A. R. WIENS.

BRUSH.

APPLICATION FILED AUG. 18, 1919.

1,388,680. Patented Aug. 23, 1921.

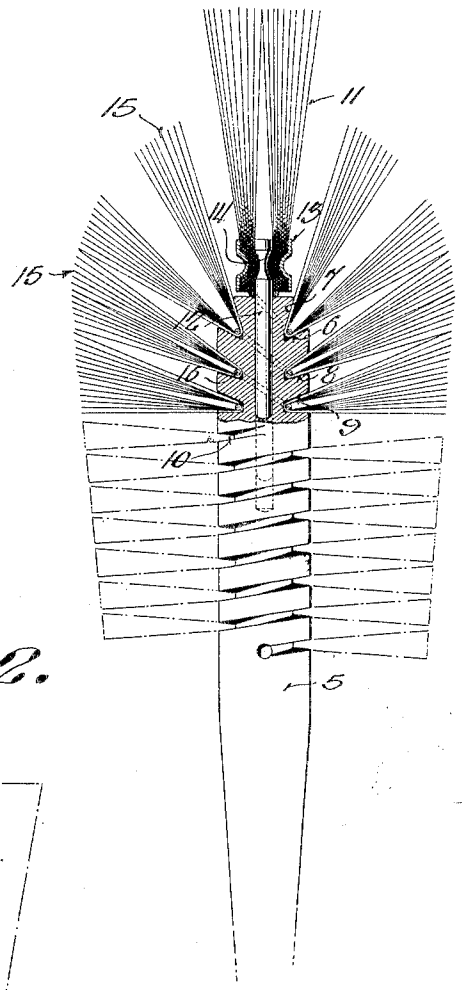
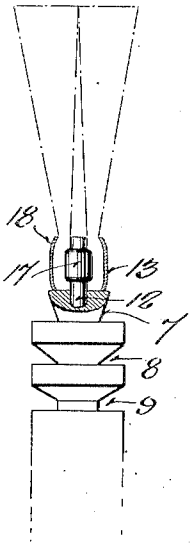


Fig. 2.

Fig. 1.



Witnesses:

Inventor:

Adolph R. Wiens

by Young & Young

Attorneys.

UNITED STATES PATENT OFFICE.

ADOLPH RICHARD WIENS, OF OMAHA, NEBRASKA.

BRUSH.

1,388,680. Specification of Letters Patent. Patented Aug. 23, 1921.

Application filed August 18, 1919. Serial No. 318,161.

To all whom it may concern:

Be it known that I, ADOLPH R. WIENS, a citizen of the United States, and resident of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Brushes; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to new and useful improvements in brushes more particularly of that cylindrical type adapted for cleaning the interiors of bottles or for similar uses, and comprising a cylindrical core formed of wood and provided with circumferential grooves in which the bristles of the brush are secured by a wire coiled in said grooves.

In a brush of this character it is highly desirable to form the core member of the smallest possible diameter so as to provide for an adequate amount of bristle material within the limitations of general diameter of the brush imposed by the restricted conditions under which the brush is to be used. Heretofore it has been found impossible to form the brush core of the cheaper hard woods, and hickory or other highly expensive wood has been employed, the necessity for this type of wood arising particularly from the weakening of the core structure caused by the formation of the circumferential bristle receiving grooves or cups particularly in the tip portion of the brush, and even with the use of this expensive type of wood it has been necessary to provide an undesirably large diameter of the core, since otherwise the stresses to which the brush core is subjected during the manufacture of the brush and during the subsequent use of the brush would procure breakage of the core at one of the cup portions.

It is therefore an important object of my invention to provide a brush structure wherein a core member of very small diameter may be employed, which need not be formed of hickory or other expensive wood and which provides for the disposition of a maximum amount of bristles thereabout to provide a most highly efficient and durable brush which is capable of meeting unusually severe lateral stresses against its core portion.

