G. RASMESEN, JR.

BRUSH.

APPLICATION FILED OCT. 15, 1913.

1,240,604. Patented Sept. 18, 1917.

Fig. 1.

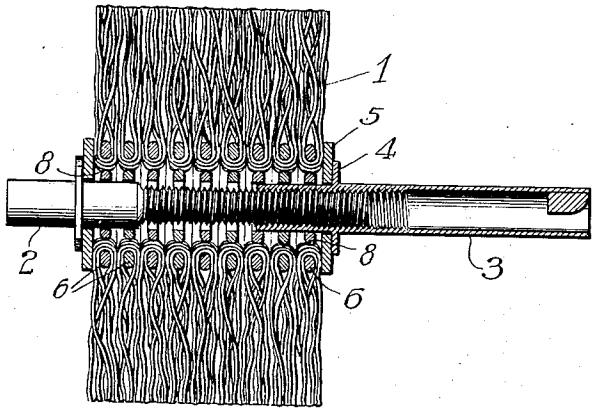


Fig. 2.

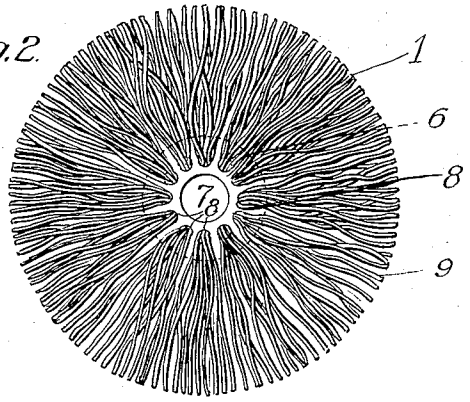


Fig. 6.

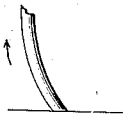


Fig. 3.

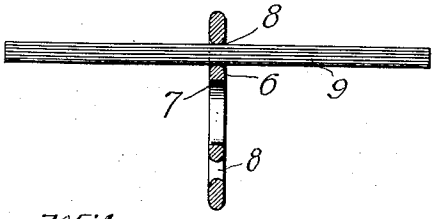


Fig. 4.

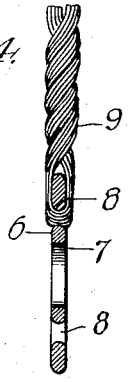
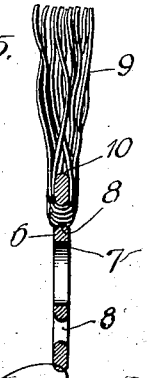


Fig. 5.



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UNITED STATES PATENT OFFICE.

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BRUSH.

1,240,604. Specification of Letters Patent. Patented Sept. 18, 1917.

Application filed October 15, 1913. Serial No. 795,233.

To all whom it may concern:

Be it known that I, GEORGE RASMESEN, Jr., a citizen of the United States of America, and a resident of Winnetka, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Brushes, of which the following is a specification.

The main objects of this invention are to provide an improved form of brush particularly adapted for cleaning surfaces or removing scale or coatings such as paints and varnishes therefrom; and to provide a rotary wire brush constructed to be driven at high speeds and remain cool during operation so as not to become inefficient by melting the varnish, and also disintegrate and break or bend the bristles from the effects of heat during operation.

A further object of the invention is to provide a wire brush with helically formed bristles in order to prevent most of the strain of vibration from occurring at the base of the bristles, and for the purpose of distributing said strain throughout the length of the wires and causing the bristles to support each other while permitting free circulation of air throughout the same. A further object of the invention is to provide a wire brush with helically formed bristles with substantially straight ends in order that the ends of the wires may be uniformly distributed over the operating surface of the brush while the wires as a whole assist in supporting each other and resisting bending strain.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of the improved brush.

Fig. 2 is a face view of one of the brush units.

Figs. 3, 4 and 5 show the manner of securing wire bristles to supporting disks of the brush, and also giving the wires a helical trend whereby they are substantially evenly spaced from each other.

Fig. 6 shows how the brush may be sharpened.

Wire brushes of the general type herein shown, are highly efficient for removing paints and varnishes, or cleaning metallic or other surfaces, but are generally short-lived due to breakage of the wire bristles, the bending strain at the point of connection between the bristles and the body of the brush when the brush is operated at high speeds being such as to cause the bristles to break off. Such brushes are also preferably driven at comparatively high speeds, say of above two to three thousand R. P. M., and the heat generated through friction between the ends of the wires and the surfaces operated upon causes the wires to heat up and increases their tendency to break and also to be bent and remain in their bent positions when cool, even if the wire was originally extremely hard.

