistance value of the fence and those of the animal and the soil, which depend on the degree of humidity and other unpredictable factors.

In this case also, the actuating signal is tied to the specific values of the resistances introduced from outside and depends on

aleatory (chance) factors, which is unacceptable.

Moreover, the output device from the element generating high-voltage discharges to the fencing (secondary of the oscillator) consists of a condenser, which will be damaged by said discharges.

Therefore, the need to obtain a circuit which overcomes the above-mentioned disadvantages has been felt for a long time.

Consequently, the object of this invention is to provide an electrifying device which operates only when an animal comes into contact with at least one conductor, and which functions independently of the specific values of the fencing and animal resistances, whatever the humidity conditions of the line and the soil.

A further object is to provide a circuit which permits reduced energy consumption and is activated only when necessary.

A further object is to provide a process which permits activation of said circuit to occur only under certain conditions.

The main object is achieved by making provision, in a circuit for electrifying devices of the type which generate high-voltage pulses along the conductors fitted to the fencing - the circuit comprising an oscillator and a time switch according to the

prior art - for the arranging of a comparator device with one of the inputs connected to the fencing line, suitable for coming into contact with an animal, such that the comparator only emits an output signal when the input (-) drops to a level below that of the other input, as a result of an animal coming into contact with the fencing.

In this way a circuit has been obtained which acts independently of the specific resistance value introduced by the animal, being based on the differences in potential.

Surprisingly, such an arrangement allows installation to be constantly checked, the effectiveness of the device to be controlled and any accidental grounding to be identified immediately.

According to an improvement, provision is made for a separator device between the oscillator and at least one of the conductors running along the fencing, said device being suitable for separating the continuous negative component, coming from the line (fence), from the high-voltage pulses.

According to a preferred embodiment, the output of said comparator device is connected to an actuator device, for example a relay, which provides for closing a circuit when the comparator is triggered.

The process by which the device is activated, when an animal

comes into contact with one of the conductors connected to the oscillator device, provides for continually comparing a prefixed value with an input value, said input being connected to one of the conductors running along the fencing, so as to intervene and provide for connecting the power supply to the time switch and oscillator only if the animal touches at least one of the conductors and the impedance of its body thereby produces an alteration in the comparator input (-), which drops to a level below the level of the other input, said intervention depending on the fact that a variation in impedance has occured, but remaining independent of the value of said impedance.

What follows is a description of a preferred embodiment, but not binding, of the circuit for realizing the above-described functions:

Fig. 1 represents a preferred embodiment of a circuit, according to the invention;

Fig. 2 represents a modification to the power supply part of the circuit if alternate power supply direct from the mains is provided, according to the invention;

Fig. 3 represents a block diagram of the circuit's main components, according to the invention.

The electrifying device according to this invention provides for sending a series of high-voltage pulses through one of the conductors running along the fencing, always referring to the

ground reference, only when an animal touches at least a part of the conductor fitted to the fencing.

According to the standards, one pulse of a millisecond maximum duration is emitted per second at an intensity of about 8000 V. The device according to this invention, therefore, emits this pulse train of known characteristics, but has the exclusive feature of generating said pulse train only when really necessary. In conceptual terms, the animal functions for this circuit as a circuit switch which provides for activating the emitting of pulses from the oscillator, switched for a suitable time.

The circuit for realizing the above-described functions is made up of four functional sections, besides the power supply, the logical interconnections of which are represented in figure 3. Inside each section, provision is made for the circuit components which carry on the necessary functions, as is better illustrated in figure 1.

We will now describe the main functional sections. Unit 11 is the comparator section. When an animal comes into contact with the conductor CC running along the fencing and, therefore, places itself between the conductor CC connected to terminal C and the earth G, connected to terminal D, the impedance of its body causes a variation in input, that if, it supplies a negative to the comparator device which switches into operation the actuator or relay RL.

The comparator input (-) is connected to an impedance of suitable value (R4) which determines the intervention threshold. The value of R4 depends, for example, on the length of the fencing, the degree of humidity, soil resistance and so on. At this point a connection is made between the power supply and the circuits of units 12 and 13. Unit 12 or time switch provides for determining the pulse frequency with the components illustrated in Fig. 1. Unit 13 or oscillator provides for sending high-voltage pulses of preset duration and frequency to terminals C and D. It should be noted that units 12 and 13 are entirely known and found in electrifying devices according to the prior art. They can be made in any other way.

