(No Model.)

R. E. WILLIAMS.

ELECTRIC BRUSH.

No. 494,359. Patented Mar. 28, 1893.

Fig. 1.

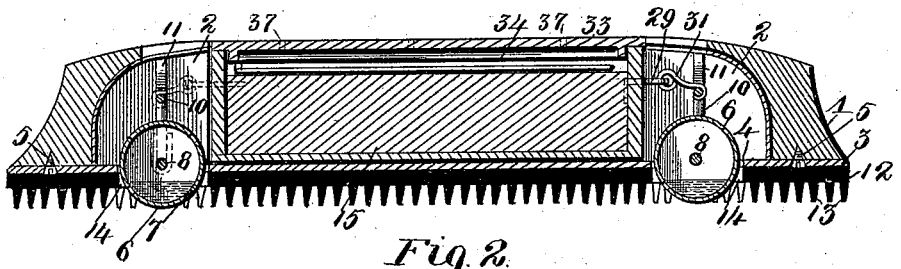


Fig. 2.

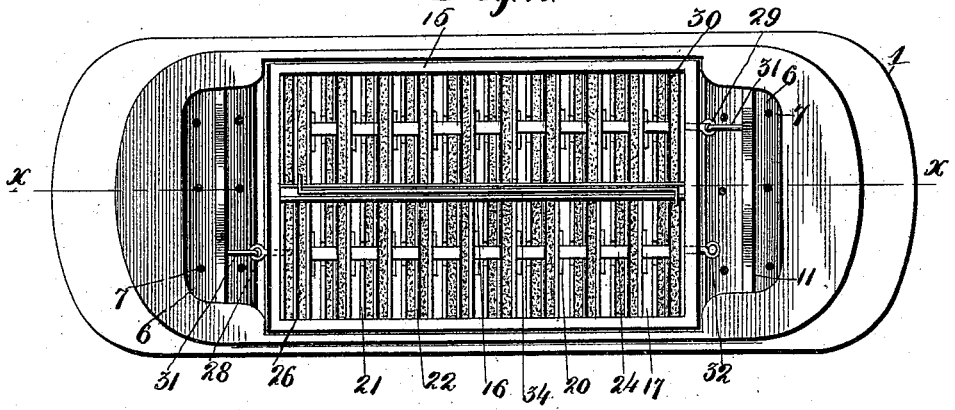


Fig. 3.

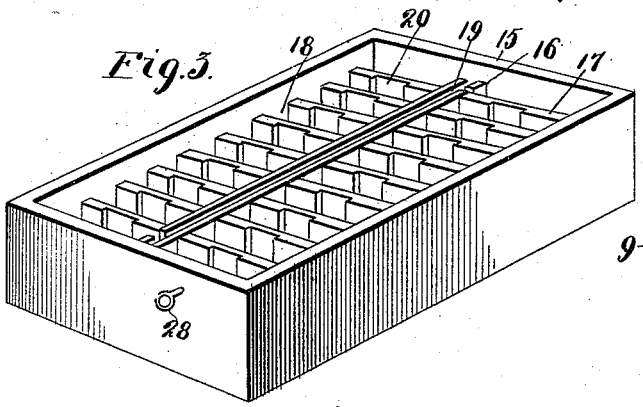


Fig. 4.

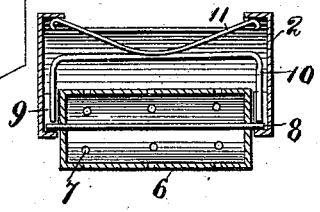


Fig. 5.

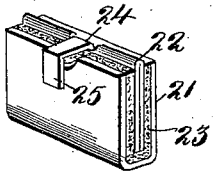


Fig. 6.

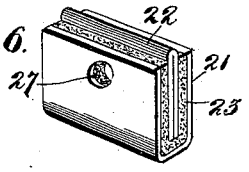
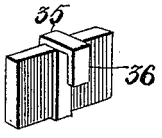


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ELECTRIC BRUSH.

SPECIFICATION forming part of Letters Patent No. 494,359, dated March 28, 1893.

