(No Model.) 2 Sheets—Sheet 1.

J. A. MALONEY.

BRUSH.

No. 557,844. Patented Apr. 7, 1896.

Fig. 3.

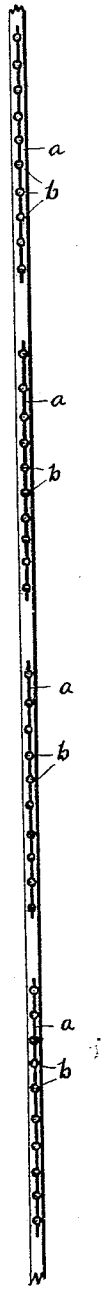


Fig. 1.

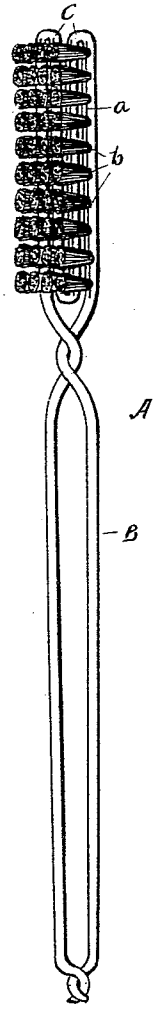


Fig. 2.

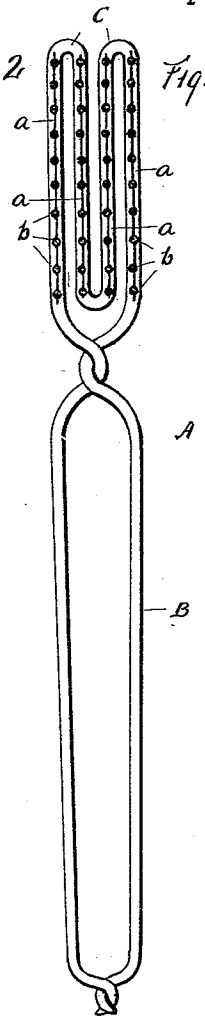


Fig. 7.

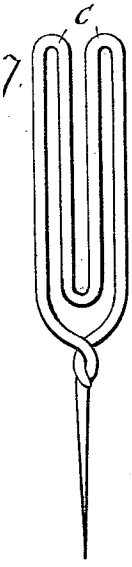


Fig. 5.

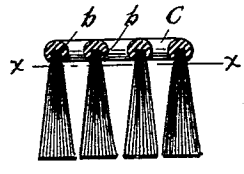
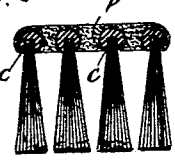


Fig. 4.

Fig. 6.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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BRUSH.

No. 557,844. Patented Apr. 7, 1896.

Fig. 9.

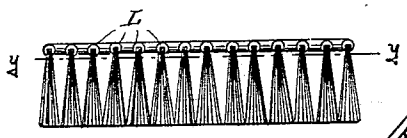


Fig. 8.

Fig. 10.

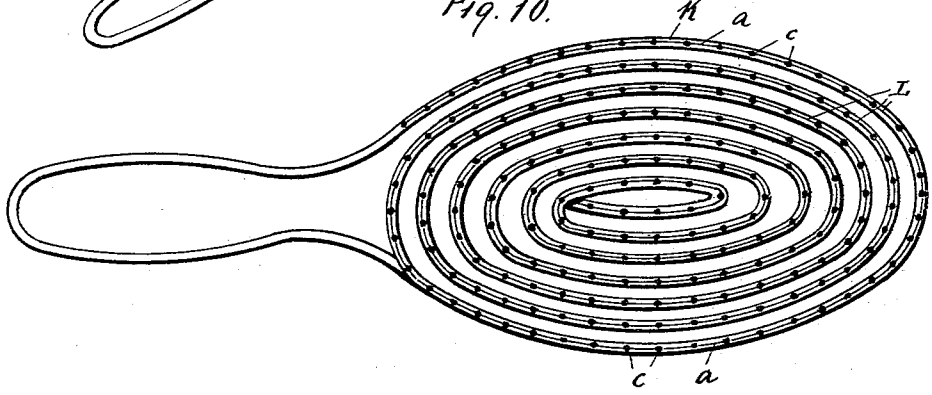
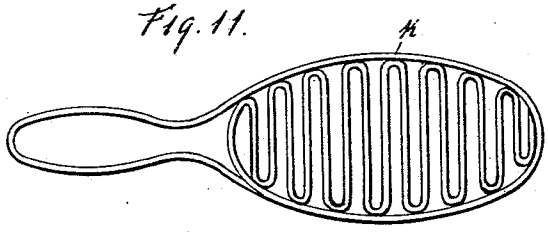


Fig. 11.



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UNITED STATES PATENT OFFICE.

JAMES A. MALONEY, OF WASHINGTON, DISTRICT OF COLUMBIA.

BRUSH.

SPECIFICATION forming part of Letters Patent No. 557,844, dated April 7, 1896.

Application filed November 13, 1895. Serial No. 568,832. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. MALONEY, a citizen of the United States, and a resident of Washington, in the District of Columbia, have invented certain new and useful Improvements in Brushes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view of a tooth-brush constructed according to this invention. Fig. 2 is a face view of the same with the bristles removed. Fig. 3 is a view of the blank from which the brush head or back is made. Fig. 4 is a cross-section of the blank before the bristle-tufts are put in place. Fig. 5 is a cross-section of the finished brush head or back. Fig. 6 is a similar view showing a backing of plastic material. Fig. 7 is a plan view of a modified form of the invention. Fig. 8 is a perspective view of a hair-brush constructed according to the invention. Fig. 9 is a cross-section on the line *z z*, Fig. 8. For greater clearness the several wires in this view are not shown in section. Fig. 10 is a plan view of the hair-brush with the bristles cut off on the line of *y y*, Fig. 9; and Fig. 11 is a plan view of a further modification.

