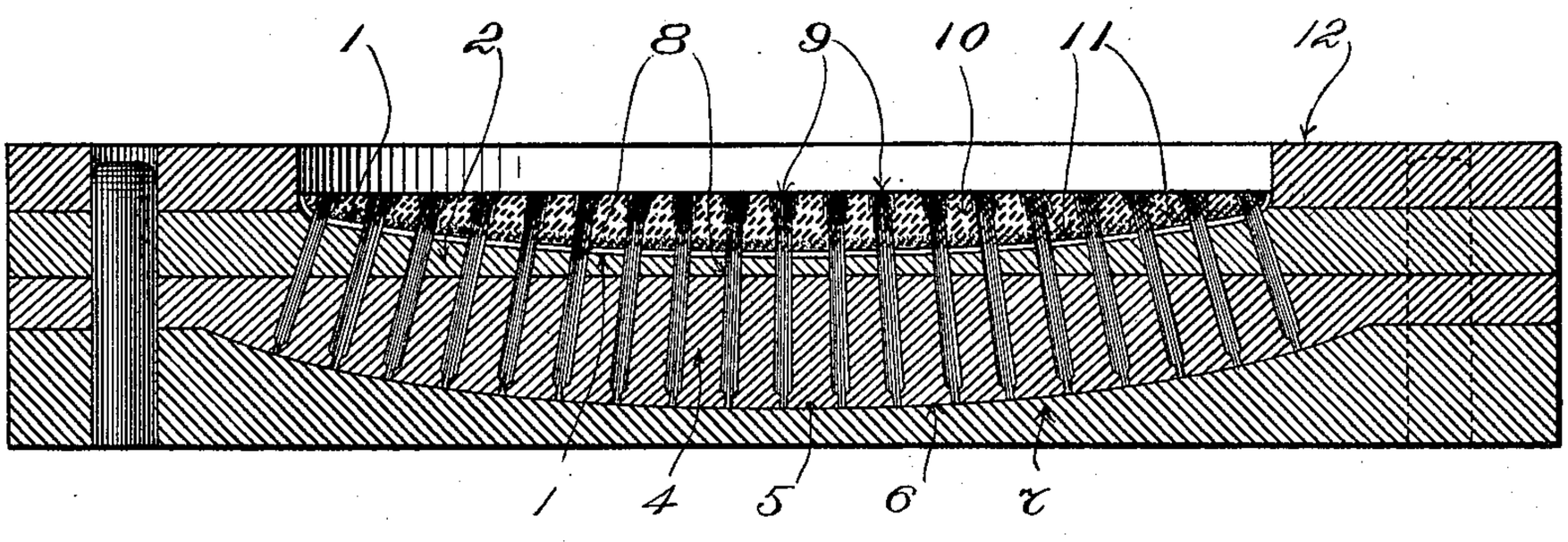
(No Model.)

A. C. ESTABROOK.

BRUSH.

No. 590,720. Patented Sept. 28, 1897.



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UNITED STATES PATENT OFFICE.

ALANSON C. ESTABROOK, OF NORTHAMPTON, MASSACHUSETTS, ASSIGNOR TO THE FLORENCE MANUFACTURING COMPANY, OF SAME PLACE.

BRUSH.

SPECIFICATION forming part of Letters Patent No. 590,720, dated September 28, 1897.

Application filed April 3, 1896. Serial No. 586,045. (No model.)

To all whom it may concern:

Be it known that I, ALANSON C. ESTABROOK, a citizen of the United States, residing at Northampton, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Brushes, of which the following is a specification, reference being had therein to the accompanying drawing.

In the case of brushes having the bristles in the form of single-length tufts and set and secured in a mass of plastic cement more or less trouble has been experienced on account of the difficulty of securing the bristles in place perfectly. To guard against the coming out of the bristles, various expedients have been resorted to. For instance, the inner ends of the bristles have been burned, thereby making enlargements on the said ends. The inner ends of the bristles also have been embedded in melted resin or shellac; but these substances are very brittle and the least bending or jar cracks them and leaves the bristles loose. In some cases the inner ends of the bristles after having been inserted in tufts through holes or perforations in a face-shell have been ironed over with a hot iron and covered with composition to hold them down and in place.

The object of my present invention is to provide a convenient and efficient means of readily securing the bristles in place, so as to prevent them from becoming loosened.

I will describe the invention first with reference to the accompanying drawing, after which the characteristic features thereof will be particularly pointed out and distinctly defined in the claim at the close of this specification.

The drawing shows in vertical section certain of the metallic plates which are employed in the process of the manufacture of a brush, with enough of a brush applied to such plates to disclose the nature of my invention. The drawing shows the tufts of bristles inserted through holes in a face-shell, which latter may be composed of metal or of plastic material. I do not regard this face-shell as essential in all embodiments of my invention.