Application filed November 29, 1892. Serial No. 453,548. (No model.)

To all whom it may concern:

Be it known that I, ROBERT E. WILLIAMS, of Hot Springs, Arkansas, have invented certain new and useful Improvements in Electric Brushes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My improvement has relation to electric brushes and consists in the novel arrangement and combination of parts more particularly set forth in the specification and pointed out in the claims.

In the drawings Figure 1 is a vertical longitudinal section of the brush taken on the line *x*—*x* of Fig. 2. Fig. 2 is a top plan view of my complete invention with the cover for the battery casing removed. Fig. 3 is a perspective view of the battery casing or receptacle. Fig. 4 is a vertical longitudinal section of one of the rollers and the metallic casing for supporting the same. Fig. 5 is a perspective view of one of the intermediate cells. Fig. 6 is a perspective view of one of the end cells to which the positive connection is made; and Fig. 7 is a perspective view of a block of carbon having a metallic connection and to be used in place of the copper heretofore employed.

The electric brush hereinafter described presents the following merits: first, a continuous current of electricity passing from the battery to each of the rollers forming the electrodes; second, friction from the face of the brush for cleansing purposes, and third pressure or massage treatment from the yielding rollers.

Referring to the drawings, 1 represents the body of the brush which is made of suitable shape and formed from hard rubber, celluloid or other suitable material, which body is hollowed out to receive the various parts comprising my invention.

2 represents two metallic receptacles suitably shaped and adapted to be removably secured within spaces formed in either end of the body of the brush, and are designed to carry and support the spring rollers in a manner hereinafter described.

3 represents a plate having two elongated openings 4, and is secured to the lower flat surface of the body 1 by screws 5 or other similar devices or forms an integral part of said body, thus holding the metallic receptacles together with the rollers in their proper positions within the said body.

6 represents two metallic rollers made in the form of drums and each provided with a series of small openings 7 which allow water to enter the said rollers when the same are immersed, thereby holding a sufficient quantity of water for all practical purposes which water not only renders a good electrical connection with the body, but at the same time is sprayed to thoroughly cleanse the parts it comes in contact with.

8 represents two shafts which are fixed to the said rollers the ends of which project a suitable distance and are received by bearings 9 formed or fixed to the opposite sides of the metallic receptacles 2, said bearings being so constructed as to allow the said rollers to be elevated when pressure is applied from below.

10 represents two U-shaped bars the ends of which are normally in contact with the ends of the shafts 8 forming an electrical connection.

11 represents two metallic springs the medium portions of which are attached to the medium portions of the U-shaped bars and the ends of said springs normally in contact with the tops of the said metallic receptacles 2.

To the lower surface of the plate 3 is attached in any suitable manner a sheet of rubber 12 having teeth or projections 13 formed on one of its sides and also openings 14 for the passage of the rollers 6 which rubber and teeth form the frictional surface for the brush and in practice are generally molded to the body of the brush. However, this rubbing surface of the brush can also be made of bristles by the employment of a suitable plate of material let in the bottom of the plate 3, and the bristles attached to said plate in any well known manner.

15 represents the battery receptacle or casing which is rectangular in shape and is removably located within a space formed for its reception in the body 1 of the brush. 16 represents a central longitudinal partition for the said receptacle 15 and 17 represents a series of

transverse partition forming receptacles 18 for receiving the cells hereinafter described. The upper edge of the said central partition 16 is provided with a groove 19, and one side of each of the transverse partitions is provided with depressions 20 for accommodating the various parts of the cells comprising the battery. The cells that I employ are all similarly constructed with the exception of the one forming the positive pole, and therefore I will describe but one pole in detail, referring particularly to Fig. 5. Referring to said figure, 21 represents the zinc element of said cell which is U-shaped, and of such a size as to fit snugly within one of the spaces 18 and also to receive the remaining parts composing the cell.

