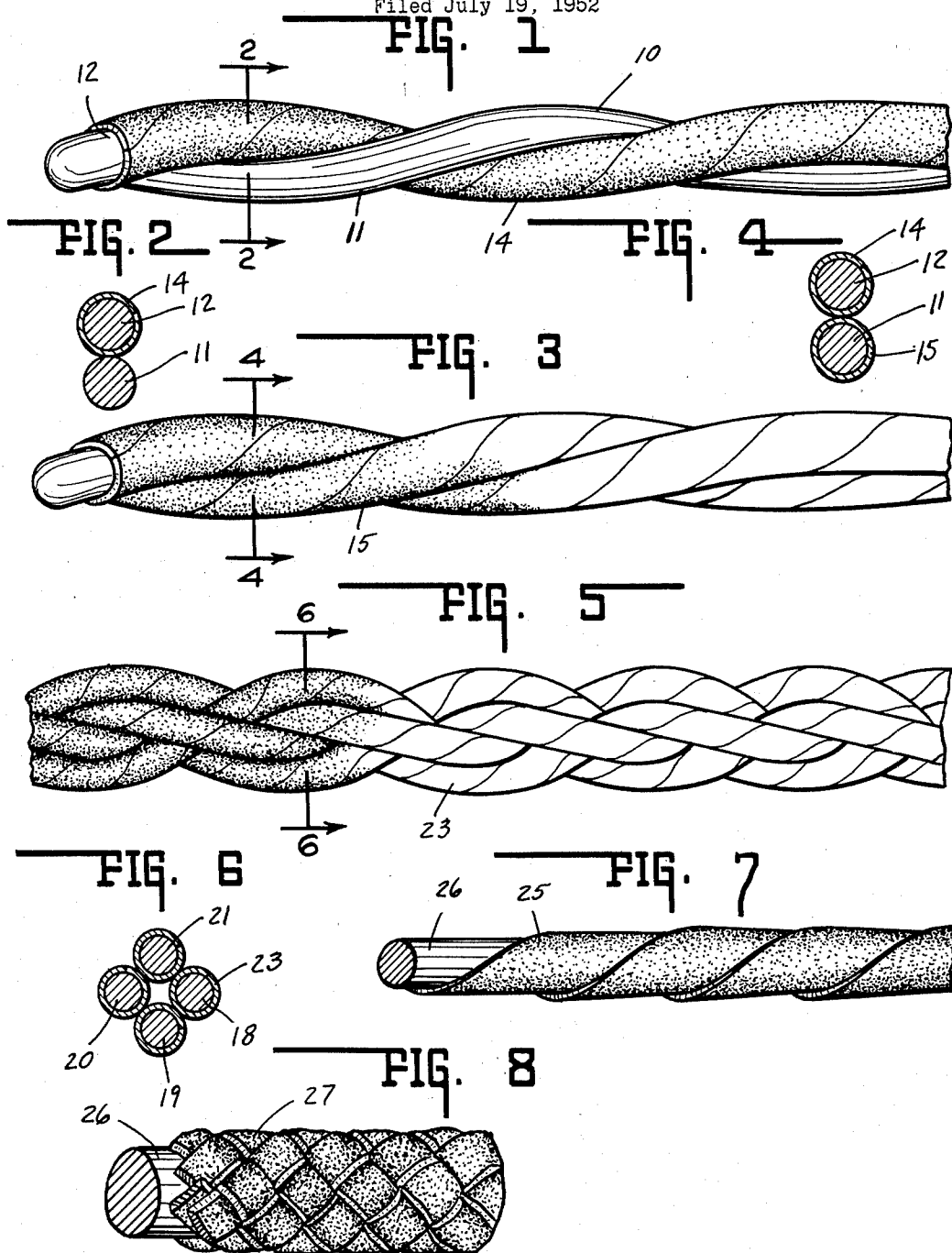


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FLEXIBLE ABRASIVE ROPE

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FLEXIBLE ABRASIVE ROPE

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This invention relates generally to an abrasive device and more particularly it relates to a flexible abrasive rope adapted to be utilized for polishing, deburring or cleaning the internal surfaces of relatively small tubular structures.

The prior art fails to disclose any satisfactory abrasive apparatus for deburring, polishing and cleaning the internal surfaces of small tubular structures having internal diameters of the order of one quarter of an inch or less. It is possible to utilize small wire brushes for this purpose, but they necessarily must comprise extremely small and flexible wires whereby they do not have sufficient rigidity or abrasive properties to remove burrs or other metal particles. More especially, a conventional wire brush is not adapted to be utilized in a curved tubular structure such for example as a pipe elbow.

Accordingly, the principal object of this invention is to provide apparatus for deburring, polishing or cleaning the internal surfaces of a relatively small tubular structure.

Another object of this invention is to provide a flexible abrasive device having the general characteristic of a rope whereby it is especially adapted to polish, deburr or clean the internal surfaces of a curved tubular structure such for example as a pipe elbow.

In accordance with this invention there is provided a flexible abrasive rope consisting of flexible wires having wrappings of an abrasive material and twisted or braided to form a rope-like structure.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

Fig. 1 is a side elevation view of an abrasive device constructed in accordance with this invention.

