

H. P. McMILLAN.
MANUFACTURE OF BRUSHES.
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1,063,166.

Patented May 27, 1913.

Fig. 1.

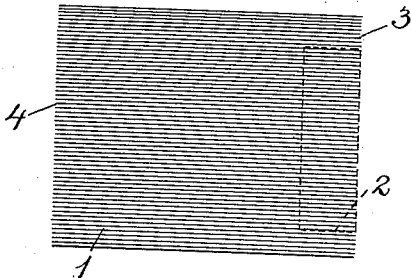


Fig. 2.

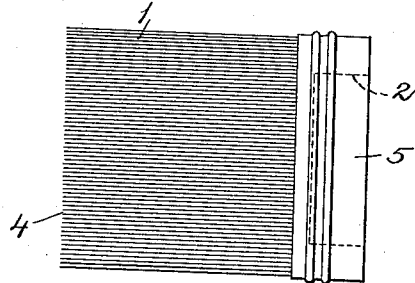


Fig. 3.

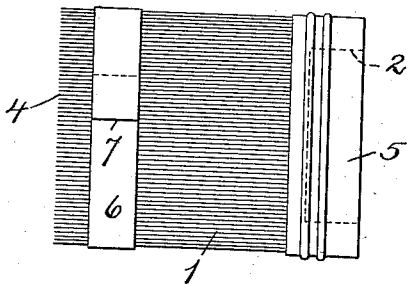


Fig. 4.

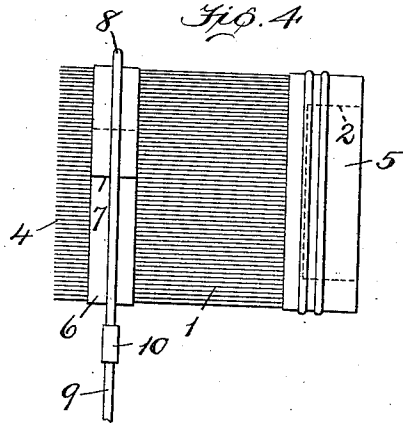


Fig. 5.

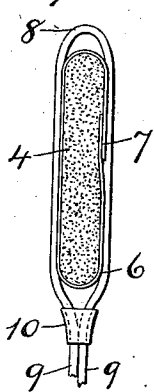


Fig. 6.

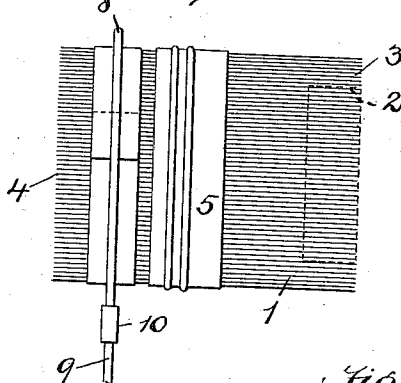


Fig. 7.

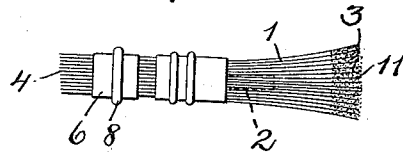
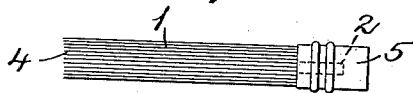


Fig. 8.



Inventor

Hugh P. McMillan

By

Mann & Co.,

Attorneys

Witnesses
Edwin L. Bradford,
H. Ferd. Vogt.

UNITED STATES PATENT OFFICE.

HUGH P. McMILLAN, OF BALTIMORE, MARYLAND, ASSIGNOR TO WM. A. TOTTLE & CO.,
A FIRM COMPOSED OF WILLIAM A. TOTTLE AND MORTON P. TOTTLE, OF BALTI-
MORE, MARYLAND.

MANUFACTURE OF BRUSHES.

1,063,166.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed February 1, 1912. Serial No. 674,680.

To all whom it may concern:

Be it known that I, HUGH P. McMILLAN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have
5 invented certain new and useful Improvements in the Manufacture of Brushes, of which the following is a specification.

This invention relates to improvements in the manufacture of brushes and has for
10 its object to improve and simplify the method of manufacturing brushes and particularly that branch of the manufacture which has to do with the preparation of the bristles to receive the cement or rubber
15 which is commonly used to bind the butt-ends of the bristles together.

