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UTILITY BRUSH

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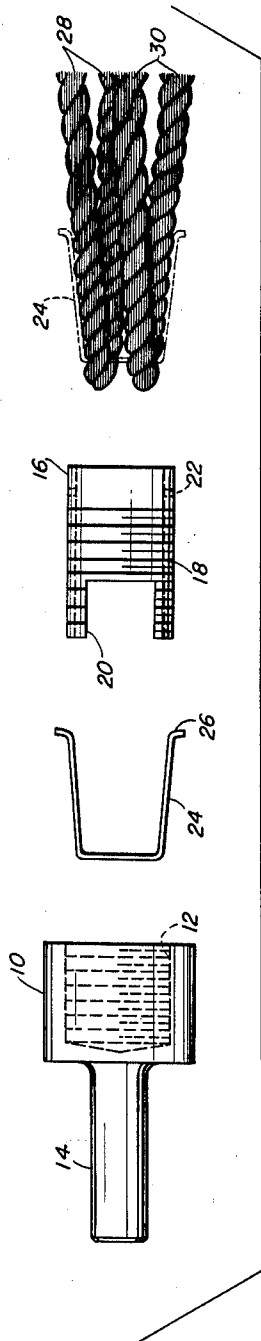


Fig. 1

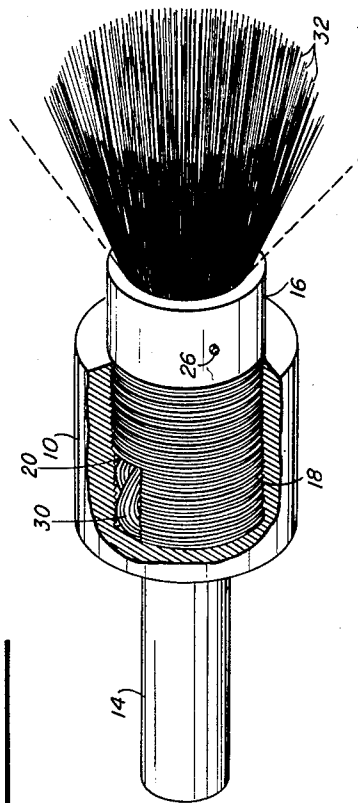


Fig. 2

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UTILITY BRUSH

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4 Claims. (Cl. 15—198)

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The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

This invention relates to a utility brush and more particularly to a re-fillable pencil type brush for use with a rotary power driven shaft.

Rust, scale, and other effects of corrosion frequently occur on surfaces which are within or between closely adjacent parts and are therefore almost totally inaccessible to commonly used abrasive and cleaning brushes. Laborious hand cleaning methods must frequently be employed in such situations.

There have been devised re-fillable brushes such as that shown, for example, in the patent to Fogliasso, No. 2,392,909. A brush of this type utilizes a complicated and costly shaped and threaded core and nut arrangement to retain the brush elements. In addition to expense and complexity of the retaining core, particularly formed brush elements are required for the specific core. Furthermore, there exists the hazard of possible accidental disassembly during use.

The brush of the present invention comprises an adapter arranged to be secured to a rotary shaft, a hollow holder body detachably secured to the adapter and simple laterally engageable and releasable spring means for detachably securing a brush element to the assembly. The parts are proportioned and dimensioned for simple access to such surfaces as the internal portions of box type boiler headers, valve guides, and the like.

It is an object of this invention to provide an improved holding means for a brush element.

Another object of the invention is to provide a brush in which the tufts of brush material may be quickly and easily replaced when worn.

A further object of this invention is the provision of a small rotary brush which incorporates inexpensive and simple replaceable bristles.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Fig. 1 is an exploded view of the brush of this invention; and

Fig. 2 is a pictorial view of the assembled brush with parts broken away.

As best seen in Fig. 1, adapter 10 formed with a blind hole threaded as at 12, is provided with a reduced diameter shank 14 which is suitably shaped for driving engagement with a power driven rotary shaft (not shown). A hollow tubular holder body 16, externally threaded as at 18, is provided with a slot or bifurcation 20 and a pair of diametrically opposed apertures 22. As illustrated in Fig. 1, threads 18 do not extend the full length of body 16 whereby the unthreaded portion thereof may be conveniently engaged by a wrench or the like. Obviously both elements 10 and 16 may be suitably circumferentially

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shaped to receive such wrench. A substantially U-shaped spring steel clip 24 is formed with outwardly turned ends 26 which are arranged to be securely held within apertures 22 by reason of the fact that the distance between flanged ends 26 is normally (in unstressed position) greater than the internal diameter of body 16. Clip 24 is constructed and positioned to place the bight thereof at right angles to and extending between the furcations of the body 16, extending substantially across the body. The brush elements or bristles 28, 30 conveniently comprise a pair of short doubled or folded lengths or sections of right lay stranded stainless steel cable or similar easily available and expendable wire elements.