Fig. 2 is a cross section taken on line 2—2 of Fig. 1.

Fig. 3 is an elevation of the modification of this invention.

Fig. 4 is a cross section taken on line 4—4 of Fig. 3.

Fig. 5 is an elevation view of a third modification of this invention.

Fig. 6 is a cross section taken on line 6—6 of Fig. 5.

Fig. 7 is a detail elevation illustrating a method of applying abrasive material to a wire as a wrapping.

Fig. 8 is an enlarged elevation view of a fourth modification of this invention.

Fig. 1 of the drawings illustrates a flexible rope-like abrasive device comprising a wire member 10 which is bent to form a loop having parallel sides 11 and 12. The side 12 is provided with an abrasive tape 14 wound spirally thereon. The wire loop has then been twisted to form a generally rope-like structure.

Fig. 3 illustrates another modification wherein both wires of the loop have been spirally wound with an abrasive tape member, the wire corresponding to wire 11 of Fig. 1 having been provided with a spiral abrasive member 15.

Figs. 5 and 6 illustrate a third modification of the invention wherein four wires 18, 19, 20 and 21 are spi-

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ally wound with abrasive tapes, such for example as 23, and braided together to form a braided rope-like abrasive structure.

The abrasive members 14, 15 and 23 may comprise conventional abrasive coated cloth or paper of various grades of fineness for deburring or polishing in accordance with the particular type of metal or in accordance with the specifications of the particular job being done.

In operation the flexible abrasive rope may be reciprocated or rotated within a tubular structure thereby to deburr, clean or polish the internal surfaces thereof. The size of the wires 11 and 12 and the thickness of the abrasive tape may be selected in accordance with the internal diameter of the particular tubular member upon which it is desired to work. Probably an abrasive rope of this type finds its most advantageous use for the deburring, cleaning or polishing of tubes having an internal diameter of one quarter inch or less. This type of abrasive device is especially desirable for use in connection with curved tubular structures where the conventional deburring devices are substantially inoperative.

Fig. 7 of the drawings illustrates a modified method of applying an abrasive tape 25 to a wire 26 where each turn of the spiral is in overlapping relation to each adjacent turn of the spiral. This method of applying the abrasive tape may be found advantageous in certain special applications.

Fig. 8 of the drawings illustrates another modification of this invention wherein a plurality of abrasive tapes 27 may be braided over a single wire 26. Tapes 27 may be applied with or without an adhesive on wire 26. The use of an adhesive presents the advantage that those portions of the tape contacting the wire but covered by overlapping portions will adhere directly to wire 26 and will provide a serviceable abrasive surface after the outer or overlapping portions of the tape have worn away. Thus the useful life of this device may be prolonged by the use of an adhesive. This modification of the invention and the modification shown in Fig. 7 are especially applicable for use in small bores or for cleaning, deburring or polishing concave surfaces having small radii.

While this invention in its various forms is disclosed as including a flexible wire, it is intended that the flexibility of the wire may be chosen in accordance with the intended application of the device. For example, if the device is to be utilized only in straight tubes or bores a relatively stiff wire may be utilized whereas a comparatively flexible wire may be utilized for devices intended for use in curved tubular structures. It will be obvious to those skilled in the art that various types of abrasive materials may be chosen in accordance with the type of work to be done by the device. Either cloth or paper backed abrasives may be mounted on the wire structure or an abrasive layer of material may be deposited directly on the surface of the wire.

The invention claimed is:

1. An abrasive rope comprising a pair of wires twisted about one another, one wire of said pair having spirally wound thereon a complete covering of an abrasive-bearing tape member.

2. An abrasive rope device comprising wires spirally twisted about one another and having a complete covering of abrasive-bearing tapes spirally wound thereon.

3. A flexible abrasive rope device comprising wires mutually twisted about one another and having a complete covering on the external surfaces thereof of members having abrasive adhering thereto.

4. A flexible abrasive rope device comprising flexible intertwined wire members each of which includes an abrasive-bearing member mounted on its surface and completely covering said surface.

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5. A flexible abrasive rope device comprising a plurality of braided wires each of which has a complete abrasive covering consisting of an abrasive-bearing tape spirally wound thereon.

6. An abrasive rope comprising a wire member and a completely covering wrapping of abrasive-bearing sheet material.

7. An abrasive rope comprising a flexible core and a completely covering wrapping of abrasive-bearing sheet material.

8. An abrasive rope comprising a flexible core and a spiral wrapping of abrasive-bearing tape covering said core.

9. An abrasive rope comprising a core and a braided wrapping of abrasive tape.

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10. An abrasive rope comprising a flexible metallic core structure and a complete covering of granular abrasive material fastened on the surface thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 8,349	Berry	July 23, 1878
604,569	Ringstrom	May 24, 1878
1,306,636	Selby	June 10, 1919
1,743,057	Wienholz et al.	Jan. 7, 1930
2,019,386	Benedini	Oct. 29, 1935
2,038,782	Ellis	Apr. 28, 1936