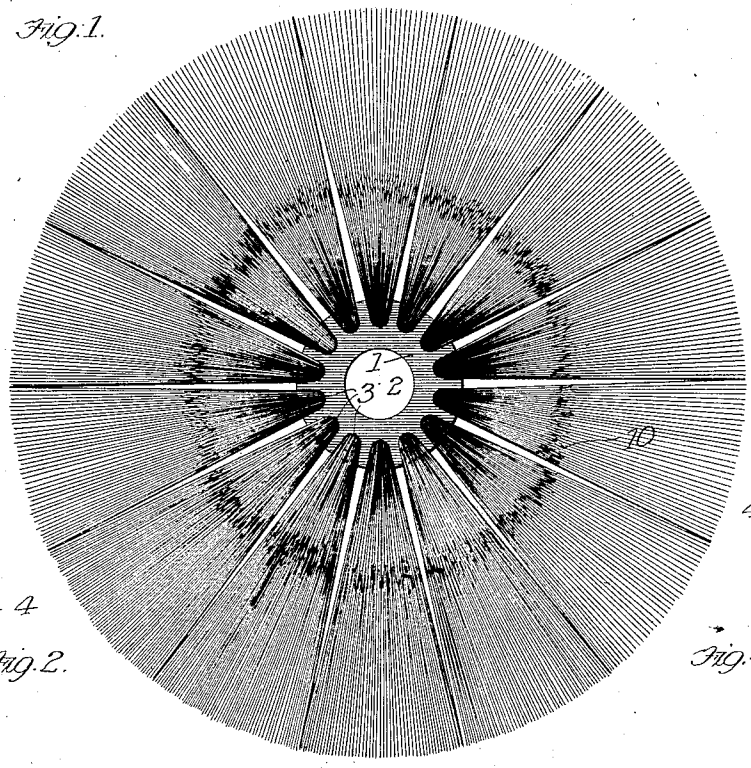
June 21, 1927. 1,633,274

G. RASMESEN, JR

WIRE BRUSH

Filed March 6, 1925

Fig. 1.



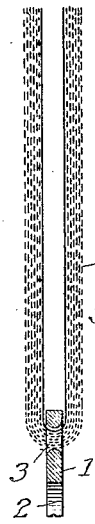


Fig. 2.

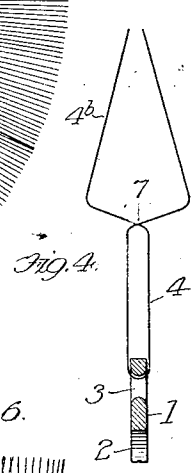


Fig. 4.

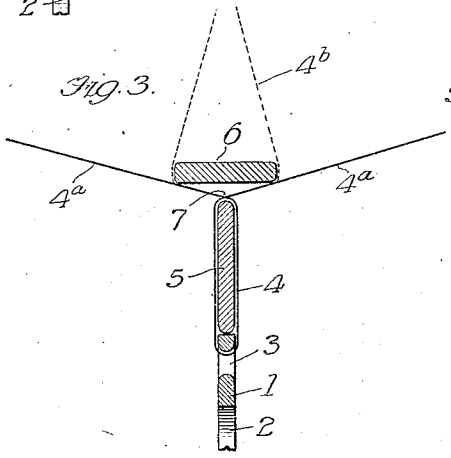


Fig. 3.

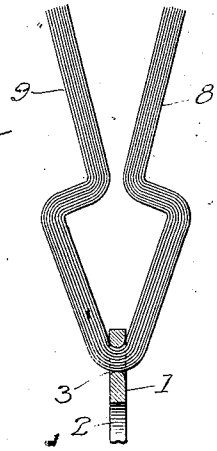


Fig. 5.

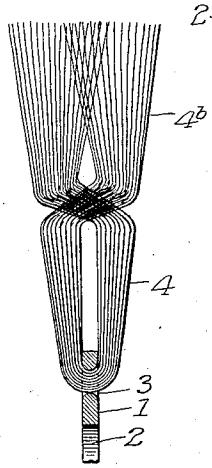


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE RASMESEN, JR., OF WINNETKA, ILLINOIS.

WIRE BRUSH.

Application filed March 6, 1925. Serial No. 13,540.

This invention relates to the tufts and a method of forming tufts for wire brushes, and to the construction of rotary power-driven wire brushes. A purpose of the invention is to provide a simple method of forming the tufts and to provide an arrangement whereby more wire may be used in a brush of given dimensions than has been possible with some brushes now commonly in use; to provide a form of tuft which may be made more or less unyielding or flexible with any given gage of wire; to provide a wire wheel-brush which will stand unusually high speed in its operation and all necessary pressure against the surface operated upon without resulting in weakening and breaking the wire forming the brush; to provide a brush which, while permitting the use of a large amount of wire therein, will still allow for ample air circulation and for the proper clearing of the wire bristles of matter cut from the surfaces operated upon; and to provide a brush in which, even though exceedingly fine wire is used in forming the tufts, the same may nevertheless be made very rigid or resistant to being flexed out of radial position. Another purpose of the invention is to avoid the necessity of weakening the wire bristles by subjecting them to undue strain or sharp bends in the forming operation and to provide a brush which will not change its form or materially its diameter under continued use.

The drawing shows the appearance of one complete section of the brush and individual tufts thereof and diagrammatic views showing the method of forming the tufts.

Of the drawing—

Figure 1 is a face view of one disk shaped section forming a complete brush, but as a rule, a plurality of such sections are mounted coaxially on a single holder to form a complete brush.

Figs. 2 to 5 inclusive diagrammatically illustrate the different steps in the process of forming the tufts for the brush.

