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2,075,705

VULCANIZING UNIT

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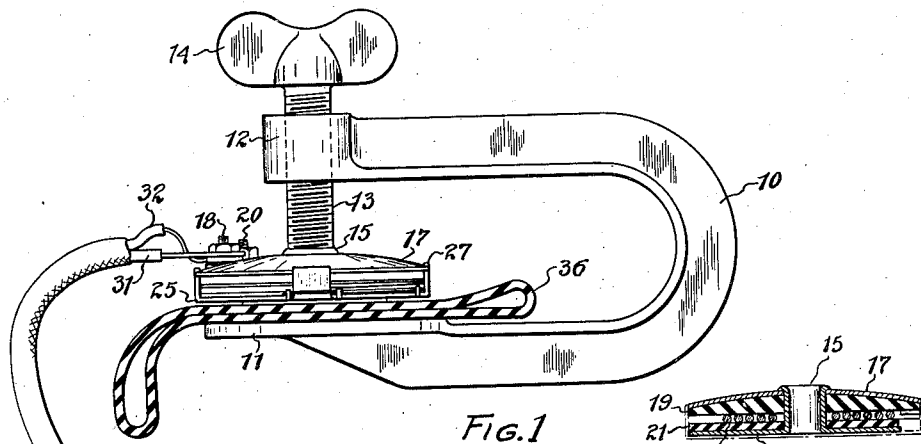


Fig. 1

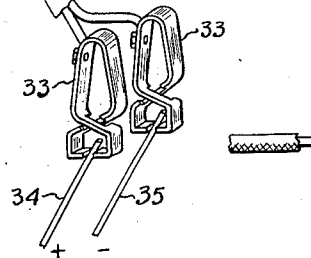


Fig. 2

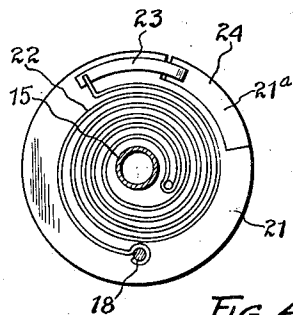


Fig. 3

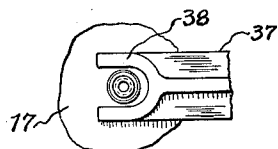


Fig. 4

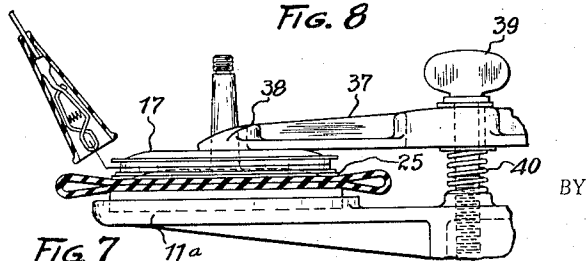


Fig. 5

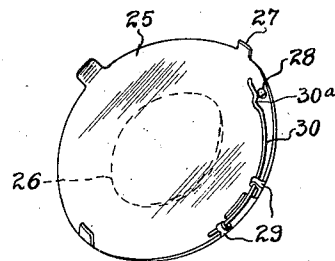


Fig. 6

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VULCANIZING UNIT

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REISSUED

This invention relates to an electrical vulcanizer and particularly to an electrical vulcanizer for vulcanizing patches upon rubber articles, such as tire tubes, rubber balls, bags and the like.

An object of the invention is to provide an electrical vulcanizer which can be manufactured and sold at a relatively low cost and which can be economically used by the purchaser.

Another object is to provide an electrical vulcanizer comprising a part which contains the heating element and which can be used repeatedly, together with a part carrying the patch and forming the vulcanizing pad and which is very simple and inexpensive and can be thrown away after use, wherefore the first named part of the vulcanizer together with a number of the second named parts thereof can be packaged and sold to the purchasing public.

A further object is to provide an electrical vulcanizer, as specified above, and wherein is embodied improved means for preventing the heat of vulcanization exceeding a predetermined temperature and, therefore, eliminating danger of injuring the article to which the patch is being vulcanized.

