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A. V. HART ET AL

1,741,700

METHOD AND APPARATUS FOR MANUFACTURING BRUSHES

Filed March 23, 1927

Fig. 1.

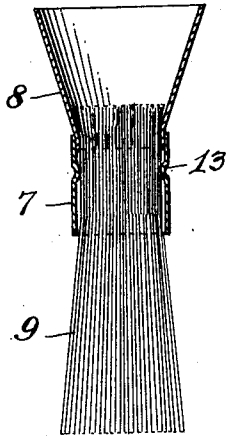


Fig. 2.

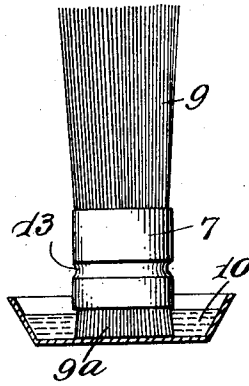


Fig. 3.

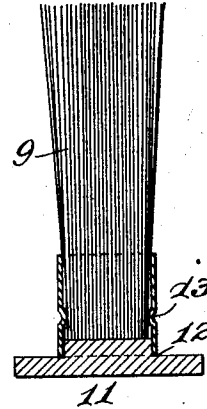


Fig. 4.

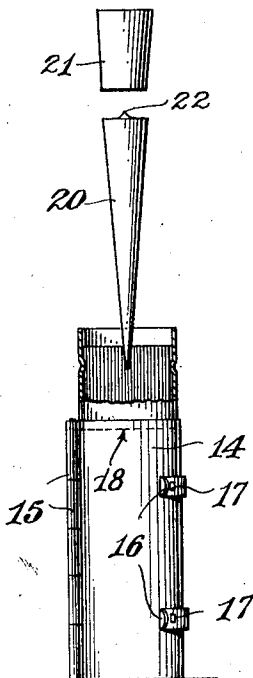


Fig. 5.

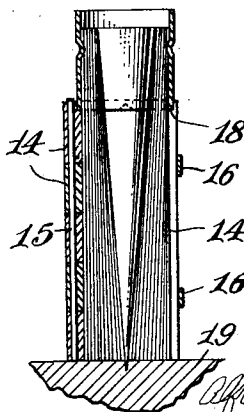
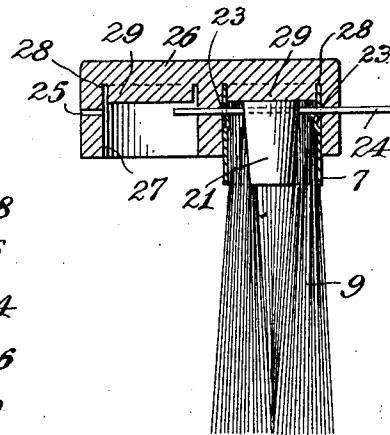


Fig. 6.



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METHOD AND APPARATUS FOR MANUFACTURING BRUSHES

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This invention relates to the manufacture of brushes and particular objects of the invention are to facilitate the assembly of the bristles into bundles and the securing of these bundles in permanent brush form.

Other important objects of the invention are to secure the bristles more firmly than has been possible heretofore, to enable this special securing being readily performed and to provide a specially effective fastening means for securing the bristles in the back or body of the brush.

Other objects and aims of the invention, more or less broad than those stated above, together with the advantages inherent, will be in part obvious and in part specifically referred to in the course of the following description of the elements, combinations, arrangements of parts, and applications of principles constituting the invention; and the scope of protection contemplated will appear from the claims.

In the accompanying drawing forming part of this specification the method of carrying out the invention and the final product are illustrated in a practical way, but it should be understood that the same may vary in process and structure without departure from the broad spirit and scope of the invention.

Figures 1 to 6 are partly sectional views illustrating successive stages in the manufacture of the brush bundle, the first view showing the assembly of the bristles in the confining ferrule, the second illustrating the dipping of the ferrule ends of the bristles in a suitable binder or cement, the third showing the bristles being forced into the ferrule to leave an open space in the end of the ferrule, the fourth illustrating the entry of the pilot point and conical wedge while the bristles are held in a clamp, the fifth showing the pilot and cone fully entered and the sixth illustrating the securing of the bristle body in the brush head by the passage of a pin through holes in the open end portion of the ferrule.

In the present disclosure the group or bundle of bristles are shown as held in a band or

ferrule 7 which ferrule is used throughout the assembling operation.

Thus as shown in Figure 1 in the first stage the ferrule is slipped over the mouth of an assembling funnel 8 so as to act as a guide or continuation of the mouth of the funnel while the bristles 9 are being pushed out through the funnel into position in the ferrule. In this first step the butt ends of the bristles are left protruding from the end of the ferrule so that when the ferrule is disconnected from the funnel there will be a considerable portion 9^a of the bristles exposed, ready for dipping in the cement or binding material indicated at 10 in Figure 2.

