May 14, 1929. G. C. CLEAVES 1,713,027

WIRE BRUSH

Filed April 22, 1925

Fig. 1



Fig. 2

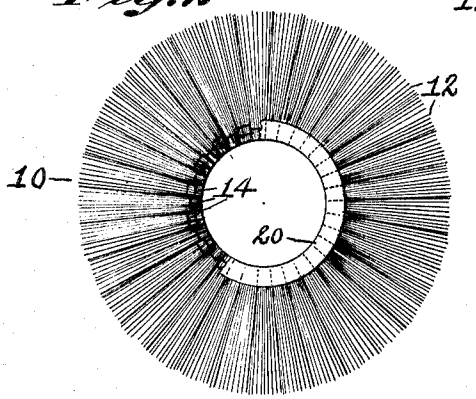


Fig. 3

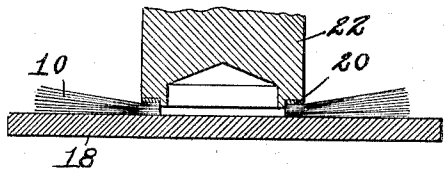


Fig. 4

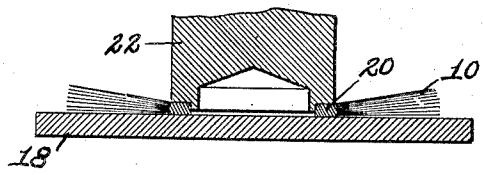


Fig. 5

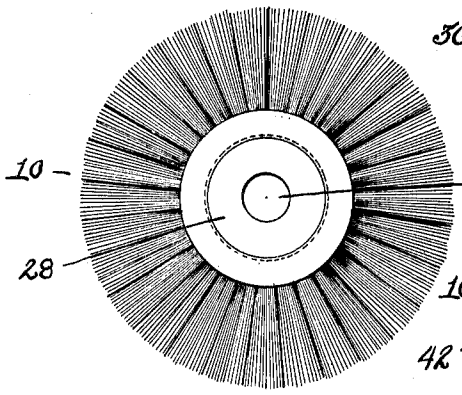


Fig. 6

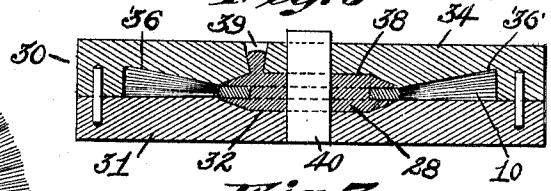


Fig. 7

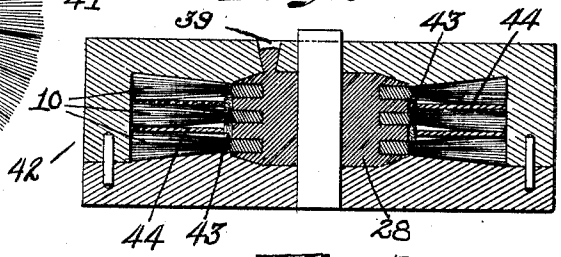


Fig. 8

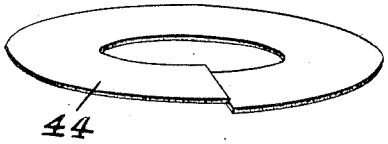
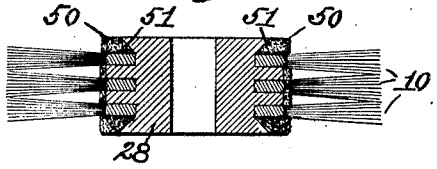


Fig. 9



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UNITED STATES PATENT OFFICE.

GEORGE C. CLEAVES, OF WOLLASTON, MASSACHUSETTS, ASSIGNOR TO WILLIAM H. DOBLE, OF QUINCY, MASSACHUSETTS.

WIRE BRUSH.

Application filed April 22, 1925. Serial No. 24,980.

This invention relates to a wire brush.

The invention has for an object to produce a wire brush of novel and improved construction which may be economically manufactured and in which the wire brush stock is securely fastened in a novel and improved manner.

A further object of the invention is to provide a rotary wire brush of novel and improved construction which is particularly adapted for use as a rotary polishing brush for polishing silverware and the like, and which is capable of outwearing any of the prior similar brushes of which I am aware.

Other objects of the invention are to provide novel methods for producing the above mentioned brushes.

With these objects in view, the invention consists in the brushes and in the various structures, combinations and arrangements of parts hereinafter described and particularly defined in the claims at the end of this specification.

In the drawings illustrating the preferred embodiment of the invention, Figure 1 is a side elevation of a length of a web of the wire brush stock preferably employed in constructing the present brush; Fig. 2 is a circular brush section made from the web of Fig. 1, showing the soldering of the butt ends of the wire brush stock; Figs. 3 and 4 are sectional views illustrating the manner in which the butt ends of the wire brush stock of a circular brush section such as is illustrated in Fig. 2, may be soldered; Fig. 5 is a side elevation of the complete rotary wire brush; Fig. 6 is a sectional view of a mold used for producing a single section brush embodying the present invention; Fig. 7 is a similar view illustrating a mold for producing a brush comprising a plurality of circular brush sections; Fig. 8 is a perspective of one of the centering rings employed in molding the multisection brush, as shown in Fig. 7; and Fig. 9 is a sectional view of a modified form of brush embodying the present invention, and which will be hereinafter further referred to.

