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L. N. PYLE
POLISHING PAD

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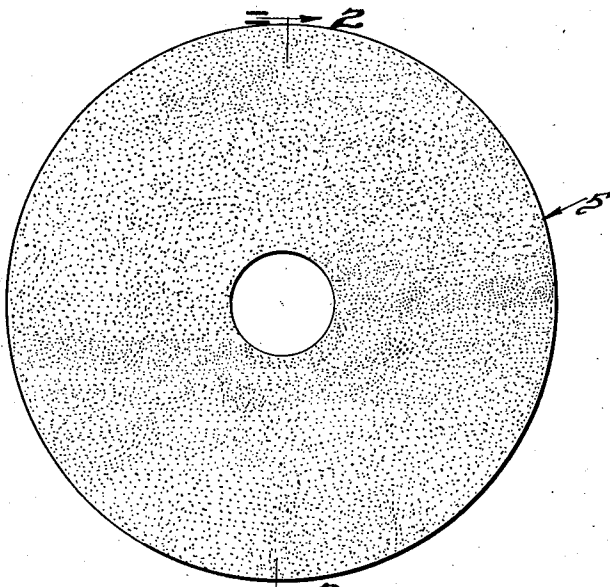


FIG. 1.

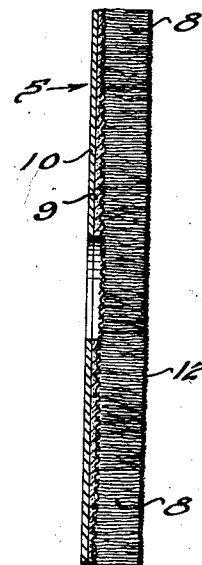


FIG. 2.

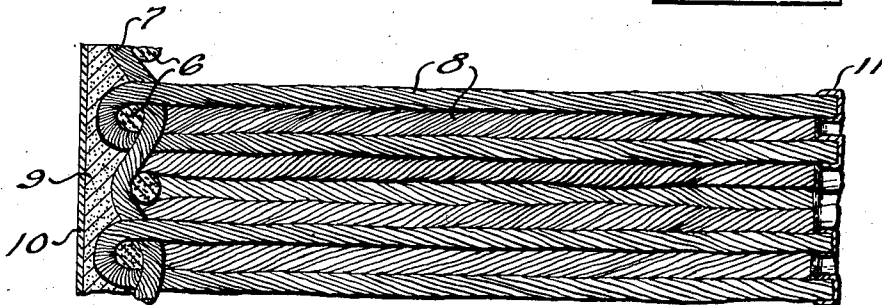


FIG. 3.

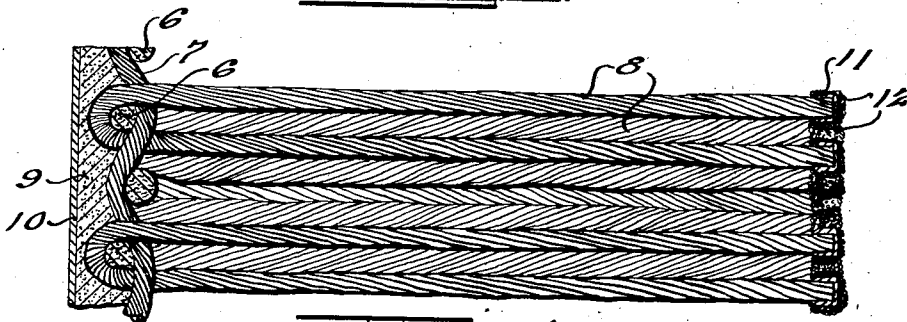


FIG. 4.

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POLISHING PAD

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5 Claims. (Cl. 51—195)

This invention relates to surface finishing devices in the form of a yielding, flexible disc, having abrasive on the surface thereof, the disc being adapted to be rotated as it is applied to and passed over the surface of the article being finished.

