F. BRAUN.

BRUSH.

APPLICATION FILED OCT. 31, 1919.

1,371,601.

Patented Mar. 15, 1921.

FIG. 1.

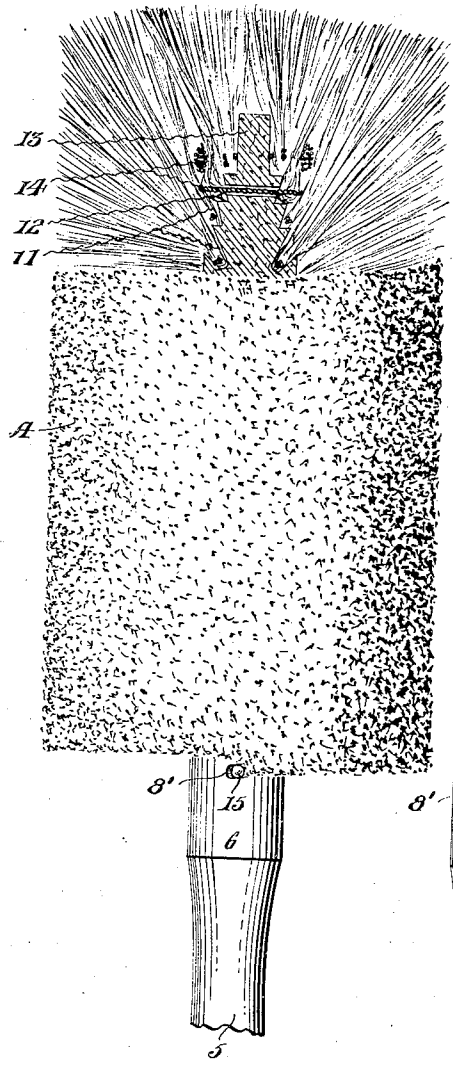


FIG. 2.

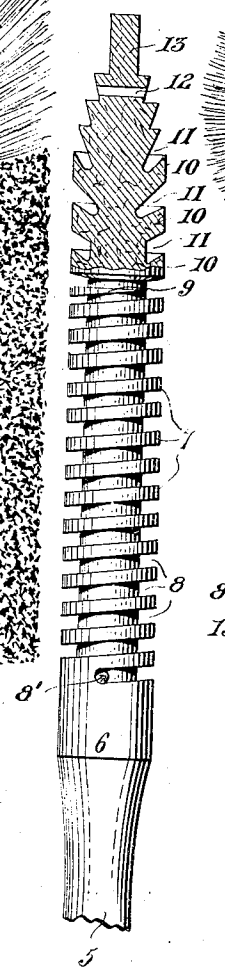
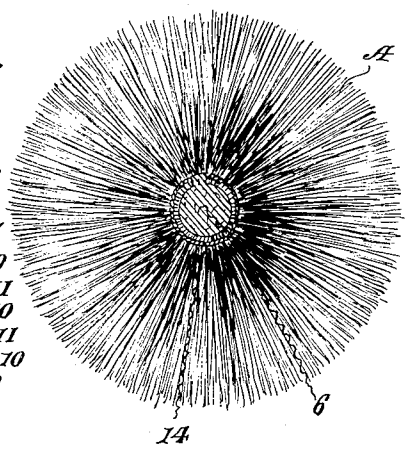


FIG. 3.



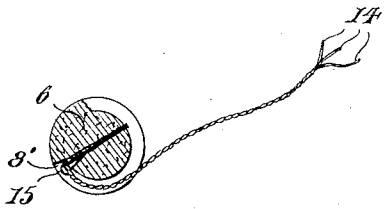


FIG. 4.

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UNITED STATES PATENT OFFICE.

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BRUSH.

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To all whom it may concern:

Be it known that I, FRANK BRAUN, citizen of the United States, residing at Brooklyn, in the county of Queens and State of New York, have invented certain new and useful Improvements in Brushes, of which the following is a specification, reference being had therein to the accompanying drawing.

The primary object of the present invention resides in the provision of a brush wherein there is provided a handle or shank having brush fibers radiating therefrom with a binding element spirally wound upon the handle or shank for retaining the brush fiber in position thereon.

A further object of the invention resides in the provision of a special binding wire, the binding wire being formed of twisted or braided strands equaling in cross sectional area the size of the single strand at present employed in this art and presenting a binding element of unusually increased strength and one which will cooperate with the fibers of the brush to prevent relative creeping movement of the brush fibers.

With the above general objects in view and others that will become apparent as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described and then claimed, reference being had to the accompanying drawing by like characters designating corresponding parts throughout the several views, and in which,

Figure 1 is a side elevational view, partly broken away and partly in section of a brush constructed in accordance with the present invention,

Fig. 2 is a side elevational view, partly broken away and partly shown in section of the handle shank of the brush,

Fig. 3 is a cross sectional view of the brush shown in Fig. 1, and

Fig. 4 is a cross sectional view of the brush shown in Fig. 1 with the binding wire attached thereto and in position for binding the brush fibers.