Unit 14 or separator device comprises a 90 V discharger, the function of which is to keep the continuous negative component, coming from terminal C and to be sent to the comparator, separated from the high-voltage pulses during activation of the circuit. These pulses, coming from the oscillator, are sent to at least one conductor CC, always referring to the ground reference.

It should be noted, referring to figure 1, that the circuit is fed with 12 V at terminals A and B and provision is made for an appropriate switch INT for actuating the circuit. According to known technology it is also possible to make provision for supplying said circuit with power from an alternating 220 V mains source. The power supply transformer circuit is illustrated in figure 2.

To complete the description, values are given below which refer to the preferred embodiment of the circuit represented in figures 1 and 2.

R1 220 KOhm	C1 100 µF 16V	D1 1N4001	TR1 BC237B
R2 220 KOhm	C2 10 µF 16V	D2 1N4148	TR2 BC237B
R3 47 KOhm	C3 1 µF 63V	D3 ZENER	TR3 2N2905
R4 1,2 MOhm	C4 1500 p F 500V	D4 ZENER	TR4 BD440
R5 470 KOhm	C5 2 µF 400V	D5 IN4148	TR5 2N2905
R6 5,6 KOhm	C6 1000 µF 25V	D6 IN4007	
R7 2,2 MOhm	C7 0,1 µF 100V	D7 IN4007	
R8 220 Ohm	C8 4700 µF	D8 IN4007	
R9 2,2 KOhm		D9 SCRTL 8003	IC1 µA 4741
R10 120 Ohm		D10 GREEN LED	IC2 SFC2812LEC
R11 Connect.set.		PT SSC110B2	PT SSC110B2
R12 1,5 KOhm		RL Relay	T1
R13 10 KOhm			Prim.100 sp Ø 0,6
R14 680 Ohm			Sec.2450 sp Ø 0,2
		SC Dicharger	T2
		90 V	Prim.80 sp Ø 0,5
			Sec.1150 sp Ø 0,16
			T3
			Prim.2100 sp Ø 0,1
			Sec.124 sp Ø 0,71

Provision is then made in the innovative process according to this invention for a stage which compares the signals travelling along the conductors on the fencing with a preset threshold value. If no animal causes a connection between the fencing and ground reference, input (-) is at a higher level than that of input (+) and no actuating signal is emitted. If a difference is detected at the comparator inputs (input (-) at a level below that of input (+)), this difference being the

result of an animal having touched said conductor and thereby introduced an extra impedance into the circuit, a signal is sent to the actuating device. Therefore, the output signal from the comparator results from a change occuring at the input to the comparator, but it does not strictly depend on the impedance value introduced by the animal.

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C L A I M S

1. An electrifying device for pasture fencing which is only activated if an animal comes into contact with a part of said fencing, comprising an electronic circuit with suitable power supply, which includes at least one time switch (12) and at least one oscillator (13) for emitting high-voltage pulses of preset frequency and duration, said circuit being connected to a ground reference (G) and to at least one of the conductors running along the pasture fencing, characterized in that it comprises a comparator device (11) with one of the inputs (-) connected to the line of fencing (CC), suitable for coming into contact with an animal, said input (-) being connected to the positive pole (A) of the power supply by means of an impedance (R4), suitably chosen according to the characteristics of the fencing and the soil, such that the comparator (11) emits an output signal to the time switch (12) only when input (-) drops to a level below that of the other input (+), caused by an animal having come into contact with the fencing.

2. An electrifying device according to claim 1,

characterized in that a separator device (SC) is fitted between the output of the oscillator (13) and at least one of the conductors (CC) running along the fencing, said device allowing the continuous negative component coming from the terminal (C) to be separated from the high-voltage pulses.

3. An electrifying device comprising a circuit according to claim 1, characterized in that the output of said comparator device (11) is connected to an actuating device (RL), which closes a circuit if one of the inputs of said comparator differs from a preset threshold level.

4. An electrifying device comprising a circuit according to claim 1, characterized in that said comparator (11) provides for connecting the time switch (12) to the power supply (A B).

5. An electrifying device comprising a circuit according to claim 1, characterized in that said actuator consists of a relay (RL).

