No. 686,655. Patented Nov. 12, 1901.

C. M. HIGGINS.

BRUSH.

(Application filed June 5, 1896.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

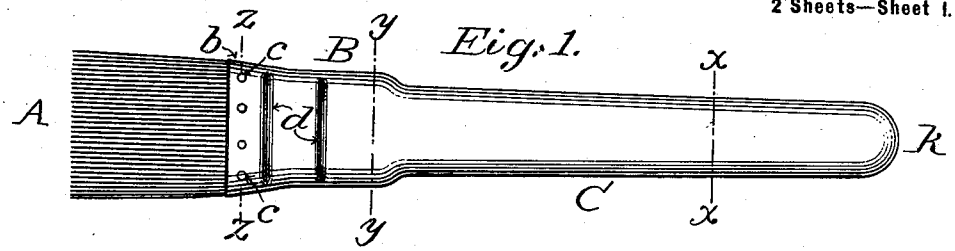


Fig. 5.

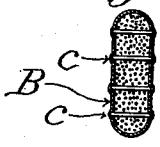


Fig. 4.



Fig. 3.



Fig. 2.

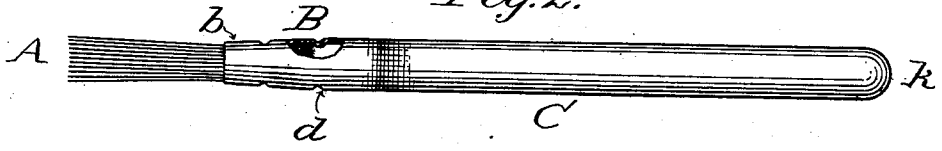


Fig. 6.

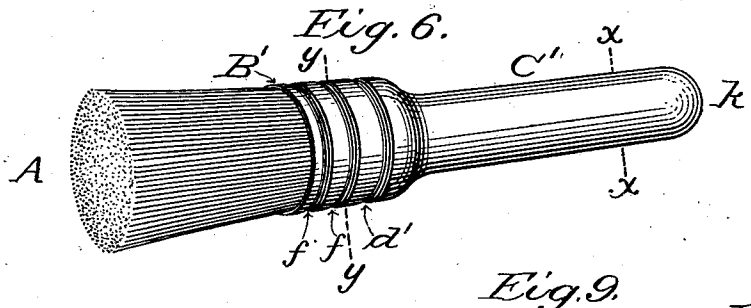


Fig. 9.

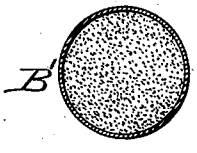
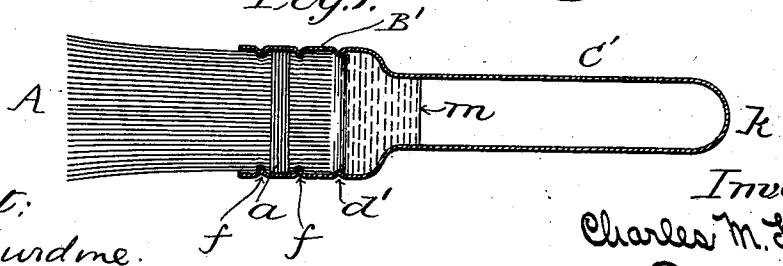


Fig. 8.



Fig. 7.



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No. 686,655. Patented Nov. 12, 1901.

C. M. HIGGINS.

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(Application filed June 5, 1896.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 10.

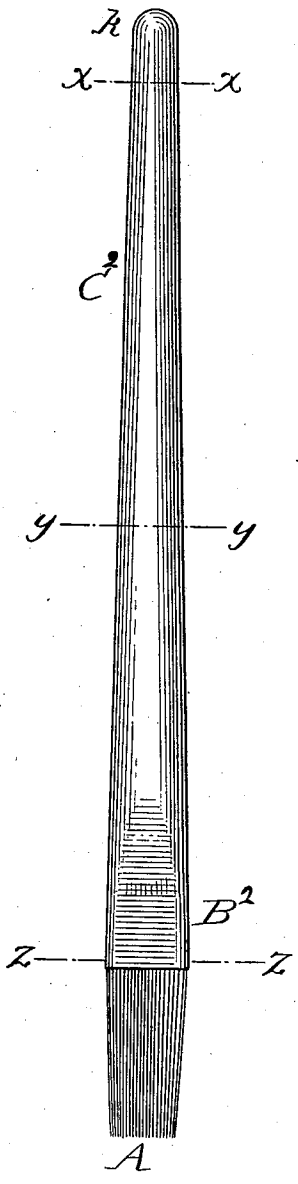


Fig. 12



Fig. 13.



Fig. 14.