Referring to the drawing, the different features of the invention are, for purposes of illustration, shown as embodied in a rotary wire brush intended for use as a wire polishing brush for polishing silverware and the like, and as shown in the drawing the rotary brush is made up of one or more circular sections 10 of wire brush stock 12, and in forming the circular brush section 10 the individual wires 12 are preferably first woven into a web such as is illustrated in Fig. 1, using the machine forming the subject matter of my co-pending application, Serial No. 722,706, filed June 27, 1924, and in which the individual wires 12 are assembled in bundles 13, and the bundles 13 are connected together by a plurality of binding strands 14, preferably of wire, woven in and out around the butt ends of the bundles. In making a rotary brush, a definite length of this web is formed into circular shape and the ends of the binding strands 14 twisted together or secured in any other convenient manner, to form a circular brush section. Provision is made for securely uniting together the butt ends of all of the individual wires 12 comprising the circular brush section 10, and for this purpose solder or other fusible metal is melted and caused to flow into the spaces between and around the individual wires, so that when the fusible metal hardens, the butt ends of the wires are embedded in a mass of the fusible metal. In practice the circular brush section 10 may be laid upon a plate 18 and a ring 20 of solder or other fusible metal placed on the top thereof. A hot soldering iron 22, preferably of annular shape such as is illustrated in Fig. 3, is then pressed down upon the ring 20 of solder. The heat melts the solder and the pressure of the iron serves to cause the molten solder to permeate through the interstices between the butt ends of the individual wires 12, causing the solder to completely encase each wire, so that when set the solder serves to unite the butt ends of all of the wire brush stock into a solid mass of metal.

The individual circular brush section thus formed may be utilized in different ways, but I prefer to embody one or more of such sections, according to the width of the brush it is desired to produce, in a metal hub 28 preferably of moldable metal such as lead, and which may conveniently be formed in the manner illustrated in Figs. 6 and 7 and described as follows. In constructing a brush of a single brush section, the latter, with the butt ends of the wire brush stock soldered together as above described, is placed in a mold 30 of a special construction having a bottom plate 31 provided with a

depressed portion 32 of a shape corresponding to the contour of one side of the hub 28. The top plate 34 of the mold is also provided with a recessed portion 36 of a shape and size adapted to accommodate the flaring brush stock and also with a second recessed portion 38 adapted to form the upper half of the hub 28. The top plate 34 is provided with an opening 39 through which molten lead or other moldable material may be poured to fill the mold and to form the hub. Both the top and bottom plates 31, 34 are provided with central holes through which a core pin 40 may be passed to form the shaft opening 41 through the center of the molded hub. After the mold has been filled with the molten lead and the latter has cooled, the completed brush is removed from the mold and the surfaces of the hub turned smooth and polished if desired.

In some instances it is desirable to produce a rotary brush of a width greater than that provided by a single circular brush section 10, and in order to produce such a brush, a number of the circular brush sections 10 may be superimposed upon one another in a mold 42 of a construction similar to that of the mold 30, but proportionately larger in size and which is illustrated in Fig. 7. Spacing rings 43 preferably of fiber, may be interposed between the successive circular brush sections 10, and in order to properly center the rings 43 within the mold 42, I preferably use split centering rings 44 in the manner illustrated in Fig. 7, and after the hub of brush has been molded and the brush removed from the mold, the split centering rings 44 may be removed from between the wire brush stock of adjacent brush sections. The molten lead forming the hub of the brush, may be poured into the mold 42 through the opening 39 in the top plate thereof, filling the mold and forming when cooled the hub of the wire brush, as shown in Fig. 7.

From the description thus far it will be observed that the present brush and its method of manufacture are such that it may be produced at a minimum manufacturing expense for the reason that the web may be formed by machine and the soldering of the butt ends of the wire brush stock and the molding of the hub may be accomplished rapidly. The individual wires of the brush stock are positively and securely held in fixed relation to the hub by the solder, and as a result the brush is capable of withstanding hard usage for relatively long periods of time as compared with the existing prior types of wire brushes of which I am aware and which are now upon the market.

The sides of the molded hub of the brush are preferably of the shape illustrated, and as a result when the brush is used for polishing silverware and the like the hub projects a minimum distance beyond the brush, and as a result the liability of injuring the silverware by the operator inadvertently striking the silverware against the hub is reduced to a minimum.

In some instances the metal hub of the brush may be provided with a cushioning ring or member 50, in order to increase the protection to the silverware or other material being polished or operated upon. In practice and as illustrated in Fig. 9, the metal hub may be molded over fiber buffer rings 50, the latter being provided with a conical central opening to form an inclined wall 51 over which the molded metal of the hub may flow to securely lock the rings 50 in fixed relation to the hub.

While the preferred embodiment of the invention has been illustrated and described as embodied in a rotary wire brush, it is to be understood that certain features of the invention may be embodied in other forms of brushes within the scope of the following claims.

I claim:

1. A wire brush comprising a woven web made up of a plurality of bundles of wire brush stock, and a plurality of metal binding strands woven about the butt ends thereof to connect the bundles into a unitary strip, and fusible metal between and enclosing the butt ends of said wire brush stock uniting the same into a solid mass.

2. A rotary wire brush comprising a circular brush section composed of a web of a plurality of bundles of wire brush stock and a plurality of metal binding strands woven about the butt ends thereof to connect the bundles into a unitary strip, and a hub of moldable metal in which said brush section is secured.

3. A rotary wire brush comprising a circular brush section comprising a web, composed of a plurality of bundles of wire brush stock and a plurality of metal binding strands woven about the butt ends thereof to connect the bundles into a unitary strip, fusible metal uniting the binding strands and wire brush stock, and a hub of metal molded on said brush section.

4. A rotary wire brush comprising a circular brush section composed of wire brush stock having the butt ends thereof connected together by fusible metal to form a unitary annular strip, and a hub of moldable metal in which said brush section is mounted.

In testimony whereof I have signed my name to this specification.

GEORGE C. CLEAVES.