

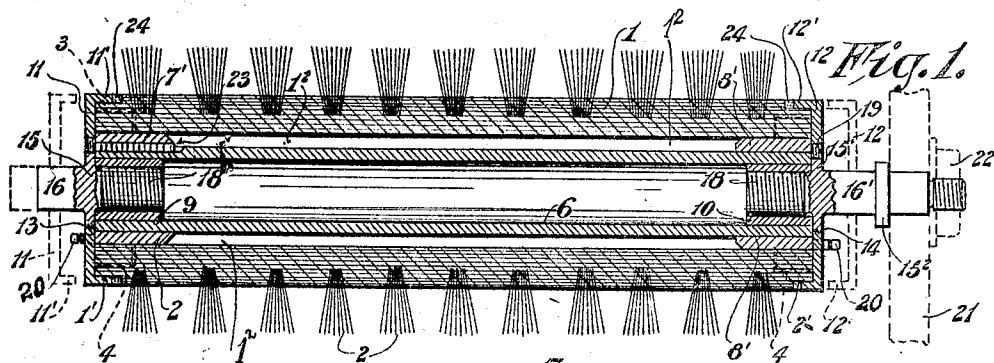
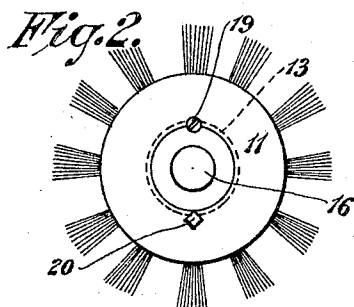
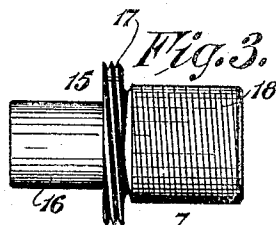
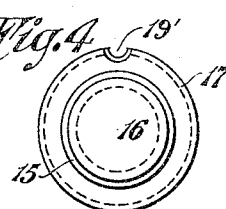
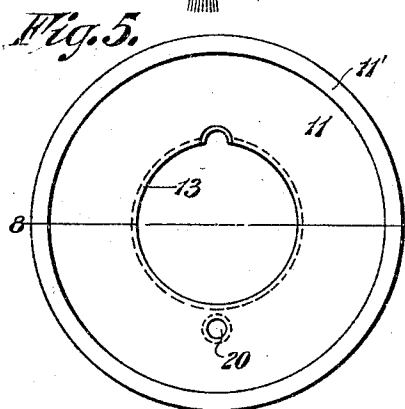
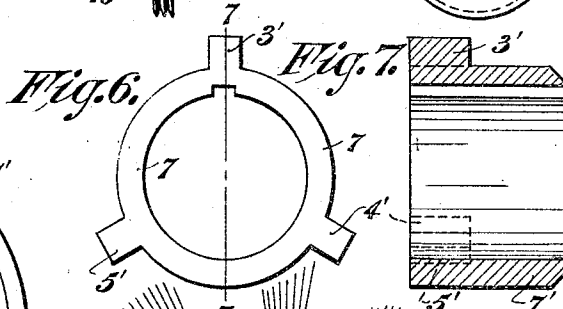
Feb. 5, 1924.

W. H. HEFFERNAN

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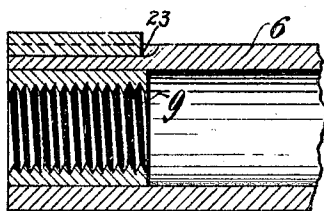
BRUSH

Filed May 12, 1921



WITNESS:

Fig. 10.



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## UNITED STATES PATENT OFFICE.

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## BRUSH.

Application filed May 12, 1921. Serial No. 468,845.

*To all whom it may concern:*

Be it known that I, WILLIAM H. HEFFERNAN, a citizen of the United States of America, residing in North Adams, in the county of Berkshire and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Brushes, of which the following is a specification.

This invention relates to improvements in brushes, and is particularly designed for use in connection with revolving brushes which are used for carrying dye from a suitable supply vat onto a roller, which in turn is used to transfer the color to the printing roller in the manufacture of cloth and other fabrics.

An object of the invention is to provide a brush which is preferably formed of paper that is suitably treated in order that it may be impervious to the liquid dye. In operation these brushes are worn out very rapidly, and it is desirable to have some means for replacing them without delaying the operation of the machine.