A further important object is to provide a securely attached and ample endmost tuft for the brush, which will not tangle under the severe usage to which it is subjected in working against the bottom of a bottle or like receptacle to be cleaned. Bristles of the type used in a brush of this character are somewhat tapered, being heaviest at what is termed their butt end portions, which are drawn from the skin of the animal, and being gradually reduced toward their flag end portions. In mixing the butt and flag end portions of the bristles at the outer portion of the tuft, such as is effected in the previous construction of brushes of this character, wherein the bristles are fastened at their intermediate portions and then bent outwardly, a considerable tendency of tangling is encountered. It is therefore more particularly my object in this connection to provide an arrangement wherein an endmost tuft of bristles may be provided for the brush having the butt end portions of the bristles securely fastened to the core in such manner as to provide a relatively long endmost tuft of ample cross sectional proportion, instead of said butt end portions being doubled outwardly, and wherein the outer portion of the tuft is thus formed entirely of the flag ends of the bristles to prevent tangling and thus materially increase the life and efficiency of the brush.

A still further object resides in the provision of a brush structure embodying the afore recited advantages which may be manufactured at a lesser cost of labor than brushes of this type heretofore used.

With the above and other objects and advantages in view, which will be apparent as the description proceeds, my invention resides in the novel features of construction, combination and arrangement of parts as hereinafter described and defined by the appended claims.

In the accompanying drawings:

Figure 1 is a longitudinal sectional view through a brush head showing one embodiment of my invention.

Fig. 2 is a detail sectional view through the tip showing a modified means of fastening the endmost tuft of bristles.

Referring now more particularly to the drawing 5 designates the cylindrical stem core of a brush for washing bottles or like receptacles, said core being of the general construction embodied in brushes of this character with the exception that its endmost tip is eliminated and that the core is of smaller diameter than usually employed and may be formed of inferior wood compared to previous requirements The ex-

tremity of the core is slightly reduced in diameter with respect to the major diameter of the core and the core is tapered inwardly to a shoulder 6 having an undercut annular face, the said tapered portion of the core forming a frusto-conical bristle seating face 7, said faces 6 and 7 defining the endmost receiving groove or cup of the core which opens obliquely toward the extremity of the core.

Annular cups or grooves 8 and 9 are formed in the core, inwardly of said first mentioned cup, the angular pitch of these cups 8 and 9 being successively reduced, and inwardly of the cup 9, the usual spiral groove 10 is cut in the core in a plurality of convolutions having its walls disposed substantially at right angles to the axis of the core for holding the bristles of the cylindrical body portion of the brush. The core is provided with an axial bore extending from its outer end to a point well past the innermost cup 9.

The endmost tuft of bristles 11 of the brush are carried by a metallic reinforcing rod 12 which is secured in the axial bore of the core. The tuft 11 is formed of bristles which have their butt portions disposed about the projected end of the rod 12 and a sleeve or ferrule 13 is disposed about the butt ends of the bristles whereby the bristles are gripped between the sleeve and rod, the sleeve and rod being formed with portions procuring an interlocking flexure of the bristle ends within the sleeve. This interlocking relation is procured in the structure shown in Fig. 1 by an annular reduction 14 of the rod 12 within the sleeve which cooperates with an inwardly bowed intermediate portion of the sleeve, said bowed portion being formed by turning the sleeve after the bristles and sleeve have been assembled on the stem. An exceedingly effective permanent anchorage for the tuft 11 is thus provided, whereby such an ample quantity of bristles may be provided by reason of the exceedingly small diameter of the metallic rod 12 that I may avoid the necessity of turning out butt end portions of the bristles into the tuft. A relatively longer tuft is thus provided which has its outer portion formed wholly of the flag ends of the bristles to avoid tangling of the bristles and considerably lengthen the life of the brush in use. Suitable quantities of bristles to provide the rounding annular end tufts 15 have their intermediate portions bent and disposed in the cups of the core, the wire 16 for securing these bristles in the cups being anchored by securement of the rod 12 at the extremity of the core. It is particularly noted that the seating surface 7 of the core for the endmost annular tuft 15 is of such pitch that the endmost annular tuft is disposed quite closely about the endmost tuft 11, thus procuring a finished appearance and an efficient operation of the brush.