6. An electrifying device comprising a circuit according to claim 1, characterized in that the power supply is of the alternating type and is transformed into a direct one of the right value by a suitable transforming circuit.

7. A process for activating an electrifying device

for pasture fencing, suitable for generating a series of pulses only when an animal touches at least one conductor (CC) running along the fencing, characterized in that the signal travelling through the conductor connected to the pasture fencing is continually being compared with a preset value and that following said comparison an activation signal is emitted to a time switch (12) connected to an oscillator device (13) only if input (-) of the comparator is altered, dropping to a level lower than that of the other input (+), caused by an animal having touched a part of the fencing, such as to generate a pulse sequence only when strictly necessary, that is, only when the animal touches said fencing.

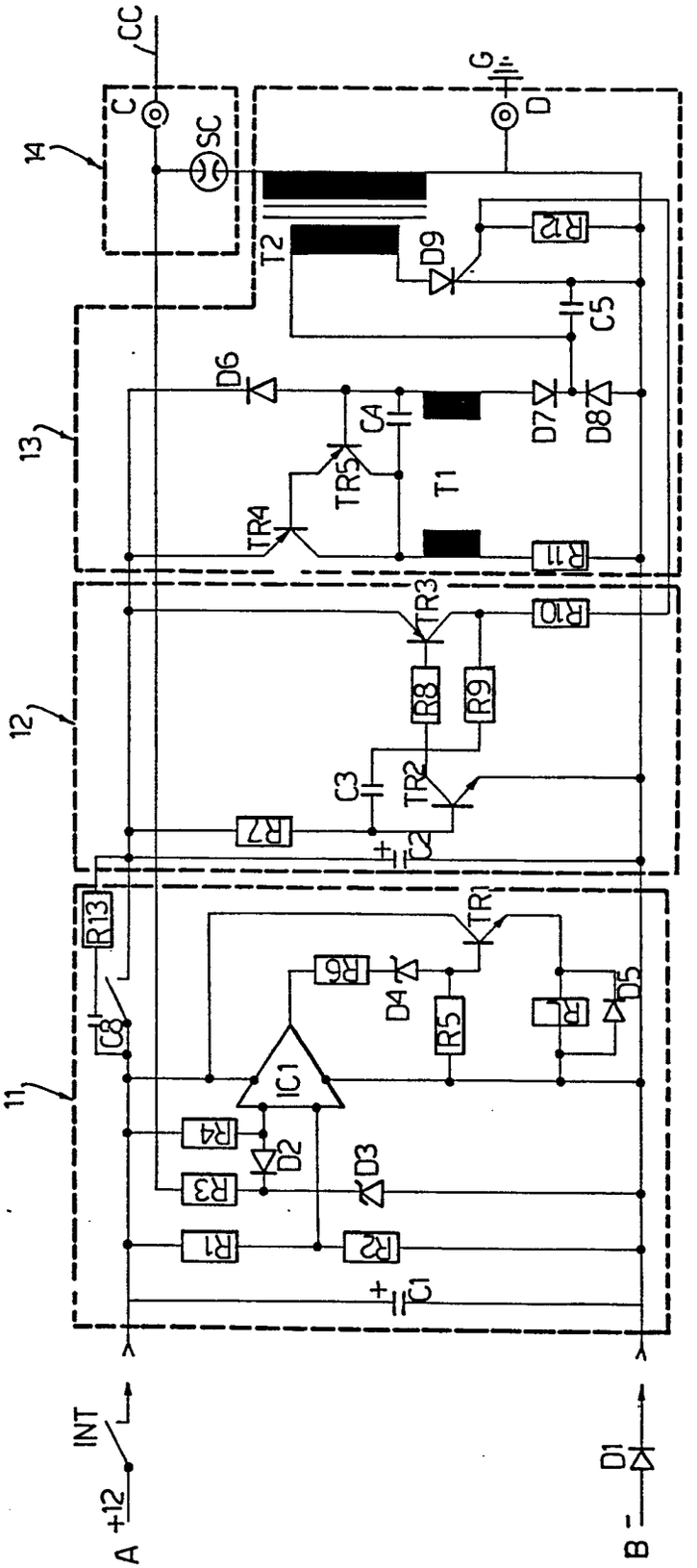

CC
C
SC
G
D
14
T2
D9
R12
C5
D6
D7
D8
C4
13
TR5
T1
TR4
R11
TR3
R10
R8
R9
12
C3
TR2
R7
C2
TR1
R13
R6
D4
R5
D5
C8
IC1
11
R4
D2
D3
R3
R1
R2
C1
INT
A +12
D1
B −

