ABRASIVE SURFACING DISK

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This invention relates to improvements in an abrasive surfacing disk, and is more particularly directed to an improved composite abrasive disk for use in the surfacing and abrading of metal, wood and other surfaces, on articles such as sheet metal bodies, floors and numerous other articles having a surface which must be cut down to a smooth and generally level condition.

In the operation of such devices the disk is secured at its center to a rotating shaft and the outer portion of the disk, which is covered on its operating surface with a suitable abrasive, is then pressed against the work, and particularly where the operation is carried out on metal there is an extremely high resistance to the rotation of the disk by reason of the cutting of the abrasive grains into the metal. The result is that the disks, in order to have a suitable life, must be made of extremely strong tough material, which at the same time must have a certain degree of flexibility to permit them to flex and bend as the supporting pad compresses or bends. It is essential that the material be capable of withstanding alternate bending or flexing at a high rate of speed and without the separation of one layer of the composite material from another.

It is, therefore, the main object of this invention to provide an improved composite abrasive disk of the character described which is formed of a compressible material having an abrasive surface so secured thereto as to withstand alternate bending or flexing at a high rate of speed without the separation of one layer of the composite material from another.

Another object of this invention is to provide a composite abrasive disk of the character described including a compressible felt body, to one surface of which is secured a canvas disk, which surface of which canvas disk is adhesively secured a layer of abrasive grains.

A further object of this invention is to provide a composite abrasive disk of the character described, including a relatively thin body of compressible material, upon one surface of which is adhesively secured a layer of grains, said layer of grains extending to and covering the outer edge of said disk.

A still further object of this invention is to provide a composite abrasive disk of the character described which is formed of a compressible material, to one surface of which is rigidly secured by stitching or the like a canvas disk, and to the outer surface of said canvas disk is adhesively secured a layer of grains, said layer of grains also covering the outer free edge of said disk.

A still further object of this invention is to provide a composite abrasive disk of the character described which is formed of a compressible material having a relatively thick body for providing the desired flexibility to permit the disk to bend and flex, but at the same time being capable of withstanding alternate bending or flexing at a high rate of speed and without the separation of one layer of the composite material from another, said disk being also capable of being resurfaced with said abrasive grains whenever found necessary or desirable.

A still further object of this invention is to provide a composite abrasive disk of the character described having a body of compressible material, to one surface of which is permanently secured a layer of abrasive grains, said body being capable of being resurfaced from time to time as such abrasive grains are worn away in use.

A still further object of this invention is to provide a composite abrasive disk of the character described which is simple in construction and which may be produced along lines convenient for low cost manufacture, and which may be highly efficient for carrying out the purposes for which it is designed.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention consists in certain novel features of construction, arrangement and combination of parts, hereinafter more fully described, illustrated in the accompanying drawing, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of my invention, I have illustrated in the foregoing drawing a preferred embodiment thereof, from an inspection thereof when considered in connection with the following description, my invention, its mode of construction, assembly and operation, and many of its advantages, should be readily understood and appreciated.

Referring to the drawing in which the same characters of reference are employed to indicate corresponding or similar parts throughout the several figures of the drawing:

Figure 1 is a view in perspective of my improved surfacing disk, the same being shown connected to an apparatus by means of which the disk is rotated;

Fig. 2 is a transverse central section through...
one form of my improved disk, being taken on line 
2—2 of Fig. 4;

Fig. 3 is a transverse central section through a 3 modified form of my improved disk, taken on 
line 3—3 of Fig. 5;

Fig. 4 is a bottom plan view of the modification 5 shown in Fig. 2; and

Fig. 5 is a bottom plan view of the modified 10 form shown in Fig. 3.

As already stated, the present invention is di- 15 rected primarily to the provision of an abrasive 20 disk for use on a rotatable shaft. As shown in 25 Fig. 1, there is provided a shaft 1 upon the free 30 end of which is mounted my improved flexible 35 abrasive covered disk 10, said shaft and disk 40 being secured to a housing 2 and are rotated by 45 the flexible shaft 3 which is carried to the hous- 50 ing 2 where it drives the shaft 1 through suitable 55 bevel gears (not shown). The housing 2 is pro- 60 vided with a suitable handle 4 by means of which the 65 operator holds the device against the work, thus giving him a quite accurate control of the operation as he can both vary the pressure of the abrasive disk against the work or vary the angle 70 at which the apparatus works, and also move the operating portion of the abrasive disk from point to point over the surface of the panel in order to prevent the warping which results in the case of certain metal panels if the disk is held in one position too long.

In the form illustrated in Fig. 2, my improved disk comprises a body 11 which may be formed of any suitable compressible material, such as felt, which had been securely stitched together by means of stitching 12 and then compressed to the desired thickness. To one face of this felt disk is then secured a layer of adhesive 22 to which is then secured a canvas disk 23, which canvas disk may be further secured to the felt pad 20 by means of the circumferential rows of stitching 24, whereby the canvas disk may be rigidly and permanently secured to the felt body.

The disk of canvas 23 is substantially of the same shape and size as the felt pad, and to the outer surface thereof is applied a layer of adhesive 25 to which is secured a layer of abrasive grains 26. The abrasive 26 is adapted to extend around the outer rim of the disk, as shown at 27 in Fig. 3. The composite structure thus formed is provided with a central opening 28, which illustrates the simplest means for permitting attachment of this disk to a supporting and driving shaft.

From the above it will be apparent that I have provided an abrasive disk which will have the desired degree of flexibility to permit the same to bend and flex while at the same time being capable of withstanding alternate bending or flexing at a high rate of speed and without the separation of one layer of the composite material from another. It will also be noted that by reason of the pad of felt provided for the abrasive material a cushioning effect will be produced in the operation of the device, thereby eliminating the necessity for a cushioning pad of rubber or the like herefore used with devices of this character.

A further feature of this construction is that the pad may be resurfaced from time to time as the abrasive is worn therefrom in the use of the pad. This is a feature which has not been possible heretofore used with devices of this character.

It is believed that my invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood from the foregoing without further description and should also be manifest that while preferred embodiments of the invention have been shown and described for illustrative purposes, the structural details are necessary capable of wide variation within the purview of my invention as defined in the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

1. A composite surfacing disk comprising a pad of compressible material which had been compressed and stitched to form a relatively stiff and rigid element, a sheet of cloth secured to said pad both by stitching and adhesive extending over its entire area, and a coating of grains adhesively secured over the facing surface of said cloth and over the outer edge of said pad.

2. A composite surfacing disk, comprising a pad of compressible material which had been compressed and stitched to form a relatively stiff and rigid element, a coating of adhesive substance applied to said element and extending over the entire surface of one face thereof and the outer periphery thereof, and a coating of grains adhesively secured to said adhesive coating to cover the entire area thereof, including the outer periphery of said element.

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