W. S. HADAWAY, Jr.

ELECTRICALLY HEATED DEVICE.

APPLICATION FILED MAY 1, 1909.

977,625.

Patented Dec. 6, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

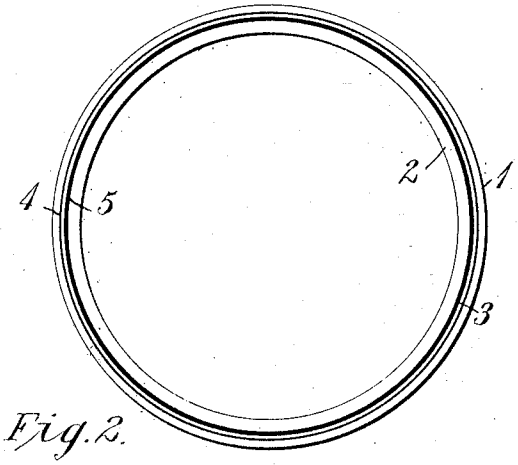


Fig. 3.

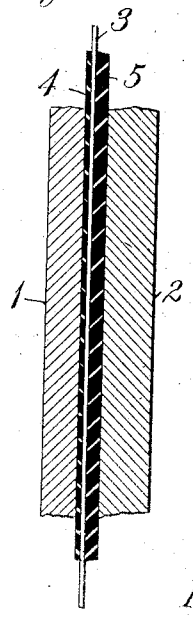


Fig. 2.

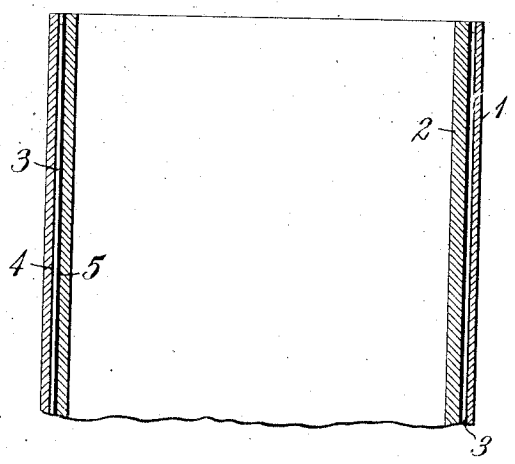
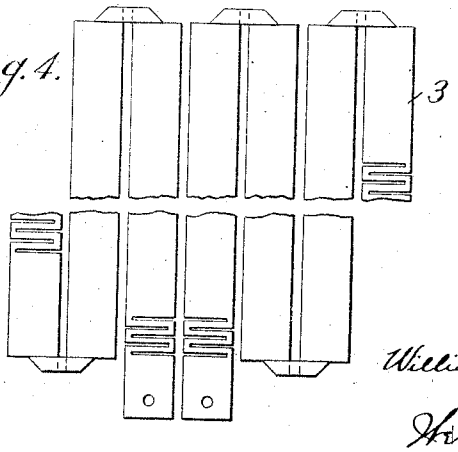


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

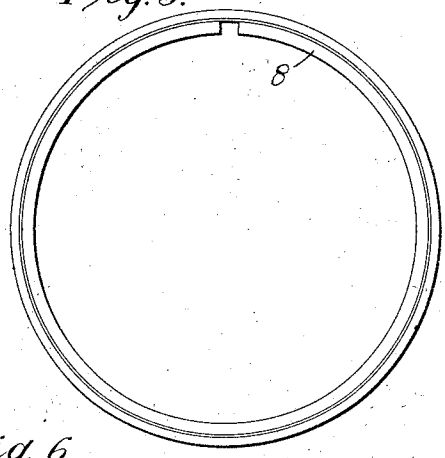


Fig. 6.

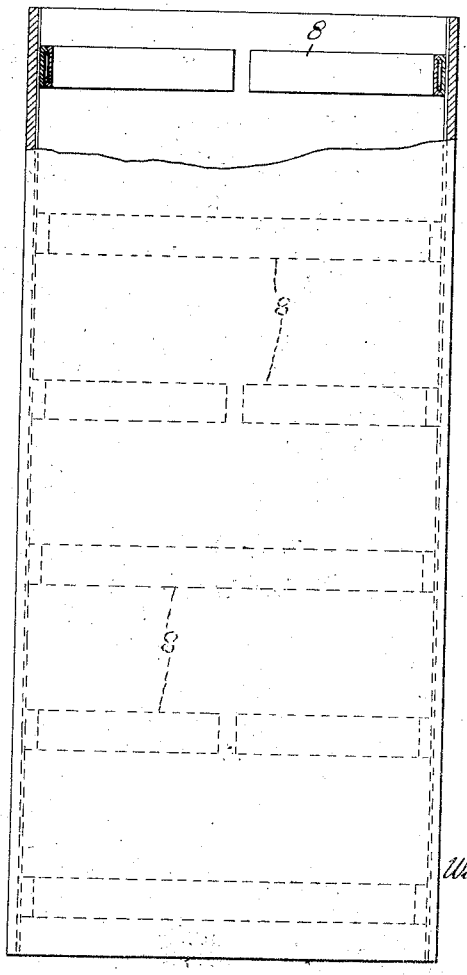
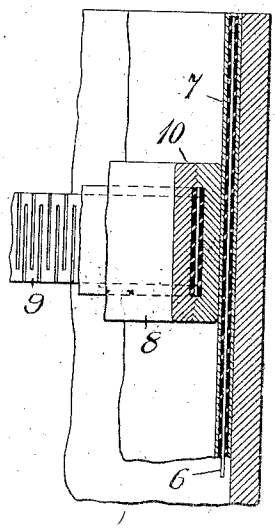


Fig. 7.



