Nov. 8, 1938. L. C. HEROLD 2,136,103

METHOD OF MAKING BRUSHES

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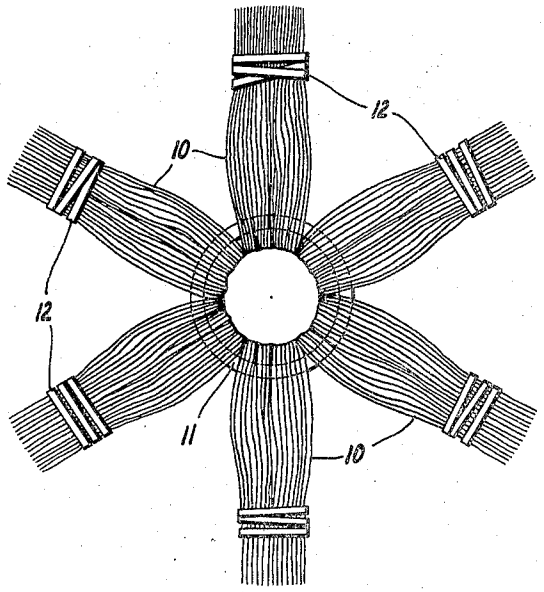


FIG.-1

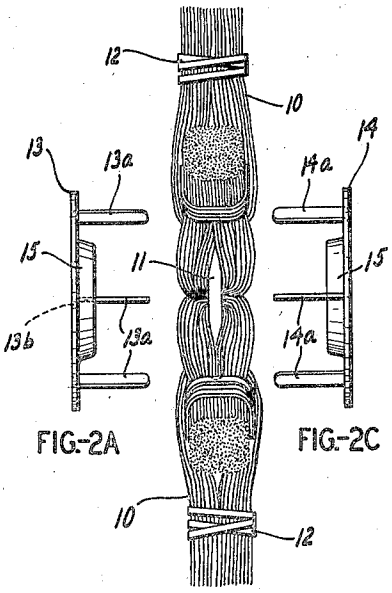


FIG.-2A FIG.-2C

FIG.-2B

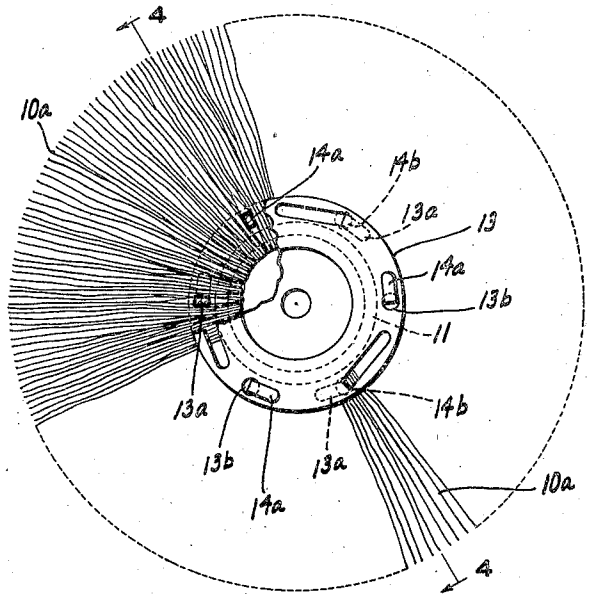


FIG.-3

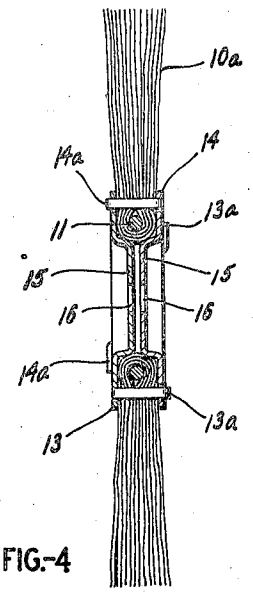


FIG.-4

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METHOD OF MAKING BRUSHES

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2 Claims. (Cl. 300—21)

This invention relates to improvements in brushes and more particularly to a rotary brush intended for operation at high speeds.

My invention provides a novel construction for a rotary brush insuring substantially perfect centrifugal balance of the brush throughout its useful life and a method of assembling the same.

One of the features of my invention is the provision of a rotary brush section of the type in which a plurality of individual bristles are assembled in a substantially continuous, uninterrupted circle from the center to the periphery thereof and to a method of assembling a form of structure whereby the bristles are held in definite sectors of the brush circle throughout the useful life of the brush.

Other novel features of my improved brush structure and method of forming the same will be apparent from the accompanying specification and drawing and the essential features thereof will be summarized in the claims.

In the drawing, Fig. 1 is a plan view showing one of the steps in the formation of my improved brush; Figs. 2A, 2B and 2C show the parts of a complete brush in position for assembling; Fig. 3 is a plan view of a finished brush partly broken away to emphasize certain features of the structure; while Fig. 4 is a sectional view taken along the line 4—4 of Fig. 3.

