

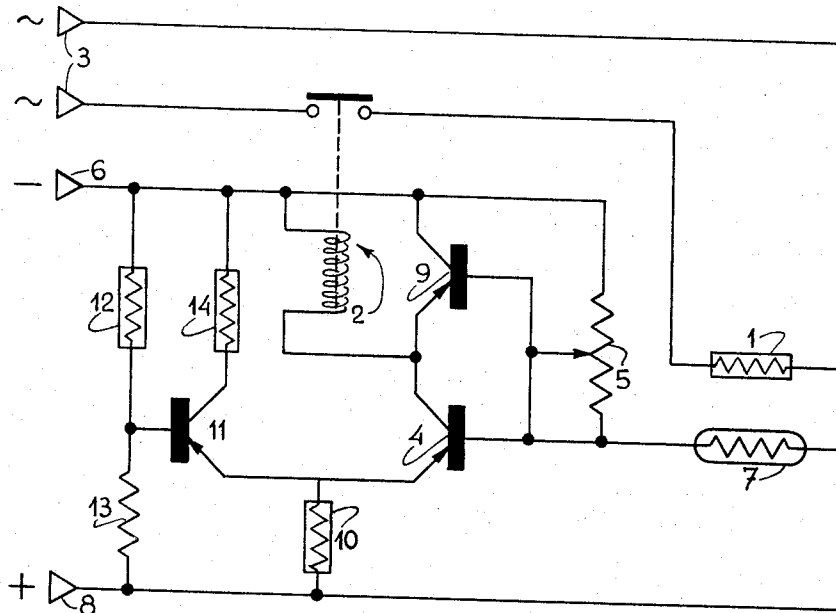
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SWITCHING CIRCUIT FOR AN ELECTRICALLY HEATED BLANKET

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SWITCHING CIRCUIT FOR AN ELECTRICALLY HEATED BLANKET

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1 Claim. (Cl. 317-132)

The invention relates to a switching circuit for an electrically heated blanket, comprising one or more resistors with negative temperature coefficient which are arranged in the blanket and which serve as temperature sensors and control the switching circuit.

With such a switching circuit, the heating circuit is switched on as soon as the temperature falls so far, that the resistance of the resistor(s) with negative temperature coefficient rises above a predetermined value, whereas the heating circuit is disconnected as soon as the temperature has risen so far, that the resistance falls below a predetermined value.

Since the switching circuit is through a flexible cord connected with the blanket and the resistor(s) with negative temperature coefficient provided therein, the risk of a short-circuit or interruption of these resistors is not imaginary. A short-circuit is not hazardous, since in that case the heating circuit is switched off. An interruption however, keeps the heating circuit switched on indefinitely, regardless of the blanket temperature, so that the blanket can be scorched or can even cause injuries to the user.

It is an object of the invention to provide a switching circuit of the kind referred to herein above, in which the heating circuit is automatically disconnected at the occurrence of an interruption of the resistor(s) with negative temperatures coefficient.

According to a feature of the invention, the heating element is connected to the supply source through a normally open contact of a relay, the coil of which is connected in the collector circuit of a control transistor, the base electrode of which is through a conventional resistor connected to the collector supply line and is through the resistor(s) with negative temperature coefficient connected to the emitter supply line, whilst the switching circuit is further provided with a guard transistor, the base electrode of which is connected to the base electrode of the control transistor, whilst its emitter electrode is connected to the collector electrode of the control transistor and its collector electrode is connected to the collector supply line.

During normal operation the guard transistor has a negligible influence on the control circuit, but at the occurrence of an interruption of the resistors with negative temperature coefficient, the voltage across the conventional resistor in the base circuit of the control and guard transistors becomes so small, that the guard transistor short-circuits the relay coil and thereby disconnects the heating circuit, although the control transistor carries the maximum current.

The invention is further elucidated below with reference to the drawing, which shows a circuit diagram of an em-

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bodiment of a switching circuit according to the invention.

The heating element 1 is through the normally open contact of a relay 2 connected to the supply terminals 3. The coil of the relay 2 is connected in the collector circuit of a control transistor 4, the base electrode of which is through a conventional resistor 5 connected to the collector supply line 6 and is through the resistor(s) with negative temperature coefficient 7 connected to the emitter supply line 8. A guard transistor 9 is with its emitter electrode and collector electrode connected to the relay coil and is with its base electrode connected to the base electrode of the control transistor 4. The operation of the circuit has already been discussed herein above.

In order to increase the sensitivity and the stability, the control transistor 4 is via its emitter electrode and through a common emitter resistor 10 coupled with a further transistor 11, provided with base resistors 12 and 13 and a collector resistor 14. However, this is not of immediate importance in connection with the invention.

The temperature at which the heating circuit is switched on and switched off, can be adjusted by means of the resistor 5, which is adjustable for that purpose, but this adjustment can also be effected by making one of the base resistors 12 and 13 adjustable or by replacing these base resistors by an adjustable potentiometer.

Although pnp-transistors have been shown in the circuit diagram, npn-transistors can be used too, provided that the polarity of the supply voltage is reversed.

Whilst a preferred embodiment of the invention has been shown and described above, it will, of course, be understood that various other modifications may be made. The appended claim is, therefore, intended to cover any such modifications within the true spirit and scope of the invention.

I claim:

Switching circuit for an electrically heated blanket comprising one or more resistors with negative temperature coefficient which are arranged in the blanket and which serve as temperature sensors and control the switching circuit, wherein the heating element is connected to the supply source through a normally open contact of a relay, the coil of which is connected in the collector circuit of a control transistor, the base electrode of which is through a conventional resistor connected to the collector supply line and through the resistor(s) with negative temperature coefficient is connected to the emitter supply line whilst the control circuit is provided with a guard transistor, the base electrode of which is connected to the base electrode of the control transistor, whilst its emitter electrode is connected to the collector electrode of the control transistor and its collector electrode is connected to the collector supply line.

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