Jan. 3, 1939. N. NÉMET 2,142,281

ELECTRIC HEATING DEVICE FOR VULCANIZING TUBES OF MOTORCAR OR MOTORCYCLE TIRES

Filed April 13, 1937

Fig. 1.

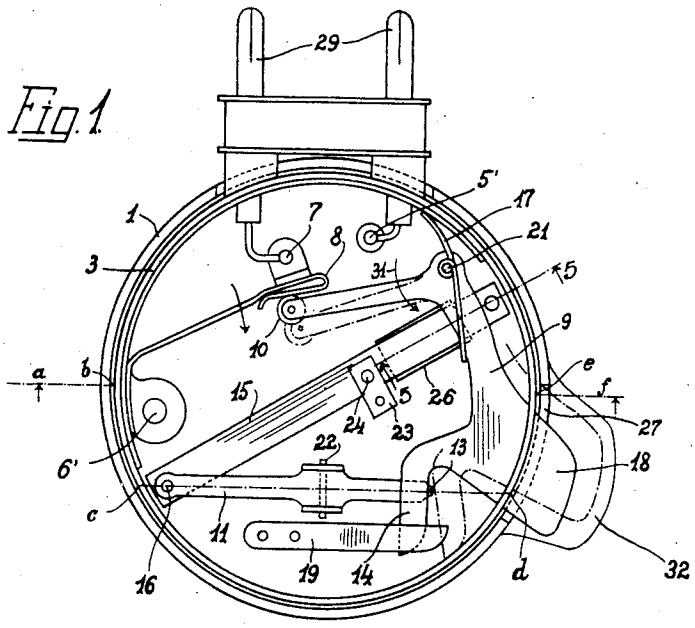


Fig. 5.

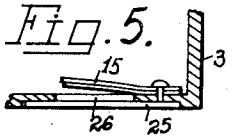


Fig. 2.

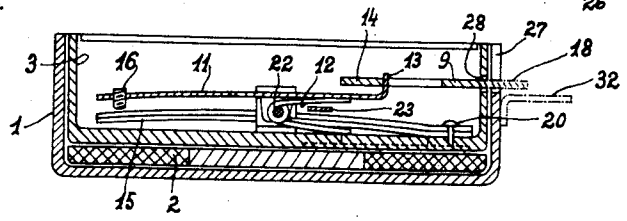


Fig. 3.

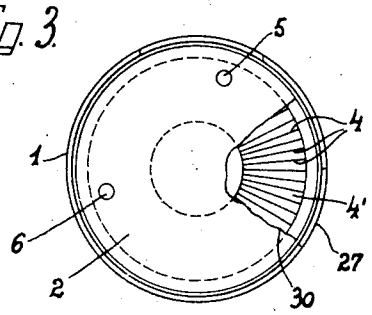
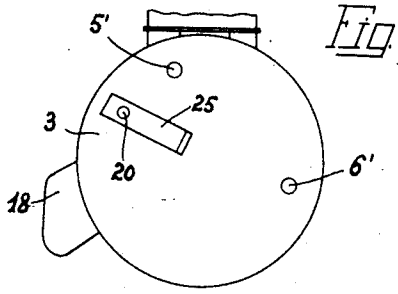


Fig. 4.



N. Németh
INVENTOR

By: Glascock Downing & Seebold
Attys.

UNITED STATES PATENT OFFICE

2,142,281

ELECTRIC HEATING DEVICE FOR VULCANIZING TUBES OF MOTORCAR OR MOTORCYCLE TIRES

Nándor Német, Pestujhely, Hungary, assignor of fifty-five per cent to Hella de Csarada and forty-five per cent to Bela Vrtyel Vertel, both of Budapest, Hungary

Application April 13, 1937, Serial No. 136,695
In Hungary September 23, 1936

1 Claim. (Cl. 219—19)

This invention relates to electric heating devices for vulcanizing India rubber articles and more particularly to devices of the kind provided with a switching device adapted to automatically cut off the flow of current when a certain temperature is attained and the vulcanizing is finished.

One object of the invention is to construct such a heating device with little dimensions and light weight in order to be able to be easily accommodated in the tool box of motor cars or motor cycles.

Another object of the invention is to reduce the current-consumption of the device to such a degree that the battery of a motor car, or even of a motor cycle should be a suitable source of current for the device for a period necessary to patch a tube.

Further objects and details of the invention will be understood from the following description having reference to the accompanying drawing.

In the said drawing Fig. 1 is a top plan view of the heating device the cover of which is removed; and Fig. 2 is a cross section taken on line *a, b, c, d, e, f*. These two figures show the device on an enlarged scale.

Fig. 3 is a top plane view, partly in section, of the outer casing and the heating body after removal of the switching device, and Fig. 4 a bottom view of the switching device, these two figures showing the invention on natural scale. Fig. 5 is a fragmentary sectional view of the casing of the switching device taken on line 5—5 of Fig. 1.

