Sept. 10, 1935. C. E. FROST 2,014,281

BRUSH

Filed Oct. 14, 1930

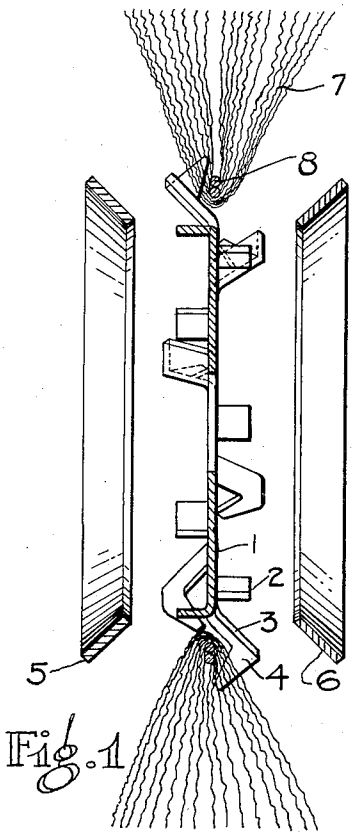

Fig. 1

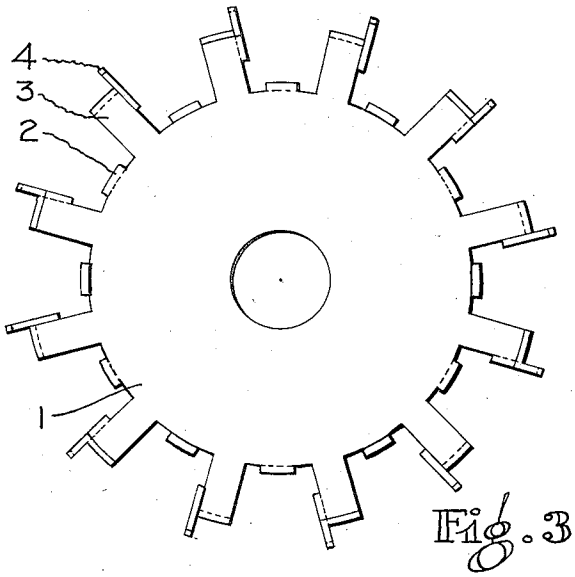

Fig. 3

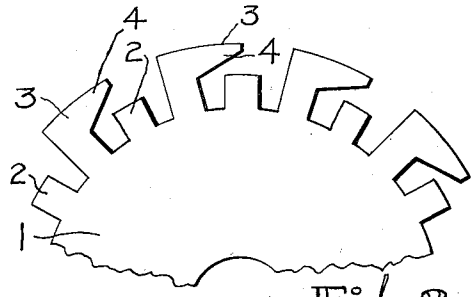

Fig. 2

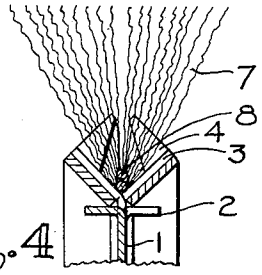

Fig. 4

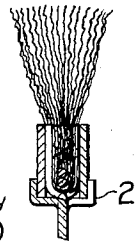

Fig. 5

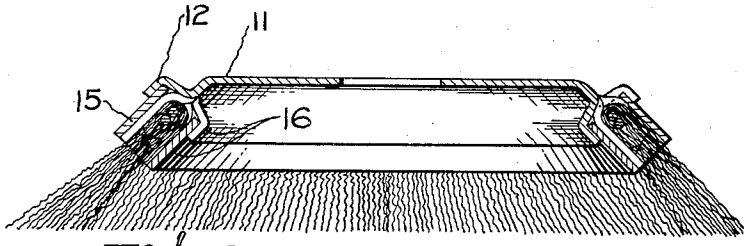

Fig. 6

INVENTOR.
Clinton E. Frost

BY
Harvey R. Hawgood
ATTORNEY.

Patented Sept. 10, 1935 2,014,281

UNITED STATES PATENT OFFICE

2,014,281

BRUSH

Clinton E. Frost, Cleveland Heights, Ohio, assignor to The Osborn Manufacturing Company, Cleveland, Ohio, a corporation of Ohio

Application October 14, 1930, Serial No. 488,581

11 Claims. (Cl. 15—181)

This invention relates to an improved brush of the type generally known in the art as sectional brushes, in which a number of disc-like sections are arranged in axial alinement and clamped together, the entire assembly producing a cylindrical brush adapted to be rotated by a machine, for many types of cleaning, polishing and the like.