In the manufacture of brushes and particularly that class of brush in which the bristles are secured in vulcanized rubber,
20 it is a common practice to apply a temporary cement such as flaxseed to the flag-ends of the bunch of bristles after they have been assembled into approximately or somewhat the shape they are to have in the
25 completed brush, to temporarily retain the bristles as nearly as possible in the form they are to have in the completed brush. This flaxseed coating must be applied and then allowed to set before the manufacturing
30 operations of the brush can continue and considerable delay is caused by this operation. Moreover, after the brush reaches a certain stage of manufacture, the flaxseed coating must be removed from the
35 flag-ends of the bristles, which causes another delay and expense.

By means of this invention the delays caused by applying the flaxseed, allowing the same to set as well as the expense accompanying the removal of the flaxseed,
40 are all avoided, and the bristles are held in a way that will enable the bunch of bristles to be handled more readily than can be done with the flaxseed-bound bristles. Also
45 by means of my invention I am enabled to so temporarily secure the bristles near the flag-ends that the butt ends thereof may readily spread, flare or separate one from another, and thereby enable the comparatively thick or stiff rubber cement to readily
50 enter the flared butt-ends of the bristles to a proper depth. After applying the rubber cement to the butt ends of the bristles and the latter are secured together, the clamp
55 on the flag-ends may be removed or it may

remain in place until the butt-ends are permanently bound by a suitable ferrule.

The accompanying drawing illustrates the invention wherein,

Figure 1 shows a bunch of bristles of a
60 definite quantity which have been arranged about a block,—the latter being at the butt-ends of the bristles. Fig. 2, shows the same with a ferrule temporarily encircling the
65 butt-ends of the bristles and the block thereon. Fig. 3, illustrates the same and also shows a temporary fabric band encircling the flag-ends of the bristles. Fig. 4, shows the same with the addition of a
70 mechanical clamp that extends about the fabric band at the flag-ends of the bristles to securely bind the latter. Fig. 5, shows
an end view of the bunch of bristles with the clamp in place. Fig. 6, illustrates the
75 bunch of bristles rigidly clamped at the flag-ends and the block at the butt-ends and also shows the ferrule in a position adjacent to the clamp,—the ferrule having been
moved from the butt-ends to free the latter. Fig. 7, shows the bristles clamped rigidly
80 at the flag-ends and the block pushed inwardly and away from the butt-ends to spread the latter and also shows the rubber cement coating applied to the spread butt-ends, and Fig. 8, shows the brush proper
85 with the ferrule and block in place at the butt-ends of the rubber cemented bristles ready to be put on a vulcanizer to harden the rubber.

In the manufacture of a brush in accordance with this invention the bristles, 1, are
90 first weighed out or the quantity determined in some suitable way. The entire quantity of bristles is then preferably divided in equal parts so that a suitable center
95 block, 2, may be placed at the butt or root-ends, 3, of the one part of the divided bristles and the other part of the bristles laid on top of the block thereby interposing the
100 block in the center of the bunch of bristles at the butt-ends as shown in broken lines in Fig. 1. The flag-ends, 4, of the bristles will
at this stage of manufacture lie close together. A suitable metal ferrule, 5, is next
105 slipped onto the bunch of bristles from the flag-ends and said ferrule is pushed onto the butt-ends of the bristles to temporarily bind the latter about the inserted block, 2, as
shown in Fig. 2. During this placing of the
110 ferrule on the butt-ends, as just described,

the bristles are manipulated to insure that substantially all of the butt or root ends will be aligned so they may subsequently be properly cemented. At this point in the manufacture of the brush it is necessary in order to properly handle the bunch of bristles that the latter be held together to enable the application of the rubber cement to the butt-ends. It is desirable also that the butt-ends, which are to receive the cement, be as free and loose as possible to allow the cement to work in at said ends uniformly and to a proper depth.

By referring to Fig. 3, of the drawing, it will be seen that while the butt-ends of the bristles are held by the metal ferrule about the center block I encircle the flag-ends, 4, of the bunch of bristles with a fabric band, 6, of suitable flexible material. In practice I have found that paper answers this purpose, and I therefore form the bands from that material. This band is wrapped about the flag-ends of the bunch of bristles and the ends, 7, thereof are lapped and may or may not be secured together. A mechanical clamp, 8, is then employed to engage the longer opposite sides of the band, 6, to compress or clamp the bristles in the band. As the band is flexible it will readily allow its opposite sides to be pressed together but will prevent the bristles from spreading during the clamping operation. The particular form of clamp is immaterial and may be very different in construction from that shown in the drawing, but I have found the form of clamp that is illustrated to be satisfactory in practice. In the present instance the clamp comprises a U-shaped spring wire the free ends, 9, of which will normally spread apart when released but which are drawn together by means of a sliding thimble, 10, so as to clamp the bunch of bristles at opposite sides of the paper band as shown in Fig. 5 of the drawing. The clamp, 8, may be utilized on brushes of various widths because the paper band, 6, will retain the bristles against spreading and the clamp merely serves to apply pressure at the opposite sides of the band. In practice the operation of applying the band and clamp is a rapid one and when completed the bunch of bristles is so firmly clamped at the flag-ends that it can be handled with little or no care in conducting the further steps in the brush manufacture, or to that point where the bristles will be permanently held. After the flag-ends of the bristles have been securely clamped the metal ferrule, 5, may be removed or it is moved toward the clamp and the block, 2, is forced between the bristles in a direction toward the clamped flag-ends as shown in broken lines in Fig. 7, with the result that the butt-ends of the bristles will be spread apart. While in this condition the free spread butt-ends of the