Another object is to provide an electrical vulcanizer which is simple in construction, relatively inexpensive to manufacture and which can be easily used for vulcanizing rubber patches upon rubber articles.

Further and additional objects and advantages not referred to above will become apparent hereinafter during the following detailed description of an embodiment of the invention.

Referring to the accompanying drawing,

Fig. 1 is a side elevational view of the electrical vulcanizer embodying the present invention, the rubber article to which the patch is being vulcanized being shown in section.

Fig. 2 is a top plan view of one of the parts or members of the electrical vulcanizer.

Fig. 3 is a side elevational view on an enlarged scale of the part or member shown in Fig. 2.

Fig. 4 is a horizontal sectional view on a reduced scale and is taken substantially on line 4—4 of Fig. 3 looking in the direction of the arrows.

Fig. 5 is a vertical sectional view taken substantially on line 5—5 of Fig. 2 looking in the direction of the arrows.

Fig. 6 is a detailed perspective view of another part of the vulcanizer, namely, the vulcanizing and patch carrying pad.

Fig. 7 is a fragmentary side elevational view of

a modified form of the invention from that previously illustrated, and

Fig. 8 is a fragmentary top plan view of the device shown in Fig. 7.

The electrical vulcanizer comprises a suitable C-shaped member 10, one arm of which is provided with an enlarged flat article supporting plate or table 11, while the other arm of the member 10 has at its end and above the plate 11 a boss 12 which is provided with a threaded bore in which is screwed a clamping bolt 13 carrying at its upper end a wing operating handle 14. The lower end of the clamping bolt 13 is provided with a reduced portion which engages in a hollow rivet 15 formed integral with a metal plate 16 and extending centrally therefrom through a second metal plate 17.

The metal plates 16 and 17, with the parts that are held in assembled relationship between said plates and now to be described, comprise one part or member of the electrical vulcanizer. The plate 17 carries a binding post 18 which is electrically insulated from the plate and extends therethrough and through an insulating disk 19 of asbestos or other suitable material located below the plate 17 as clearly shown in Fig. 3. The plate 17 is also provided with a second binding post 20 which is electrically connected with the plate. A disk 21 of insulating material, such as asbestos, is located above the plate 16, while between the insulating disks 19 and 21 there is arranged a coiled electrical resistance element 22, one end of which is connected to the post 18, as clearly shown in Fig. 4, while the opposite end of the element is suitably connected to an arcuate contact finger 23, which has its end extending over a recess 21a cut in the circumference of the insulating disk 21. The plate 16 is arcuately slitted inwardly of its circumference to provide a spring contact finger 24, the free end of which, as shown in Fig. 4, extends below the recess 21a of the disk 21 and the free end of the finger 23.

It will be seen that when the contact finger 24 is pressed upwardly its end will be free to engage the end of the contact finger 23, at which time there is a complete electrical circuit through the part or member, which circuit includes the binding post 18, the electrical resistance element 22, contact fingers 23 and 24, plate 16, rivet 15, plate 17 and binding post 20.

The other part or member of the vulcanizer comprises a flat metal disk 25 which carries on its underside the patch 26 which is to be vulcanized to the article, see Fig. 6.

The disk 25 is properly positioned with respect to the member or part hereinbefore described by means of a plurality of upstanding lugs 27 bent up from the circumference of the disk, one or more of said lugs being of a different size from the remainder of the lugs, wherefore when the disk is positioned against the plate 16 it is necessary to locate the proper lugs 27 in the proper recesses 27a formed in the plate 17. The reason that the disk 25 must be located accurately with respect to the other part of the vulcanizer will now be explained. The disk 25 is provided with a post or rivet 28 formed of fusible solder or other fusible material. The disk 25 is provided on opposite sides of one of the lugs 27 with integral hooked arms 29 in which is secured a wire spring 30 having adjacent its free end an upwardly extending hump 30a and said free end of the spring is engaged behind the post or rivet 28. The hump 30a of the spring when the parts are assembled and pressed together engages the free end of the contact finger 24 and overcomes the resilience of the same and presses it against the contact finger 23, so that the complete circuit through the first described part of the vulcanizer is established as previously referred to.