A further object of the invention, therefore, comprises an interchangeable shaft which can be readily removed from the old, or worn out tubular brush, and inserted into a new tubular brush carrying member, thus permitting the same shaft construction to be used continuously.

A further object is to provide suitable means for attaching this shaft to the brush carrying member.

Heretofore it has become a common practice in the manufacture of brushes for the purpose described, to use a wooden cylinder member having the bristles attached thereto and having bearing members or gudgeons which are suitably secured to the ends of the wooden rollers. This practice is objectionable, on account of the expense involved in replacing brushes when they are worn out, since it requires not only the turning down or reconstruction of the wooden cylinder and the insertion of the bristles therein, but the accurate centering of the bearing members therefor.

The present invention is therefore confined to the construction of the detachable shaft which is to be used with tubular brush carrying cylinders.

These and other objects will appear in the

body of the specification, and will be particularly pointed out in the claims appended hereto.

Referring to the drawings:

Fig. 1 is a longitudinal sectional view through the axis of the shaft showing the tubular brush carrying cylinder in section, also the means for detachably connecting the shaft to this cylinder.

Fig. 2 is an end view of Fig. 1 showing one of the bearing supporting plates, also the means for attaching one of the bearings to one of the plates, and the set screw for retaining the bearing in the plate.

Fig. 3 is a detail view of one of the detachable bearing stubs showing the threads at its inner end, the bearing portion at its other end, and the threaded flange which engages the threaded opening in the bearing plate.

Fig. 4 is an end view of Fig. 3.

Fig. 5 is an inside view of one of the bearing plates showing the threaded opening therein and the flange which engages the end of the tubular brush carrying cylinder.

Fig. 6 is a detail view of one of the spider pieces for insertion in the end of the tubular member of the brush, which member is formed with lugs or projections for engaging recesses in the ends of the tubular brush cylinder.

Fig. 7 is a detail sectional view on the line 7-7 of Fig. 6.

Fig. 8 is a detail view on the line 8-8 of Fig. 5, showing the threaded opening and the flanges of the bearing plates.

Fig. 9 is a view of one end of the tubular brush member, with the bearing or end plate removed, and showing one of the spiders located therein.

Fig. 10 is a detail sectional view of one end of the driving shaft which is inserted in the tubular member and showing the threaded thimble or bushing inserted therein.

Fig. 11 is a detail view of the interiorly threaded thimble removed from the shaft.

Referring to the drawings in detail: 1 designates the brush carrying tubular member formed preferably of layers of paper suitably treated to render it impervious to the dye solution in which the brush rotates. 2 designates the bristles which are secured to

the tubular member in any suitable manner. Formed in the ends of the tubular member are the three recesses 3, 4, and 5 which are spaced 120° apart, as shown in Fig. 9. These 5 recesses are for the purpose of receiving the projections 3', 4', and 5' on the spider constructions 7 and 8, shown in Figs. 6 and 7. One of these spiders, 7, is adapted to be removed and inserted into either end of the 10 tubular member, while the other spider construction, 8, is brazed, or otherwise permanently secured to the tubular shaft member 6, as shown at the right end of Fig. 1. These spider constructions are formed with cylindrical parts 7' and 8' which enter the opening 1<sup>2</sup> in the tubular member 1, as shown in Fig. 1.

Located within the opposite ends of the tubular member 6 are the interiorly threaded thimbles or bushing members 9 and 10, shown in Figs. 10 and 11. 11 and 12 indicate bearing receiving plates that are located on the opposite ends of the tubular member 1. These members are formed with 25 flanges 11' and 12' which engage the annular recesses 1' and 2' at the ends of the member 1. Formed in the plates 11 and 12 are the threaded openings 13 and 14. These openings are for the purpose of receiving the bearing stubs or gudgeon members 15 and 15', one of which is shown in detail in Fig. 3. 16 indicates the bearing portion on one gudgeon, and 16' on the other. 17 indicates the threaded flange portion, and 18 35 the threaded inner end portions which enter the interiorly threaded thimbles 9 and 10 shown in Figs. 10 and 11, and also in the assembled view Fig. 1. It is of course obvious that the threads on the oppositely located members 15 and 15' should have one 40 right and the other left hand threads.

For the purpose of rigidly securing the members 15 and 15' to the end bearing plates 11 and 12 a set screw 19 is employed in each 45 plate, as shown in Fig. 2, which engages a recess 19' in the flange 17. 20 indicates a set screw located in the end bearing plates 11 and 12 and which engages the outer ends or edges of the spider members 7 and 8, as shown in Fig. 1 at the opposite ends of the 50 same.