Rotary brushes of the type here illustrated are utilized at high speeds and often under severe service conditions and the structure of brushes now in use is either centrifugally unbalanced at the time of manufacture or because of the formation of the brush parts and the manner of securing them together the brush becomes centrifugally unbalanced while in use. My invention provides a rotary brush in which the bristles are evenly distributed about the center at the time of manufacture and are so secured that they must remain in that balanced condition throughout the life of the brush. In the embodiment of my improved brush which I have chosen to illustrate herewith I first weigh out bundles of bristles of wire, hair or other suitable material, all of said bundles being of as near equal weight as possible. A plurality of these bundles sufficient to fill the particular size circular brush being formed are then looped as shown at 10 in Figs. 1 and 2B about a central bristle ring 11. This ring is preferably a continuous circular ring of uniform section so as to be perfectly balanced centrifugally. During the further assembly of the brush the bristle bundles 10 are preferably held separated as shown in Figs. 1 and 2B. This may be accomplished by wrapping an elastic band 12 about each bundle in its looped position, or by other suitable means.

A pair of side plate members are provided to be mounted on opposite sides of the bristles and clampingly secured together as a permanent mounting for the brush. Members are provided passing between the bristles radially outwardly of the central ring 11 and rigidly secured to the side plates in a manner to permanently hold each bundle 10 in its own sector of the brush. These members might be straps separate from the side plate members and suitably secured to each plate member in permanent position rigidly attached thereto. However, I prefer to provide tongues on one of said plate members extending through the bristles to and beyond the other plate member and bent down upon the outer face of the other plate member in a manner to secure the side plate members against relative rotation and to provide permanent partition members throughout the life of the brush separating each bundle 10 (after it is released from the bands 12) in a definite sector of the finished brush.

In the form illustrated herein identical side plate members 13 and 14 are provided, each having a plurality of tongues 13*a*, 14*a* struck up from the material of the plate and bent at an angle of substantially 90° to the plate. These tongues are equally spaced circumferentially about the plates 13 and 14 and midway between these tongues and equidistant from the center of the plates are a plurality of openings 13*b* and 14*b*. In the embodiment shown each plate has three tongues and three openings and when the brush is assembled as shown in Figs. 3 and 4, the tongues 14*a* of one plate pass through the openings 13*b* of the other and are bent down upon the other plate to clampingly secure the plates together. In a like manner the tongues 13*a* pass through the openings 14*b*. This assembly step is the next step following the positioning of the parts as shown in Figs. 2A, 2B and 2C and results in a structure as shown in Figs. 3 and 4 after the bands 12 have been removed from the bristle bundles. The plates 13 and 14, together with their tongues where such construction is provided, and in any case the side plates together with the means for clamping them together and for holding the bristle bundles in their predetermined sectors are centrifugally balanced so that the brush in its final form comprises a centrifugally balanced central ring 11, side plates and securing members therefor also centrifugally balanced, and bristle material 10*a* centrifugally balanced about

the center, with the tongues 13a and 14a providing partition members holding the brush material in predetermined sectors of the brush as heretofore pointed out. This results in a brush having a more perfect balance than any heretofore known to me and one which will remain in that balanced condition until the brush material is entirely worn down.

The above described tongues might be struck up from the periphery of one of said plates and extend over to and beyond the other plate and pass through notches or openings therein to be bent down upon the other plate in a manner to secure the other plates together. However, in the form shown, the tongues are struck up from the material of the plate near the periphery thereof in a manner to form flat tongues extending in radial planes, as best seen in the broken away portion of Fig. 3, because this construction provides the least interference with the uninterrupted series of bristles extending circumferentially about the brush.

I desire to divide the brush material into a sufficient number of sectors so that no great shifting of brush material is possible during the life of the brush. For instance to divide the brush material into only two portions each extending through 180° of the brush circumference would be of very little value unless the brush were of very small diameter, but in the usual type brush I find that a division into six sectors as illustrated is satisfactory to prevent material shifting of the bristles while the brush is in use. It will be understood that the number of sectors may be varied as desired to provide the effect of centrifugal balance throughout the life of the brush as I have pointed out.

The form of the side plate members 13 and 14 may be varied to suit the circumstances. For instance the form which I have shown provides central portions 15 of the side plates offset inwardly, providing shoulders which engage the inner periphery of the bristles looped about the ring 11 and providing mounting means for the brush section. The central portions 15 may be provided with openings 16 for mounting on an arbor or the section may be otherwise mounted in any suitable manner.

What I claim is:

1. The method of forming a centrifugally balanced rotary brush having a substantially uninterrupted series of individual bristles extending radially thereof comprising weighing a plurality of bristle bundles of equal weight, looping the bristles about a central retaining ring, securing temporary holding means about each bundle to hold said bundles separate, securing permanent mounting means on opposite sides of said bristle bundles in a manner to permanently hold each bundle in a definite sector of said brush, and then releasing said temporary holding means to permit the individual bristles to spread out and form said substantially uninterrupted series.

2. The method of forming a centrifugally balanced rotary circular brush comprising weighing out loose bristle material in groups of equal weight, equally spacing said groups circumferentially about a central holding member, holding said groups in definite spaced arrangement while securing permanent holding means to retain said bristle material in said position in said brush, and releasing said material in said groups so that the bristles spread out substantially evenly about said circular brush.

LAWRENCE C. HEROLD.