The present invention provides an arrangement whereby little, if any, bending of the bristles is necessary at the point of connection with the body of the brush, the bending occurring more or less throughout the length of the bristles. This is accomplished by pivotally connecting the bristles with their support, and further helically twisting the bristles so that they may bend more or less around each other, and also applying some resistance to movement of the bristles between their pivotal connections and their outer ends. The helical twisting in the bristles or wires permits air to enter the brush near its center and freely circulate around the base of the wires and flow outwardly through the brush while the latter is rotating. As a consequence, the brush remains cool during its operation, greatly increasing the life of the brush as the wires do not lose their hardness or disintegrate under the action of the heat and vibration. When wire brushes are so constructed that their bristles are close together and matted near the center of the brush, the heat generated at the ends of the bristles through contact with the surface operated upon is conducted inwardly along the bristles to the center of the brush, and since the wires are here massed, there is little opportunity for circulation of air necessary to keep the wires cool and prevent their disintegration and loss of temper by the action of the heat.

The tufts of wire which the present brush comprises are preferably made out of wire double the length of the bristle desired. One or more of these wires is bent backwardly upon itself and then twisted by gripping the ends of the wire or wires, as shown in Fig. 4. This method of forming the tufts leaves the bristles substantially straight at their ends. When the tufts are untwisted they naturally spread apart into contact with one another

becoming substantially uniformly distributed while permitting the desired circulation of air and assisting to support each other against bending strains.

In the specific arrangement shown in the drawings, the brush comprises a plurality of disk-shaped brush units 1 supported on a shaft 2 having threaded engagement with a hollow driven shaft 3. Each of the shafts 2 and 3 is provided with an annular flange 4 for engagement with washers 5 or the supporting disks 6 of the brush units 1. The shaft 3 is suitably formed for engagement with a power driven flexible shaft, and to provide a journal. Shaft 2 may also, if desired, rest in a bearing at its outer end.

Each brush unit 1 comprises a disk 6 having a central aperture 7, through which the supporting shafts may pass, and one or more rows of small holes 8. The wires 9 of the brush units are first passed through holes 8, as shown in Fig. 3, and then are bent outwardly to lie approximately parallel with the plane of disk 6. It is preferred to next twist the strands of wire together, as shown in Fig. 4, for the purpose of giving them a helical trend and then to untwist the wires, leaving them arranged about as shown in Fig. 5 with their ends substantially uniformly spaced from each other and in contact with each other at various points along their length. The bristles are preferably made of steel so that they will return to their normal position after being bent through contact with surfaces operated upon, but the bristles in the present arrangement of brush need not necessarily be made of hard material, as they may oscillate around their pivotal connections with disks 6, and in operation normally assume a radial position through centrifugal action. The holes 8 in the disks for this reason have rounded edges, as is the case with the outer edge 10 of the disks to prevent cutting of the wires or bristles when the same rock relatively of their supporting disks.

Fig. 6 shows how the wires of the brush may be sharpened simply by rotating the brush when in contact with an abrasive surface. By this means the ends are beveled and thereby given sharpened points. The brush is then turned end for end on shafts 2 and 3, so that the points or cutting edges of the wires will then engage the surfaces operated upon, the direction of rotation of the shaft not being changed.

In the operation of the device, the brush is as a rule intended to be rotated at high speed, the action of the steel wires being to effect the desired abrasion. The wires, whether of hard or soft material, normally tend to extend radially of their supporting shaft through the centrifugal action. After the brush is pressed against the surface operated upon, the wires then bend slightly and drag over the surface, but also rock as a unit around their pivotal connection with the disks 6, and the little bending that does occur in the wires may occur at different points along their length, practically none taking place at the pivotal connections with the disks 6.

Because of the present arrangement and mode of operation of the brush wires, a practical driven brush is provided adapted for heavy service.

One of the chief advantages of the present form of brush is that it does not heat up under severe usage. This not only has the advantage of prolonging the life of the brush but makes it successful, particularly in the work of removing varnish from wood or other surfaces, for the reason that if enough heat is generated in the brush to soften the varnish, the brush will become entirely useless for this class of work. For the same reason, brushes constructed according to the present invention and having extremely fine bristles are well adapted for the purpose of simply dulling varnish surfaces which has heretofore usually been effected by rubbing with oil.

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 claim.

I claim—

A rotary brush comprising a body, a plurality of helically formed bristles supported radially thereon, said bristles being spaced apart near their points of connection with the body of the brush to provide air circulating spaces around the bristles.

Signed at Chicago this 11th day of October 1913.

GEORGE RASMESEN, Jr.

Witnesses:

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