22 represents the copper element of the cell which is formed of sheet copper and folded upon itself, and is located between absorbent material 23 which is arranged within the zinc element in the manner shown. 24 represents the metallic connection for said cell one end of which is in contact with the copper element, and the opposite end hook-shaped, the flat surface 25 of which is adapted to be brought in contact with one side of the zinc element of the adjacent cell, the depressions 20 formed in the transverse partition 17 forming spaces for receiving the said ends of the metallic connections as best shown in Fig. 2.

The cell as shown in Fig. 6 is designated by the numeral 26 in Fig. 2 and forms the positive connection for the battery, and the construction of said cell is somewhat similar to that shown in Fig. 5, but dispensing with the metallic connection 24 and in lieu thereof a circular opening 27 is formed in one side of the zinc element and absorbent material 23 is used to allow the metallic adjustable screw 28 carried by the box or receptacle 15 to be brought in contact with the copper element of said cell.

29 represents a looped wire which is passed through the opposite side of the receptacle 15 and is normally in contact with the zinc element of cell 30.

31 represents hook-shaped wires which are looped into the metallic connections 28 and 29, and the opposite ends of the said wire connections hooked over the U-shaped bars 10, thus forming an electrical connection between the rollers 6 and battery.

In Fig. 2 a third metallic connection 32 is used which is adapted to receive a suitable hook-shaped wire leading to the U-shaped bar 10 whereby one-half of the battery may be cut out for diminishing the strength of the current.

33 represents a cover for the receptacle 15 and which may be provided with any suitable number of openings 37 through which may be passed the ends of suitable conducting wires and placed in contact with any of the cells of the battery when the said battery is desired to be used for other purposes and removed from the brush.

The two series of cells separated by the central partition 16 are in electrical connection with one another by wire 34 located in the groove 19 formed in the upper edge of said partition, one end of which wire is in contact with the copper element of one series of cells, and the opposite end of said wire in contact with the zinc or oxidizable metal of the other series.

In Fig. 7 I have shown a block of carbon which may be employed in place of the copper element heretofore made use of, which material renders the battery of greater strength, and fixed to the said carbon in any suitable manner is a strip of metal 35 having a hooked end 36 providing means for contact with the oxidizable material of the adjacent cell.

From the foregoing description it will be readily understood that the positive pole of the battery is in electrical contact with one of the U-shaped bars 10 and shaft 8 and one of the rollers 6; and the negative pole of said battery is in electrical connection with the opposite roller through similar metallic connections, the body forming a continuous circuit when the said rollers are brought in contact with the same.

The battery herein described can also be adapted to the use of the faradic current by removing one of the series of cells, and substituting therefor a coil of wire the electrical connections being made to the roller in a well known manner.

Having fully described my invention, what I claim is—

1. An electric brush having yielding rollers comprising the electrodes of said brush, substantially as set forth.

2. An electric brush having yielding rollers constituting its electrodes, said rollers having perforations, substantially as set forth.

3. An electric brush comprising a body, yielding perforated rollers mounted within said body and extending below the surface of the same, a battery and metallic connections between said battery and rollers, substantially as set forth.

4. An electric brush comprising a body, metallic receptacles 2 located therein, bearings carried by the said receptacles, rollers having shafts the ends of which are located within said bearings, U-shaped bars 10 the ends of which are in contact with the said shafts, springs 11 for holding said bars in contact and rendering the rollers yielding, a battery and metallic connections between said battery and U-shaped bars, substantially as set forth.

5. A galvanic battery for electric brushes each cell thereof comprising a casing of zinc 21, absorbent material 23 located therein, copper 22 folded upon itself and located between said absorbent material, a metallic connection 24 one end of which is in contact with said copper, and its opposite end in contact with the zinc of the adjacent cell, one of said

cells having an opening 27 formed in the zinc element of the same for forming connection with the copper or carbon located therein, substantially as set forth.

6. In an electric brush a receptacle 15 having a central longitudinal partition 16, transverse partition 17 forming spaces 18, and depressions 20 formed on one side of the said transverse partition for the reception of the metallic connections between the cells of the battery, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

ROBERT E. WILLIAMS.

Witnesses:
JAMES J. O'DONOHOE,
C. F. KEELER.