An object of the invention is to provide an improved circular brush.

Another object is to provide an improved brush in which the filaments will be uniformly distributed.

Another object is to provide an improved brush which may be easily and economically manufactured.

Another object is to provide an improved brush which may be used with either vegetable fiber or metal filaments.

Other objects will hereinafter appear.

The invention will be better understood from the description of two practical embodiments thereof illustrated in the accompanying drawing, in which;

Figure 1 is a transverse sectional view of the parts of which one form of the improved brush is composed, this being shown separated for purposes of clarity;

Figure 2 is a fragmentary elevational view of the blank from which the retaining member is produced;

Figure 3 is an elevational view of the retaining member as it is formed prior to the assembling of the device;

Figure 4 is a fragmentary sectional view of the parts of Figure 1 in their first assembled position;

Figure 5 is a similar view of the same parts upon the completion of the assembly; and

Figure 6 is a central sectional view of a modified form of brush section.

The central portion of the brush illustrated consists of a sheet metal disc which is blanked, as shown in Figure 2, having a circular flat central portion 1 from which project rectangular lugs 2 and L-shaped lugs 3 alternating therewith. After the blank has been formed, the projecting prongs 4 of the L-shaped lugs are bent to a position substantially normal to the surface of the blank, the consecutive prongs being bent in opposite directions and the lugs 3 are bent to oblique positions, so that the prongs are all upwardly and inwardly directed, as most clearly illustrated in Figure 1.

The lugs 2 are bent to a position normal to the flat portion 1, the direction of these lugs also alternating. Two frustro-conical rings 5 and 6 are formed, the inner diameter of each being just sufficient to clear the lugs 2. These rings are placed adjacent the lugs 3 as shown in Figure 4, and tufts of wire or other filament 7 inserted into the V-shaped groove so formed. A ring of wire 8 is wound through the centers of the tufts, as also shown in Figure 4, the wire in the illustration being shown as making two turns around the periphery of the central disc. With the parts in the above positions, the assembled mechanism is subjected to pressure which closes the prongs over the retaining wire, causing them to penetrate the mass of filaments, flattens the rings 5 and 6 and bends the lugs 2 over the inner margins of the rings, the parts assuming the position shown in Figure 5, in which it will be noted that the rings 5 and 6 are tightly clamped together by the lugs 2, and between them hold both the filaments and the pronged lugs 3.

If the prongs 4 are longer than the distance between the rings, their ends will become clinched upon the opposing rings. The prongs overlie the retaining wire and so firmly lock this in the bottom of the channel-shaped recess formed by the rings 5 and 6 preventing the loosening of the filaments and also retaining them against circumferential movement. The clinching of the ends of the prongs is not essential to the proper retention of the filaments and wire ring, but does not impair the firm retention of these elements. It is therefore possible to use a single length of prong for brushes of different thicknesses, the prongs bending over in the case of the narrower brushes but lying straight in the case of the wider sections. This permits sections to be produced of much greater thickness than has been possible heretofore, "fills" of an inch or more in thickness being firmly retained.

By the invention above described, a brush or section is produced, which is better balanced than prior sections, is easier and more economical to manufacture, retains the filaments better, and in which, due to thicker "fills" requires less sections for a given length of assembled brush.

In Figure 6 a modified form of brush is shown, in which the disc 11 has been dished adjacent its edge, the lugs 12 retaining the rings 15 and 16 in the manner above described, but providing a brush in which the filaments extend axially beyond the retaining members, and which is particularly suitable for use in bottoms of recesses and the like.

While I have described the illustrated embodiments of my invention in some particularity, this is done by way of illustration only, it being obvious that many other embodiments will readily occur to those skilled in this art, and I do not, therefore, limit myself to the precise details shown and described, but claim as my invention all embodiments, modifications and variations coming within the scope of the appended claims.

I claim:

1. A circular brush comprising a disc-shaped central member, a plurality of radially extending circumferentially arranged looped tufts of fila-

ments arranged thereabout, a central ring passing through the bottoms of said loops, pronged lugs on said central member, the prongs of which penetrate the mass of filaments exteriorly of said ring, alternating prongs passing into said mass from opposite sides, and two clamping rings clamped to said central member and gripping said filaments and prongs therebetween.

2. A circular brush comprising a disc-shaped central member, a plurality of radially extending circumferentially arranged looped tufts of filaments arranged thereabout, a circumferential wire passing through the bottoms of said loops, pronged lugs on said central member, the prongs of which penetrate the mass of filaments exteriorly of said wire, alternating prongs passing into said mass from opposite sides, two rings clamping the filaments therebetween, the clamping rings being retained in place by lugs formed on the central member and bent over the clamping rings.