bunch of bristles will be placed in a rubber solution or coated otherwise and the rubber cement because of the spread condition of said bristle-ends will readily flow between said ends as indicated at, 11, in Fig. 7. After the butt-end of the bunch is sufficiently bound together by the rubber hardening thereon the clamp, 8, and paper band may be removed. This exact period of removal of the clamp, 8, is immaterial as the same may remain in place until the block, 2, and ferrule, 5, are returned to the butt-ends of the rubber cemented bristles as shown in Fig. 8 or it may be removed upon the rubber cement setting or becoming sufficiently hard to bind the bristles at the butt-ends together. After the block, 2, has been returned to the center of the butt-ends and the ferrule, 5, has been placed about the exterior of the rubber cemented butt-ends of the bristles, the latter will then be placed on a vulcanizer where the rubber will be permanently hardened and the brush proper will then be ready to receive the handle.

It will thus be noted that in the manufacture of brushes in accordance with my invention the freeing of the flag-ends of the bristles is instantly effected by the simple removal of the mechanical clamp and strip, and that I avoid entirely the use of flaxseed or other similar cement binder and also the necessity of removing such temporary cement from the flag-ends of the bristles after the permanent cement has been applied to the butt-ends of the bristles.

The manner of attaching the handles to the brushes is carried out in various ways and has no part in the present invention.

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

1. The improvement in the manufacture of brushes comprising the forming of a bunch of bristles with the flag-ends of the bristles arranged at one end of the bunch and the butt-ends of the bristles arranged at the opposite end of the bunch, temporarily binding the butt-ends of the bristles while the flag-ends are loose; mechanically clamping the flag-ends of the bristles while the butt-ends are temporarily bound; releasing the temporarily-bound butt-ends to allow said butt-ends to spread to receive a cement; applying a cement to the spread butt-ends while the flag-ends remain mechanically clamped; applying a ferrule to the cemented butt-ends and hardening the cement.

2. The improvement in the manufacture of brushes comprising the forming of a bunch of bristles with the flag-ends of the bristles arranged at one end of the bunch and the butt or root-ends of the bristles arranged at the opposite end of the bunch temporarily binding the butt-ends of the

bristles, encircling the flag-ends of the bunch
of bristles with a flexible band to confine the
latter end while the butt-ends are tempo-
rarily bound, clamping the flexible band
5 about the flag-ends while the butt-ends re-
main temporarily clamped to compress and
rigidly secure the flag-ends temporarily, re-
leasing the temporarily-bound butt-ends of
the bristles to allow said butt-ends to spread,
10 applying a cement to the released and spread
butt-ends of the bristles while the flag-ends
are rigidly secured, applying a ferrule to
the cemented butt-ends of the bristles and
hardening the cement at the ferrule-bound
15 butt-ends.

3. The improvement in the manufacture
of brushes comprising the forming of a
bunch of bristles with the flag-ends of the
bristles arranged at one end of the bunch
20 and the butt or root-ends of the bristles ar-
ranged at the opposite end of the bunch, in-
serting a permanent block in the butt-ends
of the bristles, placing a permanent ferrule
around the butt-ends of the bristles to con-

fine the bristles around the block in the cen- 25
ter thereof, encircling the flag-ends of the
bristles with a flexible band while the butt-
ends are confined by the permanent ferrule
to confine the flag-ends, moving the perma- 30
nent ferrule from the butt-ends toward the
flexible band to free the block at the center
thereof, forcing the block in the bunch of
bristles toward the flexible band at the flag-
ends to spread the bristles apart at the butt- 35
ends, applying a cement to the spread butt-
ends of the bristles while the flag-ends are
confined, returning the block to the ce-
mented butt-ends, returning the permanent
ferrule to the cemented butt-ends to again
confine the bristles around the block at the 40
center and hardening the cement on the butt-
ends of the bristles.

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

HUGH P. McMILLAN.

Witnesses:

G. FERD. VOGT,

CHARLES B. MANN, Jr.