The main objects of this invention are to provide a surface finishing disc or pad which has sufficient yieldability to the working surface thereof so that it will not grind off high places on the surface being finished, but will follow the uneven contoured surface piece of material so as to finish the hollows therein as well as the flat parts or the raised parts thereof; to provide a metal finishing device in which the abrading surface thereof is supported upon the end of a mass of fibrous strands, the fibrous strands being resilient so as to yieldingly support the abrading surface; to provide a surface finishing device which is particularly useful and adaptable for the finishing of sheet metal surfaces such as is required in the manufacture of automobiles and the like; to provide a surface finishing device having a yieldingly mounted abrading surface in which the resilient means for supporting the abrading surface, comprises a plurality of resilient strands which are securely anchored or locked to a supporting back member.

An illustrative embodiment of this invention is shown in the accompanying drawing in which:

Figure 1 is a view in face elevation of the abrading side of the improved finishing disc;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a greatly enlarged or magnified fragmentary view of a few strands of fibrous material showing how the strands are anchored or locked to the supporting back, and with the outer free ends of the strands treated with an adhesive;

Fig. 4 is a view similar to Fig. 3 but with the abrasive applied to the adhesive on the outer free ends of the resilient supporting strands.

In the finishing of sheet metal surfaces, it is highly desirable to have an abrading or grinding disc or pad which will follow the contour of a slightly uneven metallic surface so as not to grind away the metal from the high places on the surface but finish off and polish out the hollow or low places in the uneven surface. In the use of finishing discs or pads of this character, it is necessary that they be rotated at extremely high speeds, therefore, it is essential that the abrasive be so securely fixed or bonded to the grinding discs that such abrasive will not be

thrown off by centrifugal force and thereby injure a workman. Furthermore, loss of abrasive in this manner would quickly deplete the grinding device of its supply of abrasive and the finishing device would not be effective to do the required work.

Heretofore many attempts have been made to develop a satisfactory surface finishing material using a pile fabric as a foundation or base upon which to apply the abrasive, the abrasive being held hereto by a suitable adhesive. When an adhesive is applied to a pile fabric so that it extends for the entire length of the strands of the pile, the resulting product, due to the drying and hardening of the adhesive, is devoid of resiliency. Such a resulting product, being devoid of yieldability due to lack of resiliency of the strands of the pile fabric, thereby defeats its own purpose.

It is necessary to have the strands of the pile fabric closely compacted for two reasons. First, because the strands support each other and maintain the direction of the strands substantially normal to the plane of the back of the fabric, and, second, by having the strands of the pile closely compacted, the adhesive which bonds the abrasive thereto covers over the free ends of the strands only and extends but a very short distance down their length. The remainder of the length of each of the strands of fibrous material is free to flex and thereby provide a yielding mounting for the abrading surface.

Another shortcoming of prior art devices attempting to use pile fabric, has been the fact that the strands of the pile have not been anchored to the supporting back and as a result these strands or loops of the fabric readily pull out and become disengaged from the back or base. In the present invention the looped strands which form the pile are tightly and securely anchored to the supporting back with the result that high speed of rotation will not in any way dislodge or disengage the strands from the woven supporting back.

In the construction shown in the drawing, the surface finishing device is in the form of a disc, generally designated 5 in Figs. 1 and 2 of the drawing, and comprises a woven pile fabric having a woven back member comprising the inter-twined strands 6 and 7 around which are looped U-shaped strands 8 which comprise the pile of the fabric and which are of considerable length such as three-quarters of an inch to one inch long. The strands 8 are disposed normal to the back and are each composed of a

bundle of twisted fibrous elements. The strands are closely compacted one against another so as to support each other and at the same time prevent adhesive from passing down along the sides thereof for any substantial distance.

The strands 8 are resilient so as to provide a yielding cushion between the back supporting member and their outer free ends.

Means are provided for locking the looped strands 8 into the backing member and anchoring them securely thereto and comprise a layer of bonding material 9 which is preferably latex and which adheres tightly to the strands of the backing member as well as the strands of the pile fabric at the base ends of the loops thereof. An additional support on the back thereof may be provided in the form of a layer of relatively hard fibrous material 10 which is glued to the back by heat-resisting, waterproof material.