The invention relates more particularly to tooth-brushes, but it is also applicable to other kinds—such as hair-brushes, nail-brushes, scrubbing-brushes, horse-brushes, &c.

It is designed to provide not only a neat, light, and attractive brush, and one which can be manufactured at a comparatively small cost, but also to provide means of improved character whereby the bristles are held in place and are prevented from becoming loose and working out, as is the case with many brushes as heretofore made. This result is particularly desirable in tooth-brushes owing to the annoyance and suffering which are caused by the bristles becoming lodged in the mouth or throat, to say nothing of the increase in the life and durability of the brush.

A further object is to provide a brush which is to a certain extent self-cleaning, and which can be readily and thoroughly cleaned when necessary.

With these objects in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

In the manufacture of brushes constructed according to this invention I take a piece of slender metal, such as malleable wire, and in that portion thereof which is to form the back of the finished brush I form a longitudinal groove or channel *a*, or, as shown in Fig. 3 of the accompanying drawings, a series (in the present instance four) of such grooves or channels in longitudinal alinement and separated from each other by short intervals. These grooves or channels may extend in depth from one-half to two-thirds the diameter of the wire and are of wedge or V form, their lateral walls converging at the bottom. I also form on the line of said grooves or channels a series of brush-holding sockets *b* at suitable intervals apart, and whose diameters are from three to four or more times the width of the said grooves or channels which intersect them centrally. The depth of the sockets is preferably coincident with that of the said grooves, and they are also preferably formed with tapering or converging walls, as indicated.

I may, if desired, instead of making a series of the grooves arranged end to end, as shown, make one continuous groove running the entire length of the back-forming portion of the wire, the purpose of the arrangement shown being simply to provide plain portions at those points on the wire which come at the ends of the finished brush and where the bends are made, as seen in Figs. 3 and 7. I next set the bristle-tufts in the sockets *b*, and when these are in place the wire is subjected to compression upon opposite sides, as by means of laterally-acting dies, which have their faces shaped to conform to the wire. This action has the effect of closing or swaging the walls of the sockets *b* tightly around the bristles, the body of the wire being compressed sufficiently to close or substantially close the grooves or channels *a*. The bristle-tufts are in this manner so firmly clamped and secured that it is impossible for them to

work loose. Owing to the V form of the grooves or channels the latter are closed throughout their entire depth by the swaging action of the dies or other tools instead of at the top only, as would be the case with a groove of considerable width at the bottom. Consequently the bristles are clamped much more firmly. This is also true with respect to the sockets, which, by their tapering form, are made to close upon the bristles in a substantially parallel manner. I do not desire, however, to limit myself to any particular form of the groove or of the sockets, since, to some extent, the same result would be obtained by a square or other shaped groove and straight sockets. In some cases, if desired, the grooves may be omitted and the sockets alone used. The wire is next bent to form the brush, that portion thereof having the bristles being bent back and forth upon itself to form a series of adjacent parallel limbs or loops *c*, which constitute the brush proper. The end portions of the wire are then bent to form the handle A, the two limbs or branches being intertwisted just below the head to form the shank portion B, and thence spread into parallel relation to form the narrow elongated handle-loop. The ends of the two limbs or branches are twisted upon each other at the extremity of the loop, brazed together, or otherwise suitably disposed of. The brush is then put in a bath and nickel or otherwise plated, the plating material flowing into and filling up such portions of the grooves or channels as may not have been entirely closed by the compression or swaging tools.

For hair, horse, scrubbing, or other brushes when a greater width is necessary a longer wire may be used and additional loops or limbs *c* be made, or the wire may be coiled in substantially concentric convolutions, as shown in Figs. 8 and 10.

It is obvious that if a non-metallic handle is preferred the end portions of the wire may be brought together to form a shank, which can be secured in such handle, instead of being extended and bent to themselves constitute the handle, or instead of a plain loop the said end portions can be bent to form a handle of some more ornamental design.

Owing to the spaces between the adjacent limbs which constitute the back the brush can be readily cleaned, being, in fact, to a large extent self-cleaning.

Should it be desirable to provide brushes of this kind with a closed back, it may be readily done by covering over the wires with papier-mâché or other suitable plastic material, as indicated at P, Fig. 6.

In Fig. 11 I have shown a further modification, which may be desirable for larger brushes. In this form instead of bending the wire into a series of concentric convolutions, as shown in Figs. 8 and 10, I first bend the wire to form a large loop K of the form of the brush head or back. I then bend the wire upon itself to form a series of substantially parallel loops L, which extend transversely within the outer loop. These inner loops are then brazed or otherwise fastened at their ends to the outer loop. This mode of construction renders the brush much more rigid.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described brush-head formed of a single piece of metal having a number of adjacent limbs, having sockets therein, and bristle-tufts set in the said sockets and secured by inset or compressed portions of the metal, substantially as specified.

2. As a new article of manufacture, a blank for brush-backs, comprising an elongated piece of malleable metal of slender character, having therein one or more longitudinal grooves or channels, and a series of sockets intersected by said grooves or channels and of a diameter greater than the width thereof, substantially as specified.

3. As a new article of manufacture, a brush whose back is formed of a piece of wire bent upon itself to form a series of adjacent limbs or branches, bristles secured in said wire, and a backing of plastic material, substantially as specified.

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

JAMES A. MALONEY.

Witnesses:
GEORGE H. PARMELEE,
GEO. M. ANDERSON.