To assemble the structure the clip 24 is inserted into tubular body 16 from the threaded bifurcated end thereof until flanged ends 26 snap into apertures 22. Folded cables 28, 30 are then individually fed into and through body 16 from the threaded end thereof with the ends of each cable straddling and passing on opposite sides of the bight of clip 24. The two cables 28, 30 are preferably arranged side by side and each is pressed through the body 16 until the bight portion or fold thereof abuts the bight of the clip. To facilitate insertion of the cable ends, they may be coated with a suitable material which will prevent fraying of the ends and fouling thereof on the body 16. The adapter 10 is then threaded on body 16, the threads being right hand so that the engagement thereof is enhanced when shank 14 is driven, for example, by an electric drill or flexible cable. Bifurcation 20 facilitates insertion of the cables 28, 30 and permits the bight portions thereof to expand outwardly against threads 12 when members 10 and 16 are assembled, thereby compressing and further securing the bristle elements in the assembly between the adapter hole and the clip. Alternatively the assembly may be initiated by placing the bight of clip 24 against the folds of cables 28, 30 as illustrated by the dotted line position of the clip in Fig. 1, and then pressing elements 24, 28, 30 into body 16 from the unthreaded end thereof until the flanged ends 26 seat in apertures 22. Members 10 and 16 may be relatively axially adjusted to effect an optimum degree of compression of the folds of the cables between the adapter and the spring clip.

Disassembly is of course effected by reversal of the assembly procedure but it may not be necessary to remove clip 24 when replacing the cables.

When the brush is driven by a conventional rotary power source, centrifugal force will effect the unwinding of the strands of the right lay cable and will further effect unwinding of the wire elements 32 of each strand. In use, the filaments or wire elements 32 flare outwardly as indicated by the dotted line showing in Fig. 2. Thus when the brush is inserted in a tube having an internal diameter just greater than the outer diameter of adapter 10, the outward flaring of the filaments provides a more effective cleaning. When rotation of the brush ceases, the filaments return to the full line position of Fig. 2 and the brush may be inserted into another tube of the same small internal diameter without fouling.

It will be seen from the foregoing that the brush of the present invention may be simply constructed in small sizes with few parts. The brush uses inexpensive but efficient bristle elements which are quickly and easily attached in a manner which safely and securely retains the bristles in position, thereby avoiding the hazards of accidental disassembly during use. The bristles are similarly easily removed and replaced.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A brush assembly comprising a hollow holder body having a pair of diametrically opposed apertures therein adjacent one end portion thereof, the other end portion of said body being externally threaded and axially bifurcated, a U-shaped spring clip positioned within said body having outwardly bent ends engaged in said apertures, the bight of said clip extending substantially at right angles to and between the furcations of said other end portion, at least one folded section of right lay stranded cable straddling said clip with the inner portion of the cable fold engaging the bight of said clip and the free ends of the cable extending through and beyond said one end portion of said body, an adapter having a blind hole threadedly engaged with said threaded body portion, the bottom of said hole engaging the cable fold and bight portions of the cable fold expanding between said furcations and diametrically outwardly of said body into engagement with the threaded wall of said adapter, and means on said adapter for coupling the assembly to a driving means.

2. A brush assembly comprising an adapter, a tubular holder body, a resilient retaining member detachably secured to and within said body, a doubled brush element folded over said retaining member and having the ends thereof extending through and beyond said body, the fold of said brush element being positioned at one end of said holder body and between said member and said adapter, and means for detachably securing said body at said one end thereof to said adapter to press said brush element between said retaining member and said adapter,

said means comprising external threads on said one end in engagement with internal threads in said adapter.

3. The assembly of claim 2 wherein said body is formed with a pair of diametrically opposed apertures at the other end thereof, and said retaining member comprises a U-shaped clip having outwardly turned ends thereof engaged in said apertures and retained therein by said brush element.

4. A brush assembly comprising a hollow holder body, one end portion of said body being externally threaded and axially bifurcated, a retaining member resiliently secured to and within said body and having at least a portion thereof extending between the furcations of said one end portion, a brush element folded around said retaining member portion and having the ends thereof extending through the body and outwardly of the other end thereof, and adapter means threaded on said one end portion for compressing and detachably securing the folded portion of said brush element within said furcations and between said retaining member portion and said adapter means.

References Cited in the file of this patent

UNITED STATES PATENTS

536,181	Bingeman et al.	Mar. 26, 1895
853,582	Gohrband	May 14, 1907
1,119,335	Anderson	Dec. 1, 1914
1,451,775	Husch et al.	Apr. 17, 1923

FOREIGN PATENTS

648,303	Laffage	Aug. 13, 1928
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