Fig. 6 is a side view of one of the tufts.

The diagrammatic views illustrate the method of forming the individual tufts making up the brush and also the appearance of the completed tuft. It is customary in the manufacture of power brushes to mount the tufts on a plurality of coaxial washer-shaped supports, these supports having holes near their peripheries through which the tufts are passed in the form of straight or crimped wire and merely bent double upon themselves to extend more or less radially from the supports, or the tuft may in addition be twisted upon itself. In the present method of construction a group of parallel wires are passed through an aperture in the supporting plate and then are bent outwardly to extend radially of the support, but the bending is continued in the same direction at a point outwardly of the edge of the support so that at this point the two halves of the tuft cross each other, then each half of the tuft without being permanently bent is turned backwardly beyond the radial position and spread apart fan-wise opposite the remaining half and then released so that each half of the tuft springs to the position to which it was originally bent, but with the individual wires separated and passing between the wires of the opposite half.

Wire brushes of the general class to which this invention relates are usually provided with either more or less radially extending bristles, or bristles which are crimped along their length or twisted more or less in the form of a helical spring. Each of said prior form of brushes is objectionable in several respects, and particularly when subjected to hard usage. Applicant now proposes a very carefully made brush, intending to utilize the wire thereof to its maximum capacity. It is also the intention to accomplish with the present design of brush the fine work which may only be done with a brush formed of fine wire, but nevertheless to make such a brush highly resistant to radial pressure and the impact due to its rotation at high speed.

Therefore, each of the bristles forming the brush is bent at a definite point in such a way that the bristles intersect at this point and support one another against radial pressure to any desired degree, depending upon the number of and location of such intersecting points. With this end in view, the illustration shows a typical but simplified form of the brush. The tufts are formed on a washer-shaped permanent holder therefor, such as the perforated disk 1. This disk has a central aperture 2 through which passes a supporting spindle upon which a plurality of the brush sections may be mounted. Near its periphery, disk 1 is provided with a plurality of circular holes 3 for receiving the tufts. In forming the tufts, a group of parallel wires 4 are passed through

one of the apertures 3, and preferably sufficient in number to substantially fill such an aperture, and are then bent into U form, as illustrated in Fig. 2. A block or split ring 5 is then placed upon the periphery of the disk support 1, in order to facilitate further bending of the wires 4 at the desired location. The opposite arms of the tuft are then bent in a group across the outer edge of the member 5, so that the ends thereof extend in substantially the angle 4^a, illustrated in Fig. 3. Then another forming ring or block 6 is placed above the crossed ends of the wire tufts and these ends are then bent upwardly to the position indicated by the dotted lines, 4^b. The forms 5 and 6 are then removed, leaving one group of bristles of each tuft crossing as a unit the opposite group of bristles, Figure 4, at the point 7. Next each group of bristles is resiliently drawn backward so as to no longer cross the opposite group of bristles, coming to the position indicated in Fig. 5.

Each group of bristles in the arms 8 and 9 of the tuft are then fanned out or spread into planes, extending in the same general direction as the plane of disk 1. The two halves of the tuft are then released so that the individual bristles of the first half intersect or intermesh with the bristles of the opposite half, as indicated at 10 in Fig. 1. The bristles, therefore, at this point of intersection come into a more or less compact mass, the resilience of the bristles at their outer ends being dependent upon the distance of this point of intersection of the bristles from the outer end of the tuft and also upon the number of such intersections. The above described operation may be repeated so that the completed tuft may be provided with a plurality of such intersecting bristle supporting points between its ends. Thus it is contemplated to repeat the bending process at different points throughout the length of each tuft according to the rigidity required.

In the use of a brush, such as described, assuming that a plurality of the units shown in Fig. 1 are clamped together on a common spindle, the displacements of the tufts under operating strains in a direction parallel with the axis, is resisted by the clamping devices at the ends of the brush and by one tuft bearing against another, but the radial pressure on the ends of the bristles, when the brush is doing heavy work, may be counteracted by the entire mass of bristles of each tuft at the points of intersection thereof. By arranging just one of said intersecting points, as illustrated in Fig. 1, at considerable distances from the periphery of the brush, the brush is, of course, far more resilient than is the case when there are a plurality of these intersecting points, particularly when there is one close to the periphery of the brush.

My means of this system of manufacturing wire brushes and the construction thereof, it is possible to employ a comparatively large mass of extremely fine bristles in a brush of any given dimensions, while still having such brush highly resistant to pressure and the individual displacement of its bristles, and avoid the mere dragging of the bristles over the surface operated upon without utilizing to full advantage their cutting edges, irrespective of operating the brush under high speed and considerable pressure.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. The method of forming tufts for resilient wire brushes which consists in bending a group of parallel wires into U form and then at a point between the ends of the U bending each leg thereof to cross the opposite leg, then drawing each leg of the tuft away from the opposite one and spreading the wires thereof apart and allowing the same to spring together and cross between each other near the points of the bends.

2. The method of forming tufts for resilient wire brushes which consists in bending a group of parallel wires into U form and then at a point between the ends of the U bending each leg thereof to cross the opposite leg, and then at a point outward of said bend, again bending the wires to extend more or less parallel, then drawing each leg of the tuft away from the opposite one and spreading the wires thereof apart and allowing the same to spring together and cross each other between the points of the bends.

3. A wire tuft formed into two legs, the individual bristles of each leg crossing and intermeshing with the bristles of the opposite leg at a definite point between the ends of the tuft and beyond said point again being bent to extend in the same general direction.

Signed at Winnetka this 28th day of Feb'y 1925.

GEORGE RASMESEN, JR.