1 in the drawing represents the face-shell. The said shell is supposed to be of metal, but this is not essential.

2 is a plate having in the upper surface thereof a cavity into which the shell fits, or which gives shape to the bristle-block when the latter is composed entirely of composition. The shell 1 is perforated for the reception of the tufts of bristles which are to be applied thereto, and perforations are formed in the plate 2, corresponding in position and arrangement with those of the shell.

4 is a second plate underlying the plate 2 and having corresponding holes therein. This plate has a convex projecting portion 5 on its under side which fits within a corresponding depression or concavity 6 in the upper surface of the plate 7. In practice, after the shell 1 has been placed in the cavity of the plate 2 the bristles 8 are introduced into the perforations of the said shell and of the two plates 2 and 4. When the shell is not employed, the bristles are inserted in the same manner into the holes of plates 2 and 4. The upper ends of the bristles then are or may be burned or charred, so as to form the enlargements thereon in well-known manner. Heretofore it has been customary immediately after burning the said ends of the bristles to apply the plastic cement 10, in which the inner ends of the bristles are embedded and which constitutes the bristle-block. In accordance with the present invention, before I apply the cement 10 as aforesaid, I apply to the inner ends of the tufts of bristles an agglutinating substance, preferably of elastic nature, which agglutinates together the inner ends of all the bristles composing a tuft. Thereby the inner ends of the bristles are united and bound together, so that after the application of the cement 10 the individual bristles composing the respective tufts are secured firmly in place and are prevented from loosening and falling out of the brush.

In selecting the agglutinating material which is to be applied to the inner ends of the tufts I take one which will harden quickly and yet retain sufficient softness and elasticity to prevent cracking and hardening so as to lose its adhesive quality. Preferably I use the material known as "roofing-tar." This

is very adhesive and never becomes so hard and brittle as to lose its adhesive quality. In the drawing I have indicated this material on the tufts at 9. When the cement 10 is placed in the shell so as to fill the same and surround and cover the ends of the tufts of bristles, the heat thereof melts or softens the tar which previously has been applied to the said inner ends of the tufts. When thus melted or softened, the tar is quite liquid. At this time, and also when first poured onto the bristles, it is likely to run through the holes in the shell 1 and to become exposed at the roots of the bristles—that is to say, where they first become visible on the exterior. This injures the appearance and salability of the brush. To obviate this disadvantage, before applying the tar to the inner ends of the tufts I first sprinkle a quantity of fine white powder, as indicated at 11, into the shell 1, or into the cavity of plate 2 when such shell is omitted, and onto the tufts of bristles and work it down among the tufts and onto the inner surface of the shell or surface of plate 2, as the case may be, by means of a brush. The tar is then applied in convenient manner, as by means of a small ladle having drilled through the bowl thereof holes of proper size to permit a small quantity of the melted tar to pass through. This ladle is rubbed over the ends of the bristles until all of the said ends have had applied thereto a sufficient quantity of the tar. This is allowed to cool before the cement is applied. The heat of the cement melts and softens the tar and the excess of the latter blends with or is absorbed by the cement, thereby insuring the tight holding of the bristles, the individual bristles composing the tufts being united to one another by means of the tar, while the cement closes in around the tufts and also unites with the tar. A material as soft as the tar must be in order to enable it to be applied properly will not keep its shape nor hold the bristles in proper position, but would become softened and would yield to a pressure on the outside or on the outer ends of the bristles, which would allow the tufts to become distorted and expand out of proper shape, even although the bristles might not admit of being pulled out easily. Hence the cement and the tar must be used conjointly, as herein described.

At 12 is the plate which is placed on the plate 2 to facilitate the application of the cement 10. This plate has a hole therethrough to receive the said cement and fits around the outer edge of the cavity in plate 2 and the upper edge of the shell 1. In the process of manufacturing the brush the said cement is placed in the said hole and then is compressed in usual manner down into the cavity of the shell 1 or against the face of the cavity in plate 2, as the case may be.

It is indispensable for economical reasons that for the purpose of agglutinating together the inner ends of the bristles comprising each tuft there should be used a material which, like roofing-tar, is capable of being rendered fluid or plastic readily, and which quickly hardens to a degree that permits succeeding operations in the process of brush-making to be performed without delay incident to waiting for the agglutinating medium to set or harden.

I claim as my invention—

A brush comprising a bristle-block of plastic cementing material having the inner ends of tufts of bristles embedded therein and surrounded thereby, and agglutinating material capable of being made fluent by heat uniting the individual bristles of the tufts and blended with the cementing material, substantially as described.

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

ALANSON C. ESTABROOK.

Witnesses:

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