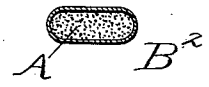
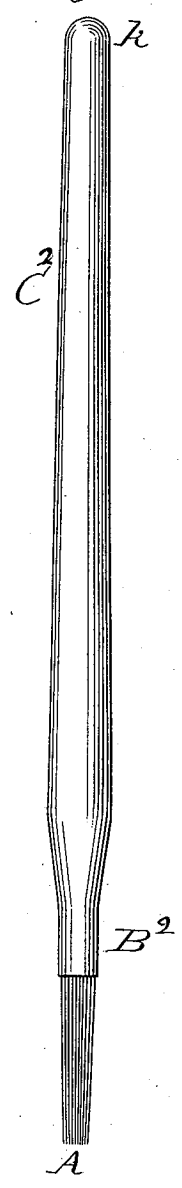


Fig. 11.



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UNITED STATES PATENT OFFICE.

CHARLES M. HIGGINS, OF BROOKLYN, NEW YORK.

BRUSH.

SPECIFICATION forming part of Letters Patent No. 686,655, dated November 12, 1901.

Application filed June 5, 1896. Serial No. 594,408. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. HIGGINS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Brushes, of which the following is a specification.

My invention applies more especially to brushes for applying liquids or pastes, such as for painting, varnishing, pasting, &c.; and the object thereof is to render the construction of such brushes simpler, stronger, and cheaper, and at the same time to give them a much neater appearance. Heretofore brushes of this kind have been made in three distinct parts—namely, the "knot" or tuft of bristles, a sheet-metal sleeve or "ferrule," and a wooden handle. The knot is held in one end of the ferrule by pinching or flattening the metal thereon and also by cementing the bristles within the ferrule, while the wooden handle is socketed and secured in the opposite end of the ferrule and abuts against the inner end of the bristles. A joint thus exists between ferrule and handle likely to get loose, and a joint also exists on the side of the ferrule itself where the edges of the sheet metal are soldered together. Brush-handles have also been made entirely of metal, but said handles have been made of parts which necessitated their being brazed or soldered together and which are objectionable for reasons which will hereinafter appear. Now in my improved brush I make the ferrule and handle integral in the form of one continuous metallic tube drawn or made in one seamless piece, and in the open end of this seamless tube I secure the swab or knot of bristles in the usual manner, thereby reducing the number of parts, dispensing entirely with joints in the ferrule and between ferrule and handle, and thus rendering the construction much stronger, more accurate, cheaper and more durable, and also much neater in appearance.

My invention therefore consists, mainly, in the construction here outlined and hereinafter fully set forth and claimed.

In the annexed drawings, Figure 1 is a broadside elevation of a flat varnish-brush made according to my invention. Fig. 2 is an edge view of the same. Figs. 3, 4, and 5 are cross-sections thereof on the respective planes x, y, and z. Fig. 6 is a perspective view of a round brush made on the same principle. Fig. 7 is a longitudinal section of the same brush. Figs. 8 and 9 are cross-sections on x and y of Fig. 6. Figs. 10 and 11 are broadside and edge views of a "flat fitch" made according to my invention. Figs. 12, 13, and 14 represent cross-sections thereof at the planes x, y, and z, respectively.

Referring to Figs. 1 and 2, A indicates the knot or tuft of bristles forming the working end of the brush, and B indicates the sleeve or ferrule in which the bristles are held, while C indicates the handle whereby the brush is manipulated. Now according to my invention both the ferrule and handle B C are made integral in the form of one continuous seamless metallic tube which is made or drawn in one continuous shell closed at the handle end, as shown at k in Figs. 1 and 2, (see also the section in Fig. 7,) and open at the opposite or ferrule end to receive the bristles. This continuous tubular handle and ferrule is preferably made of brass or other ductile metal drawn by successive operations in dies in the same manner in which cartridge-shells are made, whereby very light and strong tubes with a high finish can be obtained which will be far superior to the usual wooden brush-handles. In the case of flat varnish-brushes (shown in Figs. 1 and 2) I draw the tubes in a flat or oval form in cross-section, the thickness of the flat tube being about uniform throughout, as shown in the edge view in Fig. 2; but it tapers, diverges, or increases in width at the open or working end to form the ferrule B to receive and hold the bristles, as shown in Fig. 1, and by successive cross-sections in the planes indicated in Figs. 5, 4, and 3, having thus two diameters, narrow at its handle end and wider at the ferrule end, as shown. For a round brush—such as adapted for shaving, for stenciling, &c.—I draw the tubes round or cylindrical, as shown in Figs. 6, 7, 8, and 9, but with two diameters, the ferrule portion B′ being expanded to a larger diameter to receive the mass of bristles A, while the handle part C′ is drawn to a smaller diameter suited to the more conven-