It is understood that the brush is driven by attaching a suitable drive pulley 21 on the end of the bearing member 15', and securing the same thereto by the nut 22. For 55 the purpose of transmitting rotary motion of the tubular shaft 6 to the tubular member 1, a keyway construction 23 is employed between the tubular member 6 and the spider construction 7 at the left end of the 60 brush.

The device is assembled as follows: The loose and removable spider 7 is inserted into either end of the member 1, the flange part 65 7' entering the opening 1<sup>2</sup> of the tubular

member 1. The lugs 3', 4', and 5' of the spider enter the openings 3, 4, and 5 in the end of the member 1 (see Fig. 9). The tubular shaft member 6 is inserted in the member 1 and the keyway members 23 70 thereon and in the spider are made to engage.

The plates 11 and 12 are then placed on the ends of the member 1 by threading the part 18 of the members 15 and 15' into the 75 interiorly threaded bushings or thimbles 9 or 10. The set screws 20 are then turned down against the ends of the spiders. For the purpose of forming a water tight joint between the flanges 11' and 12' of the bearing members 11 and 12 and the ends of the tubular member 1, a packing ring or gasket 80 24 is employed (see Fig. 1).

From this construction it will be seen that the tubular shaft member 6 and bearing 85 plates 11 and 12, the spiders 7 and 8, may be readily removed when the bristles 2 are worn out, and the same inserted in a new tubular member without requiring the machine to be idle but a short time. 90

It is to be understood that the opposite ends of the tubular member 1 are formed with recesses 3, 4, and 5 that are equally spaced at 120° apart to receive the loose and removable spider 7 or the fixed one 8. 95 It is also to be understood that the spider 8 is permanently secured to one end of the tubular shaft member 6, as stated, so that when this member is inserted in the tubular member 1 the lugs or projections of the 100 spider will enter the recesses or openings 3, 4, and 5.

What I claim is:

1. In a device of the kind described, a detachable shaft support for a brush or the 105 like, comprising in combination a bristle carrying part, a shaft member, a spider secured to one end of said member, a second spider designed to have separable engagement with the other end of said member and 110 interlocking engagement with the bristle carrying part of the brush, and detachable bearing devices connected to the shaft member, whereby when the shaft is rotated the brush will also be rotated. 115

2. In a device of the kind described, a bristle carrying member, the combination of a shaft member designed to pass through said member, a device secured at one end of the shaft member and formed with projec- 120 tions to engage the bristle carrying member, a second device at the other end of the shaft member for engaging the bristle carrying member, and bearing members having detachable connection with each of said 125 devices for rotatably supporting the shaft.

3. In a device of the kind described, comprising in combination a bristle carrying member, a shaft member designed to extend 130 through said member and having threads

at each of its ends, plate members having a projection for engaging the ends of the bristle carrying member and formed with a threaded opening, bearing members formed  
5 with threads for engaging the threads of the shaft member and a threaded part for entering the threaded opening in the plate members, and means for securing the bearing members in the plate member.

10 4. In a device of the kind described, the combination, of a bristle carrying member, a tubular shaft member extending through the said member, plates at the ends of said member having threaded openings there-  
15 through, threaded bearing parts for supporting the shaft member and located in the threaded openings of the plates, and means for securing the parts in the openings.

20 5. In a brush construction, the combination, of a bristle carrying member, of a shaft therefor, means for attaching the shaft to said member to permit its being separable therefrom, said means including devices lo-  
25 cated within the ends of the bristle carrying member, plate-like members for connecting the shaft to the bristle carrying member, projections on the devices and engaging said

bristle carrying member for driving said member when the shaft is rotated.

6. In a revoluble brush construction, a  
30 bristle carrying member, a tubular shaft, means for detachably connecting the tubular shaft thereto, said means including bearing devices for supporting the brush and hav-  
35 ing threads on their inner ends, and threaded into the ends of the shaft, and a threaded part between its ends, plates formed with threaded openings to receive the threads of the bearing devices which are located be-  
40 tween their ends for supporting the bearing devices and said plates engaging the bristle carrying member.

7. In a detachable shaft construction for revolving brushes, a bristle carrying mem-  
45 ber, a tubular shaft member to which said member is connected, the bristle carrying member having recesses in the ends thereof, spider devices engaging the recesses of the bristle carrying members and the ends of the shaft, and bearing means connected to  
50 the shaft and the spider devices for supporting the same.

WILLIAM H. HEFFERNAN.