FIG.1

FIG.2

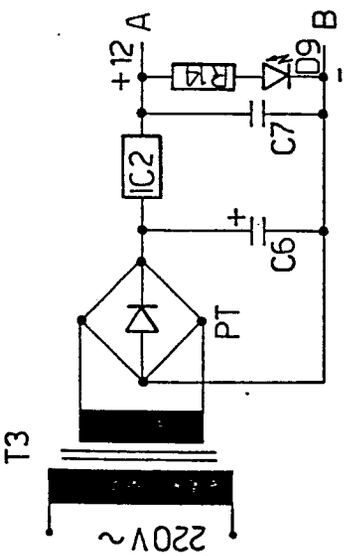
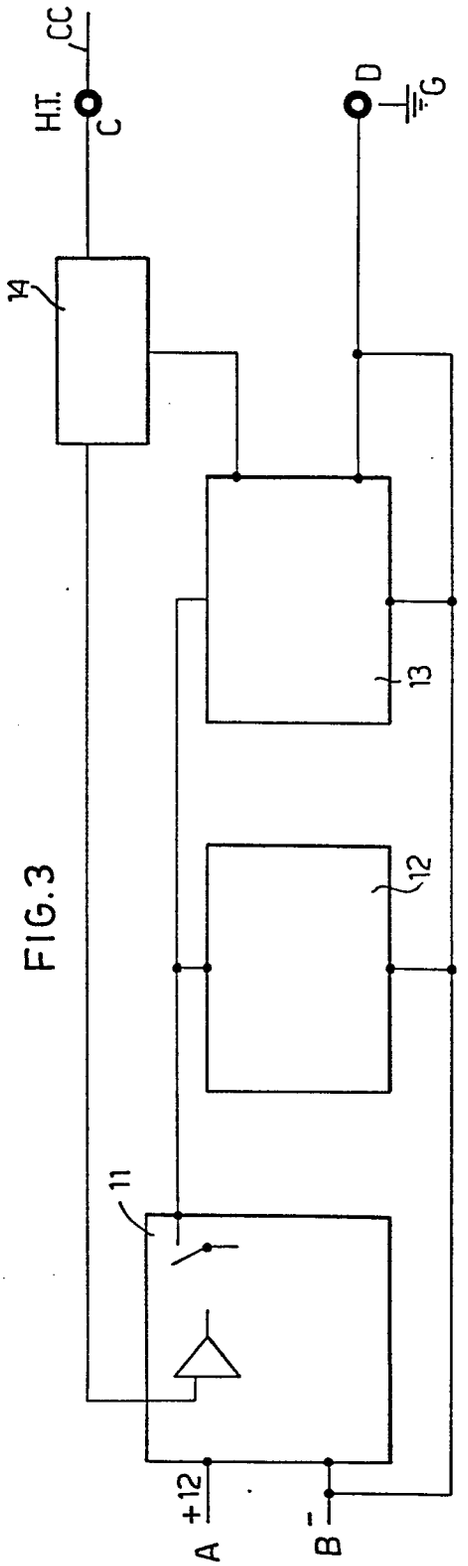


FIG.3



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EUROPEAN SEARCH REPORT

0177899
Application number

EP 85 11 2519

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	FR-A-2 373 209 (CADIOU) * Page 1, lines 29-35; page 3, line 7 - page 4, line 16; figure *	1,3-7	H 05 C 1/06
D,Y	FR-A-1 583 813 (BLANCHARD) * Page 1, line 6 - page 2, line 19; figure *	1,3-7	
D,A	FR-A-1 119 402 (THE COOKER STEWART ENG.) * Page 1, right-hand column, line 42 - page 2, left-hand column, line 30; figure *	2,3,5	
A	US-A-3 772 529 (BOEING)		TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	GB-A- 680 665 (HELIN WRIGHT MALLET)		H 05 C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14-01-1986	BIJN E.A.

CATEGORY OF CITED DOCUMENTS

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