The binding posts 18 and 20 are connected to suitable conductors 31 and 32 which, in turn, may be connected by means of clamps 33 or other suitable means to the post terminals of a battery, as represented by the conductors 34 and 35 in Fig. 1, if the vulcanizer is being used where there is no commercial current available, as for example, in vulcanizing patches upon tire tubes while on the road, or the conductors 31 and 32 can be connected to a suitable transformer if commercial current is being employed.

The article 36 to which the patch 26 is to be vulcanized is positioned on the table 11 of the member 10, and then the vulcanizer, comprising the parts previously described is positioned upon the article with the patch in the proper location thereon. The clamping screw 13 is now turned down to press the two parts or members of the vulcanizer together and to cause the patch to engage the article under pressure. At this time the hump 30a of the spring 30 has forced the end of the spring contact finger 24 which is integral with the plate 16 into engagement with the contact finger 23, wherefore when the vulcanizer is connected to a source of electrical energy a complete circuit for the current is established through the binding post 18, resistance element 22, contact fingers 23, 24 and the plates 16 and 17 and the binding post 20. The resistance element consequently heats up and raises the temperature of the plate 16 to a degree such that the patch 26 is vulcanized to the article 36.

It is desirable that excessive heat be avoided because of its deleterious effect upon the article, and such excessive heat is adequately guarded against in the vulcanizer, as will now be explained.

If during the vulcanizing operation the heat of the plate 25 should exceed a predetermined degree the post or rivet 28 which, as has been stated, is constructed of fusible material, will fuse and then the spring rod or wire 30 is free to spring outwardly and the hump 30a is moved out of engagement with the end of the contact finger 24. When this has taken place the contact finger, due to its inherent resilience, moves toward the position shown in Fig. 3 and out of contact with the end of the contact finger 23, thus breaking the circuit through the resistance element,

It will be seen that the part or member of the vulcanizer formed by the disk 25 and constituting the vulcanizing pad which carries the patch can be very economically manufactured, inasmuch as it is simply a sheet metal disk stamping having the fusible post 28 and wire 30 and contains no expensive parts such as a resistance element or other parts. In view of this fact after each use of the vulcanizer the vulcanizing pad or disk 25 may be thrown away, and when the vulcanizer is again used a new disk or pad 25 may be employed.

This arrangement possesses decided advantages in the manufacture and sale of a vulcanizer of this type, inasmuch as the device can be packaged and distributed by including in the package the resistance element carrying member of the vulcanizer and a number of the vulcanizing pads or disks 25, thus providing for a vulcanizer which is relatively inexpensive for the purposes for which it is used and which is provided with destructible means for interrupting the circuit through the resistance element when a predetermined temperature has been reached.

In the modified form shown in Figs. 7 and 8 the part carrying the electrical heating element corresponds to the plates 16 and 17 together with the elements associated therewith, while the vulcanizing pad corresponds to the pad 25 previously described. However, the two parts of the device are each provided with central openings which when the parts are assembled are in alignment and are of such size that a valve stem may extend therethrough. This device, therefore, can be used to vulcanize the rubber bases of valve stems, such as rubber stems or stems having rubber or cord fabric bases, to the inner tubes of tires. Pressure is applied to the parts of the device in any desired manner, as for example, by means of an arm 37 having at its outer end a forked portion 38 which straddles the valve stem and bears upon the plate 17. An adjusting or clamping member 39 extending through the arm and having a spring 40 arranged thereon and engaging the underside of the arm can be employed to move the arm downwardly into clamping or holding engagement with the plate 17.