The outer free tip ends of the strands 8 are provided with a coating of adhesive 11, the adhesive extending only a very short way down along the sides of the strand ends and the remainder of the strands being free of the adhesive. A coating of abrasive in granular form 12 is then applied to the adhesive 11 and thereby bonded onto the tip ends of the strand. Due to the strands being closely compacted, the abrasive 12, when first applied to the ends of the strands, forms a continuous unbroken surface or coating over the entire face of the disc 5. This abrasive surface is of very thin character, however, and immediately upon placing the disc against a surface to be finished and placing weight thereon the abrasive surface is broken up into a large number of small areas or portions but, due to the close contacting of the strands 8, the abrasive surface over the face of the pad or disc is substantially continuous, thus providing a thin layer of abrasive supported by a yielding layer of fibrous strands which are disposed normal with respect to the plane of the abrasive surface.

As stated before, in the use of this device, the thin layer of abrasive becomes cracked or checked over the entire surface area thereof and due to the yieldability of the strands 8, the abrading surface follows the uneven contour of the material being worked upon.

After the discs have been used a considerable period of time and the abrasive is worn off so that the device no longer performs a satisfactory job, the remaining abrasive and adhesive 11 may be removed from the tip ends of the strands by steam, for instance, and thereafter a new coating of adhesive and abrasive applied thereto so as to renew the disc for further use.

The relatively long, closely compacted, resilient strands 8 of the pile fabric, not being treated with adhesive, retain their original resiliency and thereby provide a cushion for supporting the abrading surface so that when the disc is rotated upon an uneven surface it will polish out the hollows and not grind off an undue amount from the high places of the surface, as is the case with finishing pads of this character which are relatively stiff or hard.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of

the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

What is claimed is:

1. A surface finishing article comprising a relatively stiff, heavy layer of fabric material forming a backing sheet, a dense mass of relatively long, stiff, closely compacted strands of a relatively stiff, fibrous material, each having one end anchored to said backing sheet to form a firm, yet slightly yielding, nap, said strands extending in a direction at right angles to the plane of said backing sheet and a layer of abrasive bonded to the other ends only of said strands, the remainder of the length of said strands being free of abrasive bonding material so that said strands firmly, yet yieldingly, support the layer of abrasive thereon.

2. A surface finishing article comprising a relatively stiff, heavy layer of fabric material forming a backing sheet, a plurality of relatively long U-shaped loops of stiff, twisted strands of a relatively stiff fibrous material anchored in said fabric layer to form a dense, firm, yet slightly yielding nap which is self-supporting at right angles to the backing sheet, and an abrasive bonded to the outer free ends only of said strands so that said strands firmly yet yieldingly support the abrasive thereon.

3. A surface finishing article comprising a relatively stiff, heavy layer of fabric material forming a backing sheet, a plurality of relatively long U-shaped loops of stiff, twisted strands of a relatively stiff fibrous material anchored in said fabric layer to form a dense, firm, yet slightly yielding nap which is self-supporting at right angles to the backing sheet, and a layer of abrasive bonded to the outer free ends only of said strands so that said strands firmly yet yieldingly support the layer of abrasive thereon.

4. A surface finishing article comprising a relatively stiff, heavy layer of fabric material forming a backing sheet, a plurality of relatively long U-shaped loops of stiff, closely compacted strands of a relatively stiff fibrous material anchored in said fabric layer to form a dense, firm, yet slightly yielding nap which is self-supporting at right angles to the backing sheet, and an abrasive bonded to the outer free ends only of said strands, the remainder of the length of said strands being free of abrasive bonding material so that said strands firmly yet yieldingly support the abrasive thereon.

5. A surface finishing article comprising a relatively stiff, heavy layer of fabric material forming a backing sheet, a plurality of relatively long U-shaped loops of stiff twisted strands of a relatively stiff fibrous material anchored in said fabric layer to form a dense, firm, yet slightly yielding nap which is self-supporting at right angles to the backing sheet, and an abrasive bonded to the outer free ends only of said strands so that said strands firmly yet yieldingly support the abrasive thereon, and a reinforcing back secured to said backing sheet for strengthening the same to resist disintegration by centrifugal force when rotated at high speed.

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