I have thus provided a highly efficient brush which, with the use of a smaller diameter and inferior quality of core wood, is considerable stronger than brushes of this type heretofore used, by reason of the provision of the rod 12 which permits the bristle seating cups to be cut into the stem core close to its center to procure an adequate depth of said cups, the rod 12 increasing the strength of the brush structure to meet lateral stresses. The method employed in forming my brush also procures an economy of labor, particularly with respect to the operation of turning the brush to fill the cups or grooves, which requires an expert workman. In my method of forming the brush, the core is provided with cups or grooves and a bore formed therein by the usual wood working operations. The operator then takes the rod 12 and disposes a batch of bristles thereabout to form the tuft 11 and disposes the sleeve 13 in place about the butt end of the bristles. The intermediate portion of the sleeve is then turned inwardly by the usual metal working operation. The rod 12 is then driven into the core and the tuft 11 thus attached thereto without the necessity of turning the core. The skilled operator then mounts the core in a suitable rotating chuck and by the usual turning operation secures the annular tufts 15 in the cups of the core. By reason of the relatively large size of my endmost tuft 11, I am enabled to reduce the number of annular oblique cups required and I effect a material saving of the amount of skilled work required. In addition to permitting the use of a relatively cheaper grade of hard wood in the formation of the core I am also enabled to effect a saving in the wood stock by reason of the lesser diameter of the core and I also effect a saving in the amount of bristles used by reason of the more advantageous relation of the endmost tufts.

In Fig. 2, I show a modified manner of procuring the interlocking relation of the butt ends of bristle tuft 11. In this modified structure the rod 12 is provided with an enlargement 17 on its projected extremity and the end portions of the sleeve 13 are both turned in at 18 to flex the bristle ends within the sleeve.

It is particularly noted that in both of my methods of securing the butt ends of the bristles, a contraction is effected adjacent the butt extremities of the tips which, in addition to providing the desired interlocking securement also compensates for the reduction of the diameter of the bristles immediately adjacent the head portion which is drawn from the skin of the animal.

While I have shown and described a pre-

ferred embodiment of my invention it will be appreciated that various changes and modifications of structure may be employed to meet differing conditions of use or manufacture without departing in any manner from the spirit of the invention.

What is claimed, is:

1. A brush of the class described comprising a wooden stem having circumferentially extending bristle seating grooves adjacent one end and an axial bore in said end, a combined reinforcing and end tuft carrying rod disposed in said bore and having one end projecting beyond the end of the stem, end tuft bristles, means for securing the end tuft bristles to the exposed end of the rod, the other or shank portion thereof serving to reinforce said stem, bristles disposed in said grooves, and a retaining wire wound in the core grooves to secure the bristles therein, one end being attached to the stem and the other end anchored to said rod between the end of the stem and the end tuft bristle securing means.

2. A combined wood and metallic brush head including an annular grooved wooden stem having its end centrally bored for a predetermined distance to form a shell, a metallic rod embedded into the stem bore forming a strengthening core for the wooden shell portion of the stem, the rod being provided with a head above the stem having annular faces of different diameters, a tuft of head bristles nested about the rod head, a binding ferrule incasing the bristles, convolutions of folded body bristles seated within the annular grooves of the wooden stem, and a wire retaining runner for the body bristles, the same being wound tautly about the annular grooves of the stem to also form an exterior reinforcement for the wooden shell-like stem, whereby its walls will be compressed about the metallic reinforcing rod to resist breaking strain.

In testimony that I claim the foregoing I have hereunto set my hand at Omaha, in the county of Douglas and State of Nebraska.

ADOLPH RICHARD WIENS.