After application of the cement, the ends of the bristles are pushed into the ferrule, for instance, by slipping the ferrule down over the bristles and then centering the ferrule over a jig having a plug 11 of a size to fit in the end of the ferrule as in Figure 3. This jig has a stop shoulder 12 for the end of the ferrule adapted to limit the extent to which the bristles will be pushed into the ferrule.

It will be noted in Figure 3 that the length of this plug portion is less than the distance from the end of the ferrule inward to the internal annular shoulder afforded by the annular groove 13 formed in the periphery of the ferrule so as to leave portions of the bristles at both sides of said annular shoulder.

The next step involves the locking of the bristles in the ferrule and the first portion of this operation involves the engagement of a clamp about the bristles to hold them compactly grouped and to take the thrust resulting from the driving of a securing wedge into the body of the bristles.

The clamp is shown in Figures 4 and 5 as made up of two semi-cylindrical members 14 connected together by a hinge joint 15 and secured in closed relation by spring clasps 16 on one part of the clamp having a snapping interlocking engagement with lugs or catches 17 on the other part of the clamp. This clamp is indicated as having an internal shoulder 18 adapted to engage the lower end of the ferrule so as to support the same at a distance above the table 19, Figure 5, equal

to the length of the bristles; in other words, so that the bristles may touch the table while the ferrule is positively supported by the clamp. In this relation and while the ferrule is thus positively supported independently of the bristles, a tapered pin or pilot 20 is entered in the center of the body of bristles, as in Figure 4, and driven down ahead of the locking wedge 21 which is shown as constructed in frusto-conical form as a continuation of the pilot pin. This wedge is shown as centered and temporarily held in centered position on the end of the pilot by a center pin 22 which, in the case of a wooden wedge, will enter the end of the wedge block as the same is forced down onto the pilot.

In the final position indicated in Figure 5, the wedge has been laid by the pilot down into the ferrule with its lower end substantially in line with the lower end of the ferrule and its upper or larger end substantially in line with the cemented ends of the bristles, where it holds the bristles firmly wedged over the top of the internal locking shoulder.

The pilot pin is shown as slightly longer than the length of the bristles from the end of the ferrule and as sharply pointed so that it may enter the material of the table, which usually will be of wood and remain temporarily attached to the table when the ferrule with the anchored bristles are lifted off the table. Usually, the clamp will first be released and taken away from the bristles so that the bristles will release their hold on the pilot pin.

The upper open end of the ferrule which is clear of the bristles is pierced in its opposite sides as indicated at 23 to receive a fastening wire or pin 24, Figure 6, which is driven in through properly placed openings 25 in the brush block or back 26. This block is shown as having a socket or sockets 27 to receive the bristle bundles and as having an annular groove 28 at the back of each socket to take the protruding end portion of the ferrule. In this relation the ends of the bristles and the end of the wedge are backed up by that portion 29 of the block within the annular groove so that the bristles and wedge are positively held at the back against displacement.

What is claimed is:

1. The process of manufacturing brushes which comprises assembling the brush bristles in a ferrule with the base ends of the bristles projecting from the ferrule, applying a cementing medium to the projecting ends of the bristles, forcing the cemented ends of the bristles into the ferrule far enough to leave the end of the ferrule open and clear of bristles, enclosing the protruding brush portion of the bristles and supporting the ferrule independently of the bristles, driving a wedge member and a preceding piloting member in through the open end of the fer-

rule while so supported, far enough to leave the wedge member in the ferrule and the piloting member in the protruding portion of the bristles and then removing the piloting member from the bristles.

2. The process of manufacturing brushes which comprises assembling the brush bristles in a ferrule with the base ends of the bristles projecting from the ferrule, applying a cementing medium to the projecting ends of the bristles, forcing the cemented ends of the bristles into the ferrule far enough to leave the end of the ferrule open and clear of bristles, enclosing the protruding brush portion of the bristles and supporting the ferrule independently of the bristles, driving a wedge member and a preceding piloting member in through the open end of the ferrule while the bristles are in a ferrule and then driving a wedge member in the ferrule and the piloting member in the protruding portion of the bristles and then removing the piloting member from the bristles, seating the back end of the bristles and wedge member against a support and passing a fastening pin through said support and the sides of the open end portion of the ferrule.

3. In the manufacture of brushes, the process which comprises assembling brush bristles in a ferrule and then driving a wedge block preceded by a penetrating pilot in through the back end of the ferrule far enough to leave the wedge block embedded in that part of the bristles within the ferrule and the pilot in the protruding portion of the bristles where it may be readily separated therefrom.

In testimony whereof we affix our signatures.

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