In the art to which this invention pertains, it has heretofore been customary to construct a brush of the general characteristics herein described with brush fibers retained in position by a single strand of flexible wire. In the winding of the wire about the handle shank for retention of the brush fibers, stress is placed thereon to insure a secure binding of the brush fibers and in so doing, the single retaining wire is materially weakened at different points and is also weakened by carbonization, thus rendering the severance of the single wire strand quite prevalent whereupon the brush is rendered practically worthless by the falling of the brush fiber. The present invention aims to overcome this difficulty in the substitution of coiled or braided strands representing in their aggregate cross sectional areas the size of one strand of wire previously employed, these combined strands being highly flexible and capable of bending and distortion in all directions without injury to the tensile strength thereof. Also, by the employment of the twisted strands the fibers engaged thereby will be prevented from relative creeping movement on the handle shank by impingement of the strand convolutions as will be evident.

Referring more in detail to the accompanying drawing there is illustrated a brush including a handle 5 having a shank 6 at its outer end. As illustrated in Fig. 2 the shank 6 is provided with a spiral groove defining a rib 7 and a cavity 8, extending over the major portion of the length thereof and terminating at a point inwardly of the outer end as at 9, while the shank beyond the spirally grooved portion is provided with a series of outwardly converging annular ribs 10 defining sockets 11 having both walls thereof outwardly directed and extending at acute angles to the longitudinal axis of the shank while a transverse opening 12 is provided in the shank outwardly of the outermost groove 11 and inwardly of the terminal end 13.

The binding wire, forming the principal feature of this invention and employed for retaining the brush fibers in position in the spiral and annular grooves 8 and 11 respectively is more clearly shown in Fig. 4, the binding element including a plurality of wire strands 14 twisted or braided into a single binding wire and adapted to have one end thereof secured by the pin 15 within the inner end 8′ of the spiral groove 8. In applying the fiber to the handle shank, the handle shank is mounted in a support for slowly rotating the same while suitable tension is placed upon the wire strands 14 connected to the handle shank 6 by having

one end thereof passed through the opening 12, for about six inches, and the shank is then revolved to cause the main strand to pass about the tip end 13 without the fibers positioned therebeneath. After one complete winding of the wire on the tip 13 the brush fibers fed from the hand are placed beneath the wire and engaged midway the ends thereof. When two complete revolutions have been accomplished, the fibers are bent at the wire engaged portions thereof, and retained in their outwardly bent position by several additional windings of the wire. The wire A is then directed to the annular shoulder adjacent the transverse opening 12, and after binding fibers therebeneath by several windings, the same is twisted with the end projecting through the opening 12, and the excess of the projecting end cut off. From this point, the wire is given a single winding in each groove 11, binding the fibers beneath the same, and automatically binding the fibers to assume the position illustrated. The wire in passing the point 9, enters the spiral groove 8 and continues uninterruptedly therethrough binding fibers in the bottom of the groove with the wire finally passed through the opening 8′ with the fastening member 15 driven into the entering end of the hole for retaining the wire in position, and with the projecting end of the wire cut off at the opposite side.

From the above detail description of the device, it is believed that the method of manufacture will be clearly apparent, it being noted that the applicant who is actively engaged in the manufacture of these devices upon a large scale has found by actual test that the employment of twisted or braided wire strands will prolong the life of a brush and render the same easily saleable inasmuch as the wire strands will last indefinitely and are practically free of breaking and weakening during the operation of manufacture. Also, the twisted wire strands positively prevent creeping movement of the brush fibers so that the brush fibers will be evenly distributed and remain substantially positioned regardless of the use to which the brush may be placed. While fibers are herein referred to, it is to be understood that hair, such as horse hair and bristles are as well adapted for the purpose. Previously, with the use of a single wire strand, it was practically impossible to use a smooth bristle on account of the smoothness of the wire, which permitted a creeping movement of the bristles, but with the employment of a twisted or braided wire, the hairs are impinged by the wire and held rigidly positioned. Also, with the use of a single strand of wire, danger of breakage is always present especially when the brush is used in water which causes a swelling of the fibers and wood stock, while with the present device, expansion of the braided wire is permissible.

It is the intention of the applicant to manufacture this brush in many different forms and for any purpose desired, such as dusting brushes, scrub brushes, bottle cleaning brushes, etc., and while there is herein shown and described the preferred embodiment of the invention, it is to be understood that minor changes may be made in the details of construction without departing from the spirit of the invention as claimed.

What is claimed as new is:

A brush of the character described comprising a shank having a circumferentially extending recess, brush elements having their inner portions arranged within the recess, and a retaining element engaging the brush elements and arranged within the recess for holding the brush elements therein, said retaining element being formed of a plurality of highly flexible and elastic metallic strands having inter-engagement throughout their entire length whereby the element is highly flexible and slightly transversely compressible and slightly longitudinally elastic when held substantially taut.

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

FRANK BRAUN.

Witnesses:

PAUL BRAUN,

JOHN W. MULHOLLAND.