ient grasp of the fingers. Both of the forms, the flat and the round, shown in the drawings referred to are very easily drawn in dies, and their manufacture will be very simple, as will be understood. The tubes being thus formed, as described, to embody both handle and ferrule in one piece, the bundle of bristles, usually termed the "knot," as shown at A, is next secured in the open end of the tube or ferrule in substantially the usual way—that is, the bristles are first assembled in the knot or mass of the right size for the desired brush by the aid of a little cup mold or die in which the tip of the bristles are socketed. The root ends projecting from the cup are then tied or bound around with cord *a*, as shown in Fig. 7, and are also impregnated with glue, shellac, or other cement to hold the bristles together in a more or less solid mass at the tied end. The cemented and tied knot is now taken out of the mold and allowed to dry, and when the cement is nearly set, but while yet somewhat soft or flexible, the knot is then by aid of a guide-funnel forced into the open end of the ferrule, as seen best in Fig. 7 and also in Figs. 1, 2, and 6. In case of a flat brush the end of the ferrule is now firmly pinched or flattened down on the contained bristles, as shown at *b* in Figs. 1 and 2, thus holding the knot securely in place and preventing its withdrawal. In some cases a few fine rivets *c* are passed through the flattened end of the sleeve, as shown in Figs. 1 and 5, to make the attachment more secure. I also prefer to roll or form an indentation *d* in the ferrule on opposite sides just back of the knot, (see Figs. 1 and 2,) which will form internal shoulders or abutments within the ferrule and prevent the possibility of the knot being forced or displaced inwardly, as will be understood. In the case of the round brush, Figs. 6 and 7, the ferrule is contracted on the contained knot in circumferential lines by rolling one or more continuous grooves or indentations *f f* all around the sleeve, as illustrated, thus giving the same effect as flattening the end of the ferrule, as at *b*, Figs. 1 and 2. A deeper circumferential groove *d'* is also rolled in the ferrule back of the knot to form the internal stop or abutment, as seen best in Fig. 7, with the same effect as the indentation *d* in Figs. 1 and 2, as will be understood.

Figs. 10 and 11 show an ordinary flat fitch made according to my system. In this case the handle C^2 and ferrule B^2 are made in the form of one continuous slightly-tapering tube, closed at the narrow or handle end, but open at the wider end, in which the knot of bristles A is inserted and there tightly secured by the pinching or flattening down of the tube thereon, as will be readily understood from the longitudinal, side, and edge views in Figs. 10 and 11 and also in the adjacent cross-sections. Fig. 12 shows the cross-section of the tubular handle near the narrow and closed end. Fig. 13 shows the section near the wide end, and Fig. 14 shows the section through the roots of the bristles where they are held in the broad flattened end of the tube or ferrule.

It may now be perceived that this method of making brushes of the described kind has several important advantages, which are great simplicity, lightness, strength, and durability, besides neatness of finish or beauty, and, what is very important, great accuracy of structure and a great reduction in cost. The tubes drawn in one piece to form handle and ferrule integral not only cost less than the separate handle and ferrule, but avoid the labor and expense of afterward uniting separate parts, as in the old construction, and in avoiding all joints in the ferrule and between ferrule and handle not only is the construction made stronger and more durable, but also much more desirable in working qualities, as a rigidity and firmness thus exists all through the brush from handle to end of ferrule, which renders the manipulations or strokes of the brush much more effective and under the more perfect direction and control of the hand, whereas where joints exist to permit play or looseness between the handle and the bristles, as often occurs in brushes of the old construction made in separate parts jointed together as described, such play or want of rigidity is often a serious embarrassment to the movement of the hand, particularly in accurate work—such as sign and fresco painting, varnishing, and fine mounting—as will be readily appreciated.

I have described the working end A of the brush as being formed of bristles, which are generally and preferably used in brushes, but of course any substitute or equivalent for bristles may be used without departing from my invention, as will be understood.

In some cases the brush may be made with a filling or abutment of hardened or fusible cement within the tube or ferrule back of the knot of bristles, as indicated by dotted lines at *m* in Fig. 7, which will still more firmly secure the knot in place in addition to the shoulder. This cement may be introduced while fused or fluid through a small opening in the side of the tube back of the knot, or it may be dropped in solid pieces into the tube before the knot is inserted, and after the knot is secured in place the brush may be placed upright and heat applied to the tube to cause the cement to melt and flow down into the base of the tube over the ends of the bristles, as shown by dotted lines in Fig. 7. As soon as the fluid cement has cooled and solidified it will become firmly united to the walls of the tube and to the ends of the bristles, and thereby secure the latter firmly in place and prevent either inward or outward displacement.

No claim is made herein to the process of manufacturing the brush with a fusible cementitious backing nor to the particular form of brush shown in Figs. 6, 7, 8, and 9 of the annexed drawings, the subject-matter

thereof being shown and claimed in a divisional application filed by me on the 18th day of April, 1901, Serial No. 56,467.

What I claim is—

1. A brush having its handle and ferrule made of a single piece of seamless metallic tube closed at one end, with a swab or knot of bristles secured in the opposite end.

2. A brush having its handle and ferrule made of a single piece of seamless metallic tube of two diameters, the outer smaller handle end of the tube being closed, with a tuft or swab of bristles secured in the larger open end or ferrule-section.

3. A brush having the handle and ferrule formed integral in one continuous metallic tube with the swab or knot of bristles inserted in the open end of said tube and having the indentation *d* in the walls of said tube back of said bristles, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand in the presence of two witnesses.

CHAS. M. HIGGINS.

Witnesses:
HORACE A. DODGE,
WILLIAM W. DODGE.