Although a preferred embodiment of the invention has been illustrated and described herein, it should be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention I claim:

1. A vulcanizing device adapted to be used with but readily separable from a suitable clamping means comprising a pair of cooperating superimposed separable members, one of which is adapted to have pressure applied thereto by the clamping means and the other of which is provided with a vulcanizing patch for engagement with a rubber article, an electrical resistance element carried by said first named member which when energized creates the heat of vulcanization, and cooperating means carried by said members and coacting automatically when said members are arranged in the clamping means in superimposed relationship and pressure is applied to the first named member by said clamping means to enable an electrical circuit to be completed through said resistance element.

2. A vulcanizing device adapted to be used with but readily separable from a suitable clamping means and comprising a pair of cooperating superimposed separable members, one of which is adapted to have pressure applied thereto by the clamping means and the other of which is a

substantially flat disk provided with a vulcanizing patch for engagement with a rubber article, a resistance element carried by said first named member which when energized creates the heat of vulcanization, and cooperating means carried by said members and coacting automatically when said members are arranged in the clamping means in superimposed relationship and pressure is applied to the first named member by said clamping means to enable an electrical circuit to be completed through said resistance element.

3. A vulcanizing device comprising a pair of cooperating superimposed members, one of said members being adapted to have pressure applied thereto by a suitable clamping means and provided with an electrical resistance element adapted to be energized to create the heat of vulcanization, the other of said members being separable from said first named member and said clamping means and adapted to carry a vulcanizing patch for engagement with a rubber article, and fusible means carried by said last named member for controlling the electrical circuit through the resistance element carried by the first named member and which fuses at a predetermined temperature whereby said last named member is destroyed by use and may be discarded following the vulcanization process.

4. A vulcanizing device adapted to be used with but readily separable from a suitable clamping means and comprising a pair of cooperating superimposed separable members, one of which is adapted to have pressure applied thereto by the clamping means and the other of which is provided with a vulcanizing patch for engagement with a rubber article, a resistance element carried by said first named member which when energized creates the heat of vulcanization, and cooperating means carried by said members and coacting automatically when said members are arranged in the clamping means in superimposed relationship and pressure is applied to the first named member by said clamping means to enable an electrical circuit to be completed through said resistance element, the means which is carried by the second named member being fusible at a predetermined temperature whereby the circuit through the resistance element carried by the first named member will be automatically broken when said second named member and said means reaches said predetermined temperature.

5. A vulcanizing device comprising a pair of cooperating superimposed members, one of said members being adapted to have pressure applied thereto by a suitable clamping means and being provided with an electrical resistance element, said member also being provided with normally

separated contact fingers arranged in the circuit through said resistance element and adapted to be brought into engagement to complete said circuit, the other of said members being separable from said first named member and said clamping means and adapted to carry a vulcanizing patch in engagement with a rubber article, and means carried by said second named member and acting when said members are arranged in superimposed relationship and pressure applied thereto to move into engagement said normally separated contact fingers carried by the first named member.

6. A vulcanizing device comprising a pair of cooperating superimposed members, one of said members being adapted to have pressure applied thereto by a suitable clamping means and being provided with an electrical resistance element, said member also being provided with normally separated contact fingers arranged in the circuit through said resistance element and adapted to be brought into engagement to complete said circuit, the other of said members being separable from said first named member and said clamping means and adapted to carry a vulcanizing patch in engagement with a rubber article, and means carried by said second named member and acting when said members are arranged in superimposed relationship and pressure applied thereto to move into engagement said normally separated contact fingers carried by the first named member, said means including a post which fuses at a predetermined temperature whereby the circuit through the resistance element is broken and said second named member is destroyed by use and may be discarded following the vulcanization process.

7. A vulcanizing device adapted to be used with but readily separable from a suitable clamping means and comprising a pair of cooperating superimposed separable members provided with aligned centrally disposed openings through which a valve stem can extend, one of said members being adapted to have pressure applied thereto by the clamping means and being provided with a resistance element which when energized creates the heat of vulcanization, the other of said members being adapted to engage the vulcanizing patch which is to be vulcanized to a rubber article, and cooperating means carried by said members and coacting automatically when said members are arranged in the clamping means in superimposed relationship and pressure is applied to the first member by said clamping means to enable an electrical circuit to be completed through said resistance element.

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