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WILLIAM S. HADAWAY, JR., OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

ELECTRICALLY-HEATED DEVICE.

977,625. Specification of Letters Patent. Patented Dec. 6, 1910.

Application filed May 1, 1909. Serial No. 493,408.

To all whom it may concern:

Be it known that I, WILLIAM S. HADAWAY, Jr., a citizen of the United States, and a resident of East Orange, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Electrically-Heated Devices, of which the following is a specification.

My invention relates to electrically heated laundry rolls and similar devices, and it has for its object to provide a device of this character that shall be simple and durable in construction and in which a maximum amount of the generated heat is conducted to the working surfaces.

When laundry rolls and other hollow cylindrical bodies are heated electrically, it is usual to place the resistance or heater element within the cylinder but it is difficult to obtain a good contact between the inner surface of the cylinder and the heater without injuring the heater in assembling the device.

In order to overcome the above mentioned difficulty, I provide, according to one embodiment of my invention, an inner cylinder the outside diameter of which is somewhat less than the inside diameter of the shell and dispose the resistance element of the device on the surface of the inner cylinder, insulating it therefrom by means of mica or other hard material. The inner cylinder is made of metal having a greater co-efficient of expansion than that of the shell, and the insulation between the resistance element and the shell is very thin, while a material thickness of insulation is inserted between the resistance element and the inner cylinder.

Figure 1 of the accompanying drawings is an end elevation of a roll constructed in accordance with my invention. Fig. 2 is a sectional view of a portion of the roll shown in Fig. 1, and Fig. 3 is a sectional view, on an enlarged scale, of one wall of the assembled device. Fig. 4 is a detail view of the resistance or heater element employed in the device shown in the other figures. Figs. 5, 6 and 7 are views, corresponding to Figs. 1, 2 and 3, of a modified structure which embodies my invention.

Referring to Figs. 1, 2, 3 and 4 of the drawings, the device here illustrated comprises a hollow cylindrical shell 1 of steel or other suitable material, an inner cylinder 2 of brass or some other metal having a greater co-efficient of expansion than that of the shell 1, and a resistance element 3 which is interposed between the shell and the cylinder and is insulated from each of them. The insulating cylinder 4 which is interposed between the resistance element 3 and the inner surface of the shell 1 is relatively thin, while the cylinder 5 which surrounds the inner cylinder 2 and on which the resistance element is mounted is relatively thick.

In assembling the device, the resistance element is disposed on the surface of the inner cylinder 2 after it has been suitably insulated, the resistance element being held in position by an outer wrapping of insulation. The size of the inner cylinder 2 and the thickness of the insulation is such that, when assembled, these parts fit closely into the shell 1.

By making the insulation between the resistance element and the shell thin, the heat generated in the resistance is largely conducted through the shell to its outer working surface, and, since the insulation between the resistance element and the inner cylinder is relatively thick, the heat is largely prevented from passing into said cylinder.

When the device is in operation, all of the parts will obviously become heated to a greater or less degree and, since the co-efficient of expansion of the cylinder 2 is greater than that of the shell 1, the resistance element will be forced into very close engagement with the inner surface of the roll.

Referring to Figs. 5, 6 and 7, the heater or resistance element 6, as here shown, is protected by a sheath 7 of thin metal, such as sheet iron, from which it is separated by mica or other suitable insulation. The sheathed resistance is so constructed as to fit into the shell 1 and, when it is in position, a plurality of interrupted thermostatic rings 8 are fitted into it and are spaced at convenient distances apart. Each of the rings 8 comprises a resistance strip or ribbon 9 and a sheath 10 built up of rods or bars of unlike metals that are welded together at their edges and are adapted to force the sheathed resistance 6 into close engagement with the inner surface of the shell 1 when electric energy is supplied to the strips 9. The strips 9 and the resistance

element 6 may be connected in circuit to receive heating current in any manner which will insure the desired results. The thermostatic rings 8 are preferably constructed in the manner set forth in my co-pending application, Serial No. 493,404, filed of even date herewith.

It is evident that structural modifications may be effected in the device illustrated without departing from the spirit of my invention, and I desire that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. An electrically heated roll comprising an outer shell, an inner cylinder having a relatively greater degree of expansibility when heated, and a resistance element interposed between the shell and the cylinder and insulated from each of them.

2. An electrically heated roll comprising an outer shell, a concentric inner cylinder of material having a higher co-efficient of expansion, and a resistance element interposed between the shell and the cylinder and insulated from each.

3. An electrically heated device comprising an outer cylinder, a concentric inner cylinder of material having a greater co-efficient of expansion, a resistance element interposed between the cylinders, a relatively thick insulating sleeve separating the resistance from the inner cylinder, and a relatively thin insulating sleeve separating the resistance element from the outer cylinder.

4. An electrically heated device comprising an outer cylinder of iron, a concentric inner cylinder of brass, and a resistance element interposed between the cylinders and insulated from each.

5. An electrically heated roll comprising an outer shell of iron, a concentric inner cylinder of brass, a relatively thick insulating sleeve separating the resistance from the brass cylinder, and a relatively thin insulating sleeve separating the resistance from the iron shell.

6. An electrically heated device comprising a member having a working surface, a resistance element for heating said member, and a member having a relatively great degree of expansibility when heated, said expansible member being located adjacent to said resistance element and being adapted to force the resistance element into engagement with the member having the working surface when heat is generated in said element.

In testimony whereof, I have hereunto subscribed my name this 20th day of April, 1909.

WILLIAM S. HADAWAY, JR.

Witnesses:
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