3. A circular brush comprising a disc-shaped central member, a plurality of radially extending circumferentially arranged looped tufts of filaments arranged thereabout, a ring passing through the bottoms of said loops, pronged lugs on said central member, the prongs of which lie in planes including the axis of the brush and penetrate the mass of filaments exteriorly of said ring, alternating prongs passing into said mass from opposite sides, and two clamping rings clamped to said central member and gripping said filaments and prongs therebetween.

4. A frustro-conical brush comprising an annularly arranged series of looped filaments with the loops directed toward the axis of the brush, a ring passing through the loops of said filaments, a retaining member having a plurality of lugs bearing upon the sides of the mass of filaments and prongs upon said lugs penetrating the mass of filaments from opposite sides thereof and beyond the ring, and two clamping elements embracing opposite sides of the looped portions of the filaments and the lugs.

5. A frustro-conical brush comprising an annularly arranged series of looped filaments with the loops directed toward the axis of the brush, a ring passing through the loops of said filaments, a retaining member having a plurality of lugs bearing upon the sides of the mass of filaments and prongs upon said lugs penetrating the mass of filaments from opposite sides thereof and beyond the ring, two clamping elements embracing opposite sides of the looped portions of the filaments and the lugs, and clamping means clamping said clamping elements to said retaining member.

6. A circular brush comprising an annularly arranged series of looped filaments with the loops directed toward the center, a ring passing through the loops of said filaments, a retaining member comprising a disc-shaped portion lying within the loops of said filaments and having lugs extending along the sides of the loops of the filaments and prongs extending from the lugs into the mass of filaments from opposite sides and beyond the ring, and two clamping elements embracing opposite sides of the looped portion of the filaments and the lugs.

7. A circular brush comprising an annularly arranged series of looped filaments with the loops directed toward the center, a ring passing through the loops of said filaments, a retaining member comprising a disc-shaped portion lying within the loops of said filaments and having lugs extending along the sides of the loops of the filaments and prongs extending from the lugs into the mass of filaments from opposite sides and beyond the ring, two clamping elements embracing opposite sides of the looped portion of the filaments and the lugs, and means clamping said clamping elements to the retaining member.

8. A brush comprising an annularly arranged series of looped filaments with the loops directed toward the center, a ring passing through the loops of said filaments, a flat retaining member having two series of oppositely directed flat prongs lying in planes which include the axis of the brush and penetrating the mass of filaments from opposite sides thereof beyond the ring, and two clamping elements embracing opposite sides of the looped portions of said filaments.

9. The method of forming a circular brush which comprises forming a generally sheave-shaped sheet metal supporting member, the member being provided with outwardly diverging lugs lying within and at each side of the peripheral groove thereof and having a centrally disposed flat disc-like hub, the lugs carrying prongs projecting towards the plane defined by the center of the groove, positioning the looped portion of a plurality of tufts of filaments within the peripheral groove between the lugs, winding a ring around the sheave-shaped member within the loops of said filaments and then subjecting the assembled device to lateral pressure to compress the diverging flanges of the supporting member tightly upon the mass of filaments and to simultaneously cause the prongs to pass into said mass of filaments and overlying said ring.

10. The method of forming a circular brush which comprises first forming a disc-like retaining member having outwardly diverging lugs, assembling this member with two dished ring-like clamping members to form a generally sheave-shaped sheet metal supporting member, the lugs of the supporting member lying within the groove formed by the dished clamping members and carrying prongs projecting towards the plane defined by the center of the groove, positioning the looped portion of a plurality of tufts of filaments within the groove and between the lugs, winding a ring around the sheave-shaped member within the loops of said filaments and then subjecting the assembled device to lateral pressure to compress the diverging flanges of the supporting member tightly upon the mass of filaments and to simultaneously cause the prongs to pass into said mass of filaments and overlie said ring and to clamp said clamping members to said supporting member.

11. The method of making a circular brush which comprises forming a generally annular sheet metal supporting member defining an outwardly opening peripheral groove and provided with prongs extending into the peripheral groove, positioning the looped portion of a plurality of tufts of filaments within the groove beneath the prongs, winding a ring around the annular member within the loops of said filaments, and then subjecting the assembled device to lateral pressure to flatten the annular member tightly upon the mass of filaments, and to simultaneously cause the prongs to be pressed into said mass of filaments and overlie said ring.

CLINTON E. FROST.