In the device shown in the drawing by way of example, 1 denotes an outer casing accommodating an electric heating body 2 and an inner casing 3 containing the automatic switching device and having a bottom of insulating material. The heating body 2 consists, in the embodiment shown, of a wire 4 (Fig. 3) wound around a ring shaped plate 4' of insulating material and lying between insulating sheets, for instance two mica plates 30. For the sake of simplicity, in Fig. 2 the sections of the parts 4, 4' and 30 are only diagrammatically shown. The two ends of the wire 4 are connected to contacts 5 and 6 situated above the upper mica plate 30. The whole heating body 2 may be easily removed from casing 1, in order to replace it by another one dimensioned for another voltage, if necessary.

On the bottom of casing 3 there are contacts 5' and 6' bearing on contacts 5 and 6, and projecting to the inner surface of said bottom, these contacts being not shown in Fig. 2. Contact 5' is permanently connected to one of a pair of outer contacts, which in the embodiment shown are constituted by plug contacts 28. The other of these plug contacts is in connection with a further, unmovable contact 7, which cooperates with a movable contact 8 constituted by a laminated spring. This spring contact is in connection with the said contact 6'. On the elastic contact 8 a roller 10 bears, which is mounted on one arm of a switching element 9 pivoted at 21. The spring 8 tends to leave contact 7 and a spring 17 bearing on the wall of casing 3 and on switching element 9 also presses the latter in the direction of the arrow 31 shown in Fig. 1.

Switching element 9 acts like a two armed lever, the arm 14 of which cooperates with a spring controlled locking lever 11 swingable around a pin 22. One end of the two armed locking lever 11 forms a hook 13 engaging arm 14, the other end being fitted with a set screw 16. Under this set screw is situated the free end of a bimetallic strip 15 secured at its other end to the bottom of casing 3. If this metal strip is heated, its free end is raised and it engages set screw 16. The free space between strip 15 and set screw 16 may be adjusted at will.

The switching element 9 has a projection 18 projecting out of casing 3 through its hole 28 and of casing 1 through a depression 27 in the cylindrical wall of this casing 1. Projection 18 enables the user to swing the element 9 around pivot 21 against the action of springs 8 and 17. A guide 19 prevents arm 14 of the switching element from being raised by the nose 13 of lever 11.

In operation, when a tube is to be patched, the heating device is put in the same place where in the so called Shaller heaters the fuel mass is placed and connection is established with the battery of the car by means of contact plugs 29. Thus the circuit is closed through contacts 7, 8, 6', 6, wire 4, contacts 5 and 5'. The temperature of wire 4 is raised in consequence of the electric resistance, so that this wire begins to heat the rubber through the bottom of casing 1, at the same time heating through a hole 26 of the bottom of casing 3 the bimetallic strip 15. When the desired temperature of about 160 centigrade is attained, strip 15 is bent to such an extent that it raises the left hand end of locking lever 11, against the action of spring 12, so that hook 13 disengages from arm 14, whereupon switching element 9 and contact 8 are moved into the position shown in dotted lines in Fig. 1. Thus the circuit is broken just when the vulcanizing is finished. The sudden jumping out of projection 18 shows to the operator that the vulcanizing is finished.

It is easy to find out the dimensions of heating

wire 4 by which after attaining the desired temperature and after breaking the circuit the elapsed period is enough for securing the patch on the rubber object.

For the next use it is only necessary to push in by a finger projection 16, whereupon contact 8 is pressed to contact 7 and hook or nose 13 of lever 11 snaps behind arm 14 under the action of spring 12.

The hole 26 may be covered by a metal tongue 25 being under the direct action of the heating body 2. The heat is conducted to the bimetallic strip by means of a rivet 20. Furthermore, a protecting plate 32 may be fastened to casing 1 to avoid injuries of element 9, 18.

Instead of screw 16 on lever 11, a set screw 24 (Fig. 1) may be used for adjusting the period of heating. This screw 24 is screwed into a little metal plate 23 which is fastened to the bottom of casing 3. When the metal strip 15 is bent to some extent it reaches screw 24, but in course of further heating the strip is bent further in spite of its engagement with screw 24. The more screw 24 is screwed near to strip 15, the more it hinders the bending movement and the later the electric circuit of heating wire 4 is broken.

Instead of bimetal 15 any other element known as a "thermostat" may be employed, which alters its shape under the action of heat.

The described simple, light and reliable construction makes the heater suitable for use on the road for patching tubes. The metal masses of the device being very little, the losses by radiation of heat are also little, so that the consumption of the device is extremely low.

I claim:

In an electric heating device for vulcanizing rubber tubes, a casing, insulating sheets, an electric resistor situated on the bottom of said casing between said insulating sheets, two contacts on the upper insulating sheet for leading current through the resistor, a second casing situated in the said first mentioned casing, two contacts on the outer bottom surface of said second mentioned casing engaging the said two contacts and projecting to the inner bottom surface, an outer contact permanently connected to one of said contacts on the inner bottom surface, a movable spring controlled contact, a further outer contact connected to the other contact on the inner bottom surface by means of said movable spring controlled contact, a movable switching element in the said second casing adapted to close the circuit of said resistor by means of said movable spring controlled contact, a part of said switching element projecting out of both casings for a manual operation, a spring controlled locking lever engaging said switching element when the said circuit is closed, and a bimetallic strip in the said second casing acted upon by said resistor for breaking the said circuit at a certain temperature and a certain period of heating by means of disengaging said locking lever from said switching element.

NÁNDOR NÉMET.