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Patented May 8, 1900..

F. G. FARNHAM.

BRUSH:

(Application filed May 20, 1899.)

(No Model.)

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UNITED STATES PATENT OFFICE.

FRANK GUNN FARNHAM, OF HONESDALE, PENNSYLVANIA.

BRUSH.

SPECIFICATION forming part of Letters Patent No. 649,290, dated May 8, 1900.

Application filed May 20, 1899. Serial No. 717,573. (No model.)

To all whom it may concern:

Be it known that I, FRANK GUNN FARNHAM, a citizen of the United States, residing at Honesdale, Pennsylvania, have invented certain new and useful Improvements in Polishing-Brushes, of which the following is a specification.

My invention relates to the manufacture of polishing-brushes, and is intended to provide an exceedingly strong construction and one which may be readily balanced, as the balancing of these brushes is a very important factor.

In applications now pending in the United States Patent Office, Serial No. 674,508, filed March 19, 1898, and Serial No. 699,151, filed December 13, 1898, I have shown and described improved forms of polishing-brushes, comprising generally a hub, outer confining disks or rings, and fiber layers between said disks or rings, the layers being separated by disks of cloth or veneer, and in these applications I have provided for the balancing of the brush by running in lead at the base of the fiber or at some position between the outer confining-disks; but in the present case I dispense with the hub and utilize a filling of cement or other suitable material at the base of the fiber and between the outer confining-disks and effect the balancing of the brush by removing a part of this filling, thus leaving a space. In the place of the hub I use a simple bushing.

In the accompanying drawings I have shown in Figure 1 the method of inserting the cement filling. In Fig. 2 I show the brush complete on one side, with a part of the filling removed to form a balance. Fig. 3 is a like view of the brush in section, showing in addition to the cement filling core-sections, these being desirable in large sizes of brushes. Fig. 4 is a plan view of the brush, partly in section, to show the space made in the filling to form a balance. Fig. 5 shows a brush in section as applied to a rotary spindle. Fig. 6 shows a modification in section of a brush.

In carrying out my invention I form the brush proper of the outer disks or rings *a*, preferably made up of a series of veneers secured together by cement and inner and outer rows of nails, as shown at *b*. The brush fiber (shown at *C*) is arranged in layers sepa-

rated by disks of cloth or other material *B*, as in my applications before referred to. At the base of the fiber and in the space left between the fiber ends and the central opening a filling of cement or like suitable material is poured after the brush is thoroughly seasoned, and I prefer to use a metal cone *a'*, as shown in Fig. 1, filling in the cement around it until the space is fully occupied. The cone is removed after the filling is partly set, and the brush is balanced by removing a portion of the cement, as shown at *G*. In some cases—for instance, in large brushes—when the cavity is extensive I prefer to have the cement filling of a less plastic nature and do the filling by forcing the filling into the cavity with a small trowel. This saves material and weight. In many cases it will be found entirely sufficient to remove a part of the material; but where this is not sufficient the space indicated at *G* may be filled with lead or other weighty material to complete the balance. This filling is shown in dotted lines at *G'*, Fig. 2.

In large sizes of brushes instead of having the cement filling extend entirely between the outer confining-rings I may utilize core-sections *H* adjacent to the rings *a* on each side and have the cement filling between the core-sections, as shown in Fig. 3.

I may make the whole construction more secure by using clench-nails *2* in Fig. 1, extending entirely through the brush from side to side.

In Fig. 5 I show how the brush may be applied to a rotary spindle. Where a bushing is used, as at *F*, Fig. 2, I prefer to make this a little shorter than the width of the brush, so that the compression on the collars *s' s''* on the spindle will come upon the brush and not upon the bushing.

In Fig. 5 I have shown a brush without core-sections attached to a rotary spindle and without a bushing. The standard size of opening for an eight, nine, and ten inch brush is one and one-fourth inches in diameter. If the consumer has a one and one-fourth inch spindle of course no bushing could be used, and the brush would go on the spindle as shown in Fig. 5. This would give a balanced brush, and at the same time no amount of pressure put on it could fracture it, as the

pressure would come on the filling. Thus in such a case a bushing would be of no use. On the other hand, should a consumer have a spindle one inch in diameter I would furnish a bushing one and one-fourth inches outside, with a one-inch hole. Spindles vary from five-eighths of an inch to one and one-half inches diameter, and the bushing is for centering the brush only.

The cement filling is advantageous, as it gives a larger cementing-surface for cementing in a hub when a brush is to be run on a taper spindle. The twisting strain in such cases comes entirely on the hub, and if the hub gets loose the brush cannot be run, and it is therefore very important that the connection be a secure one. In some cases in addition to the cement filling I may reinforce the connection by the flanged ferrules or collars shown in my prior applications referred to. Generally, however, I desire to use only one ferrule instead of two, getting, as I do, more cementing-surface for the hub, which would equal what I would gain by using two ferrules. I have illustrated this in Fig. 6, in which the gluing or cementing surface is from A to B, and the flanged ferrule is shown at 2'. The nails holding the ferrule in position extend through the brush and the opposite disk. This is important, since I am not compelled to build this brush with a ferrule previously clenched-nailed to one disk, for in such a case I could only use it with or on a taper spindle, thus requiring me to carry double quantities of stock. In this way a brush is built flat without a ferrule and ready for a straight spindle. Now if an order comes for a brush with a taper hole I cement in a bushing with a taper hole, then slip on my ferrule and use a long clenchnail, driving it clear through from side to side. Since it is not possible to drive a clenchnail through the hardened cement I employ, I first drill a hole or holes for this purpose through the ferrule, upper disk, upper core-pieces and cement, but not through the lower core-piece.

It will be understood that I do not limit

myself to a particular kind of cement to be used as a filler, and in some cases I prefer to use plaster-of-paris on account of its cheapness and, further, because it dries quickly and is not compressible. In many other cases I prefer to use a cement which has strong adhesive qualities and one which will amalgamate with the cement used in fastening in the fiber.

Under some circumstances instead of making a balance by pouring melted lead into the cavity I may use particles of lead, as in the form of shot, as this serves the same purpose and at the same time has the advantage of being easily applied and there is no danger of burning the fiber or cement, as when hot lead is used.

What I claim is—

1. A brush comprising outer confining-rings, layers of fiber between, a cement filling at the base of the fiber, a part of the filling being removed for balancing purposes, substantially as described.

2. A brush comprising outer confining-rings, layers of fiber between, a cement filling at the base of the fiber with a portion thereof removed for the purposes of balancing and a bushing fitting the central opening, substantially as described.

3. A brush comprising outer confining-rings, a layer of fiber between, a cement filling, clenchnails binding the parts together, a bushing and a flanged ferrule for additionally securing the parts together, substantially as described.

4. A brush comprising outer confining-rings, layers of fiber between, the cement filling at the base of the fiber, a part of the filling being removed for balancing purposes and a filling for the opening thus formed consisting of particles of lead, substantially as described.

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

FRANK GUNN FARNHAM.

Witnesses:

ROBT. A. SMITH,
NORMAN C. FARNHAM.